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Leveraging intersections in management theory and practice

10-11 June 2021

Electronic Conference Proceeding

Extended Abstracts

edited by

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To the reader,

this volume contains the *extended abstracts* of the Sinergie-SIMA 2021 Management Conference, hosted online by the University of Palermo on 10-11 June 2021.

The legitimacy of management scholars in society increasingly rests on their ability to create social and economic value by finding solutions and offering effective and timely guidance to decision makers in firms and institutions. This is especially true in face of the extraordinary economic, societal, health and environmental challenges that firms and governments are currently facing worldwide, also as a consequence of the COVID-19 pandemic.

The purpose of the Conference was to discuss about the enhancement of the intersections between theory and managerial practice, calling attention to the many challenges to which impactful studies about the most challenging aspects firms and managers are tackling today need to provide an answer.

These challenges encompass the bridging of different disciplines, theories, methods, levels of analysis and, in particular, the intersections between theory and practice.

The Conference call for papers gave the opportunity to submit either an *extended abstract* or a *full paper*. Overall, the editorial staff received 114 *extended abstracts* and 52 *full papers*.

For the *extended abstracts*, the evaluation of the submissions was carried out by the Conference Chairs and the Scientific Committee, on the basis of their consistency with the Conference topic and/or with management studies, according to SIMA Thematic Groups. The clarity and (even potential) relevance of the contributions were evaluated, as well.

For the *full papers*, the evaluation followed the peer review process, with a double-blind review performed by two referees - university lecturers, expert about the topic - selected among SIMA and the community of Sinergie members.

In detail, the referees applied the following criteria to evaluate the submissions:

- clarity of the research aims,
- accuracy of the methodological approach,
- consistency of the contents with the Conference topic/tracks and/or with management studies,
- contribution in terms of originality/innovativeness,
- relevance in relation to the Conference topic/tracks and/or with management studies,
- clarity of communication,
- significance of the bibliographical basis.

The *peer review* process resulted in full acceptance, acceptance with revisions or rejection of the submissions. In the case of disagreement among reviewers' evaluations, the decision was taken by the Conference Chairs. Each work was then sent back to the Authors together with the referees' reports to make the revisions suggested by the referees.

The evaluation process ended with the acceptance of 42 *full papers* and 107 *extended abstracts*, which were published in two distinct volumes.

All the *extended abstracts* published in this volume were presented and discussed during the Conference and published online on the web portal of Sinergie journal (www.sijm.it).

While thanking all the Authors, Chairs and participants, we hope that this volume will contribute to advance knowledge about the enhancement of the intersections between theory and managerial practice.

The Conference Chair and Scientific Coordination

Sandro Castaldo, Arabella Mocciaro Li Destri, Marta Ugolini, Lara Penco

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The spotty progress of neuroscience in the management fields: evidence from bibliometrics and topic modeling techniques

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Objectives. Neuroscience has become an increasingly popular lens for studying questions of interest for management (Becker and Cropanzano, 2010; Camerer et al., 2005; Senior et al., 2011). On the ground of the consideration that management would be more impactful if it takes into account the complexity and multifaceted nature of the humans (Hitt et al., 2007), scholars and researchers have found in neuroscience the ‘tools’ to understand the roots of human decision-making and the basis of differences that naturally exist among individuals (Dimoka, 2012; Massaro and Pecchia, 2019; Plassmann et al., 2012; Shane et al., 2020). Additionally, since neuroscience investigates biochemical processes that directly reflect mental activity before conscious interpretation (Lindebaum and Zundel, 2013), management has derived that individuals who make decisions in social and economic contexts do not behave as ‘simple’ rational beings, and unconscious processes partially (or totally) hidden to self-conscious have much greater relevance than previously thought.

Thanks to these novel perspectives and means, management scholars have acquired the ability to understand the processes that guide decisions (Hannah et al., 2013), as well as those that determine moral judgment (Reimann et al., 2012), respect for ethical norms or ability to control (or not to control) automatic impulses (Lieberman, 2007). At the same time, some scholars have highlighted that neuroscience reductionism, which makes ontological claims about the constitutive relationship between brain processes and human decision-making, can be problematic because “the properties and processes that makeup one level of analysis do not strictly correspond to properties and processes operating at another level” (Lindebaum and Zundel, 2013: 871). Concerns about the real possibility to infer decision-making processes from neural data (Healey and Hodgkinson, 2014) or the lack of reliability due to the considerably smaller sample sizes than those used in traditional management research studies have risen as well (Niven and Boorman, 2016; Ward et al., 2015).

Beyond extreme mania or skepticism toward adopting neuroscience by management, neuroscience has experienced spotty progress in management. What is becoming clear is that neuroscience may help us unveil some of the mysteries surrounding the human brain and, thus, the decision-making processes of managers, entrepreneurs, and consumers. At the same time, much remains to be done as neuroscience over time has narrowed on specific approaches to management research areas and topics as well as on particular neuroscience tools, especially functional magnetic resonance imaging (fMRI).

Actually, little retrospective work on the evolution of neuroscience in management fields has been made so far. Accordingly, in this paper, we address the following questions: “What are the factors that have constrained the diffusion of neuroscience in management fields? What kind of approach should management adopt to use neuroscience in a more impactful way?”

Methodology. To identify the factors that have limited the progress of neuroscience in several management fields and suggest a new approach that can overcome those limits, we will combine two methods: bibliometrics (Zupic and Čater, 2015) and topic modeling (Hannigan et al., 2019). The use of mixed methods can provide a better understanding of research phenomena and complex events than either approach alone (Edmondson and Mcmanus, 2007; Molina-Azorin, 2015; Turner et al., 2017). We apply both of them with dual intent. From one side, we aim at elaborating the results of one method with the findings from the other method; from the other side, we apply different approaches to different inquiry components. In more detail, we use bibliometrics to map the spotty evolution of neuroscience literature in management. We apply topic modeling to uncover the different neuroscience topics and how the interest in those topics has evolved along the way.

We started our research by selecting the documents representing the neuroscience literature in the management fields. We searched the areas of business, management, and economics studies from 2000 to 2020 for English articles

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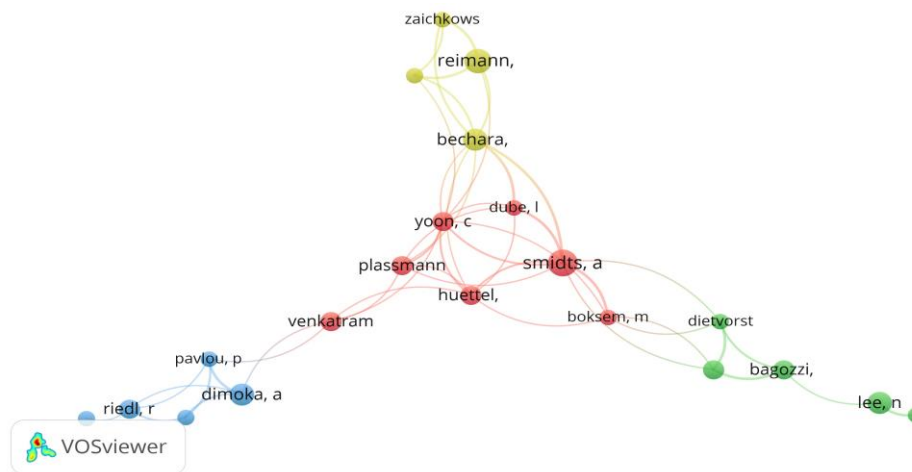
and book chapters containing the keywords “neuroscien*”. We took articles and chapters from the Science Citation Index (SCI) and Social Science Citation Index (SSCI) databases from the Web of Science Core Collection on November 11, 2020. The search strategy has produced 151 papers that represent our final sample.

Findings. We used bibliometrics to filter the pool of documents found in step 1 to more influential authors and publications. To do so, we used a software package. We decided on VOSviewer, which is based on Van Eck and Waltman (2006) VOS algorithm. The visualization of similarities (VOS) algorithm pictures connections between objects (i.e., co-occurrence and citations). VOS’s objective is to provide a low-dimensional visualization in which items are located so that the distance between any pair of objects reflects their similarity as accurately as possible (van Eck & Waltman, 2010).

Co-authorship. We sifted through the authors to identify the most impactful of them by setting a threshold of a given number of published documents and citations per author. Given that we sought both rigor and richness in the results, we set a cut-off value at 3 for published manuscripts and 30 for local citations as meaningful trade-offs for the author visualization. Of the 379 authors belonging to our sample, 28 meet the thresholds. Figure 1 shows graphically the networks of relationships for authors as produced by VOSviewer. The map consists of four clusters of co-authors.

Cluster 1 (i.e., red-colored one) is composed of 7 authors. Smidts A. shows the highest total link strength (7 documents and 8 links). He is followed, respectively, by Yoon C. (4 documents and 9 links), Huettel S.A. (4 documents and 7 links), Plassmann H. (4 documents and 6 links), Booksem M.A.S. (3 documents and 5 links), Dube L. (3 documents and 5 links) and Venkatraman V. (4 documents and 5 links). The themes upon which these scholars collaborate relate to the marketing area and are specifically concerning consumer decision making and individual preferences. Cluster 2 (i.e., the green-colored one) is composed by 5 authors. Verbeke WJMI shows the highest total link strength (4 documents and 4 links). He is followed, respectively, by Dietvorst R.C. (3 documents and 4 links), Bagozzi R.P. (3 documents and 4 links), Lee N. (5 documents and 2 links) and Senior C. (3 documents and 1 links). Within this cluster, scholars position their works at the intersection between marketing and management area. Actually, the focus is on customer orientation and theory of mind. Cluster 3 (i.e., the blue-colored one) is composed by 5 authors. The most impactful author of the group is Dimoka A. with 5 documents and 4 links. She is followed by Pavlou P.A. (3 documents and 4 links), Davis F.D. (3 documents and 3 links), Riedl R. (4 documents and 4 links) and Kenning P. (3 documents and 1 link). Scholars focus on information systems research area and their research pertain with functional neuroimaging tools, such as FMRI or EEG. Cluster 4 (i.e., the yellow-colored one) is composed by 4 authors. Bechara A shows the highest total link strength (5 documents and 8 links). He is followed, respectively, by Reimann M (6 documents and 4 links), Castano R (3 documents and 4 links) and Zaichkowsky J (3 documents and 3 links). Also in this cluster, the themes upon which these scholars collaborate are related to marketing area. Their specific focus is on how customers relate to brands.

Fig. 1: Visualization of author networks



Keywords co-occurrence

A pool of 493 authors keywords was drawn from 151 publications. A threshold of 5 was chosen as the minimum number of occurrences of a keyword. Of the 493 authors’ keywords, 21 meet this condition. Figure 3 visualizes the co-occurrence network of authors’ keywords. VOSviewer has grouped the keywords into five clusters. The clusters’ size ranged from 6 items in Cluster 1 (i.e., the red-colored one) to 3 items in Cluster 5 (i.e., the yellow-colored one). The most occurred word is “neuroscience” (75) which is mainly used with the words “cognition” (5) and “emotions” (5). It is followed by “consumer neuroscience” (32) that is used in association with neuromarketing (19) and neuroimaging (5). Attention is also given to neuroscience tools, especially in terms of “fmri” (17) - which is used in association with “organizational neuroscience” (11), “leadership” (8), “empathy” (5) and “social neuroscience” (5) - and “functional magnetic resonance” - which is used in connection with “neuroeconomics” (12), “decision making” (7), “decision neuroscience” (7), “emptions” (5) and “marketing” (5).

it would happen by chance. Our sample consisted of 616,417 words. The longest paper was made of 10,719 words. To identify the main topics of neuroscience literature, we relied on MITAO (Heibi et al., 2019), a Python based user friendly interface developed at the University of Bologna, that relies on the NLTK and Gensim libraries, which are regularly used to perform topic modeling (Hannigan et al., 2019).

Topic 1 - Neuroscience contribution to management fields. This is the most diffused topic in the sample documents and refers to the general added-value of neuroscience research methods, theories and paradigms within management scholarship. Accordingly, the most used words shaping the meaning of this topic are “brain”, “research” and “neuroscience” and documents that focused on it address themes related to marketing (e.g., Lee et al., 2007), economics (e.g., Martins, 2011; Pykett, 2013), and organization (e.g., Guyard and Kaun, 2018).

Topic 2 - Decision-making. This is the topic explicitly concerned with the decision-making process. As this regards, neuroscience lens is used to (a) uncover the hemispheres of the brain that are involved in the cognitive processes (et al., 2015); (b) to introduce eye tracking as an insightful experimental tool for digging deeper in the process of acquiring and treating information (Zuschke, 2020); and (c) to examine how achievement priming influences individual cognition leading to changes in individual behavior (Minas et al., 2018). Again “brain” is one of the most used words used in this topic and it is associated with words that explicitly concern decision making such as “data”, “information” and “decision”.

Topic 3 - Brand. The third topic relates to issues such as communication and brand. Specifically, the studies that are mainly composed of this topic focus on (a) single-neuron approach to effectively communicate with consumers (Cerf et al., 2015); (b) the psychological and neurophysiological mechanisms of how consumers relate to their beloved brands (Chen et al., 2015; Plassmann et al., 2012); and (c) neural measurements to predict future choices of consumer products (Telpaz et al., 2015). The words that mostly contribute to shaping this topic are “brand”, “study”, “neural”, “consumer”, “choice” and “responses”.

Topic 4 - Organizations. In the documents mainly constituted by the topic concerning organizational neuroscience, the authors pose two different kinds of questions: (1) To what extent does neuroscience inform organizational research? (Lindebaum, 2016; Waldman et al., 2019); (2) Does brain activity examination allow to uncover what causes and constitutes ‘good’ leadership? (Lindebaum and Zundel, 2013; Waldman et al., 2011). In answering those questions, authors use words such as “brain”, “research”, “neuroscience”, “organizational”, “leadership”, “study”, “participants”, “human”, “activity” and “behavior”. Interestingly, “gender” appears as the last word depicting this topic, thus delineating an emerging interest toward this research area.

Topic 5 - Consumer neuroscience. Topic number 5 deals with customer neuroscience. Specifically, documents that are mainly composed of this topic look at: (a) the effect of curiosity on indulgent consumption (Wiggin et al., 2019); (b) the neural processes that underlie group creativity (Paulus et al., 2010); and (c) how cognitive neuroscience contributes physiologically to adult learning (Hagen and Park, 2016). Accordingly, the most used words are “research”, “brain”, “cognitive”, “neuroscience”, “social”, “data”, “tools”, “curiosity”, “studies” and “information”.

Topic 6 - fMRI. Topic 6 focuses on functional Magnetic Resonance Imaging (fMRI) that is the most frequently employed procedure in neuroscience studies. Documents mostly composed by this topic: (a) outline the set of guidelines for conducting functional Magnetic Resonance Imaging (fMRI) studies in social science (Dimoka, 2012) and (b) represent tool applications (Dimoka, 2010; Shane et al., 2020). The most used words to represent the topic are “trust”, “distrust”, “data”, “studies”, “subjects”, “processes” and “intelligence” but also words more connected to brain science such as “cognitive”, “mental” and “cortex”.

Topic 7 - Leadership. Topic 7 concentrates on culture and leadership. Works built upon this topic relate such as to leaders’ complexity and adaptability (Hannah et al., 2013), inspirational leaders (Molenberghs et al., 2017) and transformational and adaptive leadership (M. Juhro and Farid Aulia, 2018). Most used words are “brain”, “research”, “leadership”, “neuroscience”, “study”, “neural”, “group”, “leader”, “cultural” and “culture”.

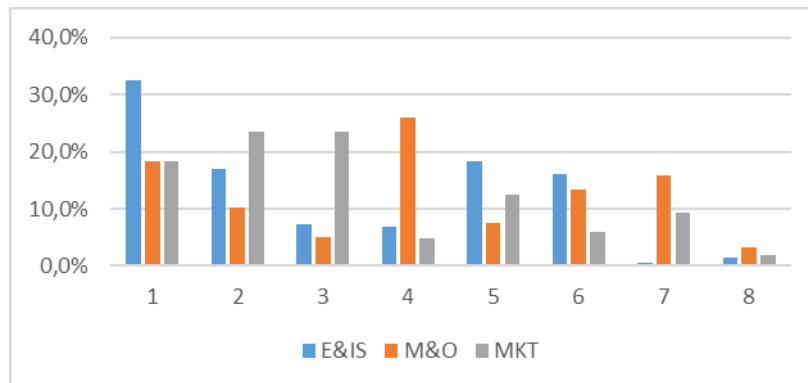
Topic 8 - Emotional Intelligence. This is the least diffused topic among sampled documents. Researchers grounding their work on this topic concentrate on emotional intelligence and, specifically, on the need of leaders for emotional intelligence (Antonakis et al., 2009) and the role of emotions in decision-making (Hedgcock and Rao, 2009; Rampl et al., 2016). Accordingly, the most used words are “emotional”, “activation”, “emotion”, “leadership”, “intelligence” and “choice”.

We went further and analyzed to what extent the eight selected topics developed over the different management fields. On the ground of the bibliometrics results, which depicted in the previous section essentially uncover the three different research areas around which neuroscience literature has developed, we attributed the documents to one of the following categories: (a) marketing; (b) economics & information system; and (c) management & organization. We conducted this phase drawing from the 2018 Academic Journal Guide of the Chartered Association of Business Schools. For journals that were not listed in the guide, we consider the description declared on the websites. For journals not clearly classifiable because oriented to general management thematic or simply sectorial thematic, we deemed the articles’ content itself.

We thus obtained that in our sample (a) 60 documents are related to management and organization area (M&O) (total counts of citation are equal to 1,387; average citations per document is equal to 23,11); (b) 57 documents are related to marketing area (MKT) (total counts of citations are equal to 1,785; average citations per document is equal to 31,875); (c) 27 documents are related to economics and information systems (E&IS) (total counts of citations are equal to 848; average citations per document is equal to 31,4).

As regards the average use topics by each research area, Figure 4 reveals that research on E&IS mostly concentrates on topic 1, namely neuroscience contribution to management fields. Whereas M & M&O emphasized topic 4, namely organizations, MKT primarily focused on topic 2, namely, decision-making, and topic 3, namely brand. Additionally, it is worth noting that E&IS is completely absent in topic 7, that is, leadership.

Fig. 7: The average use of topics by research area



Research limits. Besides making important contributions to the extant research, the present study has some limitations derived from the methodological choice we made. The sample selection was based on keyword searches, which may have reduced the search scope. However, although increasing the number of keywords could have improved the sample's content, there is a flip side to the coin. It would have also added noise and made the sample progressively difficult to manage and analyze. Additionally, more investigation and reflections should be devoted to the proposed integrated approach between management and neuroscience so as to replace the reductionist one.

Originality of the study. This research makes a theoretical contribution to neuroscience literature in two directions. Eventually, our review finds that despite come calls to change course, the strict adherence to established neuroscience approaches has left the branch of neuroscience literature unable to impact management. This outcome is then useful to scholars who want to recognize potential new topics and gaps that may help formulate new research questions and position their work in the literature. It is also useful as it drives us to suggest a new integrative approach to adopting neuroscience in management research. Furthermore, the present research makes a methodological contribution as it suggests the combination of different methods to each paper's goal. In so doing, our paper adds to existing reviews on neuroscience, such as by the recently published *Management Research Review* (Chattopadhyay, 2020), in terms of the number of sampled documents and methods used to analyze them.

Key words: neuroscience; management; bibliometrics; co-citation analysis; topic modeling.

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Balancing theory and practice: a review of the state of PLS-SEM research by the community of Italian management scholars

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Objectives. Management researchers have traditionally perceived the need to balance between rigor and relevance, thus simultaneously advancing theory and offering managerial insights. The selection of proper research methods plays a fundamental role. Among them, structural equation modeling (a second-generation technique for multivariate analysis) has witnessed remarkable popularity in the last decades to assess relationships among constructs. There are two main approaches to structural equation modeling: the covariance-based approach (CB-SEM) and the variance-based approach (PLS-SEM). However, until recently, the PLS-SEM has been to a large extent ignored and many scholars have considered structural equation modeling as synonymous with CB-SEM. In the last decade, PLS-SEM has gained a huge interest from social sciences researchers from all over the world and many management journals (such as *Journal of Business Research*, *European Journal of Management*, and many others) have published special issues on this method. The renewed interest in PLS-SEM has been largely driven by the extensive work of management and marketing scholars such as Joseph F. Hair, Jr., Tomas M. Hult, Christian M. Ringle and Marko Sarstedt (Hair et al., 2017; Hair et al., 2018). Their well-known book about this method [*“A primer on partial least squares structural equation modeling (PLS-SEM)”*] has received more than 20,000 citations in Google Scholar since the publication of its first edition in 2014. Given that the use of this method could support the Italian management scholars to further increase their participation to the international debate on management issues, we recently co-edited the Italian version of this book (Hair et al., 2020). The purpose of this extended abstract is to provide a comprehensive review of the state of PLS-SEM research by the community of Italian management scholars.

Before presenting the research methods and the results, it must be emphasized that CB-SEM and PLS-SEM are appropriate for different research contexts and aims. CB-SEM is a good alternative when the focus of the research is on confirmation (theory confirmation or comparison among theories), while PLS-SEM is particularly useful when the focus is on prediction, such as predicting the key drivers of firm performance or of consumer behaviors. Therefore, the choice between CB-SEM and PLS-SEM must be driven by the specific purpose and approach of the research. As regards the technical aspects, a key difference between CB-SEM and PLS-SEM regards distributional assumptions: CB-SEM requires normally distributed data, while PLS-SEM makes no distributional assumptions. PLS-SEM can also work with small samples and can easily handle both formative and reflective constructs and complex models (with many constructs and relationships).

Based on these premises, in this extended abstract we present a review of the journal articles using PLS-SEM published by Italian management scholars. In particular, we are interested in assessing for what reasons and research purposes PLS-SEM had been selected and preferred over alternative methods.

Methodology. We conducted a systematic search in the database Scopus using the search terms “partial least squares”, “PLS”, and “PLS-SEM” within article title, abstract or keywords (only articles were considered while other types of documents, such as book chapters were excluded from the search). In addition, as this review focuses on the community of Italian management scholars, we set the following additional search criteria: “Business, Management and Accounting” as subject area and “Italy” as country/territory. This search provided 112 entries, which are all the journal articles matching the selected keywords, published by at least one co-author affiliated to Italian universities within the disciplines of Business, Management and Accounting. We then manually inspected each of the 112 documents and excluded those published by scholars of other fields, retaining only those published by scholars of the Italian scientific disciplinary sector 13/B2 – management. We also excluded one article because it applied PLS-regression and not PLS-SEM: while the two methods are similar, they are not equivalent (Hair et al., 2017). Finally, we searched for additional articles in the archive of *Sinergie Italian Journal of Management* (using the same keywords indicated above) and we found one article (Magnani and Zucchella, 2020). Overall, at the end of this process 37 papers were retained and analyzed.

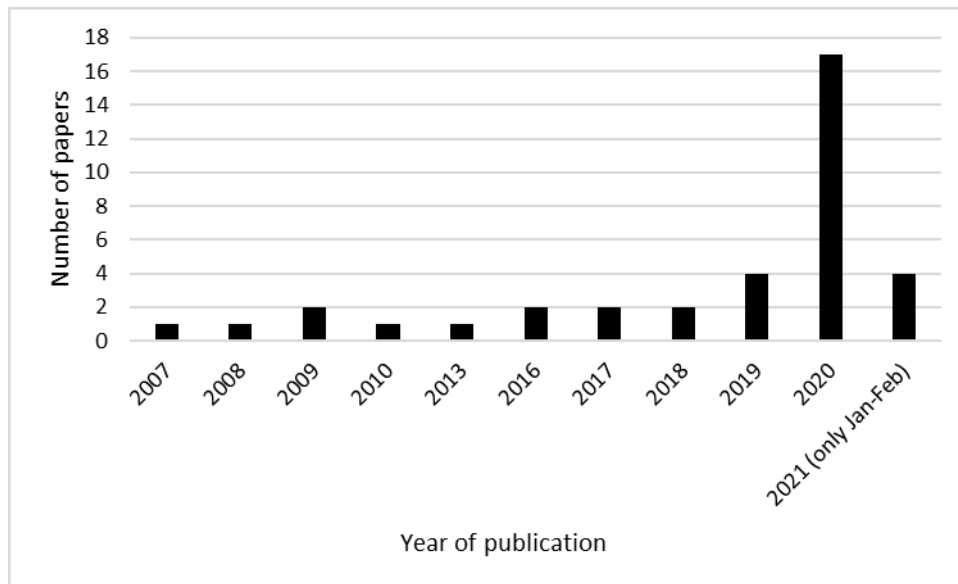
Findings. The small number of retrieved papers indicates that PLS-SEM is not yet a well-established research method among the community of Italian management scholars. However, a remarkable growth has been registered in

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2020, which may suggest the beginning of a new trend (fig. 1). Table 1 also shows the detailed list of journals in which the 37 studies were published.

Fig. 1: Number of PLS-SEM papers published by Italian management scholars



Source: our elaboration

Tab. 1: Journals in which the PLS-SEM studies were published

Journal	Number of papers
British Food Journal	4
Journal of Business Research	4
Industrial Marketing Management	2
Journal of Cleaner Production	2
Journal of Knowledge Management	2
Management Decision	2
Technological Forecasting and Social Change	2
TQM Journal	2
Corporate Social Responsibility and Environmental Management	1
European Journal of Marketing	1
Global Business and Economics Review	1
International Journal of Contemporary Hospitality Management	1
International Journal of Innovation Science	1
International Journal of Operations and Production Management	1
International Journal of Retail and Distribution Management	1
Journal of Consumer Marketing	1
Journal of Entrepreneurship	1
Journal of Intellectual Capital	1
Journal of Retailing and Consumer Services	1
Journal of Service Management	1
Journal of Services Marketing	1
Journal of Technology Transfer	1
Journal of the Academy of Marketing Science	1
Sinergie Italian Journal of Management	1
Sustainability Accounting, Management and Policy Journal	1

Source: our elaboration

We then examined whether and how the papers motivated the choice of PLS-SEM instead of other methods (Table 2). While all the studies provided at least a short description of the PLS-SEM method, 15 of them did not report explicit reasons to motivate the choice of PLS-SEM over other methods (such as, for example, CB-SEM). The remaining studies included multiple motivations. Among them “focus on prediction” and “exploratory research” were the most popular

ones, which indicates a good awareness of the strengths of PLS-SEM. The small sample size was also cited quite frequently. However, it should be remarked that the small sample size per se could not be a sufficient motivation to select PLS-SEM. On this point, it should be additionally noted that some other misunderstandings were found in the application of PLS-SEM, for example the use of some model fit indexes which are appropriate for CB-SEM but not for PLS-SEM.

Tab. 2: Reasons for using PLS-SEM

Reasons for using PLS-SEM	Number of studies
Focus on prediction	9
Exploratory research	8
Small sample size	7
Use of formative constructs	6
Model complexity	5
Distributional issues	4
Provides no reasons for using PLS-SEM	15

Source: our elaboration

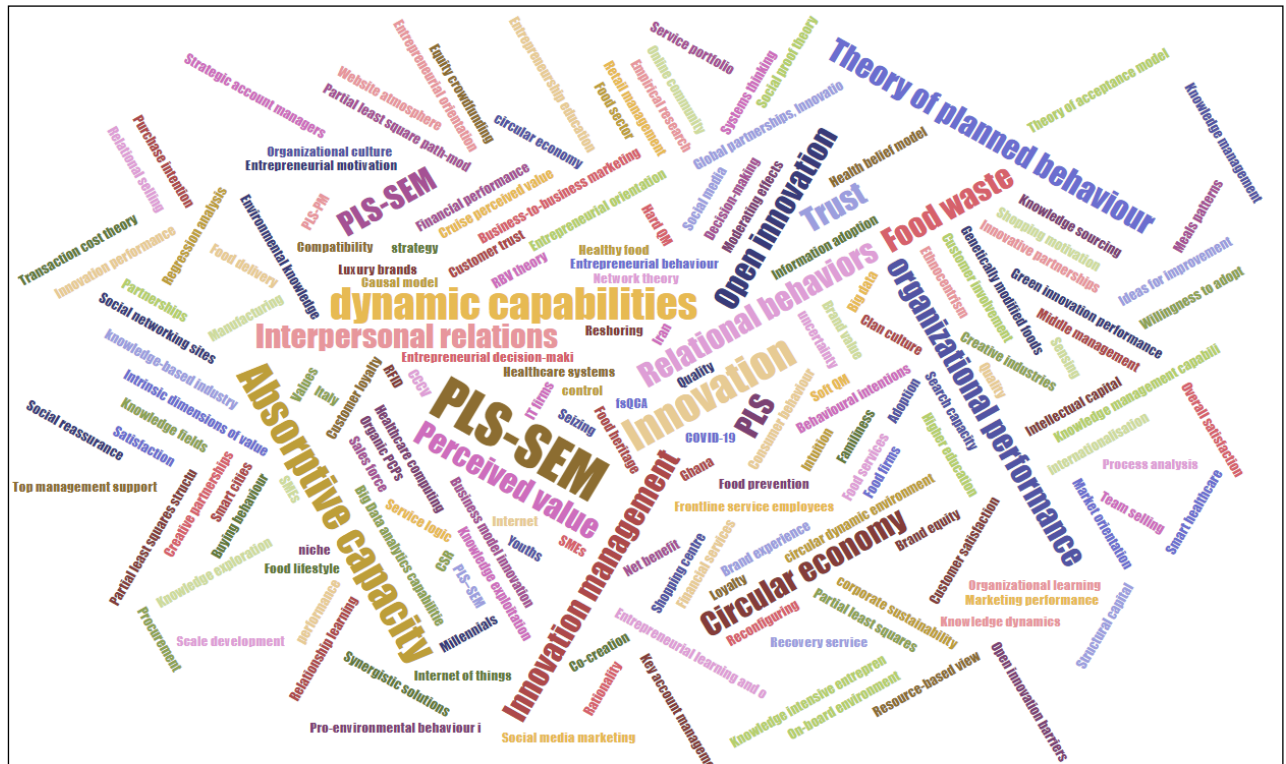
Table 3 summarizes the purposes of the 37 studies, while fig. 2 presents a word cloud of the keywords indicated by the authors of the paper.

Tab. 3: Research purposes/questions

Year	Authors	Research purpose / question
2021	Zollo L., Carranza R., Faraoni M., Díaz E., Martín-Consuegra D.	Drivers of consumers' intention to purchase organic personal care products.
2021	Khan O., Daddi T., Iraldo F.	Effects of dynamic capabilities on circular economy implementation in manufacturing firms.
2021	Ciampi F., Demi S., Magrini A., Marzi G., Papa A.	Relationship between Big Data Analytics Capabilities and Business Model Innovation.
2021	Bhatti S.H., Santoro G., Sarwar A., Pellicelli A.C.	Impact of internal and external factors of social media use by IT organisations on open innovation adoption
2020	Magnani G., Zucchella A.	Relationships between the implementation of a global niche strategy and international performance among SMEs.
2020	Fozouni Ardekani Z., Akbari M., Pino G., Zúñiga M.A., Azadi H.	Factors explaining consumer intentions to adopt genetically modified foods
2020	Khan O., Daddi T., Iraldo F.	Effects of dynamic capabilities on circular economy implementation and firm performance.
2020	Caputo F., Mazzoleni A., Pellicelli A.C., Muller J.	Factors explaining Big Data Companies' Return on Investment (ROI)
2020	Troise C., O'Driscoll A., Tani M., Prisco A.	Drivers of users' intention to use food delivery apps.
2020	Zollo L., Filieri R., Rialti R., Yoon S.	Direct/indirect relationships between social media marketing activities and consumer-based brand equity
2020	Khatami F., Ferraris A., De Bernardi P., Cantino V.	Direct/indirect relationship between food heritage and clan culture among SMEs in the food industry.
2020	Ferraris A., Vrontis D., Belyaeva Z., De Bernardi P., Ozek H.	Direct/indirect effects of creative partnerships on innovation performance in food companies.
2020	Sciarelli M., Gheith M.H., Tani M.	Effects of both soft and hard quality management on innovation and organizational performance in higher education.
2020	Cassia F.	Effects of reshoring decisions on customer-perceived product quality.
2020	Papa A., Mital M., Pisano P., Del Giudice M.	Drivers of attitude and intention to use smart wearable healthcare devices
2020	Bratianu C., Vătămănescu E.-M., Anagnoste S., Dominici G.	Influences of different types of knowledge on the effectiveness of the decision-making process in business consulting firms.
2020	Calza F., Pagliuca M., Risitano M., Sorrentino A.	Direct/indirect effects of cruise on-board environment on behavioral intentions.
2020	Castaldi L., Sepe E., Turi C., Iscaro V.	Effects of experiential learning programs for entrepreneurship education on educational effectiveness.
2020	Martínez-Martínez A., Cegarra-Navarro J.-G., García-Pérez A., Vicentini F.	Drivers of environmental organisational learning in the hotel industry.
2020	Oduro S.	Barriers to SMEs' open innovation adoption
2020	Troise C., Tani M.	Entrepreneur characteristics, motivations and behaviours as drivers of equity crowdfunding campaigns performance.
2019	Ferraris A., Devalle A., Ciampi F., Couturier J.	Effects of global R&D partnerships on innovation performance through search and integrative capacities among SMEs.
2019	Savelli E., Francioni B., Curina I.	Effects of healthy lifestyle on food waste through food waste preventing behavior.
2019	Oduro S., Haylemariam L.G.	Impacts of market orientation on firm performance and the moderating role of CSR.
2019	Cannavale C., Nadali I.Z.	The impacts of different dimensions of entrepreneurial orientation on firm performance.
2018	Merz M.A., Zarantonello L., Grappi S.	Development of a Customer Co-Creation Value (CCCV) scale.
2018	Albort-Morant G., Leal-Rodríguez A.L., De Marchi V.	Internal and external knowledge-based drivers of the firms' green innovation performance.
2017	Scuotto V., Del Giudice M., Carayannis E.G.	Effect of social networking sites and absorptive capacity on SMEs' innovation performance.
2017	Savelli E., Cioppi M., Tombari F.	Effects of web atmospherics on shopping centres' customer loyalty through shopping motivation.
2016	Mondéjar-Jiménez J.-A., Ferrari G., Secondi L., Principato L.	Drivers of intention and positive behavior towards food waste.
2016	Gallarza M.G., Arteaga-Moreno F., Del Chiappa G., Gil-Saura I.	Relationships between four intrinsic value dimensions and value-satisfaction-loyalty.
2013	van der Heijden G.A.H., Schepers J.J.L., Nijssen E.J., Ordanini A.	Relationship between frontline service employees' roles and service recovery quality.
2010	Guenzi P., Georges L.	Antecedents and consequences of customer trust in the salesperson.
2009	Guenzi P., Johnson M.D., Castaldo S.	Effects of the components of customer trust on store patronage.
2009	Guenzi P., Georges L., Pardo C.	Impacts of strategic account managers' behaviors on relational outcomes.
2008	Ordanini A., Rubera G.	The effects of procurement capabilities on performance and the moderating role of internet resources.
2007	Guenzi P., Pardo C., Georges L.	Links between relational selling strategy and key account managers' relational behaviors.

Source: our elaboration

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Source: our elaboration

Overall, the analysis of the research questions shows that PLS-SEM has been mostly applied to identify the drivers of firm's choices, strategies and performance, while in a few studies it was used to understand customer decisions to adopt products and technologies. As the analysis of the keywords highlights, the topics and the research contexts are highly fragmented but capabilities and innovation emerge as themes that are more frequently explored through PLS-SEM.

Research limits. While using a systematic approach to the literature review, the choice to rely only on one database (Scopus) and on the archive of Sinergie Italian Journal of Management may have caused the exclusion of a few journal articles. Moreover, the inclusion of conference papers may enrich the analysis.

Practical implications. *One of the main strengths of PLS-SEM is its ability to balance rigor and relevance, by focusing on prediction. This analysis reveals that the community of Italian management scholars has not yet adopted PLS-SEM on a large scale. This extended abstract encourages scholars to apply PLS-SEM to research questions that can have both theoretical and practical relevance, such as studies that predict firm performance.*

Originality of the study. *This is the first study to analyze the use of PLS-SEM by the community of Italian management scholars. PLS-SEM is quickly gaining large popularity among worldwide management scholars and may further support the participation of Italian management scholars to the international debate.*

Key words: *PLS-SEM; methods; management; structural equation modeling*

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Co-creation of value in Open Innovation: does coopetition matter?

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Objectives. Concepts such as co-creation of value as well as open innovation (OI) have emerged in recent years as paradigms in management, on one hand, and innovation, on the other. The first focuses on the creation and appropriation of value on the part of business companies and their partners and considers an individual perspective; the second concerns knowledge transfer between the firm and third parties to support innovation activities. Accordingly, the work aims to identify the conditions under which open innovation leads to value co-creation, as intended above, and which coopetition settings could eventually emerge co-creating value through OI coupled processes.

Since the very beginning of the 21st century, the perspective adopted in the research on firm value creation has partially changed, and has concentrated more on actors operating outside the firm as contributors to value creation (Prahalad and Ramaswamy, 2000), has clearly distinguished value creation from value appropriation in several past management theories, and has defined value creation as the creation of new wealth for both the firm and the environment in which it operates (Mocciaro Li Destri and Dagnino, 2005), considering that value creation could be not separate from value capture in that “ontologically value is created and only manifests itself as value captured” (Pitelis, 2009, p. 9). It is to be noticed that 2004, in particular, is to be considered central to the issue discussed in the present work. In that year, in fact, two different streams of literature started to focus on co-creation of value, the first one following a strategic perspective (Prahalad, 2004), and the second one issued in the marketing literature domain (Vargo and Lusch, 2004). These two approaches don’t converge under different profiles due to their different background even if some common traits, as well as some distinctive characteristics could be identified (Aquilani and Abbate, 2015). In this paper we will only consider the strategic perspective, thus we will follow the theoretical approach proposed by Prahalad and Ramaswamy to value co-creation focusing on “the wealth-welfare-wellbeing of all individuals” (Ramaswamy and Ozcan, 2014, p. 284), and leading to a socioeconomic view of value which overcomes the distinction between the “human” and the “economic” (Leavy, 2014, p. 13).

Chesbrough’s 2003 seminal work on open innovation defined it as “a distributed innovation process based on purposively managed knowledge flows across organizational boundaries, using [pecuniary and non-pecuniary] mechanisms in line with the organization’s business model” (Chesbrough, 2003; Chesbrough and Bogers, 2014, p. 27). This open model concerning innovation illustrates three different processes that can be carried out to enhance and support knowledge flows among partners which, in turn, can contribute to innovation processes and by consequence also affect value creation. Considering the extant literature, it is clear that open innovation processes can lead to value co-creation. Conversely, value co-creation more often emerges in those innovation activities, carried out with partners, which are at the very core of both the firm success and its ability to create and shape new “liquid” markets (Normann, 2002).

According to this perspective, a first research question emerges: under what conditions open innovation can lead to the co-creation of value?

In both domains of co-creation of value and open innovation a central issue is represented by the collaboration among partners. As practice demonstrates, partners could have fully or partially overlapping goals, as a consequence coopetition issues arises and a new research questions emerge: which coopetition settings can be identified in the process of value co-creation through OI processes?

This second research question, focused on coopetition, has been long underestimated by the literature, even if it represents a key issue both in open innovation processes and in value co-creation. Moreover, the individual perspective characterizing value co-creation following a strategic perspective makes it possible to bridge the gap between research on value co-creation and the individual level of coopetition. This latter, in particular, has been only partially developed and shows its weakness in a more in-depth analysis of the coopetition outcomes, other than knowledge sharing and group/team performance (Baruch and Lin, 2012; Enberg, 2012), and the study of how these outcomes could influence coopetition outcomes both at an organization and an inter-organizational level (Bengtsson and Kock, 2014).

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Methodology. Along with a brief literature review on value co-creation following a strategic perspective, open innovation processes and coopetition basic issues, this paper presents a discussion on the two research questions that are trying to design a first model of coopetitive setting emerging in value co-creation through OI processes.

Findings. “The co-creation view starts with interactions as the locus of value and platforms of engagements with individuals are the locus of value creation, and co-creative enterprises follow a single principle: they focus their entire organization on the engagements with individuals” (Leavy, 2014, p. 11). This statement explains the true essence of the co-creation of value following a strategic perspective with a clear focus on individuals and on the experience-mindset required to co-creative enterprises, a key role played by engagement platforms developing in the firm ecosystem. Indeed, the perspective adopted is that of the experience domain which can be defined as “a stratum of individual involvement, events, contexts, and meaning, whose configuration of experiences embodies actualized outcomes in value creation. Experience domains span environments of interactions afforded by engagement platforms” (Ramaswamy and Ozcan, 2014, p. 53, 2018). According to this approach, value is based on human experiences (Prahalad and Ramaswamy 2004a; Ramaswamy and Gouillart, 2010a; Ramaswamy and Ozcan, 2014) generated by “collaborative, dynamic, contextual, and generative human interactions at the core” (Ramaswamy, 2011, p. 196). Moreover, individuals are called to play an active role enabling interactions which develop on engagement platforms (Prahalad and Ramaswamy, 2003, 2004b). Engagement platforms are essential to this process not only because they are the locus of interactions, and therefore the “locus of value creation” (Leavy, 2014, p. 11), but also because they represent the necessary infrastructure for individuals interaction as they include “persons, processes, interfaces and artifacts” (Ramaswamy and Ozcan, 2014, p. 284, 2018). Co-creation is a long term perspective, based on the engagement of all individuals, in which value is continuously created by all actors participating in the co-creation processes and is captured by all of them at the same time but under different forms, i.e. psychological or economic benefits (Ramaswamy and Gouillart, 2010b; Saarijärvi et al., 2013). Therefore, co-creation has been defined as “both the means and the end, in a continuous cycle” (Ramaswamy and Gouillart, 2010a, p. 29) leading to a “win more-win more” result (Ramaswamy and Ozcan, 2014). In this context the firm plays the role of an interaction “facilitator” (Ramaswamy, 2011) which can build the engagement platform enabling various potential interaction forms, but which could not control the co-creation process or guide it to pre-defined and/or some desired goals (Bhalla, 2010). As a matter of fact, the firm’s attempt to take advantage of the co-creation activities could lead to a lower sense of community because of the lack of perceived trust; to a lower desire to collaborate and to enhance and support creativity, due to the motivation loss experienced by individuals preoccupied made by the firm judgment about their contributions; therefore, the control exerted by the firm over the co-creation process could lead to the loss of all co-creation benefits (Ind et al., 2013).

Open Innovation (OI) implies that R&D processes are no longer completely developed inside the firms’ boundaries but thanks to the contribution of external partners, especially in terms of knowledge transfer between the firm and other actors distributed worldwide (Enkel et al., 2009; Gassmann et al., 2010). OI literature has mostly focused on OI characteristics (Chesbrough 2003; Dahlander and Gann, 2010; Chesbrough and Bogers, 2014), OI processes (Enkel et al., 2009), OI opportunities arising from the effective implementation of this new approach (Chesbrough et al., 2006), benefits (Helfat, 2006), challenges faced by firms willing to adopt this innovation paradigm (van de Vrande et al., 2009; Sieg et al., 2010), business models able to effectively implement OI (Chesbrough, 2006).

In this paper, only basic OI processes insights will be briefly reviewed. OI processes develop in three different directions: outside-in, inside-out and coupled (Enkel et al. 2009). Outside-in processes consider that firms’ R&D activities could be supported and/or enhanced thanks to knowledge pertaining to various external partners, also using interconnected innovation networks, customer integration forms (e.g. crowdsourcing), Open Innovation Intermediaries (Enkel et al., 2006; Aquilani et al., 2015, 2017) that have been created with the aim of facilitating and supporting firms also in their search for new and/or complementary knowledge, and whose services are deemed to each firm’s need (Aquilani and Abbate, 2013). Inside-out processes are realized to bring ideas and technologies outside the firms’ boundaries on the market (Enkel et al., 2009). Among the forms used to realize such processes it is possible to identify: the creation of new ventures (Enkel et al., 2009), the design of new business models or the creation of spin-offs (Chesbrough, 2006), the commercialization of ideas and technologies, developed inside the firm, outside its boundaries realizing the so-called “cross-industry innovation” (Enkel and Gassmann, 2010), taking advantage of the learning processes involved in these processes (Lichtenthaler and Ernst, 2008). Outside-in processes have always been considered as the most frequent implemented ones (Chesbrough and Crowther, 2006; Schroll and Mild, 2011), even if a recent study carried out in the bio-pharmaceutical sector shows that even if the number of OI processes is equal for the above mentioned processes, revenues, in that specific industry, are higher for inside-out processes than for outside-in processes (Michelino et al., 2014).

Coupled processes consider that inside-out and outside-in processes are run simultaneously (Ramaswamy, 2009) and therefore the involved partners actively collaborate and cooperate (Enkel et al., 2009) generating a continuous flow of knowledge among them. Existent contributions in this domain generally state that only coupled OI processes can lead to value co-creation (Ramaswamy and Ozcan, 2014, 2018), though a recent contribution in the OI domain has shed new light on OI coupled processes and has identified four key dimensions (Piller and West, 2014): the nature of the external actor (firms, other organizations, individuals), the coupling topology (dyadic, network, community), the impetus for collaboration (top-down, bottom-up), the locus of innovation (bidirectional, interactive). These dimensions would help answer the first research question proposed in this paper.

Coopetition can be basically understood as “a dyadic construct that represents the nature of the interdependences between any pair of firms interacting on the basis of partially overlapped private interests”, while an ongoing and

uncertain environment change, coupled with the knowledge structure of the firm dyad, triggers the coopetitive dynamics (Padula and Dagnino, 2007, p. 47). This definition of coopetition highlights two important questions. The first relates to the private interests which can be only partially overlapped, as for example in Brandenburger and Nalebuff studies (1996); the second assumes that negative interdependencies - competitive dynamics - have to be taken into consideration because relevant in the attempt to take advantage of positive interdependencies - collaborative dynamics (Dagnino, 2007; Padula and Dagnino, 2007).

Simultaneous, though opposite, generating tensions are to be considered in coopetition, cooperation and competition (Tidström, 2014). Coopetition not only develops in inter-firm relationships, but also at an individual and organizational level (Bengtsson and Kock, 2014). For firms, inside those levels and among them, tensions could emerge, related to the emotive ambivalence resulting from opposite emotions. The coopetition paradox, therefore, emerges creating external barriers, as a result of internal collaboration, and internal barriers, due to divergent forces (Raza-Ullah et al., 2014). The above mentioned tensions emerge when the involved actors become aware of the coopetition paradox and directly experience both its positive and negative effects. (Raza-Ullah et al., 2014).

In coopetition various settings are responsible for the balance between value creation and value capture. Such an issue has been studied considering coopetition as a win-win relationship, but only at an inter-firms level and especially in the strategic alliance domain (Brandenburger and Nalebuff, 1996; Cairo, 2006; Clarke-Hill et al., 2003; Gnyawali and Park, 2011). Coopetition studies, at individual level, are still at an early stage when compared to literature relating to the inter-firm level, even if this approach could help bridge the coopetition studies with value co-creation and open innovation literature.

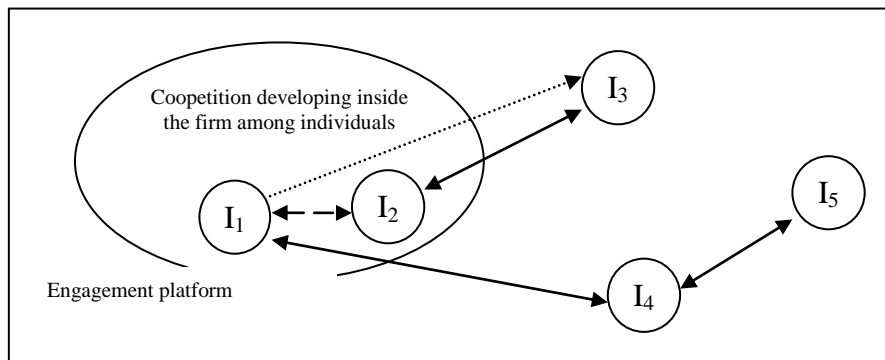
In this proposal we only focus on coopetition when value co-creation is realized through OI processes, and try to answer the above mentioned questions. The first step towards this aim is to understand when/under which conditions value co-creation, following a strategic perspective, is realized through OI processes.

Given the above scenario, it becomes clear that to co-create value in OI processes coopetition dynamics develop firstly at an individual level.

Research in this particular field has been carried out only considering individuals inside organizations and coopetitive dynamics shaped, for example, by competition for carrier and/or new job positions when trust among colleagues exist (Poulsen, 2001) (I1 and I2 in Figure 1). Although, in order to design the coopetition setting deemed to value co-creation through OI coupled processes, individuals outside the firm have to be considered, adding more complexity. In fact, we believe that coopetitive settings inside the firm don't disappear when considering coopetition dynamics leading to co-creation of value through OI coupled processes. Coopetition would so develop inside the firm and with individuals outside its boundaries and each of this dynamic is able to influence the other. Considering the new setting, in fact, an additional motive for competition among individuals inside the firm could be represented by the involvement of a valuable external individual (I3), when these same individuals still collaborate to reach their team goal and obtain a team incentive/reward. From another perspective, an established collaboration of one individual inside the firm with and individual outside the firm could make the individual compete with a colleague, but also bring inside the firm new knowledge/ideas which can be shared if trust exists, leading to new forms of collaborative work inside the company.

A third approach is based on coopetition developing outside the organizational boundaries among individuals interacting on engagement platforms which can share their overlapping interests with other individuals also operating on this platform which can/cannot (I1, I4 I5) consider a specific coopetition setting with a firm (I4 and I5). This last scenario can more possibly emerge when the engagement platform is not created by a firm or a firm joins in at a certain point of its development, or when new individuals join the engagement platform making the co-creation activities develop following new trajectories.

Fig. 1: Some possible coopetition settings emerging in value co-creation through OI processes



Research limits. Main limitation of this work is the lack of empirical validation, even if this contribution represents an attempt to a better understanding of coopetition dynamics in value co-creation processes through OI. Various new avenues of research have emerged in the paper, but the most relevant seems to be the need to include coopetition issues

in value co-creation and OI processes understanding. Furthermore, another promising direction for future research can be represented by the study of the outcomes of this coopetition dynamics for the OI coupled processes realized.

Practical implications. This paper offers some theoretical and practical contributions: (i) it bridges value co-creation and open innovation literature proposing a more in-depth analysis on the conditions leading to value co-creation in OI coupled processes; (ii) it briefly points out that coopetition dynamics are important for both value co-creation and open innovation, in spite of the minimum critical attention devoted to the subject; (iii) it, further, represents a first attempt to understand which type of coopetition is involved in co-creation of value and which coopetition sets could emerge when individuals compete inside and outside firm boundaries on engagement platforms to co-create value implementing OI processes. From a managerial point of view, the issues briefly discussed in this paper are important to better understand how interactions leading to value co-creation can be shaped also considering coopetition issues which exist, and can be really relevant, though their value has long been largely underestimated.

Originality of the study. The work aims to consider aspects that have been neglected in previous studies but which are equally important in supporting innovation processes and in creating better conditions to properly implement the co-creation of value. In particular, the originality of the study lies in the attempt of bringing out the conditions under which open innovation can lead to value co-creation and of highlighting which coopetition dynamics could eventually emerge co-creating value through OI coupled processes.

Key words: open innovation; value co-creation; coopetition; open innovation processes

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Forming an Ecosystem through an Incumbent's Strategic Transformation

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Objectives. *Technological innovation and competitive pressure can let incumbent firms suffer and disband or push them to transform in order to regain a competitive advantage (Agarwal and Helfat, 2009; Eggers and Park, 2018). In each case, incumbents can face severe hurdles because of strategic and organizational implications of change (Ahuja and Novelli, 2016; Baden-Fuller and Volberda, 1997; Capron and Mitchell, 2009; Volberda, Baden-Fuller and van den Bosch, 2001; Warner and Wäger, 2019). In particular, over the last decade the diffusion of digital technologies has oriented most of the research on strategic transformation towards the understanding of their main implications for incumbents in terms of erosion of first-mover advantages (Lanzolla and Giudici, 2017), manufacturing and supply chain management (Aversa et al., 2020), resource integration (Skylar et al., 2019), definition of identities and mindset (Anthony and Tripsas, 2016; Kammerlander, König, and Richards, 2018), design of the business model (Caputo et al., 2020; Cennamo et al., 2020; Bradley and O'Toole, 2016) and formation of an ecosystem (Ansari, Garud, and Kumaraswamy, 2016; König, Schulte, and Enders, 2012; Srinivasan and Venkatraman, 2018). Today, technological innovation and competitive pressure push incumbent manufacturers to transform into hybrid service providers making servitization one of the most relevant drivers for value creation. Literature acknowledges the relevance of a business model innovation based on servitization to achieve a competitive advantage, especially whereas firms need to expand their value proposition by adding customized services to their core business (Brax and Visintin, 2017). Manufacturing firms have indeed focussed on the combination of the traditional and mainly standardized artefacts with a set of advanced and customized services, often extending responsibilities and regular revenues payments, and making their offerings more complex (Baines and Lightfoot, 2013; Cenamor et al., 2017). Servitization trajectories affect, however, the long-term prospects of firms as changes in strategic and organizational aspects may become necessary to drive the change. Despite the scale and implications of the phenomenon, literature provides scant evidence of the process and main implications of shifting from a product-based to a solution-based business model. A more recent literature has investigated servitization applying an external perspective to ecosystem formation. Skylar et al. (2019) look at the interactions of interfirm and intrafirm change processes and their embeddedness in the ecosystem of a firm implementing servitization strategies. This perspective examines ecosystems for servitization through multi-actor lenses and emphasizes the systemic and contextual aspects together with the interactions between actors (Edvardsson, Tronvoll, and Gruber, 2011; Vargo and Lusch, 2011). The empirical analysis presented by Skylar et al. (2019) shows that the stronger the intra-firm relational embeddedness, the more the central actor is incorporated internally and is able to influence, combine and control resources and capabilities of the corporate counterparts. Moreover, actors lacking intra-organizational embeddedness need to access resources from the ecosystem to support the firm's digital servitization. The authors highlight that embeddedness is important to make the change happen within a structure as the ecosystem. Moreover, embeddedness allows actors to share resources and capabilities and adapt their activities towards a common direction, such as delivering PSS.*

To implement the shift from a product-centric business model to a service-centric, many companies intentionally or not trigger the formation of an ecosystem. In this process, the focal firm leads the alignment of partners values and secures its centric role in the ecosystem (Adner, 2017). Indeed, the role of the focal firm is essential in establishing (and maintaining) its leadership and driving the transition of the whole ecosystem while ensuring collaboration to achieve the value proposition. In parallel, the ecosystem receives competition from both external actors and internal ecosystem's participants. In this regard, there is no literature explaining the different steps leading to the formation of an ecosystem as a result of specific strategic choices and the change of the value proposition. Thus, our work is centered around the question: "To what extent the process of servitization can lead incumbents to form an ecosystem?". To respond to this question, we qualitatively investigate Philips, the Dutch firm that has been among the first to shift from a product-based business model to a service-centric one study. We investigate the process of

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formation of an ecosystem in the healthcare industry and we present a set of three strategic choices - each enabled by a set of three factors - that modify an incumbent's internal resources and external network of strategic partnerships as well as its organizational structure.

Methodology. Our study follows an inductive research design (Gioia et al., 2013) and is based on longitudinal (2011-2020) qualitative data to develop a process model of how the firm's internal and external factors have enabled the design of a service-centric business model and concurred into creation of an ecosystem (Yin, 2009; Eisenhardt, 1989; Eisenhardt and Graebner, 2007; Strauss and Corbin, 1998; Langley et al., 2013). We engaged in a longitudinal case study of Philips Nederland B.V., the Dutch firm founded in 1891 by Frederik and Gerard Philips in Eindhoven (The Netherlands) to produce and market the first light bulbs. Philips is an exemplar case as it's been among the first large manufacturers to change its product-based business model towards a service-centric one. More interestingly, since 2011 the Dutch firm has modified its business logic, abandoning the lighting industry (i.e., in 2015 it sold its Lighting Business Unit, now Signify) to become one the market leaders in the Health Technology (or HealthTech) industry. Indeed, before this decision Philips was organized in three BU: Lighting, Consumer lifestyle and Healthcare. However, the company has gradually identified emerging opportunities in the healthcare industry and, since 2016 it has Changed its organizational structure (i.e., HealthTech) now organized in three business segments: Diagnosis and Treatment, Connected Care and Health Informatics, and Personal Health. Indeed, HealthTech is considered a fast-growing sector within the broader healthcare sector which specializes on how technology applies to health (Micca et al., 2020). We analyse Philips case by employing an inductive research design to develop a process model of how the firm's internal and external factors have enabled the design of a service-centric business model and concurred into creation of an ecosystem (Gioia et al., 2013; Langley et al., 2013). During the analysis of data, we have written detailed descriptions of the case based on primary and secondary data in order to facilitate the comparison and contrasting of emerging patterns (Yin, 2014; Eisenhardt, 1989). Following Gioia et al. (2013) and in line with our inductive approach, we implemented a coding procedure supported by NVivo software, a recognized tool to support qualitative analysis.

Findings. Our literature review reveals that no empirical research has attempted to understand how a firm servitization process gradually leads to the formation of an ecosystem. We therefore examine the case of a firm competing in a fast pace and rapidly growing industry as an excellent example of how firms can continuously adapt to the environment and specifically how they can modify their business logic in order to create value for customers through a thorough understanding of the intertwined relationship between internal resources and external strategic relationships. Our results suggest that the Philips' servitization trajectory led gradually to transform the company from selling artefact to deliver PSS, and this makes Philips an emblematic example of a traditional manufacturer shifting to a supplier of hybrid customer-centric solutions. The results of our preliminary analysis allow us to the recognition of a significant corporate transformation that has happened since 2011. Moreover, three main phases guide the company's transformation: the re-centre (2011-2014), strengthen (2014-2016), and activate (2016-2019). Indeed, we have registered the presence of milestones which divided these nine years into three blocks. With this structure, we have gathered information through the reports to properly identify concepts and mechanisms which could characterize the three phases. Our findings are therefore divided in three parts. Specifically, we offer a detailed analysis of the process of servitization and the main steps enabling the formation of a double side (i.e. internal and external) ecosystem. In the first phase, Philips reacted to the re-centering of the strategic focus by adjusting its internal structures through the introduction of new business units and structures, but also through dismissals of non-core ones. The reaction of Philips can be mapped out by looking at the complexification and radical transformation of Philips' business structures. Specifically, in 2011 the business structure was made up of the three core business units: healthcare, consumer lifestyle and lighting. Together with the identification of several opportunities in the healthcare industry, there was also a growing awareness of the current internal weaknesses within the Consumer Lifestyle sector and Lighting. A first decision was taken in 2011 with the transfer of the television business (operative in 2012) to the joint venture TP Vision with TPV Technology Limited, in which Philips held the 30%. Then, in 2014 Philips transferred the remaining 30% to TPV, but kept the brand license agreement. The other decision regarded the transfer of the Audio, Video, Multimedia and Accessories business (AVMandA) to Funai in January 2013. However, in the same year Funai breached the contract and Philips decided to separate the business in a stand-alone structure within Philips called "Woox Innovations" and based in Hong Kong. In the following year, 2014, Philips agreed to sell Woox innovations to Gibson Brands, a global music and lifestyle company. As an additional sign of this rerouting, in 2011 Frans van Houten took office as new CEO, a leader that started his career in marketing and sales department and after covered a co-head position in the consumer electronics and the accountability as CEO of Philips Semiconductors. In the second phase, Philips entered a radical transformation, showing in 2014 with the decision of separating the Lighting sector into a stand-alone operating company a break with tradition. This decision is a strong evidence of the willingness of Philips to employ full resources to the healthcare business unit. Moreover, Philips created a new strategic business group within Healthcare called "Healthcare Informatics, Solutions and Services" (HISS). An important achievement of this newborn business group is the Philips HealthSuite Digital Platform (HSDP) as an interoperability-enabling solution. In 2016 Philips officially shifted from an offering exclusively based on products, to one centered on integration between product and services. Examples of these integrated solutions are monitoring-as-a-service, outcome-based models (based on clinical and economical outcomes), provider market models (allowing prices for episodes of care), pay-per use model, technology managed services, software as a service and product as a service. The activate phase underlines how Philips' solutions have been increasingly built around the idea of customer-centricity, and to do this the company

formally adopted the concepts of “design thinking” and “co-create”, thus exploring with healthcare professionals how to improve the delivery of care. Our analysis paves the way for a comprehensive understanding of the triggering factors leading incumbents to form an ecosystem by leveraging on external and internal factors that concur to the design of a service-centric business model. In our analysis the ecosystem takes indeed a double side nature and it is a result of specific strategic choices and the radical change of the traditional value proposition.

Research limits. We believe that our preliminary efforts to link literatures that have so far mostly grown apart (i.e., strategic transformation, servitization, and business ecosystems) can be relevant for further development of management literature. We are however aware that our research - moving now the first steps in this direction - requires more efforts in order to refine findings and implications for both scholars and practitioners. Moreover, we are aware that our preliminary findings discussed here presents issues in terms of generalizability as competitive dynamics and industry structures can have great influence in strategic choices of incumbents in different sectors. Nonetheless, we think that this work can be a first step towards the definition of a strategic map that may mirror and guide incumbents' strategic choices, especially whereas digital technologies change rapidly customers' expectations and needs as well as the companies' business logic and their mechanisms of value creation.

Practical implications. Literature makes clear that manufacturers entering servitization trajectories need indeed to adjust their internal capabilities and build new business logics focused on integrating service-related inputs in the value creation process (Cenamor et al., 2017). Current theorizing on business ecosystem has researched servitization trajectories shedding light on both the relational and structural embeddedness of stakeholders in the formation of systems of capabilities within the firm and networks of relationships outside it (Salvato, 2009; Bustinza et al., 2019; Kohtamäki et al., 2019; Sjödin et al., 2016; Skylar et al., 2019; Jovanovic et al., 2019). However, it is surprising that research is still scant on how incumbents deploy servitization strategy to react to technological changes and competitors' actions by leveraging on external and internal factors that concur to the design of a service-centric business model. Our work on the incumbent strategic transformation sheds light on the choices (and their main implications) of reacting to technological innovation and competitive pressure by shifting from a product-based to a service-based logic. By doing this, our work identifies a link between servitization and the formation of an ecosystem.

Originality of the study. Our study identifies and discusses the strategic transformation of an incumbent firm reacting to technological innovation and changes in the competitive pressure. We identify a set of three strategic choices (i.e., Re-centre, Strengthen, and Activate) - each enabled by a set of three factors - that can implement the transformation by leveraging on internal resources and external network of strategic partnerships and, thus lead to the formation of an ecosystem. In particular, our model shows the transformation process and disentangles internal from external factors.

Our study extends research on strategic transformation as a specific type of strategic renewal (Agarwal and Helfat, 2009) by shedding light on the strategic choices made by an incumbent within a conversation that has mainly focused on operational implications (Aversa et al., 2020), resources mix (Skylar et al., 2019; Bustinza et al., 2019), achievement of a competitive advantage, identity (Anthony and Tripsas, 2016) and innovation of a business model (Ahuja and Novelli, 2016; Bradley and O'Toole, 2016; Cennamo et al., 2020). Our research is noteworthy because there is no research explaining the steps leading to the formation of an ecosystem as a result of specific strategic choices (and the change of the value proposition) as a result of a strategic transformation fuelled by technological transformation and rising competitive pressure. Moreover, our research allows to look at the servitization strategy as a key enabler of the formation of an ecosystem (Ansari, Garud, and Kumaraswamy, 2016; König, Schulte, and Enders, 2012; Srinivasan and Venkatraman, 2018). Furthermore, we contribute to the literature on ecosystems as we have analyzed the pre-birth of a business ecosystem (Moore, 1993). More specifically, scholars have widely investigated the key features of business ecosystems, their governance and the benefits of the focal firm and the risks of actors lacking intra-organizational embeddedness (Jacobides et al., 2018; Skylar et al., 2019). However, in the existing literature there is no evidence referring to pre-existing conditions and phases leading to business ecosystems.

Key words: servitization; business ecosystem; strategic renewal; Philips; healthcare.

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Ethnic diversity, recombinant capabilities and the generation of green technologies

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We draw upon the micro-foundation of recombinant knowledge in green technologies, the international business literature on the firms' strategies for external knowledge sourcing and migration studies in the innovation field to explore the role of ethnic migrants in leveraging recombinant creation dynamics and increasing the probability of successful green innovations. Our main argument is that the involvement of ethnic inventors increases the likelihood to successfully generate green inventions, due to their inherent experiences and enabled knowledge recombination capabilities (Franzoni et al., 2014; Kerr et al., 2016; Choudhury and Kim, 2019). We rely on data drawn from the ethnic patenting database, which covers harmonized USPTO patent records granted to US-based MNEs over the period 1980-2009 (Kerr and Kerr, 2018) merged with information on the career of each inventor in the sample derived from the Harvard Patent Dataverse database (Lai et al., 2011). We find that teams composed of inventors with wider recombinant capabilities also tend to have a higher propensity of developing new green technologies. Also, a higher level of ethnic diversity among the US-based inventors correlates with a higher probability of patenting GTs, but the relationship follows a non-linear pattern along ethnic diversity. Finally, we find that patents developed by R&D teams involving a higher degree of ethnic diversity among their domestic inventors are more likely to combine technological knowledge in a novel way to develop GTs. Our results bring implications for the strategic management of inventors' teams by multinationals willing to run the green patent race and for policy-makers facing the climate change challenges.

Objectives. *The increasing awareness about the dramatic effects of climate change has brought environmental protection to the core of the policy, academic and managerial debate. A wide body of literature has stressed the role of green innovation¹ as a key driver of the decoupling of economic growth from environmental degradation (Porter and van der Linde, 1995). Accordingly, theoretical and empirical studies have investigated the factors contributing to the generation and adoption of new green technologies (GTs), as well as their impacts on economic and environmental performances - see Barbieri et al. (2016) for a survey -. Most of the existing studies have enquired into the nexus between ecological innovation and regulation, focusing on firm-, region- and country-level dynamics. Yet, despite the importance of eco-innovation for the environment, only a few studies have articulated analyses of the “antecedents of green innovation”, i.e., the very search dynamics leading to their discovery and generation (del Rio Gonzalez, 2009). Understanding the mechanisms behind green inventions is paramount both from a strategic and a policy viewpoint. On the one hand, firms willing to run the green technologies race might want to design appropriate strategies to increase their ability to successfully explore and exploit this technological domain (Orsatti et al., 2020). On the other hand, policy-makers may obtain useful indications to increase the overall level of locally available green technologies to meet more stringent environmental targets (Orsatti et al., 2021).*

The recombinant knowledge approach has been adopted in recent empirical and theoretical works addressing such neglected issues (Weitzmann, 1998; Fleming, 2001). Accordingly, the generation of green technological knowledge has been modeled as the outcome of complex system dynamics involving the combination of highly diversified and loosely related sets of competencies (Zeppini and van der Bergh, 2011). In this direction, the concept of recombinant capabilities - i.e., the capacity to combine different pieces of knowledge to generate new ideas - has been successfully applied to the analysis of the antecedents of green inventions (Henderson and Clark, 1990; Galunic and Rodan, 1998; Kogut and Zander, 1992; Orsatti et al., 2020). In particular, these latter appear to be more likely to emerge out of recombinant creation dynamics, i.e., through the combination of technologies stemming from the experimentation with unexplored interdependencies.

Recombinant dynamics are strictly related to the collective dimension of knowledge generation (Allen, 1983). Insofar as new ideas stem from the recombination of knowledge inputs, and these latter are fragmented and dispersed

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¹ Through the paper, we use the terms “green technologies”, “green innovation”, “green inventions”, “eco-innovation” interchangeably.

across innovating agents, recombinant dynamics are more likely to successfully take place when invention is organized in teams gathering together people with heterogeneous competences (Teodoridis, 2017). An important body of literature has documented the increasing weight of teamwork knowledge production (de Solla Price, 1963; Adams et al., 2005; Wuchty et al., 2007). The increasing specialization and the narrowing of expertise required for advancing the knowledge frontier on the one hand, and the augmented complexity of knowledge-based activities, on the other hand, have been proposed as possible, and not mutually exclusive, explanations of this phenomenon (Jones, 2009; Agrawal et al., 2016; Arora and Gambardella, 1994; Marrone, 2010; Harvey et al., 2014). Accordingly, inventor teams may show different propensity to generate green invention, depending on the extent to which recombinant creation dynamics are constitutive elements of team members (Orsatti et al., 2020). As such, we argue that:

H1: *Inventor teams leveraging stronger recombinant creation dynamics are more likely to generate green technologies.*

Recombinant dynamics are very much related to the distribution of knowledge sources and the composition of teams. The establishment of collaborations and networking is indeed important for leveraging external knowledge and having access to enabling competencies (Ghisetti et al., 2015; Fusillo et al., 2020). In terms of human resource management for green innovation, firms might rely on several strategies to smooth barriers to accessing external resources, especially those technologically and geographically distant from their core knowledge base. For example, firms could strategically act on the inventors' teams' composition to affect the innovative outcomes in a specific direction (Tzabbar and Vestal, 2015). Also, extant literature has shown that inventors already experienced in recombinant creation dynamics positively impact teams' success in generating green inventions (Orsatti et al., 2020).

A somewhat neglected dimension in this debate concerns the spatial dependence of technological specialization and hence the overlap of geographical and technological proximity (Antonelli, 2001). The evolutionary economic geography approach has stressed that lock-in and path-dependency are quite frequent in the patterns of regional technological specialization and diversification. Local technological capabilities emerge out of a historical process of accumulation of competencies, which renders knowledge very much embedded in the context in which it has been produced (Quatraro, 2009; Neffke et al., 2018). Therefore, access to loosely related knowledge inputs often requires the capacity to activate channels for importing knowledge from geographically dispersed sources, which increases the chances to introduce unrelated diversification in knowledge bases. Regional evidence has pointed to the importance of nonlocal agents in this respect, like entrepreneurs or multinational enterprises (MNEs) (Boschma et al., 2017; Elekes et al., 2018; Colombelli et al., 2020).

According to established literature, MNEs geographically distribute their R&D activities in order to source knowledge that is critical for the innovation process with new and diverse inputs from different locations as well as to adapt their existing knowledge assets to other locations to exploit extant innovative efforts and avoid technological lock-in (Cantwell and Salmon, 2018; Marino et al., 2020). Recent research has proposed that MNEs show a comparative advantage in developing green dynamic capabilities because of their global connectedness and access to disperse and diversified knowledge sources (Maksimov et al., 2019). Among the possible mechanisms and embracing the micro-foundations perspective of recombinant capabilities, we focus on individual-based conduits in this study. MNEs find themselves in a peculiar position to leverage individual skills to bridge different expertise (technological, cultural, and social) through intra- and inter-organizational R&D collaborations. In particular, international businesses have facilitated access to diaspora-established contacts elsewhere in the world (Lorenzen & Mudambi, 2013; Thomas, 2016).

Recent studies focused on the role of foreign-origin skilled workers in the knowledge creation and integration process of MNEs (Choudhury, 2016; Foley and Kerr, 2013; Marino et al., 2020; Useche et al., 2019). In detail, ethnic migrants are considered as exceptional contributors to the advancement of the knowledge frontier, also because of gains from specialty matching and knowledge recombination enabled by migration (Kerr et al., 2016; Franzoni et al., 2014). These recombinant creation capabilities appear stronger in more diverse teams (Choudhury and Kim, 2019). However, it is essential to acknowledge the coexistence of both the positive and negative effects of ethnic diversity on knowledge creation and integration. In fact, too much internal heterogeneity also has potential costs, such as language barriers, conflicts, internal clashes, and distrust (Solheim and Fijtar, 2018). Given these arguments, we can spell out our second working hypothesis:

H2: *There is an inverse U-shaped relation between ethnic diversity among the domestic member of the team and the propensity to successfully patent green technologies.*

Further exploration of the team composition is needed to understand better the implications for the firms' strategic management of inventors' teams to grasp the opportunities set by the hybridization of existing knowledge to create innovation in the green field. In this direction, we aim to investigate the role of ethnic inventors in alleviating the challenges for knowledge recombination by acting as a bridge within the team's diverse knowledge base and contributing to the successful creation of GTs in the organizational boundaries.

There are several reasons to expect that the impact of ethnic migrants on innovation may interact with that of recombinant capabilities in green invention dynamics. Because of ethnic migrants' connection with context-specific knowledge from their country of origins, knowledge recombination in teams involving ethnic inventors is more likely to be directed to the experimentation of unprecedented combinations (Choudhury and Kim, 2019). Moreover, when individuals with different knowledge and backgrounds interact, they may stimulate and help each other to stretch their knowledge to bridge and connect diverse knowledge (Nooteboom et al. 2007; Solheim and Fijtar, 2008).

In view of these arguments, we spell out the third research hypothesis as it follows:

H3: *Ethnic diversity favors the integration of external knowledge and the recombinant creation capabilities of the R&D team, thus increasing the likelihood of generating green technologies.*

Methodology. Our empirical analysis primarily relies on the public available ethnic patenting database, which covers USPTO patent records granted to US-based MNEs (Kerr and Kerr, 2018). Exploiting commercial ethnic names databases and name-matching algorithms, the authors determine the inventors' probable ethnicities listed in the patents among nine ethnic groups: Anglo-Saxon, European, Hispanic, Indian, Chinese, Japanese, Korean, Russian and Vietnamese.

To investigate the role of inventors' recombinant capabilities in the MNEs' context, we recreate the career of each inventor listed in the sample drawing upon the Harvard Patent Database (Lai et al., 2011), which uniquely identifies inventors listed in USPTO patents, leveraging a thorough disambiguation process. We then collect information on the technological classification of the inventors' patent portfolio, specifically on the co-occurrences of technological subclasses at the 4-digit IPC codes level. Our final sample contains 476,888 patents with at least one domestic inventor in their R&D team and granted to 2,045 US-based MNEs during 1980-2008.

We run a set of regressions by means of a Linear Probability Model (LPM) with robust standard errors:

$$GT = \alpha_0 + \alpha_1 Recomb + \alpha_2 EthnDiv + \alpha_{12} EthnDiv * Recomb + \alpha_3 EthnDiv^2 + \beta'Z + \tau_j + \gamma_k + \delta_t + \varepsilon_{jkt}$$

where τ_j are the industry fixed effects; γ_k are the fixed effects for the main technological sub-category of the focal patent; δ_t are the application year dummies.

Following previous literature in the field (Orsatti et al., 2020; Fusillo et al., 2020), our dependent variable GT is a dummy that equals to one if at least one IPC technological code of the focal patent is included in either the WIPO IPC Green Inventory (WIPO, 2012) or OECD ENV-TECH (Hašič and Migotto, 2015). $Recomb$ represents the number of first co-occurrences of technological subclasses j and m normalized by the total number of technological co-assignments the inventors have been patenting during their career, while $EthDiv$ measures the degree of ethnic diversity among the domestic members of the inventors' team computed as the inverse of a concentration index à-la-Herfindahl using the domestic ethnicity score attributed to the patent.

All the regressions contain an extensive set of control variables Z . First, we include a set of covariates controlling both for the structural characteristics of the R&D team and the average experience, productivity and quality of their members. Second, following extant literature, we control for MNEs' features that might influence their ability to leverage the recombinant capabilities of the inventors they employ to create green technologies. Since the literature highlights the existence of mechanisms alternative to ethnicity for facilitating or hindering the recombinant capabilities of the domestic inventors to create complex knowledge - specifically, green technologies -, we also control on those individuals' characteristics that might enact their abilities to bridge across the diverse knowledge base of the R&D team. Detailed definitions of all the variables are reported in Table 1.

Tab. 1: List and description of the control variables

Variable	Description	Type
<i>Team controls</i>		
Team size	# Inventors listed in the patent	Patent level
Tenure	# Years since inventors' first patent	Team average
Patent stock	Inventors' patent stock at t computed with a depreciation rate of 15%	Team weighted average
Triadic patents (%)	Share of inventors' triadic patents	Team weighted average
Green inventions	Log of # green technologies in the patent portfolio until t	Team weighted average
<i>Firm controls</i>		
Firm age	# years since firm's first patent	Firm level
Productivity	log of # patents until t	Firm level
Green experience	Dummy equals to 1 if the firm has patented at least one green technology until t	Firm level
<i>Alternative explanations</i>		
Geographic dispersion	Dispersion index based on the inventors' residing countries as reported in patent	Patent level
Network breadth	# Unique collaborators with whom the domestic inventors' have been working until t	Team average (domestic inventors)
Geographical bridging	# Unique countries where the domestic inventors have been residing until year t	Team average (domestic inventors)
Global team experience	# Patents with at least one domestic and one foreign inventor in which the domestic inventors have been involved until t	Team average (domestic inventors)
Foreign collaborations	Share of foreign collaborators with whom the domestic inventors have been working until t	Team average (domestic inventors)
<i>Patent controls</i>		
Technological scope	# unique IPC subclasses listed in patent	Patent level
Backward citations	# Backward citations reported in the patent	Patent level
Forward citations	# Citations received by the patent after 5 years	Patent level
Claims	# Claims reported	Patent level

Findings. Starting from a baseline empirical exercise without any control variable, Model 1 confirms both H1 and H2. Thus, inventors' teams leveraging more intense recombinant capabilities are associated with a higher probability of patenting green technologies, other things being equals. In other words, teams composed of individuals with a higher propensity to create new technological combinations between previously unrelated technologies also tend to have a

higher probability of developing new green technologies. Moreover, the higher the level of ethnic diversity among the US-based inventors, the higher the probability of patenting green technologies (H2a). However, such a relationship shows a non-linear pattern as it decreases with ethnic diversity (H2b).

In Model 2, we also include the interaction effect between our main explanatory variables. These results provide a first test for determining whether ethnic diversity among the US-based inventors acts as a complementary channel reinforcing the knowledge recombinant capabilities leveraged to develop new green technologies (H3). The positive and significant coefficient of the interaction term suggests that patents developed by R&D teams involving a higher degree of ethnic diversity among their domestic inventors might be more likely to combine technological knowledge in a novel way to develop green technologies. All the previous results are confirmed when introducing the full set of control variables at the team and firm-level (Models 3-4). The sign and significance of the main explanatory variables are consistent with the baseline model specification also as we include proxies for potential mechanisms alternative to ethnicity (Models 5-6) and patent-level features (Models 7-8).

Tab. 2. Main results

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Recomb	0.0275*** (0.0009)	0.0247*** (0.0010)	0.0058*** (0.0008)	0.0036*** (0.0009)	0.0086*** (0.0008)	0.0049*** (0.0009)	0.0086*** (0.0008)	0.0049*** (0.0009)
EthnDiv	0.0210*** (0.0059)	0.0135** (0.0059)	0.0272*** (0.0049)	0.0216*** (0.0049)	0.0255*** (0.0049)	0.0156*** (0.0049)	0.0257*** (0.0049)	0.0158*** (0.0049)
Recomb*EthnDiv		0.0178*** (0.0036)		0.0134*** (0.0030)		0.0237*** (0.0030)		0.0236*** (0.0030)
EthnDiv squared	-0.0287*** (0.0103)	-0.0307*** (0.0103)	-0.0460*** (0.0084)	-0.0475*** (0.0084)	-0.0349*** (0.0084)	-0.0374*** (0.0084)	-0.0356*** (0.0084)	-0.0381*** (0.0084)
Constant	0.0580*** (0.0006)	0.0593*** (0.0006)	0.0501*** (0.0018)	0.0512*** (0.0018)	0.0458*** (0.0033)	0.0475*** (0.0033)	0.0467*** (0.0034)	0.0484*** (0.0034)
Team controls			Yes	Yes	Yes	Yes	Yes	Yes
Firm controls			Yes	Yes	Yes	Yes	Yes	Yes
Alternative explanations					Yes	Yes	Yes	Yes
Patent controls							Yes	Yes
Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Technological F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R ²	0.1775	0.1775	0.4245	0.4245	0.4275	0.4275	0.4286	0.4287
Adjusted R2	0.1774	0.1774	0.4244	0.4244	0.4273	0.4274	0.4285	0.4286
Adjusted within-R2	0.0022	0.0022	0.3018	0.3018	0.3054	0.3055	0.3065	0.3066
Observations	476,888	476,888	476,888	476,888	476,888	476,888	476,162	476,162

Robust standard errors. *** p < 0.01, ** p < 0.05, * p < 0.1.

Research limits. Notwithstanding the limitations in using patent data for empirical studies, the information contained in patent documents provides a uniquely detailed and broadly available source of information on inventive the development and evolution of technological knowledge (Griliches, 1990; Pavitt, 1985; OECD, 2009). However, further exploration is needed to better understand the implications for the firms' strategic management of inventors' teams to grasp the opportunities set by the hybridization of knowledge to create innovation in the green field and the potential synergies between multiple diversities dimensions. Unfortunately, due to our data's nature, we are not able at this stage to distinguish between first or second-generation immigrants nor identify the ethnic inventors in the patents - and consequently, their distinctive features in terms of experience and collaboration -.

Practical implications. Overall, our results suggest that ethnic diversity might act as valuable individual-level enabling channels to knowledge integration in the MNEs' organizational space, thus providing multinational corporations with additional opportunities to tap new and heterogeneous knowledge sources. Managing both geographically dispersed inventors or culturally diverse R&D teams might embody equally successful knowledge recombination mechanisms to create green technologies, depending on the organization's characteristics.

These considerations have relevant implications in terms of human resource management for green innovation. Accordingly, extant literature has shown that inventors already experienced in recombinant creation dynamics positively impact teams' success in generating green inventions (Orsatti et al., 2020). Other works have documented that the inclusion of academic staff in inventors' teams may increase the capacity to generate green inventions because of its capacity to command and combine knowledge spanning heterogeneous and loosely related scientific domains (Quatraro and Scandura, 2019). All in all, these findings reason with policy-makers and managers and how they can enhance firms' recombinant capabilities in responding to climate change challenges.

Originality of the study. Our work adds to the existing literature in many respects. First, it allows extending the analysis of the strategic management of inventors' teams for the generation of green technologies by considering the distinctive role of ethnic inventors in bringing variety in collective invention dynamics (Choudhury and Kim, 2019; Marino et al., 2020; Bahar et al., 2020). Second, we contribute to the literature analyzing the impact of ethnic inventors on MNEs' innovation performances (Choudhury, 2016; Foley and Kerr, 2013). Third, we contribute to the policy

debate by stressing the importance of the interplay between macro and micro-level dynamics in designing the appropriate incentives to invest in green technologies development (D'Agostino, 2015; Marin and Zanfei, 2019). Finally, our research is also close to the recent literature about the importance of extra-regional and international knowledge flows in invention dynamics, including the role of global pipelines and of the interaction of localized knowledge dynamics of domestic and foreign-owned firms (Boschma and Iammarino, 2009; Zhu et al., 2017; Bathelt et al., 2004; Morrison et al., 2013; Wang and Guo, 2017). Further research could explore whether MNEs exploit green knowledge developed at home for building competitive advantages within the internal network of subsidiaries located in different countries in conjunction with host-country specific advantages or how environmental regulations in home and host countries affect the MNEs global exploitation strategy.

Keywords: green technologies; recombinant capabilities; ethnic diversity

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Exploring the innovation paths of SMEs to face the COVID-19 crisis: a cluster analysis applied to the Italian context

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Objectives. *The COVID-19 pandemic has deeply impacted the firms' survival before than their competitiveness, due to the limitation in the distributions of products and interaction with markets as well as due to constraints in the firm international supply chain (Pantano et al., 2020). Lockdown of manufacturing and retailing activities asked firms to rapidly rethink their business in order to reduce economic losses and competitive damages, through a proper assessment and feasibility analyses of their business models (Donthu and Gustafsson, 2020). In order to solve the emerging problems, firms are embracing methods and processes that are responsive rather than reactive to the crisis (Chesbrough, 2020), and they are switching to new operating models focused on the customer and supported by the right governance (Verma and Gustafsson, 2020). On the one hand, it becomes relevant to consider how firms may approach their market and, on the other hand, redesign their offering up to a complete business model innovation (BMI) process (Mitchell and Bruckner Coles, 2004). Innovation becomes, therefore, a key factor to overcome the crisis generated by COVID-19 pandemic (George et al., 2020) as already shown in past turbulent periods (Cucculelli and Peruzzi, 2020).*

Strategic management studies have highlighted how in times of crisis there is an opportunity of strategic renewal, where firms may diversify their business by investing in new products, new services and/or new markets (Naidoo, 2010). Firms that are able to innovate can more positively cope with the challenges related to a period of crisis, also taking into consideration past innovation paths (Archibugi et al., 2013). Firms may expand or revise their strategies by revising their existing products (or services) or developing new ones, also in the direction of new market expansion, acquiring new customer (Wang et al., 2020). Innovating business through diversification (development of new products and/or new markets) and/or servitization (development of new services) strategies, during COVID-19 pandemic could help firms in revitalizing business (Ebersberger and Kuckertz, 2021; Verbeke and Yuand, 2021). In this regard, COVID-19 crisis has accelerated innovation processes not because firms want to innovate but because they had to (Heinonen and Strandvik, 2020). Nevertheless, research highlights the potentialities of crises as source of opportunity for firms specifically in pursuing BMI (Ritter and Pedersen, 2020) as a far more advanced strategic path for value creation and capture (Foss and Saebi, 2017) and a more advanced radical forms of innovation (Geissdoerfer et al., 2018).

Several firms, especially in the manufacturing industries, are innovating their business models following a service-driven orientation (Martinez et al., 2017). According to scholars servitization refers to the shift in the firm's offering from products to solutions (Baines et al., 2011), where the value creation is not related to selling tangible products but a more complex and rich bundle of elements (goods, services, supports etc.) (Vandermerwe and Rada, 1988). From this perspective, servitization has been considered a promising strategic shift for manufacturing firms, specifically in high-competitive contexts (Cusumano et al., 2015; Lightfoot et al., 2013). One of the main challenges of servitization is to determine the new value proposition, which has clear impacts on the business model value architecture as a whole (Ayala et al., 2019). As emerged during both COVID-19 pandemic as well as other turbulent times, servitization, which focuses on service-centric business model (Kowalkowski et al., 2017), positively stabilizes businesses and sustains competitiveness (Kwak and Kim, 2016; Rapaccini et al., 2020). Especially during crisis periods, servitization may become a sustainable strategy whenever the firm is able to invest in digitalization processes that can enable the shift towards augmented products/solutions.

Especially during COVID-19 pandemic, digital technologies have been particularly important as tools enabling firms to overcome the limits of physical interaction with customers and sales management (He et al., 2021). Both for consumers and in the business-to-business domain, digitalization has been highlighted to enhance customer engagement and interaction at distance (Kang et al., 2020; Papadopoulos et al., 2020). Adaptation made through

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online platforms and other web-based technologies helped entrepreneurs to create new customer relationships and entering in new markets (Shepherd, 2020). Simultaneously, advances in digital technologies, such as cloud, big data analytics, artificial intelligence (AI), Internet of Things (IoT), and virtual/augmented reality enable capabilities for the dynamics of market forces and transmit critical information for autonomous decision making (Lee and Trimi, 2021).

The COVID-19 crisis generates many strategic issues for firms and push firms to react to difficulties emerged. Innovation may represent a key strategic investment for firms under many forms and complexity (i.e. convergence innovation (Lee and Trimi, 2021). According to recent contributions the COVID-19 opens relevant issues for research in technology and innovation management as well as for firm strategy (Chesbrough, 2020). It becomes crucial to explore and explain how firms have redesigned their strategies and related innovation activities to overcome the pandemic. The paper aims at investigating the strategic implications in terms of innovation for firms considering both product and market innovation (as forms of diversification) as well as servitization (as form of business model innovation) as alternative strategic paths firms may have developed to cope with the pandemic scenario. In so doing, though a cluster analysis the paper aims at answering to the following research questions: (1) How firms react to the market-related challenges in the COVID-19 scenario considering for product/market innovation as well as in terms of BMI with specific attention on servitization? (2) Which are the main features of the different innovation paths emerged during the COVID-19 pandemic? (3) Is there a relationship between innovation paths and the use of digital technologies during COVID-19? This analysis is relevant to provide additional knowledge in the understanding on the strategic reactions of firms in times of crisis, enriching the theoretical debates on innovation (product/market, BMI and servitization) as well as research on digital transformation. Particular attention is related to such innovation processes in the context of Small and Medium-sized Enterprises (SMEs), which may suffer from the pandemic, but that could also exploit their potentialities innovation-wise (Juergensen et al., 2020; Papadopoulos et al., 2020).

Methodology. To reach the research purposes a CAWI-based survey has been carried out between October and November 2020 addressing the questionnaire to a stratified sample of more than 4,800 Italian SMEs operating in different manufacturing industries (grouped into Low-Medium/low and Medium/high - High technological industry) collecting 257 useful questionnaires. The sample consists of two different groups in terms of economic and financial indicators used by financial institutions to rate companies (average turnover 2016-2018; average turnover growth 2016-2018 and average ROE 2016-18), specifically the top- performers (coded 1) and the average-performers (coded 0).

The questionnaire focused on assessing the firm's response to the COVID-19 pandemic consists of several sections. In the first section, it aimed at assessing some business variables such as the main client served before and during the pandemic (B2B vs B2C), the change of distribution channels, the comparison between the turnover during the pandemic and the turnover of the same period of 2019 (decreased; stable; increased). Then, the R&D activities have been assessed. It has been assessed the level of R&D during the pandemic (decreased; stable; increased); if R&D allowed to develop new products (yes or no); and if the outputs of R&D have been useful only for the pandemic periods or also to redefine the firm's offering for the post-pandemic period (7-points Likert scale; 1 = completely disagree; 7 = completely agree).

In the second section, as far as business innovation is concerned, we assessed the improvement of servitization during COVID-19, as BMI (Rapaccini et al., 2020), assessing the development and offering of a set of services and the firm's diversification strategy evaluating the offering of new products and/or the penetration of new markets. To perform the analyses we calculated a "servitization index" and a "diversification index" respectively as the mean of the items of each variable.

Finally, in the last section, we aimed at assessing some strategic variables. Firstly, we aimed at evaluating the customer's needs during pandemic (Donthu and Gustafsson, 2020). Then, we assessed the role of technologies during the COVID-19 pandemic (Priyono et al., 2020). Specifically, taking into consideration the different features of the different sector investigated, we assessed the increased use of two main groups of technologies. The first group refers to five ICT: website, social media, e-commerce, CRM and SCM. The second group regards five Industry 4.0 technologies: big data, cloud, IoT, AI and augmented reality. In addition, we assessed if, during the pandemic, the technologies improved the relationships with customers, suppliers and employees/collaborators and the perceived relevance of technologies in improving, in the post-pandemic period, the production and value-chain activities as well as the smart working.

Following recent literature about technology use (Agostini and Nosella, 2019), to capture and analyse the most positive behaviours of firms in response to COVID-19 pandemic (value 5-6-7 of the 7-points Likert scale), for the customer needs requested during the pandemic as well as for the use of technologies we proceeded with the "dummification" of the items. In this sense, we created for each one of the items of the variables before mentioned a binary variables attributing the value 0 for the "negative values" of the Likert scale (values 1 to 4) and the value 1 for the "positive values" of the Likert scale (values 5 to 7). In addition, only respect to the "increased use of technologies during the pandemic" we included in the value 0 of the binary variable created also the option "Technology not used". Table 1 describes the items and the measures of servitization, diversification and the other strategic variables analyzed (customer needs and use of technologies), specifying the items transformed in binary variables, the servitization and diversification indexes and the ICT and Industry 4.0 variables created.

To answer to our research questions we employed a cluster analysis to determine distinct homogenous groups with similar innovation characteristics (Lorentz et al., 2016) for understanding the response paths to the COVID-19 crisis. We clustered groups according to their similarity in terms of servitization and diversification. Considering the

explorative purposes of the study, we performed a hierarchical cluster analysis (HCA), which determines the adequate number of groups for sample division, using Ward's method in the clustering process, with the Euclidean distance measure of similarity among respondents (Hair et al., 2010). After obtaining the cluster compositions, we performed the analysis of the different variables investigated, through the Pearson's Chi-squared standardized measure of association, to understand if the groups formed with cluster analysis presented different COVID-19 response patterns (Ross, 2010).

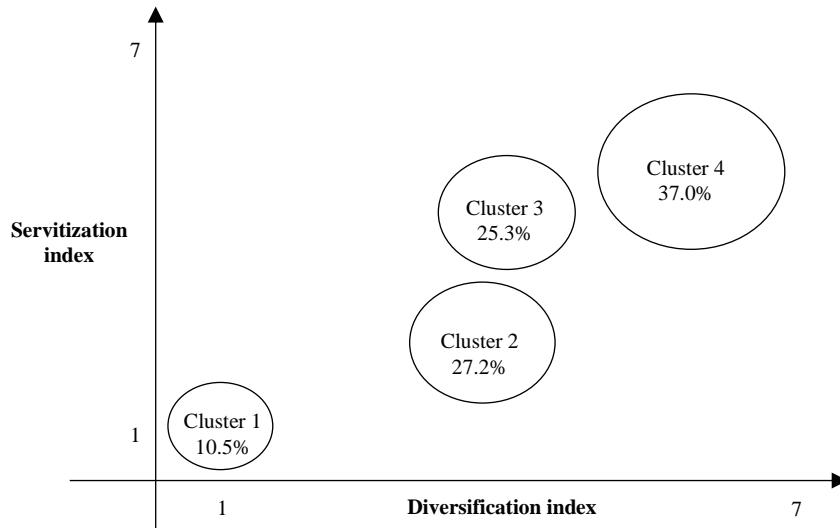
Tab. 1: Items and measures of strategic variables

Variable	Items	Measure
Servitization	(1) product customization services (2) pre and post-sales services (3) complementary product-related services (4) consulting and training services (5) pay-per-use services (6) digital app to support product-use Servitization index	7-points Likert scale (1 = completely disagree; 7 = completely agree) mean of the six items
Diversification	(1) offering new products in existing markets (2) offering existing products in new markets (3) offering new products in new markets Diversification index	7-points Likert scale (1 = completely disagree; 7 = completely agree) mean of the three items
Customer needs during the pandemic	Increased demand for customized products/services Increased attention to price Increased attention to sustainability Increased demand for innovative products/solutions	7-points Likert scale (1 = completely disagree; 7 = completely agree) Dummification: 1 = values 5-6-7 of Likert scale, 0 = otherwise
Increased use of technologies during pandemic	(1) website (2) social media (3) e-commerce (4) CMR (5) SCM (6) Cloud computing (7) Big data (8) Artificial intelligence (9) Internet of Things (IoT) (10) Augmented reality Increased use of ICT Increased use of Industry 4.0	7-points Likert scale (1 = completely disagree; 7 = completely agree) plus the option "Technology not used" Dummification: 1 = values 5-6-7 of Likert scale, 0 = otherwise 1 = at least the one positive value of the first five technologies investigated; 0 = otherwise 1 = at least the one positive value of the second five technologies investigated; 0 = otherwise
Use of technologies during the pandemic to improve	Relationship with customers Relationship with suppliers Relationship with employees/collaborators	7-points Likert scale (1 = completely disagree; 7 = completely agree) Dummification: 1 = values 5-6-7 of Likert scale, 0 = otherwise
Relevance of technologies in the post-pandemic	Improve relationships along value chain Improve production processes Developing smart products Transforming sales and distribution processes Smart working	7-points Likert scale (1 = completely disagree; 7 = completely agree) Dummification: 1 = values 5-6-7 of Likert scale, 0 = otherwise

Source: Authors' elaboration

Findings. HCA allowed to identify different groups with regard to the different levels of servitization and diversification strategies firms implemented during the COVID-19 pandemic. Specifically, HCA grouped the firms of the sample into four distinctive clusters. As shown in the Figure 1, the clusters are positioned on the chart taking into consideration the group's mean of both servitization and diversification indexes with the circle width related to the size (number of firms) of the cluster. Cluster 1 (10.5% of the sample) is the "less innovative" with none levels of both servitization (group's mean = 1.03) and diversification (group's mean = 1.00) indexes. Cluster 2 (27.2%) groups the "medium-low innovative" firms, with low level of servitization (group's mean = 2.22) and medium level of diversification (group's mean = 3.51) indexes. Cluster 3 (25.3%) is the "medium-high" group, with higher level of servitization (group's mean = 4.00) and medium level of diversification (group's mean = 3.69) indexes. The last group of firms is convened in the Cluster 4 (37.0%), where firms have shown the most innovative response to the COVID-19 crisis, innovating their business model through servitization (group's mean = 4.36) and adopting high level of diversification strategy (group's mean = 5.15) indexes. From this first analysis, two interesting results emerge. Firstly, it is interesting to note that the "most innovative" cluster is the large group in terms of size. Moreover, almost the 90.0% of the firms of the sample, during the COVID-19 pandemic, have adopted some innovation strategies (servitization and/or diversification) to overcome the crisis and sustaining business activities.

Fig. 1: Cluster groups



Notes: N = 257.

Source: Authors' elaboration

Based on the results of the cluster analysis, we have explored the strategic and business characteristics of the four clusters identified to outline differences and similarities across them (Tables 2 and 3). Table 2, concerning the clusters' business characteristic, shows a significant difference in terms of performances of the firms belonging to the different clusters, while no differences emerge as far as the industry is concerned. Cluster 4, the "most innovative" during the pandemic, is mainly made by top-performers, suggesting how those firms may be more prone to innovate the business model through new services as well as to offer new products and explore new markets. Moreover, Cluster 4 is the only group with the highest percentage (20.0%) of firms that during the COVID-19 pandemic increased the turnover. The positive performance could be related to the improving of B2C market. Interesting results emerged also with respect to the R&D activities. Also in this case, the R&D activity performed during the pandemic by the Cluster 4 resulted to be, respect the others three clusters, functional not only to solve issues emerged from the pandemic, but also for post-pandemic strategies. The "medium innovative" clusters, that are Cluster 2 and 3, are quite similar and show acceptable innovation activates especially for the post-pandemic; instead the "less innovative" Cluster 1 has shown the poorest R&D activity.

Tab. 2: Clusters' business characteristics

Variables	Cluster 1			Cluster 2			Cluster 3			Cluster 4		
Industry-group	Low-Mlow	Mhigh-High		Low-Mlow	Mhigh-High		Low-Mlow	Mhigh-High		Low-Mlow	Mhigh-High	
Low-Mlow vs Mhigh-High tech industries	51.9%	48.1%		58.6%	41.4%		50.8%	49.2%		37.9%	62.1%	
Performance	Top	Average		Top	Average		Top	Average		Top	Average	
Top- vs Average-performer*	18.5%	81.5%		22.9%	77.1%		30.8%	69.2%		43.2%	56.8%	
Main clients	B2B	B2C		B2B	B2C		B2B	B2C		B2B	B2C	
Before COVID	85.2%	14.8%		90.0%	10.0%		89.2%	10.8%		92.6%	7.4%	
During COVID	85.2%	14.8%		88.6%	11.4%		87.7%	12.3%		86.3%	13.7%	
Distribution channels	Yes	No		Yes	No		Yes	No		Yes	No	
Changed during pandemic	11.1%	88.9%		14.3%	85.7%		6.2%	93.8%		17.9%	82.1%	
Turnover	Decreased	Stable	Increased	Decreased	Stable	Increased	Decreased	Stable	Increased	Decreased	Stable	Increased
Turnover COVID vs Turnover 2019**	59.3%	33.3%	7.4%	61.4%	34.3%	4.3%	60.0%	36.9%	3.1%	56.8%	23.2%	20.0%
R&D	Decreased	Stable	Increased	Decreased	Stable	Increased	Decreased	Stable	Increased	Decreased	Stable	Increased
R&D activity performed during COVID-19	15.4%	69.2%	15.4%	12.5%	72.5%	15.0%	22.6%	61.3%	16.1%	13.6%	57.6%	28.8%
R&D during pandemic	Yes	No		Yes	No		Yes	No		Yes	No	
To Solve COVID issues**	7.7%	92.3%		17.5%	82.5%		19.4%	80.6%		40.9%	59.1%	
Develop new products/services***	0.00%	100.00%		47.5%	52.5%		38.7%	61.3%		72.7%	27.3%	
Useful only for pandemic	7.7%	92.3%		10.0%	90.0%		9.7%	90.3%		16.7%	83.3%	
Useful for redefining offer after pandemic***	30.8%	69.2%		40.0%	60.0%		38.7%	61.3%		83.3%	16.7%	

Notes: *** $p < 0.001$; ** $p < 0.01$.

Source: Authors' elaboration

Table 3 presents the analysis regarding the strategic variables of this study, highlighting the relevance of customers and technologies for the crisis management paths of higher innovative clusters. In the table only the positive values are reported in order to have an immediately understanding of differences. The most part of firms of Cluster 4 (most innovative) and then, respectively in terms of importance, also a relevant part of Clusters 2 and 3 (medium innovative clusters), have received from their customers a higher demand of customized and innovative products/services and a higher attention to price and sustainability. Respect to the “medium innovative” clusters, the request of customers during the pandemic have been particularly important for firms focused principally on diversification strategies, as Cluster 2 regards the firms with low levels of servitization index and medium levels of diversification index. Such findings outline the key role of customers as source for innovation both in terms of products/markets diversification as well as of servitization and BMI, especially during the COVID-19 pandemic (Ding and Li, 2021; Li-Ying and Nell., 2020). Cluster 4 is significantly different from the other groups and particularly from the Cluster 1 also with regard to the use of technologies during the pandemic and the use for the post-pandemic period. Cluster 4 shows the highest percentage (more than 80.0%) of firms that increased the use of technologies during the COVID-19 pandemic, followed by Cluster 2 (low servitization index - medium diversification index), then the Cluster 3 (high servitization index - medium diversification index) and the Cluster 1 with a very small percentage of firms that increased the use of technologies. For the “medium innovative” cluster, focusing on diversification (Cluster 2) rather than servitization (Cluster 3) assumes a more important role for the increased use of technologies. Cluster 4 also shows a higher percentage of firms that used technologies to improve relationships with customers, suppliers and employees during the pandemic. Cluster 2 and 3 have similar results. Finally, Cluster 4 considers, more than other clusters, technologies very important for the post-pandemic to improve production processes and value chain relationships and activities. For the post-pandemic Cluster 2 that focuses more on diversification, technologies are mainly relevant for improving production processes, instead for Cluster 3 mainly for develop smart products. The use of technologies for smart working scope is relevant for all clusters.

Tab. 3: Clusters' response paths during COVID-19 pandemic

Variables	Cluster 1	Cluster 2	Cluster 3	Cluster 4
Customer needs during Covid				
Higher request customized products/services**	11.1%	37.1%	33.8%	51.6%
Higher attention to price***	14.8%	45.7%	40.0%	58.9%
Higher attention to sustainability***	0.0%	24.3%	20.0%	40.0%
Higher request innovative products/services***	0.0%	45.7%	21.5%	63.2%
Use of technologies during pandemic				
Higher use of ICT***	22.2%	62.9%	44.6%	83.2%
Higher use of IoT***	25.9%	67.1%	47.7%	85.3%
To improve relationships with customers***	37.0%	41.4%	40.0%	74.7%
To improve relationships with suppliers**	33.3%	41.4%	29.2%	60.0%
To improve relationships with employees/ collaborators **	59.3%	50.0%	44.6%	74.7%
Use of technologies in the post-COVID				
Improve relationships along value chain**	33.3%	47.1%	47.7%	68.4%
Improve management of production processes**	44.4%	50.0%	44.6%	72.6%
Develop of new products**	18.5%	38.6%	49.2%	57.9%
Transform sales and distribution*	37.0%	44.3%	41.5%	63.2%
Smart working	66.7%	57.1%	56.9%	65.3%

Notes: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

Source: Authors' elaboration

In terms of response paths to the COVID-19 crisis, the study stressed the key role of innovation strategies and identified four different paths wherein R&D activities, customer needs and digital technologies assume a key role in pursuing servitization, BMI and diversification strategies that support firms in the management of business activities and relationships. Firms that faced the COVID-19 crisis focused on the improvement of servitization, the innovation of business models and the diversification of products and markets mainly through a higher use of digital technologies that allowed them to be connected with customers.

Research limits. The study has some limitations that could be thought as hints for the future research. Firstly, it is based on quantitative exploratory analysis. A more comprehensive research mixing quantitative and qualitative analyses (in-depth interviews) is under development to understand how firms used the different technologies to improve both servitization and diversification to satisfy the customer needs to support firm's competitiveness in the post-pandemic period. One more limitation regards the multi-industry composition of the sample. Focusing on one sectors or macro-sector could improve the quality of analysis and the definition of the clusters. Furthermore, some limitations relate to the explorative nature of the study. Cause-effect analysis could improve the explanation of the relationships among the different variables.

Practical implications. Solving problems during a crisis demands speeding up innovation by repurposing the knowledge, resources, and technology you already have at hand (Von Krogh et al., 2020). Research on business models

(Teece, 2010) recognizes the relevance of an appropriate strategic analysis to develop sustainable business models, hard to be imitated and on which firm may root its competitive advantage. In case of turbulent competitive, such as the COVID-19 pandemic firms should focus on the identification of new sources of value creation (and delivery) and capture, which overcome investing in new products/markets or services to exploit new market opportunities to sustain business and strengthen their competitive advantage. In this regards, the strategic choices for firms should be referred to a business model portfolio, where firms may follow BMI by developing additional business models through servitization through which firms could exploit. Being resilient and adaptive it is not enough, firms should also utilize the crisis to generate new business opportunities, developing new products/services and/or entering in new markets (Nenonen and Storbacka, 2020). COVID-19 stressed the opportunity to digitize businesses and identify alternative business models through the development and offering of new services that could be useful for companies that are looking to expand their horizons. Moreover, firms that focus their strategy mainly on products/markets diversification should be ready in terms of technological asset during the crisis period if they aim to overcome them.

Originality of the study. The research is one of the first study that aims at exploring the role of both servitization and diversification for the response paths of firms to the COVID-19 crisis, through the identification of different clusters. Based on an original sample of Italian SMEs, our study highlights similarities and differences in the patterns of crisis management, discussing how digital technologies and customers are consistent with the response strategies of firms. Moreover, the study provides further knowledge in describing how firms should react to the crisis events and in turbulent scenarios caused by the COVID-19 pandemic.

Key words: Innovation; diversification; servitization; business model innovation; digital technologies; COVID-19

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Recognizing opportunities during the crisis: a longitudinal analysis of Italian SMEs during Covid-19 crisis

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Objectives. *SMEs' opportunity recognition has been extensively studied in entrepreneurship literature (Eggers, 2020). In times of crisis, when SMEs suffer the loss of profits, customers and perhaps even key employees, it is very difficult for them to identify and explore new opportunities (Liguori and Pittz, 2020). However, given their size, SMEs may benefit from their flexibility with regard to both opportunities and threats (Eggers et al., 2012).*

Crises, such as Covid-19, determine negative consequences for SMEs (Bailey et al., 2020; Liguori and Pittz, 2020), but can also stimulate their innovation efforts (Chesbrough, 2020) and several authors have analyzed SMEs' behaviors during crises, including the Covid-19 pandemic (Liguori and Pittz, 2020). Some authors acknowledge that SMEs are indeed particularly prone to recognize, evaluate, and exploit new opportunities associated with crises such as Covid-19 (Eggers, 2020).

Beyond these findings, not many works have examined how SMEs can recognize new opportunities during crises such as Covid-19 (Kraus et al., 2020) and some scholars have emphasized the need for further investigation on this subject (Eggers, 2020: p. 206). In Italy, one of the first countries affected by Covid-19 from March to May 2020, Covid-19 has created the conditions for which many Italian SMEs have tried to recognize new opportunities. For instance, many of them have temporarily converted part of their manufacturing activities to provide new products, such as surgical masks or hand sanitizers (Seetharaman and Gallucci, 2020; Ferrigno et al., 2020). Based on these premises, this study aims to investigate the following research question: how can SMEs recognize new opportunities during the Covid-19 crisis?

To tackle this research question, we review existing literature on SMEs' opportunity recognition during crises (Devece et al., 2016; Eggers, 2020) and identify four main factors that characterize SMEs' opportunity recognition during crises: (1) prior knowledge, which refers to "consolidated knowledge, experience and routines on product development" (Baron, 2006); (2) alertness, which is the "capacity to possess keen insights to identifying entrepreneurial opportunities" (Baron, 2006; Gaglio and Katz 2001); (3) information search, which refers to the "capacity to discover opportunities by starting from a known information domain" (Baron, 2006); and (4) cognitive traits, which include "creativity, self-efficacy, the propensity to assume risks, the need for achievement, the need for independence, and locus of control" (Ardichvili et al. 2003).

Methodology. *After identifying these factors, we conduct a longitudinal analysis of four paradigmatic examples of Italian SMEs (Cifra, Kontessa, ModaImpresa, and Roncato) that reacted to the Covid-19 crisis by temporarily converting part of their manufacturing activities to provide new products for the society (such as surgical masks, hand sanitizers, etc.). Our longitudinal analysis ranges from March to December 2020 and is based on 19 interviews with senior managers and entrepreneurs of these firms and a massive amount of secondary data (reports, web speeches, videos, and press releases).*

Given the novelty of the context we aim at analyzing in this study - i.e. SMEs' opportunity recognition in a crisis, and more specifically during Covid-19 - and our theoretical understanding of the factors under inquiry, we used an inductive, exploratory approach in our empirical analysis. Such a research approach is adequate to build new theoretical interpretations to address existing problems (Lee et al., 1999). More specifically, we used the theory-building approach proposed by Eisenhardt (1989) and the guidelines by Yin (2003) to build theory from four case studies (i.e., Cifra, Kontessa, ModaImpresa, and Roncato). We began by independently reading press releases, web interviews, and official pages of the four SMEs to develop an initial understanding of SMEs' entrepreneurial opportunities (in terms of products or services) during Covid-19 crisis. After, we collected and analyzed 10 interviews. By analyzing these data, the authors gained that, in the first two weeks of the pandemic, the owners of the four SMEs were so concerned about saving their employees' jobs and contributing to local communities' needs that they tried to discover new entrepreneurial opportunities. The authors followed up the interviews to fill in details, clarify events, and

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resolve any remaining discrepancies. Both primary and secondary data analyzed refer to data collected in Phase 1.

Thereafter, we started by building the individual case studies from secondary data collected in Phase 2. We examined these data to track the major changes in the evolution of the pandemic and consequently the exploitation of SMEs' entrepreneurial opportunities. More importantly, we used the second-round interview transcripts to deepen our understanding of the individual case studies and the main factors that led each of the four companies to identify new entrepreneurial opportunities in Phase 2. We analyzed 9 additional transcripts using within-case and cross-case techniques (Eisenhardt, 1989), and current understanding of SMEs' opportunities recognition during crises (Eisenhardt and Graebner, 2007). We then conducted a cross-case analysis to explore the existence of any consistent patterns of relationships across the cases (Eisenhardt, 1989). During the cross-case analysis, we iteratively examined the qualitative data by moving back and forth between the theory, data, and literature to adjust for emerging theoretical relationships. We applied a replication logic in which each case is conceived as separate.

Findings. Through our longitudinal analysis, we analyzed the factors that led some Italian SMEs to recognize new opportunities during Covid-19 crisis. These factors - prior knowledge, alertness, information search, and cognitive traits - have been extracted from the literature about opportunity recognition during crises (Baron, 2006; Bendickson et al., 2020; Peris-Ortiz et al., 2013) and we also found them in our empirical research. Furthermore, we also found a fifth factor which led SMEs to recognize new opportunities during the Covid-19 crisis, namely purpose-driven orientation. In the following subsections, we will provide a detailed discussion of how each one of these five factors enabled SMEs to identify new opportunities during the Covid-19 crisis.

Prior knowledge

Background knowledge affects the entrepreneur's ability to understand, extrapolate, interpret and apply new information in a way that others cannot come from work experience, education, or other sources (Ramos-Rodríguez, 2010). In March 2020, Cifra, a sector leader in the production of sporting goods, had noticed the rapid market changes that were taking place. At that moment Cesare Citterio, CEO of the company with over 20 years of experience in the sportswear sector, having a deep knowledge of human skills and technologies within the company, proposed to his team to convert part of the production into masks. The awareness of possessing technological skills has enabled companies to discover and recognize new business opportunities. The rapid adaptation was made possible because the company had strong technological skills.

In addition to the technological skills, the company leveraged the skills and abilities of the team, in particular of the production manager, Mario Radaelli, with over 20 years of experience in the sportswear sector. Indeed, it is known in opportunity recognition literature during crises that firms and teams with strong prior knowledge can be assumed to be more effective in making a decision than firms and teams without solid prior knowledge (King, 2002). Thus, in a few days, Cifra first designed and then obtained a patent for the WARP MASK, a double-layer, anti-droplet, washable protective pad, treated with antibacterial and antiviral Viroblock technology. Taking advantage of all his technological knowledge for the production of masks, the company also opened a dedicated site, namely "warpmask.com", through which the masks were sold.

Albeit in Phase 1 this entrepreneurial opportunity was immediately recognized by the company, the market, and consequently the demand for this product changed. In Phase 2, the urgency of the masks was no longer so evident, but further needs emerged shortly. At that moment, Cifra's owner understood that soon many other manufacturers would enter the market and produce masks. Thus, Cesare Citterio decided to bring antiviral technology into sportswear products.

During the Covid-19 crisis, SMEs did not have much time to structure new strategies. Only those with strong skills and experience (Ramos-Rodríguez et al., 2010) were able to recognize an opportunity and structure a rapid response. In fact, by exploiting its prior knowledge in terms of sector and technological skills, Cifra was able to recognize different types of entrepreneurial opportunities in Phase 1 and Phase 2.

Alertness

It is known in the opportunity recognition literature during crises that exposure to a problem increases alertness to the stimuli relevant to the solution (Grégoire et al., 2010; Williams et al., 2017). At the beginning of March 2020, ModaImpresa, like all firms that operate in the fashion sector, was in full swing of deliveries for the summer. Moreover, ModaImpresa was in the process of collecting orders for autumn-winter 2021. The lockdown blocked all the activities of ModaImpresa deliveries, orders included. Romolo D'Orazio, CEO of ModaImpresa, realized that there was a lack of individual protection tools.

However, while in Phase 1 the need was to plug the shortage of PPE, in Phase 2, when the Covid-19 virus spread like wildfire on Italian territory, the need was ensuring PPE with a greater health component. People's desires were changing, masks were accompanied by the need for other individual protection products and companies were taking actions to produce masks. ModaImpresa sensed the rapid change in the market and, "by connecting the various changes", decided to invest in a new project that would take care of the medical part only.

The ability to be alert has led ModaImpresa to react at different times and in different ways during the pandemic. In the literature on crises, the creation of new business ventures is well known (Williams and Shepherd, 2016). Indeed, during a time of great collective crises companies have the resources and organizational structures in new ways to help the local community. These new initiatives can also materialize in new businesses but also new individual projects (Shepherd and Williams, 2014).

Information search

Recognizing a new opportunity is only possible with the right information (Williams and Shepherd, 2016). In times of crisis, where the market equilibrium swings like a pendulum, the search for information has become a fundamental element. Simona Buti, CEO of Kontessa had just returned from Japan when the national lockdown soon occurred. The CEO of the company reflected on the experience she had in Japan, a region where most people were used to face masks as PPE. Thus, moved by the aim to save the work of the company's employees, she tried to figure out the necessary information to be able to produce the masks. Shortly after, Kontessa's owner realized that the material used to fill the bags was made of TNT with micro-small holes that made it breathable. Moreover, the same material could be important to make the prototype of the mask.

However, the company finds itself having to seek further information. The search for TNT and the right supplier was not the only information the company sought. As already mentioned, these companies had never produced masks and, in Italy, few or no one was involved in its production. To produce a suitable mask, it was necessary to "stop the nose mask" in a painless knot and find a soft elastic that did not hurt the ears. As regards the painless knot, the founder of the company personally took care, together with her model-maker sister, to find an ingenious solution. The forretto had to be solid but painless, so they initially used CUKI underwires and then the underwires with which the vegetables are bound. As regards the soft elastic, instead, after looking for the elastic bands in different suppliers, the company mobilized the internal skills to ensure that the elastic did not come off internally. Finally, Kontessa was able to carry on her business only to have the domain of known information.

Cognitive traits

Opportunities' recognition during crises is strongly influenced by the traits and management skills of the people who run the company (Sambasivan et al., 2009) and, in the case of SMEs, by the owners of the company. The lockdown caused by the pandemic has inhibited traveling on both national and international territories. At that moment, Cristiano Roncato, CEO of Roncato, one of the major Italian manufacturers of suitcases, realized that shortly afterward all production would stop for a long time. Thus, he had the intuition to make printed masks in collaboration with a partner. However, the production of the masks was very different from the one usually adopted by the company. Despite everything, the production of the masks went on throughout Phase 1.

Subsequently, the creativity of Roncato led to evolve its concept of mask into a different mask, with an innovative technology that allowed to eliminate up to 99% of viruses that rest on the mask and also permitted it to be washed once a week with the consequent reduction of waste and pollution. Furthermore, at the same time, Roncato works on a kit that also includes the disinfectant gel so that when you start traveling, the consumer will also have his kit for traveling. In recognizing these opportunities, the entrepreneur's self-efficacy played an important role. According to prior literature, self-efficacy is usually conceived as the belief of entrepreneurs in their ability to exercise control over certain tasks (Tumasjan and Braun, 2012). Roncato was far from producing PPE. Moreover, the activity could seem potentially risky. However, the determination, the conviction of being able to have control of the management, and the ability to lead the team towards a common goal allowed the company to manage a situation of crisis. In fact, during an emergency, although on the one hand it is necessary to implement effective and rapid decisions, on the other it is necessary to have the skills to guide your team towards the realization of the activities.

Unexpected finding: Purpose-driven orientation

From the analysis of our data, a further factor still not investigated in the literature of opportunity recognition emerged. More concretely, the four SMEs have reacted to Covid-19 by taking care of the needs of the community inside and outside the company. However, considering the new emerging literature about purpose corporations (Henderson, 2020), it is not surprising that some firms adopt behaviors geared towards achieving pro-social goals, working towards common causes that go beyond mere profit gain and which emphasizes social gain (Birkinshaw et al., 2014). Such firms give considerable attention to their global commitment to society, which includes wider goals, such as "making a difference, improving lives or reducing harm" (Rey et al., 2019). Therefore, we can assume that firms that took initiative during the Covid-19 crisis responded, albeit with different intensity, to the features of purpose corporations moved by the desire to help (Rey and Bastons, 2019). In this study, we unveil the nature of purpose-driven orientation by unraveling two key dimensions: 1) safeguard of employees' jobs; the Covid-19 crisis has created serious consequences for companies for several reasons. First, the prolongation and extension of the blockade measures caused a reduction in working hours internationally. Thus, business owners were concerned about saving their employees' jobs. 2) contribution to local communities' needs; the Covid-19 pandemic has generated a huge and sudden increase in demand for PPE. The demand for these products could not be satisfied in various countries, with the necessary speed, by institutional bodies (WHO, 2020) and this has also stimulated the actions of companies (Baldwin and Di Mauro, 2020; Tognini, 2020). In particular, the four SMEs have taken steps to meet the needs of local communities.

Research limits. *This study has several limitations, some of which also represent research opportunities. First, alternative qualitative approaches could also be relevant to build theory from longitudinal research. Future studies might validate the theoretical arguments developed in this article by adopting alternative research designs.*

Second, performance implications of opportunity recognition were not analyzed. Covid-19 is an unprecedented crisis that has caused many financial problems to SMEs. Thus, we have reason to believe that it is premature to discuss how entrepreneurial opportunities, recognized by SMEs' owners during Covid-19, have fully or partially reinvigorated the fuel of their organizations. Future research may investigate this intriguing line of inquiry.

Third, Italy was the empirical context through which we studied opportunities recognition. The firms analyzed in this study have voluntarily reacted to Covid-19. However, in some countries (i.e. China), institutional factors were relevant. Future research may for instance understand how government initiatives shaped SMEs' opportunity recognition.

Practical implications. This study also offers three implications for SMEs' owners, young entrepreneurs, and managers. First, a pandemic crisis can stimulate SMEs' owners to identify new business opportunities. Our case studies show that, in Italy, some SMEs have not been frightened nor closed their manufacturing activities. Instead, these companies reacted to Covid-19 by identifying new business opportunities that kept employees' jobs and led them to experiment with new products, involve new partners in their supply chain, and embrace change.

Second, this study also proposes some best practices for SMEs managing a crisis. During a crisis, such as Covid-19, new business opportunities can be identified and exploited by SMEs. In this article, we show that SMEs' owners may discover new entrepreneurial opportunities through prior knowledge, alertness, information search, cognitive traits, and purpose-driven orientation. These factors may explain why some entrepreneurs (and organizations) can recognize opportunities that others simply fail to see in managing a crisis.

Third, this study shows that only SMEs with a strong identity and purpose orientation have recognized entrepreneurial opportunities. This is useful for entrepreneurs because it could stimulate you to take actions to increase the sense of identity and belonging in the company.

Originality of the study. The results of our qualitative analysis on four paradigmatic examples of Italian SMEs that reacted to Covid-19 (Cifra, Kontessa, ModalImpresa, and Roncato) also suggest that it was speed a key element that has shaped the relevance of prior knowledge, alertness, information search, and cognitive traits in discovering new entrepreneurial opportunities during the Covid-19 crisis. Indeed, the findings indicate that, in the case of the Covid-19 crisis, alertness requires the ability to connect elements that could change over time. SMEs went through two phases during the Covid-19 crisis and each of them was different in terms of resources and market. The ability to quickly identify non-current but future market changes allowed the owners of the companies interviewed to recognize the opportunity to safeguard their employees and the community.

Furthermore, our study provides another new and interesting element. Indeed, our findings suggest the existence of a fifth factor which is not mentioned in the literature about SMEs' opportunity recognition during crises, i.e. purpose-driven orientation (Henderson, 2020). In fact, we found that opportunity recognition has been strongly influenced by the fact that SMEs' owners were extremely concerned about saving their employees' jobs and contributing to local communities' needs.

Key words: opportunity recognition; Italian SMEs; Covid-19; purpose-driven companies; longitudinal analysis; crises

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Omissis

Exploring digital transition strategies for the “Made in Italy”: the case of digital craftsmanship at design Italian shoes

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Objectives: *Firms’ business models change over time due to the forces that influence their evolution and innovativeness (Baden-Fuller and Haefliger, 2013). Recent changes in socio-economic contexts, determined by the transition to the Industry 4.0 paradigm and the ongoing pandemic, are requiring firms to reshape their business models quickly. Both phenomena are acting as forces that push firms to rapidly reconfigure their business strategies in terms of digital transformation to respond to an increasing demand for online transactions and for online (Cennamo et al., 2020) personalized, and tailor-made offerings (Wang et al., 2017). Despite the urgency for digital transformation in terms of the processes of design, production and distribution, as well relationship with customers, firms still lack experience with digital technologies implementation and the know how to effectively digitalize processes to boost productivity and effectively respond to customers’ needs (Guenzi and Habel, 2020; Björkdahl, 2020; Cennamo et al., 2020).*

Customers’ need for personal care. A recent research on sales force and customer care, (Salesforce, 2021) on a sample of 7,000 professionals in 33 different countries (300 in Italy) highlights that the main weakness of customer service teams lies in the technological gaps in their structures. The 86% of managers found critical issues in several interaction tools, especially digital ones, which are particularly used by consumers (e.g. social media, digital corner, smart app, e-commerce multiplatform). The report confirms the growth in the use of digital tools, 81% of customer service managers confirm that initiatives in this field are accelerating, and the increase in the use of solutions based on artificial intelligence for the automation of certain processes (whose implementations have increased by 32% and 67%, respectively, over the past two years). As Regional Sales Director of Salesforce Service Cloud observes, “The fastest companies in responding to the paradigm shift are those who have understood the importance of focusing on the centrality of the customer to raise the level of assistance services.” (Salesforce, 2021)

In 2015, a study by Deloitte (2015) on the rise of mass personalization highlighted that the future of customer engagement lies in a business model that will implement mass personalization providing tailored products since the demand for personalized products will continue to increase. In some categories, up to 50% of customers’ express interest in purchasing personalized product or services. Moreover, the majority of consumers would also be willing to pay a premium price, particularly in the more expensive or fashion-related categories. “In the future, businesses that do not incorporate an element of personalization into their offerings risk losing revenue and customer loyalty. Businesses that embrace personalization have the opportunity to create a differentiated proposition that may command a price premium and improve consumer traffic and conversion. The challenge is to determine how many options are necessary for a product and or a service to feel unique while still profitable” (Deloitte, 2015).

The implementation of this specific business model requires the knowledge of the right capabilities to rethink firms’ actual strategies (Wang et al., 2017) such as: the capability to completely fulfill each customer requirement and quickly reconfigure the supply chain, distribution logistic and implement a rapid paradigm change in the processes of design, production, and relationship with customers (Cennamo et al., 2020; Solberg et al., 2020; Kostis and Ritala, 2020).

The present study aims to investigate innovative approaches to support Italian firms in detecting the right capabilities to deliver online personalized and tailored customer experiences while shopping online for “Made in Italy” products. On one hand, this study responds to the urgent need to reduce the gap between pre-and post-pandemic customers’ needs for engagement and customer care while shopping online. On the other hand, it also aims to innovate firms’ ecommerce processes to differentiate their offers in actual and incoming scenarios of online markets. The sale of customizable products is defined in the literature as a mass customization (MC) strategy (Kaplan and Haenlein, 2006) based on “developing, producing, marketing and delivering affordable goods and services with enough variety and customization that nearly everyone finds exactly what they want” (Salvador et al., 2009, p.48). As stated in previous research (Aichner and Coletti, 2013), branding products no longer guarantees loyal customers because tried-and-true marketing techniques from the past no longer work for most products-particularly for complex ones based on new technologies. Mass customization is considered a promising strategy to improve a company’s relationship with its

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customers (Pine et al., 2009). Companies that implement mass customization could increase customers' loyalty by improving the fit between the self-designed product and individual preferences and pushing customers to change brands if another company offers a similar product in terms of price and quality, which also allows one to personalize the product (Aichner and Coletti, 2013). Mass personalization is the advanced stage of mass customization since addresses a market of one, which is the extreme case of mass customization (Wang et al., 2017)

The online product personalization strategy is becoming increasingly widespread, especially via online sales configurators (OSCs) which are knowledge-based software applications that support potential customers as they can choose from a company's product offerings the product solutions that best suit their needs (Tiihonen and Felfernig, 2017; Randall et al., 2005). OSC software can be designed for supporting the sales force in guiding customers toward solutions that fulfill their personal requirements. For customers, searching online among thousands of possibilities for a solution that coincides with one's needs can become overwhelming (Huffman and Kahn, 1998). The functionalities of an OSC help in responding to customer care, as its implementation allows the support of potential customers in their decision-making processes, for example, by reducing choice complexity (the amount of information processing that is necessary to make a decision). Likewise, it is acknowledged in the literature that product configurators can support consumers in identifying their own solutions while reducing computational and non-computational sources of decision difficulty e.g., see (Tiihonen and Felfernig, 2010; Falkner et al., 2011).

From the firms' perspective, OSC also help to improve the quality and speed of firms' offerings, delivery to customers by reducing costs (e.g., stock costs and unsold products) (11-13), as well to mitigate the negative effects of product customization on cost, time, and quality of performance (Trentin et al., 2013; Trentin et al., 2012).

As stated in a previous study (Di Maria and Finotto, 2008), the advantages of implementing an OSC as user toolkit rely on the opportunity for firms to both shift part of the burden for customization and innovation onto users. User-to-user diffusion (Di Maria and Finotto, 2008) as well as spontaneous support within users' communities play a key role in the creation and development of brands' values (Jeppesen, 2005; Aichner, 2012). In their study Di Maria and Finotto (2008) highlighted that Italian small and medium-sized enterprises (SMEs) could benefit from these strategies because of their collaborative vocational approach to markets as well as the economic advantages the communities of customers and user-generated content approach can offer compared to structured research-and-developed-based innovation. However, the Italian SMEs may pose limits in terms of competences and resources available internally, specifically in the domain of marketing or ICT-and require new forms of the division of labor at the local and international level (e.g., networking as a solution to exploit external specialization) (Di Maria and Finotto, 2008).

The present study aims to shed light on the viability of mass personalization as an ecommerce strategy for Italian SMEs, especially those in the "Made in Italy" group. The present study focuses on the ecommerce of personalized products via OSCs, enabling potential customers to co-design and buy their products online.

Methodology. This study employed quali-quantitative methods to collect useful data for the initial explorative steps of the study. In a first stage, to describe the globally adoption of OSC and the level of adoption by Italian firms the study empirically analyzes a sample of 1,400 online sales configurators listed on the Cyllege database. In the second step, the study describes analyzes the state of the status quo regarding how each configurator, from Italian firms, supports customers during their online product personalization by performing/realizing at least one product configuration experience. In this way, the study determines the capabilities of Italian configurators. This analysis follows the methodology adopted in previous studies regarding mass customization with OSCs (Trentin et al., 2014; Sandrin et al., 2017), which identify five capabilities deployed by OSCs to support customers in finding the product configuration that best matches their needs, namely: benefit-cost communication, user-friendly product-space description, easy comparison, flexible navigation and focused navigation capability¹. A researcher with high expertise in configurator capabilities collected the data, while the interpretation was conducted through a collaborative endeavor with authors. These five sales-configurator capabilities (Trentin et al., 2014) play a key role in preventing user abandon before a purchase, as they alleviate difficulties experienced by a potential customer in terms of both cognitive and emotional efforts of their decision-making while configuring a product. Additionally, the five capabilities deploy a synergic effect (Sandrin, 2017) in providing potential customers with high levels of benefits such as: hedonic, creative achievement, uniqueness and self-expressiveness benefits that lead to higher consumer willingness to pay (Franke and Schreier, 2010) as well as unplanned shopping decisions and higher repurchase intentions (Franke et al., 2010; Babin et al., 1994).

In the third stage, the study investigates opportunities and obstacles in product personalization implementation by providing the case study of DesignItalianshoes (DIS), an Italian SME that operates in the fashion industry producing men's footwear. This case was selected due to the specific characteristics of DIS's business model in terms of mass

¹ Description of OSC capabilities: Focused Navigation capability (FocN): The ability of an OSC to quickly focus a potential customer's search those solutions of a company's product space that are most relevant to the customer himself/herself. User-friendly product space description (UFD): The ability of an OSC to adapt the description of a company's product space to the individual characteristics of a potential customer as well as to the situational characteristics of his/her using of the OSC. Flexible Navigation capability (FlexN): The ability of an OSC to let its users easily and quickly modify a product configuration they have previously created or are currently creating. Easy comparison capability (EC): The ability of an OSC to support its users in comparing product configurations they have previously created. Benefit-cost communication capability (BCC): The ability of an OSC to effectively communicate the consequences of the configuration choices made by a potential customer both in terms of what he/she would get and in terms of what he/she would give (Trentin et al., 2014)

personalization that is business to customers to business (B2C2B), as an intersection business model which combines business to customers (B2C) and ,business to business (B2B).

Findings. Preliminary results from Step 1. *The findings of this step show that the selling of personalized products is a process adopted by firms in 38 countries around the world. Of these listed counties, Germany has highest percentage of configurator implementation (40.9%) from a sample of 1,400 online sales configurators, followed by the US (31.2%), Austria (6.8%) and the UK (4.2%). The database reports a list of 21 Italian firms that have implemented selling personalizable products via OSCs. The database groups configurators into 17 product categories; the one with the most prevalent implementation of OSC is house and garden, comprising 18% of the configurators’ sample. This is followed by accessories (12%), apparel (12%), motor and vehicle (10%), food and packaging (8%) and sport equipment (8%), office and merchandise (6%), food and packaging (4%), printing platforms (4%), footwear (3%), industrial goods (3%), electronics (2%), games and music (2%), pet supplies (2%) and uncategorized (2%).*

Of the Italian OSCs, the product category most implemented with OSCs is motor and vehicle (33%), followed by accessories (19%), apparel (14%), house and garden (14%), sportswear equipment (10%), footwear (5%) and industrial goods (5%). One interesting aspect of Italian configurators is that they are often implemented by high-end and luxury brand firms, such as Lamborghini, Ferrari, Ducati and Gucci. Additionally, Italian configurators for sportswear equipment enable the personalization of technical products, and footwear configurator allow the personalization of high-quality, handmade leather Italian shoes.

Despite the limited number of configurators for Made in Italy products, it is interesting to note that 48% of configurators are implemented by SMEs, 24% by large firms such as Ferrari, Ducati, Lamborghini and Gucci, and 14% by firms with 10 or less employees. Despite the growing demand for personalized products reported in several studies (cit.reports), Italian firms still lag behind in shifting towards mass personalization and thus exploiting the opportunities offered by this business model.

Preliminary results of Step 2. Findings show that of the 21 configurators implemented by Italian firms, 14 were active at the moment of our analysis, 2 were in the reconfiguration process and 5 were no longer active. Of the analyzed configurators, each had a capability to guide a customer through their personalization process. The most common capability found is focus navigation (Flex), which refers to the ability of an OSC to let its users easily and quickly modify a product configuration they have previously created or are currently creating. Flex capability was detected in 79% of the configurators, while 57% of OSCs were found to have the ability to quickly direct a potential customer’s search towards the solutions in a company’s product space that are most relevant to them; this trait is termed focus navigation capability (FocN). Additionally, 50% of the configurators were found to have the ability to relate the description of a company’s product space to the individual characteristics of a potential customer, as well as to the situational characteristics of their usage of the OSC; this is defined as a user-friendly product space description (UFD). Only 21% of OSCs effectively communicate the consequences of the configuration choices made by a potential customer both in terms of what they would get and in terms of what they would give; this is termed benefit-cost communication capability (BCC). Additionally, the so called easy comparison capability (EAC) was detected in a limited number of configurators (14%) that support their users’ ability to compare product configurations they have previously created (EAC).

Findings of this step show that even though configurators implemented by Italian firms have a high level of ability in guiding potential customers toward the selection of their personalized product, they have a low capability of communicating to customers the effective and whole value of the configured product, including costs in terms of delivery price and timing. Information of delivery price and timing is especially relevant at the final steps of customers’ decision process. As stated in previous research (Aichner and Coletti, 2013), price and waiting time play a key role in determining customers’ choices of whether to rely on a certain company to buy a customized product.

Of the configurators analyzed, only three were found to implement a 3D visual representation of the product. The configurators from Ferrari and Lamborghini simulate a background in which the product is located. In terms of product visualization, each of the configurators analyzed lack realistic product representation. Examples include missing a whole view of the ongoing configuration, for example by missing the visual representation of both front and back side of the product (e.g., of a case or bike), missing of visualization of both items in personalizing products that are sold in pairs (e.g. shoes), and missing a fitting simulation for example how the personalized pair of glasses fit on different face shape in the case of personalizable accessories (e.g., glasses) or on different body shape for personalized apparel.

Step 3. Digital craftsmanship: The case of Design Italian Shoes (DIS)²

To further explore how to capitalize from selling personalizable product via OSC and the potential obstacles to implementing this strategy, we analyze data with qualitative information collected from a structured interview with Dr. Andrea Carpineti, CEO of DIS, an Italian SME that sells in Italy and 35 other countries with 90% of its income derived from selling personalized products via OSCs. Their approach to mass personalization is multichannel, with a network of corners and retailers in which customers can configure and order personalized shoes in addition to orders they can

² “DIS production is made in Le Marche region, inside traditional workshops, protectors of a 100+ years old tradition: they shape the so-called “Shoe Valley” network, the Made in Italy footwear district which is a worldwide pride for shoe manufacturing. All DIS shoes are crafted by hand and more than 220 steps are required to make a single shoe. All shoes have a Blake construction, meaning that the outer sole gets stitched directly to the insole, in order to give max flexibility, comfort and lighter weight” retrieved on march 2021 at. <https://www.designitalianshoes.com>

directly perform via an online sales configurator. Today, DIS is one of the internationally referenced companies for customizable Made in Italy craftsmanship. The company's mission derives from the intersection between local craftsmanship in the man footwear industry and internationalization through digital technology implemented in all firms' divisions, from order inception to product delivery. These processes are supported by digital interfaces that enable real-time interactions that convert the traditional craftsmanship of shoes into digital craftsmanship. The firm began as a start-up operating alongside local retailers by selling customizable products defined as "exotic," which refers to products difficult to find and, in the case of footwear, shoes of very small and/or large sizes or shoes that meet specific customers' needs. Since DIS's founders evaluated the characteristics and peculiarity of footwear district of the Made in Italy in Le Marche region, which contain many types of craftsmanship, they reconfigured DIS initial core by implementing an innovative business strategy with technology especially design to a B2C2B model of mass personalization.

By observing the local reality in which various offers were distributed in different geographic areas of the same district, losing the ability to be easily accessible to demand, DIS's founders researched what business model could be implemented to convert the disadvantages of geographical dispersion into a suitable business model for DIS and artisans in the district. A large number of artisan shops specialized in specific shoe models were concentrated in distant geographic areas, making it difficult for a customer to find in a single area or store one or more products that meet their wants or needs. Thus, the potential variety of products actually offered was geographically disseminated. DIS's founders reconfigured the core business to implement a production system that connected artisans in a digitized network for the production of customizable shoes. DIS' founders built up the so-called "Shoe Valley" network that nowadays count on 90% of the revenue on the selling of personalized shoes via OSC, a business model is definitely win-win for all involved. Due to product personalization via its online configurator, DIS has achieved a repurchase rate of 25% on sales of products that can be customized.

Mass personalization processes have been implemented in the entire industry process by decentralizing the supply chain in a backend structured with a network of artisans in the Le Marche shoe-manufacturing district. Thanks to the adoption of digital interfaces, each artisan unit is informed by the digital interface through which can also communicate in real time to update and monitor the entire process from the order being placed until its delivery. The digitization of the entire process of product personalization facilitates one of the key factors in successful mass production: delivery time. DIS is able to deliver all over the world with guaranteed delivery within 10 working days from the issue of the order. Another key factor of DIS business model is that all digital interface including the product configurator are designed by one of the DIS founder and programmed within DIS Information technology (IT) team.

From a customer experience point of view, online co-design enables a product configurator to be accessible from the firm's website. The product configurator is entirely programmed by the DIS ITC department and coordinated by one of the three co-founders. As described by CEO Dr. Andrea Carpineti during the interview, the configurator is translated into six languages to allow customers from foreign countries to place orders in their preferred language, while the interface automatically translates the order into Italian in the backend. The digitalization of this technology aids in preventing communication problems between customers and the artisans and sub-suppliers of components (e.g., leather, soles) who receive orders and work on them up to fulfillment within the scheduled time. During the production process, all actors involved can interact in real time to update the state of the order, and end users are continually updated on the progress of their personalized products. The implementation of the DIS configurator is aimed at offering the customer significant benefits in addition to the utilitarian benefit derived from the closeness of fit between objective product characteristics (i.e., physical, aesthetic, functional characteristics) and individual preferences regarding a product's functional and or instrumental characteristics (Turner et al., 2020). Due to its specificity, the DIS configurator provides users with a product space that contains a variety of options and attributes enabling users to self-design a product with the feeling of creating something personal and unique. The DIS configurator guides end users to a final product personalization that can deliver a high level of uniqueness and self-expressiveness, creative achievement and hedonic benefits³ compared to a configurator with a limited product space offering and a limited number of personalizable components. Specifically, the benefits that a customer can derive from the possession of a DIS personalized footwear include a high level of uniqueness that a consumer derives from the opportunity to assert their personal attributes by possessing a personalized product and a high level of self-expressiveness that originates from the opportunity to possess a product that reflects the consumer's self (Merle et al., 2010). This is in accordance with the self-consistency motive underlying self-concept; the term self-consistency denotes the tendency of an individual to behave consistently with their view of themselves. Like uniqueness, the self-expressiveness benefit is related to the symbolic meanings a person attributes to objects through social construction and represents the claims of the DIS firm to allow customers to:

"be different, be yourself." The DIS configurator is also programmed to provide users with additional benefits especially related with the experience of product configuration itself, such as creative achievement and hedonic

³ Benefits descriptions: Uniqueness (UN): The benefit acquired from the opportunity to assert personal uniqueness using a self-customized product. Self-expressiveness (SE): The benefit derived from the opportunity to possess a product that reflects one's self-image. Creative-achievement (CRA): The benefit derived from the capacity of the product customization experience to arouse in the configurator user the feeling of pride of authorship. Hedonic (HE) The benefit derives from the capacity of the product customization experience to be intrinsically rewarding to the configurator users. (Trentin et al. 2014, Sandrin et al.2017, Merle et al.2010)

benefits. At this regard, the configuration experience is intended to be highly engaging through the graphic 3D representation of the product, the visualization of the changes on each product component that can be quickly modified by users at any time he/she prefer modify his/her configuration and the variety within the product space.

Due to the opportunity to personalize all components of the shoes, the DIS configurator engages end users in a configuration experience able to arouse high levels of pride of authorship, including the feeling experienced by individuals of being the creator of an artifact (creative achievement). At the same time, the configuration process's realistic 3D visual representation of the desired product and real-time visualization of each change users make is able to engage users in an enjoyable shopping experience (hedonic benefit). Hedonic benefit derives from the capacity of the mass personalization experience to be intrinsically rewarding for potential customers. Both of these latter benefits are part of the configuration process itself and thus may be experienced even if a potential customer does not take advantage of the opportunity; this leaves the users with a rewarding feeling. In contrast to configurators that enable the personalization of only a limited number of components (e.g., from our group of configurators, Ducati, Laos and Gucci), configurators with flat product representation (2d) and those that do not make user choices and changes visible in real time nor provide a final representation of the configured products, the DIS configurator provides a high level of both creative achievement and hedonic benefits. Future developments are on the way in the areas of 3D visualization and augmented reality to evoke the thrills of retail shopping.

Dr. Carpineti describes how the whole product personalization experience begins with an offer of personalized customer care. DIS offers customer support at every step of the configuration process. Additionally, in situations regarding choices that can be perceived as risky, such as the size of the footwear, the customer is given the opportunity to choose how to be supported in identifying their correct size. Personalized attention allows a company to reduce the complexity of choice by supporting the customer from choosing the size to closing the sale. The choice of size is one of the factors that distinguishes DIS offerings, thanks to the variety of options it offers, to simplify a selection that in an online shopping process can be perceived as risky by potential customers (Pires et al., 2004). The site also offers the possibility of carrying out body scans through an application for customers' mobile phones.

Obstacles to implementing mass personalization. As confirmed by Dr. Carpineti, the implementation of this specific production and selling process has not gone without criticism. There are indeed several obstacles, especially in regard to the digitalization of craftsmanship activities. Based on the experiences of DIS, obstacles to the implementation of mass personalization processes include the lack of transcoding of communications concerning orders, the lack of real-time communication between backend actors, the lack of a shared same individual language between the frontend and backend and the lack of customer care capable of following each customer in real time from the beginning to the closing of the sale. Among these challenges, the greatest was the gap from local artisans business vision and DIS's founders one. Several were cultural barriers that the co-founders faced to communicate on the advantages of participating in a long-tail business model for local artisans. For the craftspeople to rethink their production and sales processes in 2015, when the market guaranteed large volumes of sales and even seasonally it was convenient to stock 10,000 pairs of identical shoes, rethinking their business with a view to selling a few units of many different varieties of footwear aroused skepticism and distrust.

Advantages to implementing mass personalization. The pandemic has also caused a drastic drop in sales in the fashion sector due to the decline of all activities related to socializing and fashion. The fashion sector has suffered from the consequences of the pandemic in terms of lost sales. The implementation of mass personalization networking has enabled the activation of a sustainable model of re-evaluation and interconnection of craft activities through digital interfaces. The implementation of mass personalization networking allows artisans to minimize unsold goods and avoid having to invest and receive payments in advance from the DIS. It also allows local production systems to survive the economic side effects of the pandemic. The DIS experience is the result of a successfully implementation of mass personalization based on a corporate innovation process that involved a large part of the district in which the company operates by implementing networking of digital artisanship of leather shoes that represent one of the excellence of Made in Italy.

In spite of the sustainability of the model created by DIS, the drop in demand will have consequences that go beyond the business model. Once more, the firm is reconfiguring its business model to convert the critical consequences of the pandemic into opportunities. So far, DIS has expanded the portfolio of retailers involved in the personalization process by offering white label personalization services to other brands as well. In the near future, besides customizable products, DIS is preparing to respond to the growing demand for mass personalization in the B2B space, designing and programming mass personalization models including sales configurators implemented with advanced digital technologies for fashion brands.

Research limits. The present study is still ongoing; its limitations will be address in next step of the investigation such as data collection, in deep analysis (e.g. Clydlege database contains data about a large number of configurators but does not cover all the existing, up the date of the study was the one publicly available which allows the search for configurators worldwide).

Practical implications. The present study describes the state of product personalization among “Made in Italy” companies. These findings are informative regarding the maturity of the online sales of customizable products achieved by Italian firms that have already implemented this business model. The study contributes to managerial implications by suggesting improvements for firms that could benefit from implementing offers of personalizable products or services in their ecommerce platforms.

The review of “Made in Italy” configurators shows that upgrades are needed to successfully implement capabilities such as easy comparison and benefit-cost communication. Based on the findings of current configurators among “Made in Italy” companies, they would benefit from implementing or improving their capability to communicate cost-benefit information, including delivery timing information, to both increase operational efficiency and customer intention to proceed with purchases.

These improvements could contribute to enhancing customers’ perceived benefits related to the possession of customized products, such as self-expressiveness and uniqueness.

The implementation of product visual representation could also contribute to enhancing customers’ perceived hedonic benefits by facilitating an intrinsically enjoyable online flow experience and enhancing customers’ involvement with the products they configure. The opportunity to personalize almost all components of a product could contribute to enhancing customers’ perceived benefits of creative achievement—the feeling of being the creator of their own products. Additionally, wait time plays a crucial role in the willingness to use product customization offers and should be a sign to companies that are offering mass customization, not just to concentrate on price and quality but also to optimize information and physical flow to reduce production and delivery time to a minimum. Even in this initial step, this study provides managerial insights into how to move from mass production to mass personalization and from artisanship to digital artisanship. Regarding this latter purpose, we share the DIS practices to shed light on the opportunities and obstacles Italian firms could face in implementing product personalization.

This DIS case study shows how a company can invest in the right capabilities (introduced in the previous section) to provide personalized products, a personalized customer experience, and sustainable mass personalization production. It is a successful case of offering personalization while also investing in the adoption of digital technologies to support all parties involved in the supply chain. The case of DIS shows that the sale of configurable products via OSCs can be beneficial to business in terms of: (i) offering differentiation through individualization of products or services; (ii) reducing capital commitment and overproduction; (iii) improving quality in customer service; and (v) integrating of customers into value creation. The best practices described in the case of DIS suggest managerial insight into moving from artisanship to digital artisanship, as well as how to improve shoe configurators and ultimately increase a potential customer’s purchase intention by personalizing customer care. Additionally, it reveals the importance of designing an online personalized experience to give both end customers and firms’ employees a stronger sense of presence in a technology-mediated environment.

Originality of the study. Despite the online sales of personalizable products are well known, especially in the literature on mass customization and artificial intelligence, however, a limited number of studies have researched their implementation by Italian companies and how to capitalize on their potential for “Made in Italy” ecommerce. This study describes a starting point for the implementation of mass personalization as a process that can successfully drive firms toward digital transformation and enhance customer engagement. Innovative types of ecommerce, such as product personalization, can play a key role in fostering a company’s capabilities to improve both digital transformation and customer-centric relationships.

The present study aims at contributing to the ongoing debate on firms’ digital transition and customer-centricity in the looming socio-economic context of the “new normal” by focusing on opportunities for mass personalization for “Made in Italy” SMEs. In particular, its original contribution relies on its investigation of how to overcome the conflict of having a high demand for a personalized product or service, but an offer that is slow in responding to this demand and increasing customers’ new requirements.

Key words: digital transition, personalization, customer care, user experience design, craftsmanship, e commerce

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Industry 5.0 and Business model innovation in SMEs: an explorative study on the Role of Competence Centers in Italy

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Objectives. As Industry 4.0 keeps affecting manufacturing industries, researchers from different fields have started to raise concerns on how Industry 4.0 technologies are implemented. Particularly, notwithstanding their tremendous potential of improving the overall production system performance, if they are not used for wider social implications, they might threaten human and societal wellbeing (Friedman and Hendry, 2019; Kaasinen et al., 2020; Skarlatidou et al., 2019; Wang, 2017). These new technologies can indeed improve production efficiency, while enhancing employees' capabilities and overall wellbeing (Pinzone et al., 2020). Yet, although human centricity has been a central component of the Industry 4.0 paradigm (Kaasinen et al., 2020; Zolotová et al., 2020), there is still concern on how the combination of technical solutions and organization of work will evolve in manufacturing. For instance, new socially sensitive challenges are increasingly sparking up across researchers advancing concerns, such as blue-collar workers replacement (Kiel et al., 2017).

Hence, the literature has recently advanced that an over techno-centric focus on the optimization of industrial production processes might myopically overlook the broader social, political, and cultural landscapes (e.g., Fantini et al., 2020; Horváth and Szabó, 2019). Therefore, a new revolutionary wave, labelled Industry and Society 5.0, is emerging, where humans and machines reunite to collaborate and the individual returns at the centre of the whole innovation management process (e.g., Carayannis et al., 2020; Demir et al., 2019; Ferreira and Serpa 2018; Longo et al., 2020).

Industry 5.0 focuses on the potential synergies between human creativity and craftsmanship coupled with the speed, productivity, and consistency of digital technologies and robots. Whilst the research on Industry and Society 5.0 is still in its infancy, the literature seems to agree on its underpinning principles. A shift toward a more human-centric view (Ferreira and Serpa, 2018; Skobelev and Borovik, 2017), which structure technological development around ethical values, emotional intelligence as well as societal wellbeing, seems to be predominant (Friedman and Hendry, 2019; Kaasinen et al., 2020; Philbeck et al., 2018). Although Industry 5.0 may appear premature as Industry 4.0 has not been fully embedded into firms, the imminence of this new wave describing human-machines collaboration has also been hoped for by several policymakers. For instance, the European Commission emphasizes that technological innovation should not be implemented to displace people but, on the contrary, enhance their inclusion in a desirable future (Horizon Working Programs, 2020).

The literature has already shown that the new Industry 4.0 technologies deeply affect companies' existing logics and ways of doing business, thereby leading to business model innovation (e.g., Kiel et al., 2017; Müller et al., 2018). The embracement of a 5.0 perspective of doing business requires firms both a technological transformation as well as a more ideological and cultural shift which places human centeredness as the guiding principle (Zolotová et al., 2020). Arguably, this drives firms towards new business models which consider sustainability issues, embedding the triple top and triple bottom line approaches to balance business goals with environmental and social concerns (Carayannis et al., 2017). As a matter of fact, embedding sustainable practices in business model innovation is widely seen as the key to increase an organization's resilience to changes in its environment (Carayannis et al., 2017, 2014).

The aforementioned scenario poses significant challenges to firms, especially SMEs, which are still struggling in their digital transformation as they lack adequate resources, technical competencies and cultural mindset (Moeuf et al., 2018; Hock-Doepgen et al., 2020; Witschel et al., 2019). This offers opportunities for cooperation with external partners and institutions, as governmental and industrial initiatives can indeed support SMEs in their efforts by bringing together companies with complementary capabilities (Müller et al., 2018).

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In this regard, policymakers worldwide have been encouraging and supporting firms with several measures. Among all the various initiatives put in place by policymakers, it is possible to make a first distinction between financial and non-financial measures (Mazzuccato, 2018). Non-financial measures strongly emphasize the need to enhance knowledge transfer and close collaboration among the different actors within the business ecosystem. In this regard, Competence Centers have been purposely established as innovation ecosystems which, bringing together universities, governments and industry, should provide support to SMEs in the implementation and application of Industry 4.0 technologies (Piano Calenda, 2016). The national plan “Industria 4.0” launched eight Competence Centers as poles of “innovation constituted according to the model of public-private partnerships, with at least on research organization and one or more firm”. Competence Centers are “hybrid organizations” able to facilitate the embedding and exploiting of new technological approaches into firms’ routines (Meyer et al., 20109). Competence Centers are strongly linked with Universities or research centres and involve a consortium of companies working together with the purpose of helping companies developing skills and competencies as well as specific innovation projects. They aim at supporting SMEs at different levels from assessing their level of technological maturity, offering skills training for the application of Industry 4.0, as well as proper implementation of innovation projects on industrial research and experimental development through technology transfer (Müller and Hopf, 2017). Given their high involvement in implementing Industry 4.0 within companies, it is likely that they might play a pivotal role in assisting SMEs throughout a more human-centered digital transformation.

Therefore, the study aims at understanding the potential contribution of Competence Centers in supporting SMEs’ business model innovation towards Industry 5.0.

Methodology. The study adopts a qualitative methodology to investigate the role of Competence Centers in supporting SMEs’ business model innovation towards Industry 5.0. The rationale behind a qualitative methodology lies in the exploratory nature of the study (Eisenhardt, 1989; Yin, 2014; Voss et al., 2002). Although Competence Centers are specialized in a set of specific Industry 4.0 technologies and related competencies, they all perform three broad activities:

- orientation through workshops, seminars, webinars, assessments of digital readiness, company visits, etc.;
- training activities ranging from customized courses to hands-on training in the Competence Center’s laboratories;
- innovation, industrial research, and experimental development projects which make use of Industry 4.0 enabling technologies through open calls co-financed by the Competence Center and the Italian Ministry of Economic Development (MISE).

The empirical inputs to the analysis mainly come from different data sources. However, in-depth interviews with competence centers managers and university representatives within the competence centers have been carried out as a primary data source for the study (Yin, 2014; Eisenhardt and Graebner, 2007). Semi-structured interviews allow a wide coverage of the research themes and the right flexibility in gathering informants’ free descriptions. This far, we have conducted five interviews within three Competence Centers between November 2020 and February 2021. The interviews lasted between 45 to 60 minutes on average; they were conducted in Italian, audio recorded and transcribed verbatim. The interview track is based on open-ended questions within a standardized protocol to ensure both a right balance between consistency in the interviewing style and an adequate level of freedom in answering. Then, secondary data, such as open calls, general presentations, lists of courses, etc., have been taken into consideration and coded.

Although the research process has not been completed yet as the study is still ongoing, we might already provide preliminary valuable insights and implications.

Findings. The study findings revealed that notwithstanding Competence Centers’ activities are still highly focused on generating knowledge and interest in Industry 4.0 technologies; there is a general awareness of the underlying meaning of Industry and Society 5.0 among study participants. In this regard, they emphasize that Industry 4.0 technologies have the potential to go far beyond the efficiency of the factory by enabling new approaches to solve the current social and environmental problems. Notably, study participants strongly believe that Industry 4.0 places humans and societal wellbeing at its core and offers valuable opportunities to enhance employees’ capabilities and benefit society at large. They especially indicate that these technologies are actually useful to the individual in her daily work. For instance, collaborative robots are designed to work safely around people, freeing workers from repetitive and dangerous tasks, thereby easing labor fatigue. As argued by Competence Center 3 General Manager: “Industry 4.0 enhances the worker, more than what automation did in the 70s and 80s. That automation replaced the blue-collar worker. Instead, many of the 4.0 technologies increase the operator’s potential, enhancing her performance. With a microphone with glasses, her productivity increases by 20%. [...] Collaborative robotics, exoskeletons are human-centric as they relieve physical effort, they help you”.

While highlighting that the fourth industrial revolution as such is first and foremost a socio-cultural revolution, study participants also acknowledge that firms, especially SMEs, endanger to implement new digital technologies following a mere techno-centric view. They emphasize that technology is a tool, which can be used for good or for bad purposes, the use of technology can be even abused, or it can be demonized. SMEs’ techno-centric implementation of digital technologies is mainly due to firms focusing their attention on coping with daily problems and issues, thereby dedicating few resources to look at the future ahead.

In this regard, study participants highlight that the activity of Competence Centers is fundamental to drive SMEs’ business model innovation processes towards a more environmentally sustainable and human-centric direction. Notably, data analysis shows that Competence Centers are mostly focused on providing support in four broad areas: ergonomics, safety management, environmental sustainability, and ethics.

First, they believe that ergonomics of the workplace is of utmost importance to avoid technology rejection by workers. As argued by Competence Center 1 node manager: “Some technologies, such as cameras, sensors, exoskeletons, aim at studying human-machine interactions not only physical but also from an emotional, ergonomic, point of view. The purpose is to understand how to reorganize manual operations in a safer and more pleasant way for human beings, focusing on ergonomic both physical and cognitive”. In this regard, a Competence Center are usually able to find a technology provider in its network which can provide SMEs with specific competencies to implement a digital technology (e.g., a specific type of exoskeleton) which effectively helps workers in their daily activities. This is pivotal as SMEs seem to be even aware of the competencies they need and willing to invest in new technologies, yet they do not know how to find those competencies. The distance between the firm and the competencies needed is often so great that the firm alone would hardly be able to bridge the gap without someone in between.

Second, study participants strongly emphasize safety management as a critical area where they are keen to invest since too many dramatic events still happen. Thus, they widely finance digitization and robotization projects to increase operator productivity and safety. For instance, Competence Center 5 general manager stated: “The Competence Center made a clear choice to focus on strategic infrastructure security through advanced digital technologies and cybersecurity by paying attention to workers’ safety within the port”.

Third, Competence Centers support SMEs in the business model innovation process, which considers environmental sustainability as a priority. They strongly promote the implementation of innovative solutions with energy efficiency for a definitive change towards circular economy models as well as innovative projects for environmental monitoring (e.g., monitoring the air quality of dangerous gases). As argued by a Competence Center 2 general manager: “Another project that we are carrying out with one of our partners is about leveraging artificial intelligence to optimize the cooling cycle of refrigeration systems. This means that instead of generating greenhouse gases, these machines will even be able to absorb them.” The effects in terms of environmental sustainability are highly considered as evaluation criteria of the proposed projects. For instance, Competence Centers usually require firms that participate in the open calls to provide an estimate of the economic benefits of the innovative project in terms of reducing inefficiencies, waste and unnecessary costs.

Fourth, Competence Centers are somewhat acting for incorporating ethical issues into the implementation of digital technologies in SMEs. In this regard, working with technology provider, Competence Centers are trying to include ethics already in the digital technology provided to SMEs. As a matter of fact, these issues are extremely complex, and they are likely to overwhelm the entrepreneur. In this regard, Competence Center 5 general manager declared: “We introduced the topic of ethics. We have dealt with it on the training side, not yet introduced on the services we actually provide. It is a delicate and complex matter”. For instance, a Competence Center also have a working group which deal with the topic of robotics from an ethical point of view. Nonetheless, study participants strongly emphasize that they still experience difficulties in dealing with ethics, but they fully acknowledge that this matter will become even more important in the future.

Overall, the most important activity is the provision of education and training courses through which the Competence Center involves and sensitizes SMEs on environmental, social, and ethical issues, also encouraging collaboration between the center itself and individual companies. Data analysis shows that the most effective way to make people and companies understand that Industry 4.0 places humans and environment at the center is training them before financing them. Awareness of those who use technology is fundamental to ensure that a given technology is used properly and does not become an element that undermines humans’ work and wellbeing. For instance, Competence Centers organizes various webinars on environmental sustainability matters (e.g., circular economy, innovative and sustainable materials, women entrepreneurship, etc.) with the aim of making firms aware that these issues exist and how they can tackle them through business model innovation processes. Competence Center 2 general manager stated: “I would say that training is the key aspect. If training tackles these issues and is included in our programs, such as webinars, courses, and anything else, it is obvious that it helps the company. For example, at the end of this week, we will have a webinar on the circular economy, which goes in this direction”. These events are attended by several firms, which largely exceed the number of companies getting funds. Education and training courses appear extremely important to deal with ethics as this topic is considered a delicate and complex issue, strongly intertwined with legal aspect, which can even become a great barrier when negative examples contaminate the whole perception of ethical matters.

Their efforts to drive firms towards environmental, social, and ethical issues are also formalized into their open calls, which are directed to finance the implementation of new digital technologies in innovative projects. The open calls issued by the Competence Centers aim to answer various needs or technological gap, such as digital technology-enabled security and optimization of strategic infrastructures, smart logistics, circular economy models, and human-robot collaboration, among others. Therefore, study participants highlight that open calls pay close attention to “walk the talk”, trying to raise awareness on these issues in a concrete way and effectively support companies that truly aim to evolve in this direction.

Therefore, study findings pinpoint that Competence Centers hold a pivotal role in supporting SMEs’ business model innovation processes towards Industry 5.0. However, more have yet to be done in the future, given their evolution within the European context. They have a tremendous potential to drive SMEs away from a techno-centric view of technology implementation.

Research limits. As with any other research, this study is not without limitations, which also offer fruitful opportunities for future research. First, the study employs a qualitative methodology which does not allow for statistical generalization. Nevertheless, this was beyond the scope of our analysis.

Second, although researchers used multiple data sources (i.e., semi-structured interviews with key informants and secondary data analysis) to triangulate findings, this far the number of interviews is rather low. However, this study is still ongoing, and the researchers plan to conduct additional interviews among Competence Centers' members. Moreover, a longitudinal study might help to solve this limitation further. This would imply repeating the interviews over time to observe changes which might occur, and it is particularly interesting for future researchers given the imminent evolution of Competence Centers as European Digital Innovation Hubs.

Finally, as the study represents one of the first attempts to deepen into the role of Competence Centers for business model innovation within a logic of Industry 5.0, its limitations might prompt to future research development which might lead to a more refined conceptualization of Industry 5.0. as well as to a more in-depth and rich evaluation and assessment of Competence Centers practices. For example, through empirical cases, further studies could focus on organizational and strategic contexts of firms which have been receiving assistance from Competence Centers.

Practical implications. Although the study has been not completed yet, it offers some insightful implications for Competence Centers, policymakers and firms.

On the firm side, the study has confirmed the struggle faced by SMEs in the implementation of Industry 4.0 technologies. In particular, besides financial difficulties, cultural barriers due to a lack of knowledge and understanding of the concurrent impact that digital innovation might have on more human and social aspects might risk undermining the very same implementation of the innovation process. Therefore, SMEs should avail themselves of Competence Centers, taking a more holistic approach through which digital transformation is preceded by education and training at different organizational levels, starting from management to blue-collar workers. SMEs should move beyond the logic of purchasing one single new technology to improve efficiency but instead look for more long term and comprehensive solutions which involve systematic and radical innovation of their business model.

As for Competence Centers, the study has confirmed their pivotal role in supporting SMEs throughout their process of digital transformation. In particular, the analysis has revealed that as in the near future innovation is likely to take place in more responsible ways, which indeed take into account societal wellbeing and ethical factors, their relevance is likely to increase. Competence Centers have the important role of educating SMEs in pursuing digital transformation according to an Industry 5.0 paradigm. This will be achievable only through the provision of more holistic and customized solutions which comprehend education and training as well as assistance for the entire restructuring of work systems through designed-based frameworks, including work organization and division as well as workers tasks. Therefore, in the near future, it is important that Competence Centers will focus even more on integrated offering based on long term collaboration with their client firms as well as on providing greater incentives for innovation which has a larger incidental impact on societal wellbeing.

Finally, in relation to policy, there is a need for more clear and unified standards and codes of practices for Competence Centers to inform their activities in promoting a more ethical and human-centered digital transformation.

Originality of the study. The originality of the paper is twofold. Firstly, the study has been conceived as an attempt to pave the way for an Industry 5.0 digital transformation structured around the paradigms of human-centeredness, social wellbeing, and ethical values. While most of the research has been focusing on technological aspects of Industry 4.0, including the consequential improved efficiency and productivity performance of firms, this paper has uncovered the role of Competence Centers envisioning a future scenario where SMEs will be required to learn how to implement Industry 4.0 technologies also taking into account human, social and ethical values. Furthermore, as Competence Centers are a relatively new actor of the Italian context, to the best of our knowledge, this study represents a very first attempt at systematically analyzing their practices and their impact on business model innovation.

Keywords: Industry 4.0; Industry 5.0; Business model innovation; Competence Centers; SMEs

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Hackathon-platforms as enablers of a sustainable approach to develop innovative solutions

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Objectives. *The aim of this work is to shed light on the role of hackathon-platforms as enablers of innovative and sustainable solutions in the tourism industry. Hackathon-platforms can be considered as open innovation platforms that involve several stakeholders in a bottom-up approach of innovation generation. Innovation in tourism has been defined as the generation, acceptance and implementation of new ideas, processes, products or services (Hjalager, 2010). It has been recognized as a way to achieve growth and long-term oriented success in rapidly changing tourism markets (Pikkemaat et al., 2019). It allows companies to quickly respond to the constant request for new experiences and tourist empowerment (Roper and Tapinos, 2016), the high competitiveness (Divisekera and Nguyen, 2018), the sustainability challenges (Nidumolu et al., 2009), and the regulatory forces, such as to increase health and safety (Makkonen et al., 2018) and to respond to uncertain conditions (Martínez-Pérez et al., 2019; Divisekera and Nguyen, 2018).*

Innovation process no longer needs to be effectively managed alone, as external partnerships can be beneficial (Dahlander and Gann, 2010). In line with the increasing attention to innovation in tourism and hospitality, research on collaboration for innovation in this industry has quickly expanded in the past years (Gomezelj, 2016). Collaborative innovation has been defined as the pursuit of innovations across firms' boundaries through the sharing of ideas and knowledge (Baldwin and Von Hippel, 2011). It can encompass several external parties (e.g. customers, suppliers, competitors, universities and research institutes) and cover a range of collaboration forms and approaches in relation to an interactive, distributed, and open nature of innovation (Feranita et al., 2017). Collaboration adds value for firms through gathering information, building on accumulated knowledge, practice, experience, and capabilities in co-producing integrated tourism services (Egger et al., 2016). Also, collaboration ensures the adequate supply of skilled personnel, which is considered a key factor for innovation among tourism and hospitality firms (Divisekera and Nguyen, 2018) and favour radical sustainability solutions (Kennedy et al., 2017). Several scholars (e.g.: Baglieri and Consoli, 2009; Egger et al., 2016; Gomezelj, 2016; Marasco et al., 2018) have also emphasized the preeminent ICT's role in facilitating 'collective innovation' in tourism. The large diffusion of digital technologies has radically changed firms' open innovation (OI) strategies by creating the processes of users' empowerment, as well as larger and more highly participated innovation processes (Mount and Garzia Martinez, 2014). This is because as open, low cost, and ubiquitous tools, digital technologies allow firms to tap into the knowledge and experiences of a larger number of actors, allowing them to actively participate in the OI process (Brunswick and Vanhaverbeke, 2015). The virtual interaction occurs through an 'interactive coupled model' (West and Bogers, 2014) that involves iterative knowledge exchanges amongst members of the community (Chesbrough and Bogers, 2014).

A key principle underlying this phenomenon is the proliferation of intermediaries that intervene for facilitating peer-to-peer sharing of ideas, information, goods, and services, and thereby creating value for all participants. As stated by Troise et al. (2020, p. 2), "open innovation intermediaries play a key role in the open innovation process ensuring access to a multitude of users". They are able to regulate activities and, in so doing, to generate network effects and create value by facilitating relationships. Such organizations leverage a broad community of people in the creation and development of innovative ideas, obtaining and sharing new knowledge (Howells, 2006). They serve as virtual knowledge brokers (Verona et al., 2006) and facilitators (Sieg et al., 2010) to assist knowledge flows that support stakeholders to co-ideate and co-design. To solve this role, they usually use online, web-based platforms able to stimulate, facilitate, and support the ongoing interactions and collaborations among different stakeholders and to increase the combination of the complementary capabilities necessary to develop innovative products and projects oriented to value co-creation activities (Troise et al., 2020). Even though the phenomenon of web-based platforms is quite recent, technological advances are causing fundamental disruption innovations by empowering (traditional, but also new) actors to form new markets, offerings, management practices, and competitive strategies (Sigala, 2018). Platforms encourage the exchange of knowledge and creation of new ideas based upon existing and new resources that, consequently, create new value for participating members who pool and combine their knowledge, facilities, tools, and

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skills (Kuang et al., 2019), thus contributing to the development of sustainable solutions that take into accounts the interests of several stakeholders (Parguel et al., 2017). According to Pikkemaat and Peters (2016), establishing platforms can, thus, be an important first step in facilitating OI and collaboration between stakeholders. Among these types of platforms, online idea and design contests (Morgan and Wang, 2010; Terwiesch and Xu, 2008) are increasingly used to leverage the creativity, skills, and intelligence of thousands of individuals on the Internet. They enable interaction with other like-minded peers, building relationships, and establishing a sense of community (Terwiesch and Ulrich, 2009). Users can collaborate, discuss, share insights, and learn from the aggregate knowledge and feedback of others, while still competing for prizes (Hutter et al., 2011). Also known as hackathons, they are becoming an important research area due to the opportunity they have to facilitate a variety of initiatives, such as implementing OI practices to discover new ideas (Karlsen and Sundnes, 2017), increasing the growth of entrepreneurship (Kitsios and Kamariotou, 2018), and solve environmental, social, or business challenges (Granados and Pareja-Eastaway, 2019).

Looking at the specific tourism literature, Sigala and Ukpabi (2019) proposed a study about the use of hackathons as a citizen engagement tool in inspiring entrepreneurial interest in line with the principles of the collaborative and sustainable economy. However, as Antikainen et al. (2010) stated, managing an online innovation community is quite challenging. Supporting and facilitating such interactions are difficult given the lack of offline communication traits and interactions with others (Antikainen et al., 2010). To reduce these challenges, as well as to boost participants' sense of collaboration, defining interesting objectives is crucial (Adamczyk et al., 2012). Furthermore, Adamczyk et al. (2012) argued that the intermediary needs to be aware of participants' motivations. It has to facilitate an exciting experience to all members and, thus, pay attention to the atmosphere and communication styles (Lee et al., 2010), in other terms to work for spreading among all the participants a sense of belonging to a community (Antikainen et al., 2010).

Due to this premise, our aim is to investigate the role and functions of hackathon-platforms and explore how organizers support the post-contest process. Hereby, we support the understanding for how hackathon-platform organizers, working as OI intermediaries, can support hackathon-participants in boosting their innovative and sustainable tourism new ideas.

Our research question is formulated accordingly: What are the functions of a hackathon-platform designed to promote innovation and sustainability in the tourism industry?

Methodology. Assumed the novelty of the phenomenon under investigation and the inductive nature of the research question, the study adopts a qualitative, case-based approach that may enable the exploration of a phenomenon within its context, by using a wide range of data sources (Yin, 2003). The selected case is 'Hack-for-Travel'. The choice of this case study is based on the combination of theoretical interests and ongoing research activities (Siggelkow, 2007). Indeed, 'Hack-for-Travel' represents a novel and successful example of hackathon initiatives. It is one of the first attempts within the Italian context combining the possibilities offered by the power of Open Data and looks like as one of the most rapid and concrete reactions to the crisis generated by the COVID-19 in the tourism industry. By providing practical solutions to the pandemic, Hack-for-Travel represents a sustainability initiative aimed at designing strategies to relaunch tourism in the pandemic era that has deeply changed tourist behaviours, asking for solutions to overcome uncertainty and anxiety (Sigala, 2020). A single longitudinal, exploratory case study (Yin, 2003) has been conducted. With analysis of archival material and interviews to nine key informants representing both the categories of organizers, mentor and participants. The study of hackathon-OI intermediaries within the context of tourism represents a contemporary phenomenon (Sigala and Ukpabi, 2019). In fact, looking at the tourism and hospitality industry, researches specifically focused on the role of hackathon-platforms are rare. In spite of that, the proliferation of "opening-up-movements" in the tourism and hospitality industry - recently labeled by Egger et al. (2016a, 2016b) as Open Tourism - highlights the increasing interest on OI developments in this sector (Grissmann et al., 2013; Lee et al., 2017; Tussyasiah et al., 2017). This research topic poses "how" and "why" questions, and the case study approach is useful for addressing such questions because it allows to study the phenomenon more in depth than a large-scale survey or an experimental research (Gummesson, 2017). A case study is considered a suitable research approach when exploring emerging complex phenomena (e.g., hackathon development and use) within real-life settings (Eisenhardt, 1989), in order to induce theories (Benbasat et al., 1987). Additionally, the case study approach is greatly suggested for researches where theories are at their formative stage (Benbasat et al., 1987). Finally, the longitudinal case study approach (Yin, 1984) has been adopted in order to get insights on the overall organization of the 'Hack-for-Travel'. 'Hack-for-Travel' is an online hackathon run between April 30 - May 2, 2020 in Italy. The purpose of this event was "to organize a marathon of ideas completely online to put many brilliant minds to work on operational, practical solutions, useful to get out of this situation and face the next months of living with the virus with greater hope" (CEO of Data Appeal). The goal of the project was to "provide an online platform capable of creating a sense of community in which to share experiences, skills and emotions" (CEO of Data Appeal).

The website of the event is www.hackfortravel.org while a Facebook page has been used to perform lives in order to stay in touch with all the participants. All the information has been also bounced on all social networks with the hashtag #hackfortravel. After their constitution, teams worked using several online platforms as Slack, Google Meet, and Zoom.

The event had a great resonance as confirmed by Data Appeal - the company that launched and managed this hackathon. There were more than 1,200 registered participants, over 300 applications as mentors, 150 of whom have followed and advised the working groups. 90 projects applied and 69 made it to the final submission.

Findings. Preliminary findings show that hack-for-travel is indeed a platform that generates innovative ideas as response to grand challenges. Hackathons generates benefits related to innovation, sustainability, and competitive advantage respectively for the three actors involved: companies and institutions, innovators, and organizers. In other words, hackathons are sources of innovation for companies and institutions that launch challenges to solve. Innovators, instead, benefit from social sustainability having the chance to collaborate with several stakeholders to generate their ideas, and being exposed to the opportunity of showing off their capabilities to actors belonging to the industry. This is particularly relevant for young innovators. Finally, hackathons represent a way through which organizers gain visibility in their sector, developing a relevant network that allows them to position in the market. Most importantly, they achieve these goals, by promoting ethical behaviors aimed at benefitting a multitude of actors. About the phases, the pre-hackathon organization is indeed at the base of an effective and successful generation of innovative ideas during the hackathon. However, the post-hackathon is not managed by organizers who do not give further support to the most successful ideas, as the relationship between innovators and organizations proceed without the need for further intermediation. This last aspect shows again the ethical approach of hackathons organizers whose interest is just connecting actors to make them generate innovative and valuable ideas without trying to capture value from such process.

Research limits. The exploratory nature of this study asks for other empirical validation of the results of such a study. Moreover, future studies should consider multiple hackathons to highlight common characteristics or differences depending on different contexts in which it is related to (e.g., industry, online vs offline)

Practical implications. This analysis sheds lights on the relevance of hackathons for the sustainable development of innovative ideas. It highlights the relevant steps to follow in order to structure it properly creating benefits for all the stakeholders involved in the process of innovative ideas generation. This aspect is particularly relevant for the Covid-19 pandemic, given that hackathons give the possibility to build the innovation process through online platforms that respect the principles of social distancing while cutting transportation costs for participants.

Originality of the study. To our knowledge, this study is among the first one to deeply analyze hackathons and its sustainability and innovation implications. This is a relevant aspect given that hackathons are increasingly common tools for R&D and the generation of innovative initiatives for organizations (i.e., companies and institutions).

Key words: open innovation; innovation intermediaries; hackathon; sustainability

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The drivers of Industry 4.0 embeddedness in an innovation ecosystem

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Objectives. During the last decade, according to academics, scholars and policy makers, we have entered the “Fourth Industrial Revolution” (Schwab, 2017). This unprecedented technological change has become a relevant topic, causing profound transformations of industries, labour market and society. Firms, especially, are facing challenges due to demand, production processes and organisational business model transformation (Kagermann et al., 2013). In fact, the last years has seen increasing policy attention towards the opportunities offered by the application of disruptive enabling technologies into industrial activities (European Commission, 2017). In this scenario, the concept of Industry 4.0 (I4.0) has been put forward to reflect a radical change in manufacturing processes defined by a seamless integration of automation and digitalisation into existing industries. In particular, the transformational processes of I4.0 have been associated with a group of interrelated technologies such as Robots and 3D printing, Big Data and Internet of Things, which are driving the “Fourth Industrial Revolution” (Kagermann et al., 2013; Schwab, 2017). With regard to the wide production transformation caused by the introduction of a new set of technologies, many researchers have highlighted it tends to occur in “waves”. These waves begin with the introduction of a breakthrough technology in a specific sector, and the development of this new technology is possible thanks to incremental innovation in other sectors with different applications (Kondratieff, 1935; Perez, 2010). Moreover, since technical and technological change is a significant driver of these waves and industrial revolutions are originated by these kinds of transformation, industrial revolutions seem to be reflected in these waves. Therefore, the new digital technologies are increasing the technical and economic complexity and leading to the “Fourth Industrial Revolution”, entailing a shift from mass production to “mass customisation” through automated and real-time manufacturing processes (Porter and Heppelmann, 2014).

In this context, firms operating in different sectors must deal with the ongoing technological transformation adjusting their growth and value creation strategies. In the evolution of firms’ growth strategies, the search pattern of new opportunities is indeed not restricted anymore to the firm’s network, but it is expanded to the possibility to take advantage of new interdependences (Jacobides et al., 2018). In this regard, digital technologies, multi-level ecosystems and platform economies have created new opportunities at a firm level in a more complex strategic decision environment (Teece, 2018). Specifically, both the increase of complementarities and interdependencies between different sectors (Feldman and Lendel, 2010) and the increasing role in the innovation process of non-economic actors (Teece, 2007) led an increasing literature to focus ecosystems (Teece, 2014; Carayannis et al., 2018; Adner, 2017; Corrente et al., 2019). In this context of radical changes, Teece (2014) suggests moreover that the ecosystem concept might replace the concept of industry in the exploration of the opportunities and risks entering businesses.

In such a context “innovation ecosystem” has become a key concept (Adner, 2006) and it is defined as “the evolving set of actors, activities, and artifacts, and the institutions and relations, including complementary and substitute relations, that are important for the innovative performance of an actor or a population of actors” (Granstrand and Holgersson, 2020, p. 3). Moreover, “as digital technologies are entering into more and more industries, the relevance of all components of the innovation ecosystem concept will likely increase due to the connected and generic nature of such technologies” (Granstrand and Holgersson, 2020, p. 8).

Ecosystem is not a new concept. Moore (1993) describe an ecosystem as a set of producers and users around a focal organization that contributed to its performance. By his point of view, a company is not considered as a member of a given industry, but rather as part of a business ecosystem. More recently, Feldman et al. (2019) state that an ecosystem generally involves agents, institutions, activities or processes, and surrounding culture and it has a dynamic nature. The current technological and production transformation are triggering new critical issues for the actors and institutional entities included in the innovation ecosystem, in particular where digital infrastructures have a fundamental role in localized production systems characterised by small and medium-sized enterprises (SMEs) population (Moeuf et al., 2018). Indeed, the combination and recombination of new technological knowledge with the exiting sets of knowledge embedded into a SMEs manufacturing system may determine the creation of a new industrial landscape (De Propriis and Bailey, 2020), impacting on the innovation ecosystem structure and interconnections.

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In the light of this, the paper wants to understand which are the drivers of Industry 4.0 embeddedness in an innovation ecosystem.

The innovation ecosystem concept highlights the importance of the actors which make up the structure of the ecosystem. These actors can be distinguished between firm and non-firm actors. These key actors, through knowledge transfer by means of the exploitation of their network can foster innovation and in consequence supporting the creation and the development of the ecosystem. They thus allow the bridging of innovation in a particular context acting as brokers.

In Nineties, Burt (2000) introduced the concept of 'structural hole' in his research about the social capital and the conditions that foster the emergence of good ideas in a community. Structural holes occur in weak and unexploited connections between subjects and groups in a network systems logic. According to Burt's idea, these holes are the source of competitive advantage for individuals which are able to span the hole with their relationships. Burt does not consider indeed the lack of links in a system as a negative aspect of the systemic structure. These holes are instead opportunities for new entrepreneurship and the emergence and embeddedness of new ideas and practices.

In particular, innovation brokers are 'organizations that both act in a liaison role between the sources of new ideas and the users of those ideas in innovation networks, and are also set up specifically to perform this broking role' (Winch and Courtney, 2007). Therefore, the main role of these organizations is to enable other organizations to innovate. Innovation ecosystems are built upon these bridges activated by the actors within the ecosystem.

In Burt's idea, the entrepreneur, thus the firm, is the main broker of innovation. But while the entrepreneurship agent has an incentive to bridge connections between other subjects putting them nearer and shortening the cognitive distance in order to get an advantage, the non-firms actors are pushed by other kinds of incentives (Burt, 2000).

Therefore, in the ecosystem each actor have a peculiar role in supporting and generating innovation, as well as acting as a bridge of innovation between the different types of subjects. In particular, the current technological transformation related to I4.0 is affecting the role and the importance of the several ecosystem actors, presenting new opportunities and challenges.

Therefore, besides understanding the drivers of Industry 4.0 embeddedness, this paper identifies the actors that lead innovation ecosystems characterized by I4.0 technologies.

Methodology. *In order to understand the drivers of embeddedness of I4.0 in an innovation ecosystem and the multifaceted role of firm and non-firm actors in fostering or hampering this process, we will analyse the mechatronics industry, in particular the SMEs' system, in the Autonomous Province of Trento (Italy). Mechatronics is a technology fusion of mechanics, electronics and IT (Kodama, 1992), which allows automation. Since automation is at the base of smart manufacturing of I4.0, mechatronics plays a pivotal role enabling I4.0 implementation.*

In the province, mechatronics sector has become the subject of a strategic regional policy of Smart Specialisation (conceived within the reformed Cohesion policy of the European Commission) and the provincial industrial base can be a fertile ground for I4.0 technologies emergence and therefore a significant case study. Indeed, the Province of Trento is characterized by a long manufacturing tradition, focused on iron and steel, mechanical engineering and precision mechanics. The individuation of mechatronics as strategic field followed the implementation of specific actions by the local government of the province which include the establishment of measures which have deeply influenced the innovation ecosystem structure, in particular the non-firm actors settlement (e.g., the University, research institutes, industrial parks and technological transfer laboratories).

We adopted a multi-step procedure in order to draw the mechatronics industrial boundaries. Firstly, we map the sectorial codes through a literature review, considering the firms which produce a mechatronics product and/or components or concerned in mechatronics automation processes.

Secondly, after identifying the population underlying these criteria, we submitted a survey to a sample of firms in the ecosystem. The contact strategy of the survey consists in several steps. Firstly, we identified the random sample which is made of 290 mechatronics firms. The survey was validated by experts involved in mechatronics industry and a 'pilot' survey was sent to some firms in order to confirm the intelligibility of the language. Then, we sent an email to the firms of the sample, addressing it to the top management or the entrepreneur. After ten days, we sent a recall email, excluding the firms that had already answered. Two weeks later, we contacted by phone the firms in order to increase the representativeness of sample and to minimize self-selection bias for which only firms that feel mechatronics and adopt 4.0 may have asked to the questionnaire.

The survey contains 36 questions divided into 3 structured macro areas of interest: general information, innovation and I4.0 technologies, collaborations and knowledge transfer in the ecosystem. The enquiry is based on a questionnaire mainly composed by original questions, even though we use some queries from previous studies in order to guarantee the compatibility. In particular, we take the cue from Community Innovation Survey¹ and the work of Plechero (2018) about the mechatronics sector in the province of Vicenza (Italy).

The variables identified in the survey are all qualitative, some dichotomous and others categorical. Moreover, 7 semi-structured face-to-face interviews to significant ecosystem's stakeholders were conducted to deepen the understanding of the I4.0 technologies embeddedness and the role of the several actors in the ecosystem, in order to support the quantitative results. These interviews facilitate also the contact with entrepreneurial environment of the province and help to validate the language of the online questionnaire.

The response rate of the survey was 25.5% on the total number of the contacted firms and the Pearson's chi-squared confirmed that the respondents were representing the mechatronics firms population in a significant manner.

We analysed the main drivers of I4.0 embeddedness through a quantitative analysis comparing two models: the generalized ordered logit and the generalized ordered probit. The comparison allows us to give more robustness to the analysis, returning the main drivers of I4.0 embeddedness and also the role of the main firm and non-firm actors in the Trento's innovation ecosystem. We identify the portfolio of I4.0 technologies adopted by firms as our dependent variable (I4.0.portfolio). Indeed, the number of technologies that a firm can adopt can vary (from 0, if it does not utilize any I4.0 technologies, to 9, which is the maximum number of employed artefacts declared by firms). This variable captures the ability and inclination of mechatronics firms to adopt a wide range of I4.0 technological machineries and knowledge.

Several firms' characteristics and relations with the ecosystem is taken into account as independent variable, such as firm size (ranging from micro to medium firms since we examine just SMEs), the age (young ≤ 5 years, medium 5-10 years and old >10 years), the sectorial code, the presence of an internal R&D department, the belonging to an industrial group, the adoption of mechatronics production processes (which tell us the utilization of automation at the base of some I4.0 technologies in the manufacturing process), the innovation activity, the relation with industrial parks, the utilization of technological transfer laboratories, and the membership of a business association. Moreover, to capture the role of university and research centers, we consider the support of these subjects to the firms' innovation activity. We eventually consider the support of local government through financial aid.

Findings. Analysing the factors that influence the adoption of I4.0 technologies, the firm size is significant only for the generalized ordered logit, therefore being a small firm compared to a micro increases the probability of adopting I4.0 technologies, however this is not confirmed by the other model under exam.

Both models confirm that belonging to some sectors other than general mechanics ('traditional' sector from which mechatronics originated) increases the probability of using I4.0 artefacts. Although the effort by mechanical firm to upgrade to mechatronics the Trento's SMEs are still lagging behind compared to other sectors regarding the new fourth technological wave. On the other hand, this data could be due to the fact that mechanical companies prefer to continue producing a traditional product, because they are risk averse due to generational change, as emerged by the face to face interviews.

Belonging to a group is significant for the use of I4.0 technologies, probably because it involves a greater organizational structure and, in addition, the intra-group transfer of technologies is facilitated. Furthermore, for SMEs being part of an industrial group could give the typical advantages of large enterprises, favouring the transition to advanced technologies such as I4.0.

Production process innovation is a determinant that positively affects the use of the technologies of the fourth industrial revolution. The reason is that these technologies can be used in manufacturing processes in order to implement Smart manufacturing. On the other hand, according to both models, product and service innovations are not significant for the transformation of businesses towards the fourth industrial revolution.

The models return that collaborations are not significant for I4.0 technologies adoption, but confirm the key role of some non-firm actors. Using technology transfer laboratories (in this case Prom Facility customer) and exploiting prototyping services for product development is a factor that is significantly associated with the use of advanced technologies by companies. This may be due to various reasons, for example because companies that approach this type of service may tend to be more technologically advanced than those that do not use it. The laboratory that we focus on is a pivotal subject between university, firms, industrial park and research institute, therefore its ability to bridge innovation is confirmed.

Conversely, being part of a business association (in this case Confindustria Trento) compared to be outward decreases the probability of adopting the technologies of the fourth technological wave. In fact, local organizations and institutions do not always play a role in propelling innovation for local businesses (Bellandi et al., 2018).

Finally, even though it is significant only for ordered logit model, a firm established in the industrial park is more likely than an external one to adopt the technologies in exam. This is probably due to the highly technological nature of the SMEs present in the industrial park. It maintains the important role of industrial park in fostering the I4.0 path development.

Through the quantitative analysis, we identified the drivers of I4.0 embeddedness in an innovation ecosystem. Moreover, we pinpoint some actors which are able to bridge innovation across the ecosystem, in particular through their relations with firms, in order to support the systemic I4.0 technological transformation.

Research limits. Although this analysis has the limit of not being able to take advantage of analysis comparative with other national and international case studies, the work sought to clarify the embeddedness of I4.0 in an innovation ecosystem and the main actors which act as bridge of innovation. Moreover, the innovation ecosystem boundaries of mechatronics, not defined in a homogeneous way in the literature and by policy makers, have represented a critical issue for defining firms and non-firm actors as part of the ecosystem. In order to mitigate this limit, we took into account the emergent sector of mechatronics, which can be considered the precursor of I4.0. The absence of longitudinal data impedes us to analyse the effect of I4.0 technological transformation throughout time, preventing the examination of the innovation ecosystem evolution.

Practical implications. Regarding managerial implications, this paper can provide awareness to firms regarding the drivers of I4.0, as well as shed the light on the relevance of non-firms actors for the exploitation of the network and the bridging innovation in the context of innovation ecosystem. Considering these ecosystem's element can be also useful for policy makers in order to sustain the transition to I4.0 fostering and facilitating the interactions between the several actors in the innovative ecosystem.

Originality of the study. As stressed by Feldman and Lendel (2010), emerging industries do not fit into existing classifications, thus making empirical analysis complex and fuzzy. Looking at the categories describing past industrial activities, it is hard to map evolutionary phenomena and to fix boundaries for new industries. In this work, we offered a view for the explanation of the mechatronics by tracking the sectoral boundaries. Moreover, this analysis contributes to the understanding of the drivers of I4.0 embeddedness in an innovation ecosystem and highlights the role of specific firm-related actors in an innovation ecosystem characterized by SMEs, underling their role of brokers of innovation. Specifically, this paper wants to understand which are the drivers of the digital transformation of manufacturing SMEs and the nature of their innovation ecosystems. The quantitative analysis reveals that business associations are not at the core of innovation in the SMEs. An important role is played instead by the linkages between SMEs and the technology transfer laboratories. In the innovation ecosystems of SMEs, the role of non-firm actors seems crucial. Industrial park and local government seem to have a positive impact of I4.0 adoption. As above-mentioned, technological transfer laboratories are of relevant importance for defining the innovation ecosystem. In conclusion, this analysis contributes to the understanding of the drivers of firms' I4.0 upgrading and highlights the role of specific firm-related actors in an innovation ecosystem characterized by SMEs, underling their role of brokers of innovation.

Key words: innovation ecosystems; SMEs; Industry 4.0; bridge of innovation; digital technologies.

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Exploring the linkage between open innovation and organizational learning: insights from exemplary alliance case studies

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Objectives. *The competitive landscape in which companies must compete today is increasingly turbulent and dynamic (Dagnino et al., 2020). Generating innovation has become crucial in many dynamic industries and is recognized as the only way through which firms may achieve a series of temporary competitive advantages and respond to market and technological uncertainty (Andrevski and Ferrier, 2019). In the last 20 years, innovation management literature has shown that firms can generate innovation through activities that are not exclusively related to “internal” processes (Chesbrough, 2003, Dell’Era et al., 2020). Open Innovation paradigm has emerged as a strategic orientation for firms aiming at capturing external knowledge to commercially exploit their profitable innovative potential (Cheng & Huizingh, 2014). In fact, firms may not be able to invest in innovation alone (Huizingh, 2011), and therefore seek external sources from which to draw new knowledge (Frenz and Ietto-Gillies, 2009; Laursen and Salter, 2006). Among the several strategic tools through which firms may access new knowledge, it is well recognized in the literature that strategic alliances are the most widespread ones (Ferrigno et al., 2021; Mamédio et al., 2019; Mowery et al., 1996).*

However, alongside the ability to identify external sources from which to draw knowledge, firms must also be able to learn from these sources (Winter and Szulanski, 2001). For this reason, Organizational Learning literature has investigated the processes which allow organizations to learn (Zollo and Winter, 2002). Within this vein, researchers have pointed to the importance of many ways through which organizations can learn (Barkema and Schijven, 2008). According to them, firms can learn from others (Haunschild and Miner, 1997); by experimentation (Pisano, 1994); by improvisation (Baker et al., 2003); and by doing (Argote, 1999).

Notwithstanding it is quite known that, given market and technological uncertainty, organizations need access to new knowledge and that Open Innovation strategies allow them to seek that knowledge, existing literature investigating the link between Open Innovation and Organizational Learning is surprisingly scarce. Exploring such a link is fundamental as many firms adopt Open Innovation strategies such as strategic alliances to successfully learn from others (Faems et al., 2005). Nowadays, in fact, big companies such as P&G, Xerox, Huawei, and IBM are increasingly making use of strategic alliances that allow them to gain new knowledge from partners.

To address this research gap, we conduct an in-depth analysis of the literature on Organizational Learning and Open Innovation and we identify, per each literature, two key dimensions that indicate the way through which organizations learn and acquire knowledge from collaborating with external partners. By combining Open Innovation (Chesbrough, 2003) and Organizational Learning literature (Levinthal and March, 1993) in relation to strategic alliances, we elaborate a matrix (see Figure 1) in which we argue that two main open innovation strategies - i.e. inbound and outbound open innovation strategies - may drive firms’ strategic orientation to access new knowledge (Dahalander and Gann, 2010). Moreover, we argue that the implementation of these open innovation strategies in the context of strategic alliances may lead firms to either (mainly) experiential or (mainly) experimental learning (Zollo and Winter, 2002). In the following section, we validate this matrix through a sample of representative qualitative case studies.

Fig. 1: Open Innovation strategies and Organizational Learning modes

Open Innovation Strategies	Organizational Learning modes		
		Experiential	Experimental
	Inbound	Type I	Type II
	Outbound	Type III	Type IV

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Methodology. *On the basic principles of theoretical sampling (Eisenhardt, 1989), we searched for the units for research, based on characteristics or attributes that are important to the evaluation (Yin, 2018): 1) known alliances between large companies recognized on the international market; 2) companies that have adopted an open innovation inbound or outbound strategy; and 3) companies that have used an experiential or experimental learning approach. In particular, we verified that the two partners of each alliance reported in their website the adoption of inbound or outbound open innovation strategy. Based on these criteria, we have selected four representative alliance case studies formed by the following partner: 1) P&G and Xerox, 2) L'Oréal and Founders Factory; 3) Huawei and Leica; and 4) BMW and IBM. Per each alliance case study, we collected several data from different sources (Creswell 1998; Jick 1979): videos, data available from websites, press releases, newspaper articles and, when possible, financial data from AIDA-Bureau van Database Dijk. As regards data analysis, we validated our matrix and their relations through an inductive and confirmatory approach in our empirical analysis (Lee et al., 1999). Confirmatory approaches tend to confirm a researcher's preconceived notions and they are well recognized in the literature (Ruddin, 2006; Yin, 2018). In this paper, we used an approach similar to previous literature (Casprini et al., 2014; Ferrigno and Cucino, 2021). More specifically, we first conducted a within case analysis of each strategic alliance and after a cross-case analysis to dissect a trend that characterises each quadrant of the matrix.*

Findings. *The analysis of the four cases of strategic alliances allow us to fill the matrix reported in Figure 2.*

Fig. 2: Open Innovation strategies and Organizational Learning methods in strategic alliances

	<i>Experiential</i>	<i>Experimental</i>
<i>Inbound</i>	<p><i>Type I</i></p> <p><i>Alliance partners</i> P&G and Xerox</p> <p><i>Key Features</i> Complementary sectors Strong experience Improve each other</p>	<p><i>Type II</i></p> <p><i>Alliance partners</i> L'Oréal and Founders Factory</p> <p><i>Key Features</i> Distant sector Deepen sector or new sector Trial and error</p>
<i>Outbound</i>	<p><i>Type III</i></p> <p><i>Alliance partners</i> Huawei and Leica</p> <p><i>Key Features</i> Complementary sectors Strong experience A new sector</p>	<p><i>Type IV</i></p> <p><i>Alliance partners</i> BMW and IBM</p> <p><i>Key Features</i> Distant sector A new sector Technology transfer</p>

Each alliance case is representative of the combination of one Open Innovation strategy (inbound or outbound) with one Organizational Learning method (experiential or experimental learning). In the following section, we discuss four types of links between Open Innovation strategies and Organizational Learning Methods in the four cases of strategic alliances.

Type I: Inbound Open Innovation and Experiential learning

Caroline Basyn, director of global business services at P&G, proposed outsourcing printing across all two hundred P&G sites to an MPS provider. At that time she said: "I want to manage the whole fleet as if it were a printer". The goal was to have a printing strategy that offered innovative ways for P&G employees to be more productive and more mobile. Then, in September 2008, they began working with Xerox, which helped them set goals for an MPS implementation.

This type of Open Innovation is "inbound" because P&G uses available external knowledge as a source of internal innovation. Within a year of forming the partnership, Xerox announced the first innovative solution it had co-created with P&G: the mobile printing solution. The solution allowed P&G employees to use a smartphone to easily transmit documents to a secure server or cloud. Thus, both firms had managed to achieve different objectives while not operating in the same market. The mobile printing solution was the first contribution to support P&G's "500 Million Minutes Return" program, reducing the time employees spend on printing and output problems. For the success of the partnership, P&G has made it a priority to assign adequate human resources. In fact, it was necessary to bring together people with specific experience and who knew the company, its activities, and its criticalities well.

Type II: Inbound Open Innovation and Experimental learning

In 2016 L'Oréal, a well-known brand in the beauty & cosmetics sector, decided to explore new sectors; to achieve its goal, L'Oréal knew it needed a partner completely different from its current business. Thus, bearing in mind "Makeup Genius" success, on May 12th 2016 L'Oréal announced a strategic partnership with the Founders Factory, a leading global multi-sector digital accelerator and incubator based in London. As such, L'Oréal became the Founders Factory's exclusive partner for investments in beauty tech startups worldwide. This allowed L'Oréal to deeply connect itself to a global ecosystem of world-class startups and entrepreneurs operating in the field of beauty, in line with L'Oréal's CEO Jean-Paul Agon vision of the transformative power of digital for beauty.

By supporting startups through the Founders Factory digital accelerator and incubator, the French giant applying an inbound - Open Innovation. Although almost everyone can completely agree that L'Oréal is "importing" knowledge, someone can argue that a coupled Open Innovation can be taking place in this partnership.

This alliance L'Oréal is not just sourcing and acquiring expertise from outside the organization. The corporation is providing a significant contribution to its partners: a history of scientific knowledge in the beauty industry. In the words of Brent Hoberman, Co-Founder and Executive Chairman of the Founders Factory: "Marrying our expertise in digital with L'Oréal's brands, scientific research, and audience reach offers a compelling opportunity to build and scale the next generation of beauty startups".

Through this strategic alliance, both L'Oréal and the Founders Factory will provide and receive a significant contribution to the development of incubated companies, achieving benefits in many different ways. One of the main benefits the Founders Factory has received from L'Oréal through this partnership is strategic support. This means that the digital accelerator and incubator receive help to scale their products through L'Oréal's distribution channel, enjoy a low-risk testing partner and have access to deep expertise and market insights concerning the beauty industry. Concerning this aspect, Lubomira Rochet states that "In this 'test&learn' approach, we are supporting the development and growth of promising young entrepreneurs by sharing our expertise and network, and in the meantime we invite them to bring new ideas to the digital projects of our brands. Open Innovation is a win-win strategy that fosters disruptive thinking and pushes forward our digital leadership in beauty" (Galang, 2017).

Type III: Outbound Open Innovation and Experiential learning

In 2014, Huawei was looking for ways to improve its smartphone cameras, and Leica had been looking to branch out into the mobile space. Through a series of talks, Huawei and Leica decided there was a match and began working on. Thus, in February 2016, as communicated in the website of Leica, "Huawei Consumer Business Group (BG) and Leica Camera AG are delighted to announce the start of a strategic partnership, a co-operation with shared premium ambitions and spirit, which will see both technology and photography brands combining their shared ethos in a long-term commitment to the art of craftsmanship, meticulous engineering and the spirit of winning collaboration, to create a powerhouse in the reinvention of smartphone photography". In this announcement are synthesized all topics of the new strategic alliance: combining innovation and design, uncompromising quality for customers, and unlocking the growth potential of both brands.

It is a perfect example of outbound Open Innovation : LEICA technology allowed Huawei to leap forward in the smartphone sector, especially in the top of the range. Leica & Huawei opened a joined R&D center, where they have more teams working in the areas of R&D and innovation than before, according to both companies' representatives. For the collaboration Leica and Huawei have opened a joint research and development center, where they have combined the different skills of their respective areas of research and development and innovation. In this way, one partner learns from the other partner about a completely new but at the same time complementary sector. In fact, although they are different sectors, one firm could support the other to strengthen their business. More concretely, while LEICA made available its teams of experts in the field of optical cameras and zoom, Huawei shared its experiences in the field of mobile telephony. Thus, the advantages were twofold. In particular, LEICA pushed an "old brand" to the new generations. With the partnership, the Leica brand, already known to older people, can be brought closer to the smarter and younger generations. On the other hand, Huawei improves its technology. Indeed, the implementation of the new technology works with the new artificial intelligence (AI) which is now playing a more important role: the images are looked at by a "mathematical equation", which helps the phone understand what that image actually is. With more people using smartphones as their primary camera, the improvements to the processor will make the smartphone camera smarter.

Type IV: Outbound Open Innovation and Experimental Learning

BMW and IBM announced (2017) that both companies are jointly developing a cloud computing project that could help up to 8.5 million drivers diagnose and repair problems, save on auto insurance, and benefit from other third-party services. The BMW CarData network will integrate with IBM Bluemix platform, where it will have access to Watson Internet of Things capacity. Drivers using the BMW ConnectedDrive app will be able to access services as data is collected. The partnership was very stimulating but high-risk at the same time because neither of the two giants had entered that business. This outbound Open Innovation alliance demonstrates that IBM faces new challenges and reacts

with a flexible experiment-based strategy. Indeed, in addition to its strong focus on integrating the knowledge and ideas of customers, suppliers and partners early in its innovation process, IBM has created an excellent patent strategy.

Analyzing the IBM case it becomes clear that IBM has decoupled the locus of innovation file (in terms of applying the idea and transforming it into innovation) with the locus of knowledge creation (invention or research) and the locus of commercialization (product development or exploitation of innovation). In this alliance, the experiential process is very important because the planning process was sophisticated. Indeed, this strategy allows commercialization through active know-how to transfer projects and license those patents that cannot be efficiently implemented internally or that do not fit the innovation strategy (exploitation of knowledge).

Research limits. Several limitations are taken into our study. First, the generalizability of our findings can be enriched by conducting an in-depth analysis of some of the four alliance cases we analyzed. Second, we focused on inbound and outbound Open Innovation. We are aware that sometimes coupled innovation could take place in alliances. Thus, we invite scholars to examine whether experiential and experimental learning differ when both inbound and outbound Open Innovation characterize the alliance. Lastly, future studies might unveil the impact of experiential and experimental learning on product innovation performance.

Practical implications. This study also offers interesting implications for companies' managers. First, the findings of this study suggest that two learning approaches - i.e. experiential and experimental learning - may drive companies to learn from alliance partners. Second, we found that these learning approaches may be reflected in different Open Innovation practices - i.e. firms open up their innovation processes by exploring and integrating external knowledge for technology development and technology exploitation (inbound Open Innovation) or by utilizing not only internal but also external paths of commercialization (outbound Open Innovation). Third, the results of this study propose best practices for companies that are willing to open up their innovation processes with alliance partners by bearing in mind the learning outcomes that may be exploited through the alliance.

Originality of the study. This study provides three theoretical contributions. First, academic literature investigating the link between Open Innovation and Organizational Learning is surprisingly scarce. Understanding such a link is crucial because many firms adopt Open Innovation strategies such as strategic alliances to successfully learn from others (Faems et al., 2005). In this paper, we propose a framework that links two types of Organizational Learning, namely experiential and experimental learning, and two well-known Open Innovation strategies (inbound and outbound). This, in turn, allows us to propose four different typologies of learning opportunities that could be pursued by alliance partners.

Second, this paper contributes to Organizational Learning literature (Shahriari and Allameh, 2020) by highlighting that the two different learning methods (e.g. experiential and experimental) may be combined with two different Open Innovation approaches, facilitating the effectiveness of such methods. Third, this study contributes to the Open Innovation literature by showing how the different learning methods are chosen by the company according to the sector of origin of the company. In particular, in the case of distant sectors, companies prefer to approach the partnership in an experimental way; otherwise, in the case of complementary sectors, companies learn mainly by leveraging their own experience.

Key words: open innovation; alliances; organizational learning

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Living Labs' key principles: are they always applicable? The Modena Automotive Smart Area case

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Objectives. Living Lab (LL) concept enters in the European policies in 2006 with European Network of Living Labs (ENOLL), an umbrella organization active worldwide which has boosted the number of LLs among the European countries increasing the interest authors have in this topic (Hossain et al., 2019), defining them as “user-centred open innovation ecosystems based on a systematic user co-creation approach, integrating research and innovation processes in real-life communities and settings” (openlivinglabs.eu/aboutus). Growing attention has been devoted to, till reaching the Italian landscape recently: LLs are formally mentioned for the first time with the Italian 2015-2020 National Program for the Research (PNR), that sees LL as a tool in support of a more applied and industrial research and provides the allocation of resources to finance some LLs across the nation. Within the PNR a definition of LLs is provided, likening them to places of research and experimentation carried out in real contexts in which companies, research centers, public administration and, especially, final users develop new applications, technologies and services. Albeit the interest the topic has gotten in the policies, also at a national level, there is still a problem in illustrating LLs due to the indeterminateness and pluri-definition of the elements characterizing them. In particular, a clear identification of the criteria necessary to recognize a particular organization as a living lab is missing. In the last decade, an increasingly number of scholars has been starting to study LLs as units of analysis to understand the innovation processes and outputs from different perspectives and diverse fields (Greve et al., 2020; Leminen and Westerlund, 2019; Leminen et al., 2017; Ballon et al., 2005). Given the fact that we are dealing with a quite recent phenomenon, the literature proposes different definitions. LLs can then be defined, among others, as a form of test and experimentation platform (TEP) (Ballon, 2005), a methodology (e.g.: Eriksson et al., 2005; Feurstein et al., 2008), a network (e.g.: Westerlund and Leminen, 2011; Ståhlbröst and Bergvall-Kåreborn, 2011), a regional system (Oliveira et al., 2006) and an innovation management tool testing, developing and validating new products or services through jointly work among several institutions and with a direct participation of citizens and users (Eriksson et al., 2005; Almirall et al., 2012). The aim of this paper is then to determine a set of founding principles for the LL construct based on the extant literature, namely Openness, Empowerment of Users and Realism, and to use them in the characterization of a real case. We then take in consideration the Modena Automotive Smart Area (MASA) as case study in order to investigate whether a relationship exists between the tested technologies and the intensity by which the three key principles are involved in the formation and in the early stages of the observed LL. MASA is configured as an open-air laboratory, pivoting around technologies concerning autonomous driving, and its objective is to test in a real-life context Advanced Driver-Assistance Systems (ADAS) and protocols of interaction among vehicles and the surrounding urban environment (V2V and V2X). Some of these innovations match with the notion of “creative destruction” coined by Schumpeter. They challenge current best practices in the automotive industry, by pushing towards a stronger replacement of the existing products or processes (König and Neumayr, 2017) and requesting urgent changes in firms’ competencies. Furthermore, they may produce also deep effects at the societal level (Fagnant and Kockelman, 2015), by heavily affecting collective and individual mobility behaviors.

Methodology. A qualitative approach following Eisenhardt’s recommendations (Eisenhardt 1989; Eisenhardt and Graebner 2007) is adopted, with the purpose to offer new insight to theory from case study research (Eisenhardt 1989; Eisenhardt and Graebner 2007; Yin 2014) on a recent and still empirically understudied topic (Westerlund et al., 2018). The selection of MASA as case study has a twofold reason. Firstly, it is the first automotive LL arose in Italy, making some processes developing in it more spontaneous and interesting to be investigated. Secondly, we had a deeper access to its information, with a direct involvement of authors’ university in the activities carried out within the LL. After having defined the purpose of the study and the initial research question, we mapped the literature framework to derive the key principles that define LLs and, in parallel, we investigated the empirical context of analysis, gathering data about the selected case study. Data are collected from secondary sources, involving memoranda of understanding signed by the parts, MASA website and articles concerning MASA’s activities. Data analysis started with the

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identification of similarities and contradictions by contrasting the emergent theoretical framework with the characteristics of the case study (Eisenhardt 1989). The intensity of the key founding principles observed within MASA has been evaluated matching and interpreting data collected about the actions undertaken by MASA with the characteristics that can be referred to each key principle.

Findings. Based on the analysis of the extant literature and the recognition of the two main theoretical frameworks on which LLs are rooted, namely Open Innovation (OI) and User Innovation (UI) theories, three key principles have been identified: Openness, Empowerment of Users, and Realism. The first one emphasises that the innovation process should be as open as possible. In that sense the collaboration among actors of different nature is incentivized, based on the idea that the innovation process should follow a horizontal path, going beyond the boundaries of the single organization. According to the second principle, Empowerment of Users, user has to be seen as an additional stakeholder of the LL: not as just a target, but as a partner, directly involved in the test-related decisions. Alongside the Openness and the Empowerment of Users, Realism is seen as the third key element defining LLs (Bergvall-Kåreborn and Ståhlbröst, 2009; Almirall et al., 2012; Hossain et al., 2019), to be seen in a wider perspective, not only as the necessity of the LL to test innovations valid for real market, but also to include real-users in real life situations (Ballon et al., 2005). Creating an outstanding context that gives the chance to study technologies and their interaction, Realism highlights the necessity to set up a real-world environment where to investigate on the innovations.

Within MASA, we observed that, while the Openness and Realism principles are active as key principles with high intensity since its inception, the Empowerment of Users is present with a lower degree of intensity.

The Openness principle is at the base of MASA foundation. The innovation technologies carried out within MASA are suitable for a multi-stakeholder platform as the LL, where an analysis from different points of view is necessary to fully understand the phenomenon and the interdependencies that belong to it. MASA itself has been set off by a memorandum of understanding signed by different actors: University of Modena and Reggio Emilia, the Municipality of Modena and an important firm working in the automotive industry. As the analysis of the memoranda of understanding underlines, each part has undertaken a precise commitment to promote MASA externally, defining its involvement by its institutional roles. As a matter of fact, while Municipality of Modena has arranged the ground for the on-road tests, helping to the definition of a real urban context, technological innovations are enhanced within the LL thanks to a jointly work between private firms, professors, researchers and students from the university.

Realism principle is well expressed in MASA through the Model Smart Area, a small Smart Cities placed in an urban area located in the northern part of Modena. The selected urban area is characterized with crossing, roundabouts, an overpass, parking area and pedestrian crossings for testing vehicles equipped with ADAS devices up to levels 3 and 4 (Scagliarini, 2019). The area has been built to test the ADAS technologies in a real environment, by exploiting a real urban setting characterized by a complex and complete urban architecture. The area where the vehicles are tested is totally enclosed among buildings representing the everyday life of a common neighbour, such as the school, the municipal library and the Health Centre, leading to the vehicles and sensors covering the area to have to face with real obstacles and to answer to actual contingencies. The real-life setting makes a unique and efficient way to test such technological innovations, performing specific methodologies that would have not be possible elsewhere, and incentivizing a deep expression of the Realism. The experimentation on urban road allows a first gradual approach to test the efficiency of the technological innovations and it could represent a first opportunity to measure the consumer's acceptance, underpinning the social and indirect impacts of innovation, the stricter and stricter connections and influences linking the technological innovation with the social and economic changes.

Finally, Empowerment of Users, differently from the other two principles, finds less space in this context, leading us to conclude that this principle is still at an evolution phase since its exhibition is developed more in a form of Involvement of Users than Empowerment. In an attempt to involve the users, MASA has been running during the years some events to show the technologies tested and implemented within the LL. In such events, run in the last four years, demonstrations of driverless and connected cars have been performed within the Modena Autodrome and within the open-air lab, besides academic seminars and roundtables involving all the stakeholders from the different institutional spheres. During some of these events citizens have gotten the possibility to be passengers of those vehicles, driven by researchers of MASA within a safe environment of experimentation.

There may be some reasons that do not allow a high degree of intensity for Empowerments of Users principle, reasons related to the type of technology and the context. First of all, the direct participation of the final user in experimentation is more difficult when there is a deep technological complexity to test and when the effects on the society are complex (Fagnant and Kockelman, 2015). The technological engineering complexity, given to the introduction of connected and autonomous cars, is combined with a contextual complexity that develops on several orders: legal framework (e.g., Scagliarini, 2019; Miniscalco, 2019), economic and environmental impact (e.g., Yun et al., 2016; Gandia et al., 2018), and, above all, issues related to the acceptance of the technology by the final user (Machado et al., 2018; Nielsen and Haustein, 2018). Unlike other types of LLs, MASA, as an automotive LL, deals with technological innovations which, in addition of being extremely complex from an engineering point of view, they are also considered invasive and difficult to be understood by the society (Nielsen and Haustein, 2018), at least until when they are not directly experienced in their use. Secondly, the complexity of these technological innovations and their implementation lead to a more top-down configuration of the LL, meaning that its establishment and evolutions are more easily expressed through formal processes driven by institutions. In the case of MASA, it's a formal document, the memorandum of understanding signed by UNIMORE, Municipality of Modena and private firms, that defines its start; also, the evolution of MASA can be identified through formal agreements between the parts. That is, in this specific

sector, the scope and the organization of the LL have been determined by the institutional actors taking part in it. Conversely, other cases (e.g., the urban LLs, see Nesti (2018) for urban LL examples), are based on emergent and grassroots ideas, some of them identified by the citizens themselves through informal ways (Leminem, 2013). These factors make, somehow, more difficult the fully application of Empowerment of Users principle, partially explaining its lower intensity.

Based on our findings, we may argue that, even if the ideal-type construct of LL has been shaped in the literature by the concurrent and symmetric presence of the three key founding principles, the degree of intensity involving different LLs may change according to the innovation being studied within the LL. The emergence of technological and contextual factors that hinder the application of Empowerment of Users principle or make the emergence of interactive practices more difficult to implement in early stages, opens the question about the way these key principles interact among them and the contextual factors that may shape the formation of a LL and support specific evolutionary paths accordingly. Furthermore, our preliminary findings pave the way for further analysis on the existence of other emergent types of key principles that may help understanding the formation and the evolution of LLs within specific technological settings and societal contexts. For example, our findings offer some support to investigate the role of the variable "Involvement of Citizens", which can take the form, for instance, of public engagement initiatives or infotainment events. We may argue that those practices could complement the Empowerment of Users principle or even could be considered as proxy of direct engagement of users in the test of technology or as active part in the innovation process in all the cases when this engagement is difficult to implement. This usually occurs when technologies are available only at the prototype level or when the absence of an adequate regulatory context inhibits the development of test sections that directly involve the users in real-world setting, such as urban roads.

Research limits. Each study has its own limitations. In our case, a systematic review of the literature is missing. Moreover, future confirmatory research requires the investigation of more case studies, preferably having different characteristics related to the context and the type of innovation characterizing the LL, in order to better refine the emerging results. Finally, as a case study, it does not allow for the generalization of results. Future stream of research will focus on such limitations, to further explore the characteristics of LL, how the identified principles are exploited, by taking into consideration the emerged intervening factors, ultimately expanding our knowledge on the topic. Moreover, findings suggest that an evolutionary analysis should be performed in order to define whether similar paths of implementation of the key variables are followed by other automotive LLs.

Practical implications. The paper supports managers and practitioners in performing innovative activities, projects, or management tools in harmony with the context they operate, underlying the elements that should be evaluated in the construction of a LL. Focusing on automotive LLs, the paper emphasizes the characteristics they should have, pointing out how LL could represent an important tool to better recognize the social and technological complexities of autonomous driving technologies.

Originality of the study. The originality of the work is threefold. Firstly, this study took a step forward in conceptualising LLs and discussing their underlying assumptions and theoretical frameworks, identifying the set of principles that emerge by the current literature as the ingredients for the identification of LLs. Secondly, it evidences how the three key concepts can be expressed with different degrees of intensity, playing an important role in detecting the position of a specific LL within the action space defined by the principles. Thirdly, it points out how a step forward has to be made by the current academic debate on the taxonomic configuration in defining LLs. Indeed, the current literature excludes the definition of LL in relation to the specific scope of the LL, the broaden contextual factors it has to face, and the nature of the technological innovation it investigates.

Key words: *Living Labs; autonomous driving; Openness; Realism; Empowerment of Users*

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Investigating determinants of blockchain adoption

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Objectives. *In recent times, blockchain has been used in several business contexts such as open manufacturing (Li et al., 2018), real estate (Veuger, 2018) and healthcare (Agbo et al., 2019). The strength of this technology is to have redefined supply chain management, creating new challenges and new opportunities in terms of reduced cost, efficiency, security and customer relationship.*

Blockchain is defined as a “a distributed database, which is shared among and agreed upon a peer-to-peer network. It consists of a linked sequence of blocks, holding timestamped transactions that are secured by public-key cryptography (i.e., “hash”) and verified by the network community. Once an element is appended to the blockchain, it cannot be altered, turning a blockchain into an immutable record of past activity” (Seebacher and Schüritz, 2017:15). In other words, blockchain can be considered as an ordered, incremental, solid and digital block of cryptographically linked data (Zheng et al., 2018). The main difference between blockchain and conventional digital technologies is its distributed Peer-to-Peer (P2P) nature as it allows to transfer all the transactions worldwide, without a central server.

There are several benefits in the use of Blockchain technology in different domains such as strategic, organisational, economic, informational and technological categories (Olmes et al. 2017). Blockchain provides adopters some advantages such as: anonymity, immutability, transparency and fast transactions (Abubakar et al., 2020). Moreover blockchain allows the reduction of several costs (i.e. transaction, processing, administrative...) (Casino et al., 2019). The decentralized structure allows to completely eliminate intermediaries enabling the actors to interact more quickly and more efficiently. Focusing on supply chain management, the use of smart contracts reduces the complexity of processes and transaction costs (Kim and Laskowski, 2017; Tian, 2017). Traceability across supply chains will be improved, which implies greater efficiency in fraud prevention (Chen, 2018). The transparency and traceability provided by blockchain can address a variety of issues in supply chains (Wang, Han, and Beynon-Davies 2019), increasing trust in the brand (Boukis et al., 2019).

Boukis et al. (2019) have studied how blockchain can improve customers' experience and how it helps in increasing their engagement with the brand.

The Blockchain and Distributed Ledger POLIMI Observatory (2020) have shown that during 2019 Italian companies invested approximately EUR 30 million in blockchain projects, a 100% increase compared to 2018, placing Italy among the top 10 countries in the world for the number of blockchain projects developed in 2019.

Despite its rapid evolution, blockchain still remains an immature technology with numerous applications yet to be discovered and it is still an hot topic that is more and more investigated (Kamble et al., 2019; Queiroz and Wamba 2019; Wamba et al., 2020; Wong et al., 2020). This remarkable growth requires a greater understanding of the main factors that lead companies to adopt blockchain technology.

The purpose of this article is to fill this gap, investigating factors influencing firm's blockchain adoption.

In order to investigate the determinants of blockchain adoption we use the technology acceptance model (TAM) (Davis, 1989). We propose an innovative approach to investigate intention to integrate business processes with blockchain technologies, extending TAM with “efficiency” and “customer service quality” (See figure 1). The utility of the TAM refers to its ability to reliably predict the acceptance of technology in a wide range of technologies and in various types of contexts such as software applications (Szajna, 1996 ; Gao, 2005) and e-commerce (Morris and Dillon, 1997; Koufaris, 2002).

The TAM was proposed by Davis (1985) and examines the technology adoption process through the perceptions of the users on its utility and ease of use of technology. According to Davis (1985) intention to adopt technology is the result of interaction of attitude, perceived usefulness and perceived ease of use.

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Attitude (ATT) refers to “the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question” (Ajzen 1991:4). Attitude toward user acceptance of technology is defined as an individual’s overall efficient reaction (liking, enjoyment, joy, and pleasure) to use technology (Davis 1989; Taylor and Todd, 1995). Lou and Li, (2017) have shown that attitude is the most important predictor of intention to adopt blockchain technology. Other scholars have confirmed that attitude is a strong predictor of intention to adopt blockchain (Kamble et al., 2019; Albayati et al., 2020; Jain et al., 2020). On the same page in the TAM model, the behavior intention (BI) variable is directly influenced by perceived usefulness (PU) (Davis, 1989). Perceived usefulness concerns the “degree to which a person believes that the use of a particular system would improve his or her work performance” (Davis, 1989: 26). When individuals perceive a system as useful, they link it to a positive performance from the use and are, consequently, reinforced to use it (Pfeffer, 1982; Schein, 1980; Vroom, 1964). Several scholars (Folkinshteyn et al., 2016; Jaoude et al., 2017; Knauer et al., 2019; Nureyev et al., 2020) have found that perceived usefulness positively influences the intention to adopt blockchain technology.

Davis (1993) posited that the user’s attitude toward it determines adoption of a particular technology and the development of attitude is contributed by perceived usefulness and perceived ease of use (PEU). While perceived usefulness refers to the degree to which the user believes that using the technology will improve his or her work performance, perceived ease of use refers to how effortless he or she perceives using the technology will be. Davis (1989:26) defines perceived ease of use “the degree to which a person believes that using a particular system would be free of effort”. The positive influence of perceived usefulness on attitude can be easily understood if we think that when someone perceives an activity as beneficial to obtain the estimated results he will be more inclined to accept the new technology (Liao et al., 2007). In the Blockchain context, perceived usefulness has been shown to be a strong predictor of the attitude towards the adoption of blockchain technology (Kamble et al., 2018; Nureyev et al., 2020; AlSuwaidan and Almegren, 2020). On the same page when users find a technology easy to use and don’t require much effort to learn it, they will be more likely to adopt it (Tan and Ooi, 2018).

Nureyev et al., (2020) have highlighted that perceived ease of use influences positively attitude toward adopting blockchain. At the same time perceived ease of use is also hypothesized to influence perceived usefulness (Davis, 1989). Perceived ease of use positively influences perceived usefulness because technologies requiring fewer efforts can be perceived as more useful (Karahanna and Straub, 1999; Gangwar et al., 2015). The results from previous research have revealed the significant effect of perceived ease of use on perceived usefulness (Davis, Bagozzi and Warshaw 1989; Wang et al. 2003; Kleijnen, Wetzels, and De Ruyter 2004). The positive influence of perceived ease of use on perceived usefulness was confirmed also in blockchain context (Kamble et al., 2019; Kamble et al., 2021).

Based on these premises, we propose the following hypothesis:

H.1 Attitude positively influences the intention to adopt Blockchain technology.

H2: Perceived usefulness positively influences the intention to adopt blockchain technology.

H3: Perceived usefulness positively influences the attitude to adopt blockchain technology.

H4: Perceived ease of use positively influences the attitude to adopt blockchain technology.

H5: Perceived ease of use positively influences perceived usefulness of blockchain technology adoption.

Several scholars extended TAM to better comprehend the dynamics explaining the behavioral intentions. In the 2000, Davis and Venkatesh extended the TAM model defining the TAM2 adding various constructs to understand the determinants of perceived usefulness in order to make the original model better. Other scholars (Venkatesh, et al., 2003) analyzed several models to improve the TAM results in order to explain technology adoption. On the other side several scholars have adapted it to other specific contexts as e-commerce (Gefen & Straub, 2000; Pikkarainen et al., 2004; Natarajan et al., 2016;), and mobile services (Gefen, et al, 2003; Lopéz-Nicolas, et al. 2008; Leiva et al., 2017, Rafique et al., 2020; Vahdat et al., 2020). Also in the studies on blockchain some scholars add to traditional TAM other constructs.

For example, Lou and Li (2017) have extended TAM with compatibility or complexity, while Kamble et al. (2019), have considered discomfort and insecurity. To the best of our knowledge there are no studies that investigate how “efficiency” and “customer quality service” may influence blockchain adoption.

One of the main reasons that led firms to adopt a new technology is linked to technology capacity to increase efficiency in the process and improve customer relationships. Operational efficiency includes cost-based and refers to quality costs, engineering change costs and manufacturing costs (Yeung, 2008).

Blockchain allows the reduction of several costs (transaction, processing, administrative, etc.) (Casino et al., 2019). The decentralized structure allows to completely eliminate intermediaries enabling the actors to interact more quickly and more efficiently with a huge reduction of intermediaries cost, which translates into greater automation in the business processes, generating lower operating costs (Bocek et al., 2017). Blockchain aims to reduce transaction costs, improve business relationships and negotiation speed, reduce fraud risks, increase the verifiability of transactions and increase oversight capacity (Swan, 2015; Yermack, 2017). The peer-to-peer and transparency capabilities of the blockchain make organizational resources more fluid, allowing companies to move away from traditional ownership frameworks (Hasan et al., 2020). This technology facilitates the automation of manual business processes, allowing human resources to focus on other, higher value-added activities. For example administrative tasks can be significantly reduced or eliminated due to increased visibility of transactions (Nowiński e Kozma, 2017; Subramanian, 2017). At the

same time when blockchain is used for certifying legal agreement, labor costs, attorney fees, court fees, and tax consultant fees are greatly reduced (Hald and Kinra, 2019). The verifiability and immutability features of the blockchain ensure the security and reliability of the data, increasing trust in the organization, which is useful for managing this socially complex and operationally sophisticated task. The real innovation of this technology has been to minimize the “costs of trust” by automating it. In fact, in this regard, thanks to the immutability of the recorded data, the blockchain is able to create a new form of trust based on the transparency and traceability of the transactions carried out, rethinking of supply chains and supply chain management (Panisi, 2017). For this reason blockchain not only allows firms to improve efficiency of a firm’s processes, but also improve customer relationships.

Blockchain helps firms to evaluate and mitigate supply chain risks by providing a reliable means to track and trace product origins and processes (Francisco and Swanson, 2018). According to Garg et al. (2021:4) blockchain allows banking operators to automate routine and repetitive operations across the stakeholders of a business. In this way, banks and other organizations can implement blockchain technology “to design customer-centric business activities and provide value-based services”. Moreover Noor et al. (2018) have shown how blockchain promotes greater trust, lower costs and increased security, while overall increasing customer service quality, for customers in the energy sector.

Efficiency and customer service quality are the main benefits of blockchain. Karamchandani et al., (2020) have shown that blockchain perceived benefits positively affect the perceived usefulness of blockchain adoption. On the same page several scholars have shown that perceived benefits positively influence the adoption of technology (Lee, 2009; Rahayu and Day, 2015). Therefore, it is reasonable to infer that efficiency and consumer service quality positively influence perceived usefulness and user attitude to adopt blockchain technology.

Hence we propose the following hypothesis:

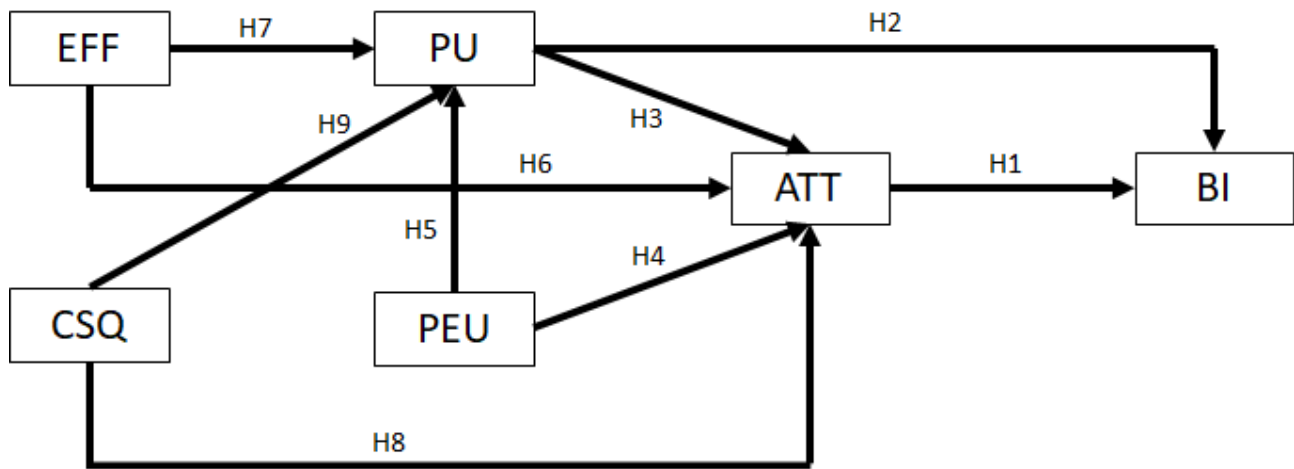
H6: Efficiency positively influences the attitude to adopt blockchain technology

H7: Efficiency positively influences the perceived usefulness to adopt blockchain technology

H8: Customers service quality positively influences the attitude to adopt blockchain technology

H9: Customers service quality positively influences the perceived usefulness to adopt blockchain technology

Fig. 1: Proposed model



(BI: Behavior intention; ATT: Attitude; PU: Perceived usefulness; PEU: Perceived ease of use; EFF: efficiency; CSQ: Customers service quality)

Methodology. The data will be collected using a survey questionnaire designed from previously validated scales adopted in the relevant literature and we will use the translation and back-translations procedures (Saunders et al., 2009) to produce the Italian version.

TAM constructs will be measured using 16 items (5 items for ATT, 3 items for BI, and 4 for each of PU and PEU) adapted from previous literature (Davis, 1989; Kamble et al., 2018). Moreover our external constructs will be measured by 8 items. Efficiency and customer service quality was measured respectively by 3 and 5 items and adapted from Garg et al., (2021). All the items will be measured using a seven-point Likert scale (1 = “strongly disagree” and 7 = “strongly agree”). Finally we will ask some demographic information about (sectors, size). We will make sure the companies that answer the survey know the blockchain technology, asking them to answer only if they know this technology.

In order to reduce retrieval bias (Kline et al., 2000; Podsakoff, 2003), we will intermix the items from different constructs in the various scale grids, while to reduce social desirability bias, we will add guidelines to the survey to explain the scope of the survey, and to provide contacts for further information (Saunders et al., 2009). Like other studies on intention to adopt blockchain (Queiroz and Bamba, 2019, 2020; Wong et al., 2020), the data collected will

be studied adopting the Partial Least Squares approach to Structural Equation Models (PLS-SEM) (Hair et al., 2011), using SmartPLS (Ringle et al., 2015) for model evaluation.

Findings. This study will contribute to the debate on blockchain studies, adding new factors useful for investigating blockchain firm's adoption. Furthermore, it will help us to enhance the role of the efficiency and consumer service quality in understanding the drivers behind these processes. According to previous studies, in fact, we expect to find a significant effect of TAM constructs. Moreover we expect that both efficiency and consumer service quality have a positive and significant effect on perceived usefulness and on attitude.

Research limits. There are several limitations in this research. First of all, we will focus only on Italian companies. Second, we won't focus on a specific business sector. Finally we extend TAM only with perceived benefits (efficiency and customer service quality), not considering for example inhibitors that may influence the adoption of blockchain. Others research may focus on the determinant in the adoption of blockchain in a specific sector (i.e banking, food) or extend the analysis to other countries. At the same time future research can integrate our model with other constructs useful to better predict determinants of blockchain adoption.

Practical implications. Hopefully, this research will have practical implications for many stakeholders and will provide interesting information for them. We expect that findings can help managers to better understand the drivers of blockchain adoption in firms' processes. As a consequence, our results should be able to suggest founders where to focus their resources to improve the use of this blockchain technology. The results could be useful to service blockchain vendors as well, highlighting the need to leverage on some characteristics of blockchain in order to increase the adoption by the firms. Finally our research will have interesting results also for policy makers to recognize that blockchain technology has the ability to transform firms' processes and encourage its adoption.

Originality of the study. We propose an innovative approach to investigate factors influencing the adoption of blockchain. We extend the TAM model with efficiency and customer service quality. These constructs were used in literature to analyse and describe characteristics of blockchain technology. To the best of our knowledge there are no studies that analyse the perception of the capacity of blockchain to improve the efficiency of the firm processes and customer relationship and how these constructs can influence the adoption of this technology.

Key words: Blockchain, Technology acceptance model, PLS-SEM.

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Digital-health system and patient engagement: a literature review

STEFANIA MELE * FILOMENA IZZO *

Objectives. *Digital health has evolved through different research and application steps starting as just a communication medium, to complement traditional services, to a technology of automation and decision tools that expands the scope and range of health services. At the same time, the use of digital healthcare is a strong answer to new pandemic times. It could be a crucial part of the service jointly self-management, but it is evident that patients should be engaged in the process to be part of the ecosystem. Thanks to ICT technologies it is always easier to create innovative solutions to help the emergency of the health system, our study tries to systematize what has happened in this disruptive situation in management studies, consolidating lessons learned in last twenty years.*

Methodology. *The research contains five phases: study design; data collection; data analysis; data visualization and interpretation.*

In the study design, we define the main objective of this research that is to evaluate and classify the different characteristics of existing literature that lies at the crossing among digital healthcare and sustainable sanitary models, especially in Covid pandemic emergency in management realms.

We adopt an objective and a subjective approach to examine how the topic of Digital-health system and patient engagement has been integrated into the business and management field.

For data collection we select the Web of Science (WoS) database. Data analysis is staged by a bibliometric analysis which characterizes the objective approach.

Bibliometric refers to “the collection, the handling and the analysis of quantitative bibliographic data, derived from scientific publications” (Verbeek et al., 2002: 181). It contains general descriptive statistics (e.g. identifying the main authors, publishing journals, etc) (Wu and Wu, 2017) and more sophisticated methods like the document co-citation, collaboration, and co-occurrence analyses (Briner and Denyer, 2012; Rosseau, 2012).

The bibliometric analysis is carried out by using the R package bibliometrix version 2.2.1 (Aria & Cuccurullo, 2017) which also allows for extracting bibliometric networks using different units of analysis, i.e. citations, authors, countries, keywords, etc.

Bibliometrics can make a systematic, transparent, and reproducible review process based on the statistical measurement of science, scientists, or scientific activity (Broadus, 1987; Diodato, 1994; Pritchard, 1969; Crane, 1972). Data visualization is used to represent a science map and the result of data analysis.

The last step is interpretation, where the objective method is combined by a subjective approach (qualitative analysis, pp. which is based on scholars’ analysis of a given area of research. In fact, a qualitative evaluation completes the bibliometric analysis, in particular the literature linking Digital-health system and patient engagement in business and management phenomena is studied and graded.

Findings. *IC and digital technologies are completely changing the healthcare field (Sousa et. al., 2019; Izzo, Camminatiello, 2020). Technology is one of the most important levers of change in all industrial and service sectors. Digital technologies have been revolutionizing the healthcare sector for some decades and with increasingly smart evolutions. Its players cannot create value and gain sustainable competitive advantage without new technology-based devices.*

Disruptive innovation in the healthcare sector is an important way to address various industry problems and create value (Christensen, 2009).

Talking about digital health generally means talking about e-health, e-care or remote technologies for health as in the case of telemedicine. Telemedicine refers to the remote diagnosis and treatment of patients using telecommunication technology (Stanberry, 2000). Today, new technologies and devices are transforming the way organizations and health systems offer their product. Technological development is related to changing paradigmatic visions, not only in the health and wellness sectors, but also in the management of health systems and the engagement of the patient in these services (Robbins et al., 2013).

Thanks to digital technologies it is increasingly easier to create innovative solutions to improve the quality of the health system. The goal is to reduce the costs of remote patient monitoring both before and after hospitalizations and

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pandemic emergency accelerate this need. Today, ICT solutions and devices transform the way healthcare organizations deliver their services and co-create value (also via apps and sensors) with the client / patient (Prahalad and Ramaswamy, 2004).

Eysenbach (2001) defines e-health as "an emerging field at the intersection of medical informatics, public health and the health industry, referring to health services and information provided or enhanced through the Internet and related technologies". The birth of e-health, in addition to the development and creation of new models in this sector, has initiated the development of engagement paradigms. Indeed, as stated by Robbins et al. (2013), the health business model is increasingly customized according to the patient's needs.

The introduction of Artificial Intelligence solutions in the healthcare system to reduce human error and improve treatments and diagnostics (Meskò et al., 2018) also represents an important innovation and a technology that will lead to profound managerial changes: thanks to these systems, doctors will implement specific interventions tailored to their patients and monitor patient data in real time (e.g., via smartphone). Telemedicine could be the best solution to combine health, medicine, and technology to act on various critical points such as setting specific parameters to control each patient or checking data in real time with a doctor / patient in direct relationship. This technological acceleration creates a unique health management and communication context (Gustke et al., 2000; Munos et al., 2016).

Digital healthcare in 2020 has been acting an increasingly major position in the management of the NCOVID-19 crisis and research studies are becoming to indagate the new role of telehealth both in emergency and in new sanitary models defining a new scenario also in study field.

This paper has the aim to provide a systematic literature review to analyse the effect of digital healthcare on patient engagement. A disruptive innovation without an integrated health system and an inclusive engagement could not be enough for a new paradigm: technology and inclusion should complement together.

Indeed, we performed an analysis of articles of the last 22 years (from 1998 to 2020 year in which first telemedicine discussions were implemented also in European institutional context) evidencing new and consolidate application of digital healthcare.

Key words: digital, technology, health system, patient engagement, Covid, Bibliometrix

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Does industry change affect strategic, governance, and financial configurations of private hospital providers? A survey of Italian private healthcare organizations

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Objectives. *The National Health Service, for years, has been affected by a profound evolution of institutional structures, due to the search for greater economic sustainability. In the last decade, ten Regions are or have been affected by the Health Deficit Return Plans, while the remaining ten Regions have initiated processes of greater centralization of health choices and policies, with the aim of rebalancing the system's hospital-centered vision. In this sense, even accredited private hospitals have been affected by a variety of pressures, both financially and from a regulatory standpoint, which feed a progressive sectoral concentration (Cuccurullo et al., 2017). The accredited private nursing homes now have 30.2% of the beds of the overall hospital offer (Lega et al., 2018). They are particular companies, being private but operating in a regulated sector, and are therefore subject to the dynamics and rules of public systems (Carbone 2013). Moreover, they tend to be small (only 12% exceed 200 beds) with concentrated ownership (typically family business), so with greater difficulties they face the sectoral transition. Only recently are they the subject of attention by the academic world, in particular in terms of company size and activities with the use of qualitative methods, such as case studies. The economic-financial configuration is little explored, together with the governance structures and the strategic ones. The purpose of this work is to bridge this gap with the help of a quantitative-statistical method, analyzing the evolution of the strategic, governance and financial configurations of Italian nursing homes over the last decade.*

Indeed, our research questions are:

- RQ 1. Which financial aspects best explain the variability among private hospitals?
- RQ 2. What are the main configurations of private hospitals?
- RQ 3. How have these configurations changed over time? (2008; 2012; 2016)

Methodology. *The objective of this study is to analyze the distinct configurations of companies operating in the private hospital sector. By using the PTA, combined with clustering techniques, we map: (i) the different corporate governance characteristics of the Private hospital; (ii) the most relevant economic-financial indicators.*

Data collection. *To conduct the empirical analysis, the Aida database of Bureau van Dijk was used, which contains information from about 980,000 companies. The information that can be consulted concerns all the financial data of Italian companies, in addition to other information of a legal nature such as the corporate structure, group structure, extraordinary finance operations, commercial information and more. All data are indexed and can be used as search keys, processed, evaluated and exported in multiple formats. The survey began in 2018. Through the AIDA database it was possible to find the data of all the private hospital present in the country that duly filed the financial statements in the years 2008-2012-2016. The query was made using Ateco code 86.10.10. To conduct the empirical analysis, the following variables were included:*

- location as a Region in which the operational headquarters are located;
- ownership structure, such as (i) legal form, (ii) number of shareholders, (iii) BVD independence indicator;
- company size measured on the basis of (i) related and (ii) total assets;
- operational growth (revenues) and structural growth (employees and total assets);
- economic performance, through (i) ROA, (ii) ebitda margin, (iii) net income/sales;
- financial profile, understood as (i) debt/equity ratio, (ii) financial leverage and (iii) primary liquidity ratio.

The companies in the sector that had regularly presented their financial statements were 1165.

After which we proceeded excluding (Figure 1):

- companies that presented the following legal forms: Consortium (1), Social Cooperative (27), Entity (1), Foundation (3), S.A.S. (1), S.C.A.R.L. (5), S.C.A.R.L.P.A. (29), S.R.L. simplified (14), limited liability consortium

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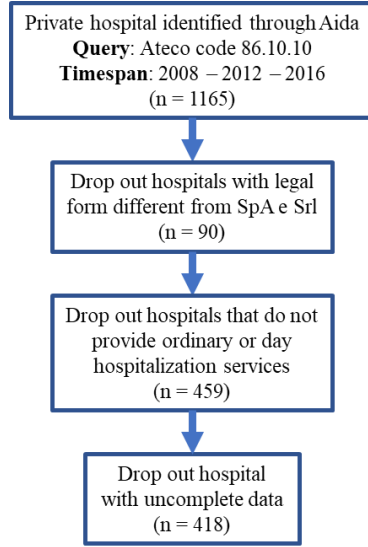
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- company (6), joint stock consortium company (1), simple company (2);
- companies that carry out rehabilitation activities and rest homes, that is to say those realities that do not provide ordinary or day hospitalization services, as they have financing mechanisms, other than those at a rate per service (459);
- the companies for which complete information was not available for the three financial years considered (418).

Our final dataset is composed of 198 companies observed in 3 different periods (2008 - 2012 - 2016) in which the same variables are measured (EBITDA / Sales, ROA, ROE, Debt-to-equity ratio, financial independence index, rate interest coverage, liquidity index). The data is arranged in a list of three tables, corresponding to the three periods. Each table has 198 rows (companies) and 7 columns (variables). Our data frame is therefore a time series, with each table corresponding to a date.

Fig. 1: Data collection workflow



Data analysis. To answer the first research question and therefore bring out the most characterizing (and differentiating) characteristics of the Italian private hospital, was used Partial triadic analysis (Jaffrenou PA, 1978). Partial triadic analysis (PTA), also called X-STATIS, is an extension of principal components analysis (PCA). PTA is a tailor-made technique for managing multiple data tables that measure sets of variables collected on the same observations but at different times or places (Thioulouse J. & Chessel D., 1987; Simier M. et al., 1999; Thioulouse J. et al., 2004; Thioulouse J. & Dray S., 2007; Rolland A. et al., 2009; Bertrand F. & Maumy M., 2010; Mendes S. et al., 2010; Thioulouse J., 2011).

Although the same has been little used in economic-financial analyzes, compared to Self-Organizing Maps (Dameri et al., 2017; Lassini et al., 2016), it was considered here that it was better appropriate to represent the most relevant to the private hospital. PTA is a technique based on a simplified approach of three modalities of factor analysis (Tucker LR., 1966; Kiers & Henk, 1991) which allows to:

1. compare relationships between different data sets,
2. integrate these datasets into an optimal weighted average called compromise,
3. and finally, project each original dataset on compromise to analyze commonalities and discrepancies.

Let $X_1, \dots, X_k, \dots, X_K$ be K -tables of quantitative variables with the same n rows (samples) and the same p columns (variables). Let $(X_1, Q, D), \dots, (X_k, Q, D), \dots, (X_K, Q, D)$ be the K associated statistical triplets. The PTA can be broken down into three steps (Thioulouse & Chessel, 1987; Lavit, 1988; Lavit et al., 1994):

- The Interstructure uses the vectorial correlation coefficient or RV coefficients to compute a matrix of scalar products between the tables that measures their relationships. Since all the tables have both the same rows and columns, STATIS, and the associated computation of the RV coefficient, is performed directly on tables. The eigenvalues Λ_B and the normed eigenvectors U_B of the Rv matrix are used to compute a score of the tables $S = U_B \Lambda_B^{-\frac{1}{2}}$, where the letter B (Between) refers to the interstructure. These scores can be plotted in a correlation circle.
- Let $u_B^T = (\alpha_1 \dots \alpha_k \dots \alpha_K)$ be the first eigenvector of the Interstructure analysis with $\sum_{k=1}^K \alpha_k^2 = 1$. The α_k are used to define the K -table weighting. The Compromise table is therefore built as a combination of the K tables: $X = \sum_{k=1}^K \alpha_k X_k$

The analysis of the Compromise is the analysis of the triplet (X, Q, D) in the sense of a duality diagram.

The row scores (L) projection of the rows of X onto the principal axes (A) and the column scores (C) projection of the columns of X onto the principal components (B) are given by $L = XQA$ and $C = X^T DB$.

An RV coefficient can be calculated between the Compromise table X and each table X_k : $Rv(X, X_k)$. It represents the squared cosine and defines the link between the Compromise and each table.

- The Infrastructure projects the elements (rows and columns) of each table onto the analysis of the Compromise.

Comparing the PTA with other data dimensional reduction techniques such as the SOM we note how the PTA is better able to manage a large amount of data unlike the SOM. Despite this, the SOMs have a great advantage, that is, they favor a direct interpretation of the data by also explaining the non-linear relationships (Peeters et al. 2006). Taking this into account, given the high number of observations and given the structure of our data, it was decided to use the PTA. For the analysis, was used *ade4*, a multivariate data analysis package for the R statistical environment (Thioulouse & Dray, 2007). We calculate the PTA of the economic-financial variables measured on 198 private ospital but in three different periods. The three tables, which form our historical series, are standardized for each year and then transformed into a single data frame. The PTA is calculated with the *pta* function.

To answer the second research question, that is identify the configuration of Italian private hospitals, was used hierarchical clustering techniques. Cluster analysis has been used several times both in the hospital sector and in the corporate economic sector. Clustering or group analysis is a set of multivariate data analysis techniques aimed at selecting and grouping homogeneous elements in a data set. Clustering techniques are based on measures related to the similarity between elements (Romesburg, 2004). In the hierarchical analysis of clusters, the segmentation technique is based on a logic of minimizing the distances between the statistical units within the groups and maximizing the distances between the groups (Saâdaoui et al., 2015). Initially, each element is assigned to its own cluster and the hierarchical clustering algorithm proceeds iteratively, at each stage joining the two most similar clusters, continuing until there is only one cluster (Bridges & Cecil, 1966). The results can be viewed through a dendrogram which will help to understand exactly how many groups to form. For the hierarchical analysis of the clusters was used the *hclust* function of the *stats* package. This package contains functions for statistical calculations in R.

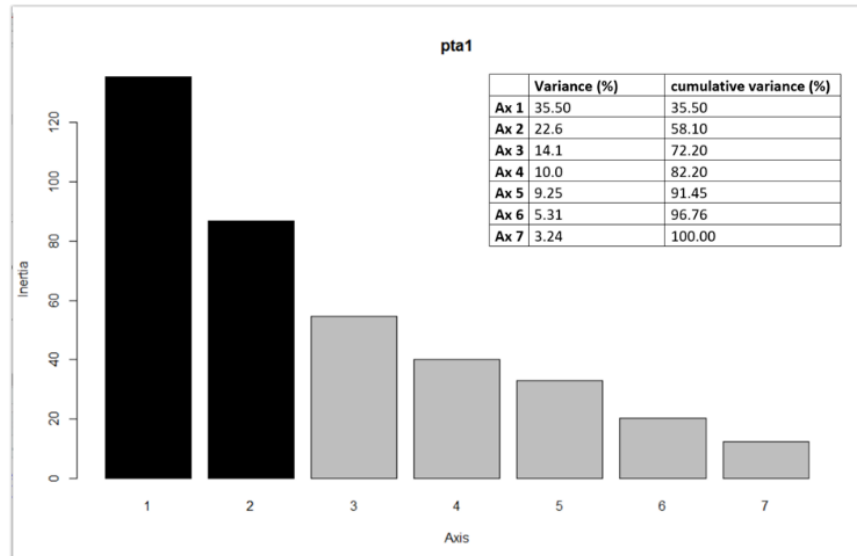
Finally, to answer the third research question, that is to identify how the configuration of Italian private hospitals change over time, we combined the results of PTA with the results of hierarchical analysis of the clusters. We identified the barycenters of each cluster and analyzed their trajectory over time (2008-2012-2016). We choose to use the barycenters because studying the trajectory of all 198 private hospitals would lead to poorly understood results. The centers of gravity represent the "average position" of all the companies that are in a particular cluster, or the arithmetic mean of the coordinates of each company on the axes identified through the PTA. Therefore, they are the best representation of our clusters.

Descriptive findings. We analyze the ownership structure of the 198 private hospitals of all 21 Italian regional health systems considering the legal form, the number of shareholders and the BVD independence indicator. Regarding the legal form, the private hospitals that make up our dataset are distributed in a homogeneous way. In total, there are 85 companies that are joint stock companies ($n = 79$ s.p.a. and $n = 6$ s.p.a. with sole shareholder) and 113 companies that are limited liability companies ($n = 100$ s.r.l. and $n = 13$ s.r.l. with single shareholder). Regarding the number of shareholders, they have on average 11 shareholders. as proof of the fact that Italian private hospitals are small companies and above all family-run companies, 50% of them have between 1 and 3 shareholders. Finally, to characterize the degree of independence of a company with regard to its shareholders, we use the BvD Independence Indicator. More than 50% of the private hospitals in our dataset have an Indicator D. It is allocated to any company with a recorded shareholder with a direct ownership of over 50%.

Results of the partial triadic analysis. In the *ade4* package, the results of a PTA are stored in an object of the *Dudi* class. A *Dudi* class object is a list that contains both input and output data. The input data are the data tables (transformed into *data.frame*) and the weights for the rows and columns (stored as vectors). The output data are the results of the analysis of the input data. Among the output data we have the screeplot of the eigenvalues (*\$eig*). The screeplot shows the importance of each major component. In the screeplot in Figure 2, we see the first two components (colored black) which are the ones selected to form the biplot. These summarize 58% of the variance of the original variables. Since we are in a compromise situation, we believe that these two axes (Ax 1 and Ax 2) represent satisfactorily the information contained in the original variables.

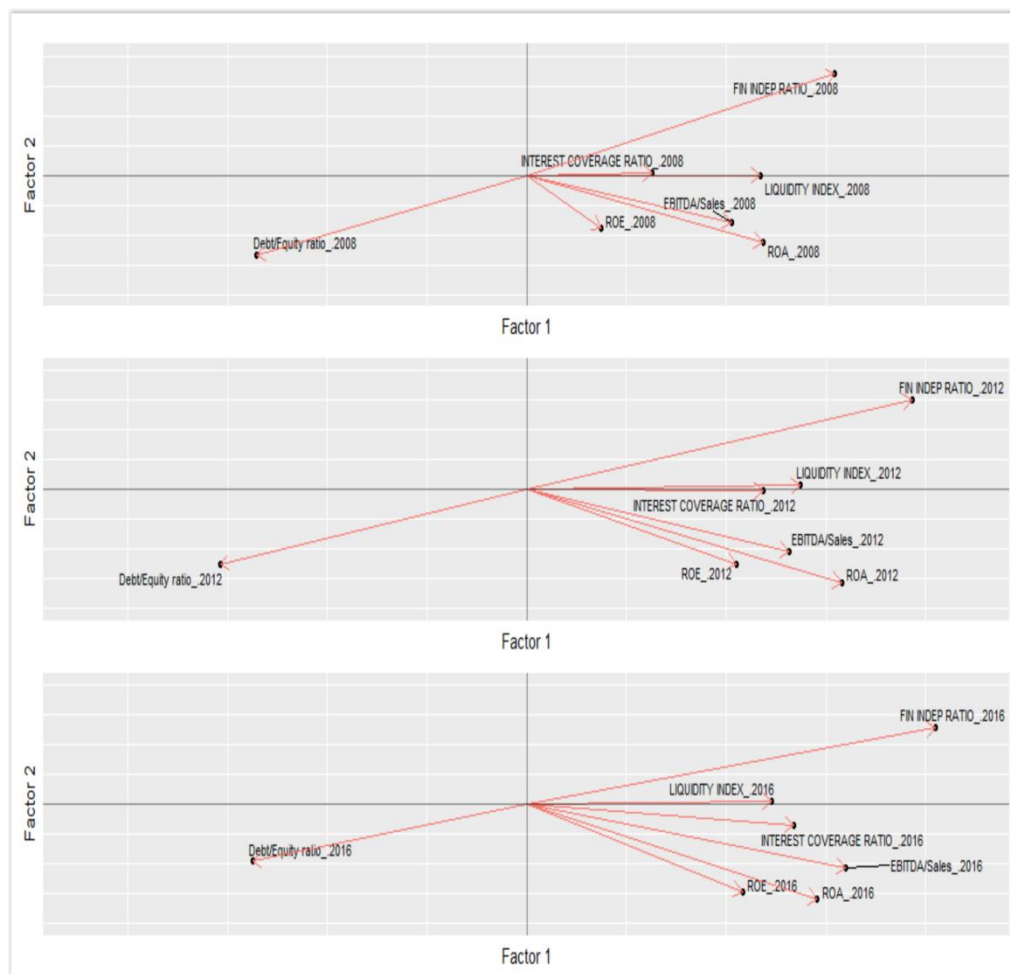
The results of the partial triadic analysis are presented in Figure 3. This figure uses the coordinates of the Infrastructure step of the PTA and shows the factorial map of the economic-financial variables. Compared to the results obtainable with a PCA, the graphs of the three periods are now at the same scale and can be overlaid and compared. The advantage of using the PTA lies in the fact that all points are in the same space, so the two axes have the same meaning in all three graphs. We can interpret the first axis as the solvency axis (financial profile) and the second axis as the profitability axis (economic performance). Through PTA, these two aspects have been identified as the best aspects to explain the variability among private hospitals.

Fig. 2: Eigenvalues screeplot



Source: our elaboration

Fig. 3: Factorial map of the economic-financial variables



Source: our elaboration

Results of hierarchical clustering techniques. Starting from the common structure of the axes over the years, it was possible to identify the main configurations of private hospitals, through a hierarchical cluster analysis. The results

of the hierarchical analysis cluster, in the three periods, are presented in Figures 4 - 6. As we can see, there are 4 different clusters identified by the scree-plot criterium (criterion of the maximum difference in Height). Looking at the average values of the variables in each cluster, we can understand what are the configurations of the private hospitals that compose them.

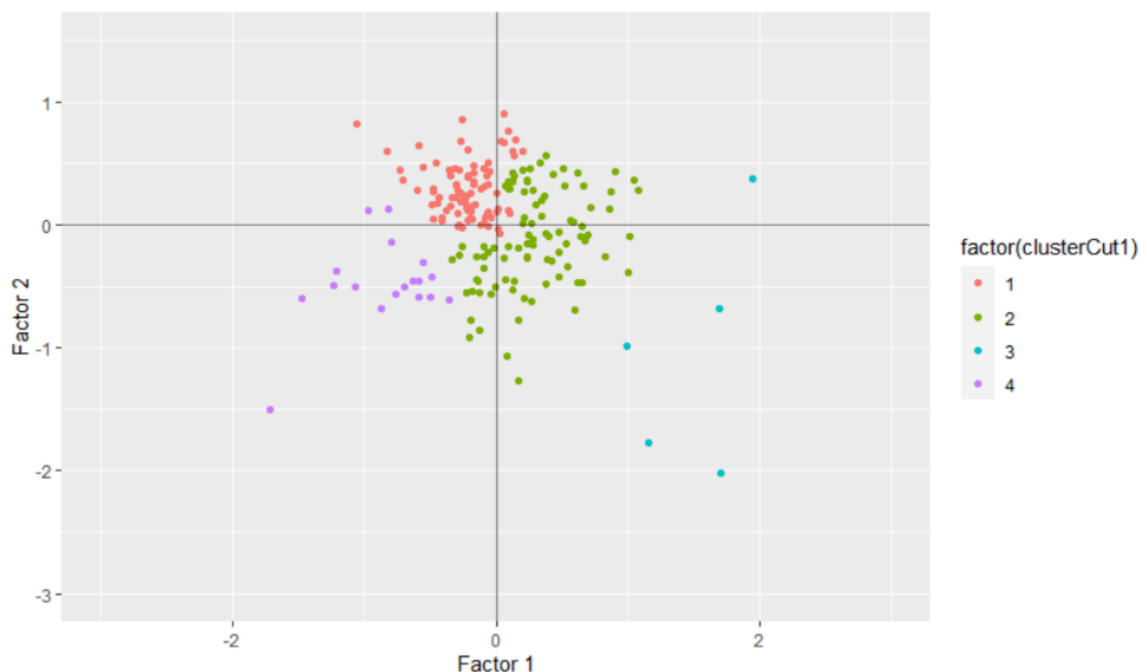
Cluster n°1 is located in the upper left quadrant. This cluster is characterized by private hospitals in a situation of severe financial stress. This cluster is defined by a liquidity index and an interest coverage rate of less than 1. The liquidity index is an instrument that expresses the company's ability to meet the financial commitments undertaken. It is given by the ratio between available assets and short-term debt. The numerator represents the amount of cash in hand and in the bank, the readiness for realization and short-term credits. The denominator instead is given by the debts to be paid immediately on sight or in the short term. Having a liquidity index lower than one means that the companies that are part of this cluster have a shortage of liquidity with respect to short-term debts. The interest coverage rate, on the other hand, indicates the degree of coverage that the operating result is able to provide at the cost of financial charges. It is given by the ratio between EBITDA and financial charges. The numerator represents the operational management of the company. The denominator, on the other hand, is given by financial charges. Similarly, having an interest coverage rate of less than one means that the income generated by the operations is not sufficient to remunerate the capital acquired to produce it. In this case, the final solvency is negative.

Cluster n°2 is located in the upper right quadrant. This cluster is characterized by private hospitals in an excellent situation both financially and economically. In fact, in this cluster we find positive values both of the debt ratios (eg liquidity index = 2) and of the profitability ratios (eg EBITDA/Sales = 16.5%). In this case, the solvency and the final profitability are positive.

Cluster n°3 is located in the lower right quadrant. This cluster is characterized by private hospitals in a situation of severe economic tension. This cluster is defined by an EBITDA/sales ratio of less than 10%. The EBITDA/Sales indicator expresses the company's true ability to stay on the market as it measures how much operating income it is able to generate per unit of turnover. EBITDA is the most important measure of income because it is not influenced by investment policies (through depreciation), financing policies (through interest expense), extraordinary and fiscal policies. Having a low EBITDA/sales ratio means that you are not very profitable companies. Looking also at the ROE values of private hospitals in cluster 3, we see that the percentage of profitability of invested capital is low. A value tending to zero means that wealth is neither being created nor destroyed. In this case, the final profitability is negative.

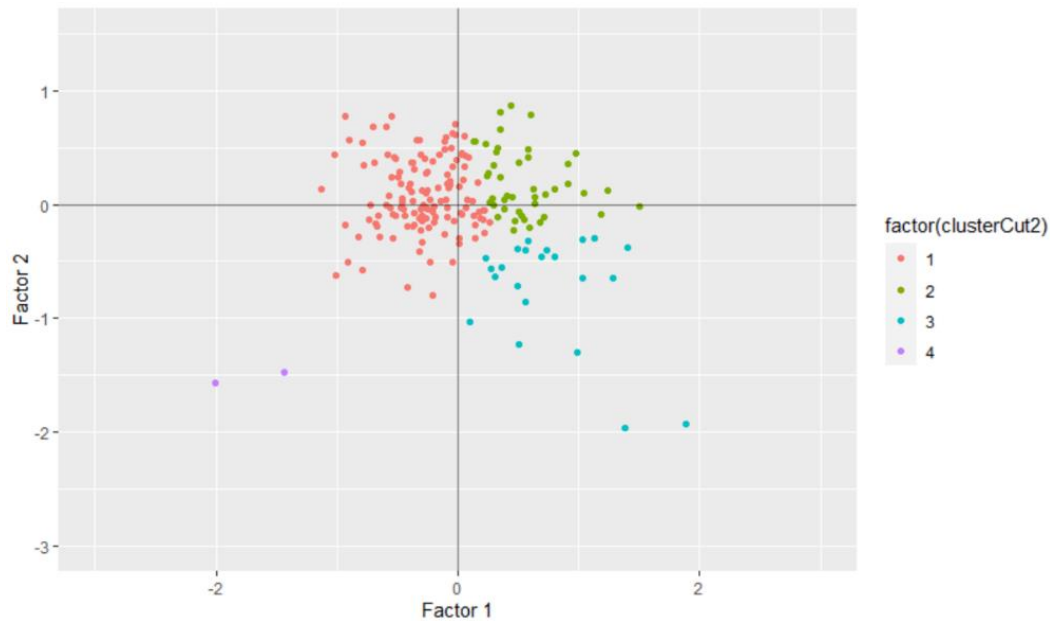
Finally, cluster n°4 is located in the lower left quadrant. This cluster is made up of private hospitals in the worst situation. Indeed, in this cluster we find lower average values, both for debt ratios (eg liquidity index = 0.69) and profitability ratios (ROE = -3.95%). In this case, the solvency and the final profitability are negative.

Fig. 4: Factorial map of private hospital in 2008



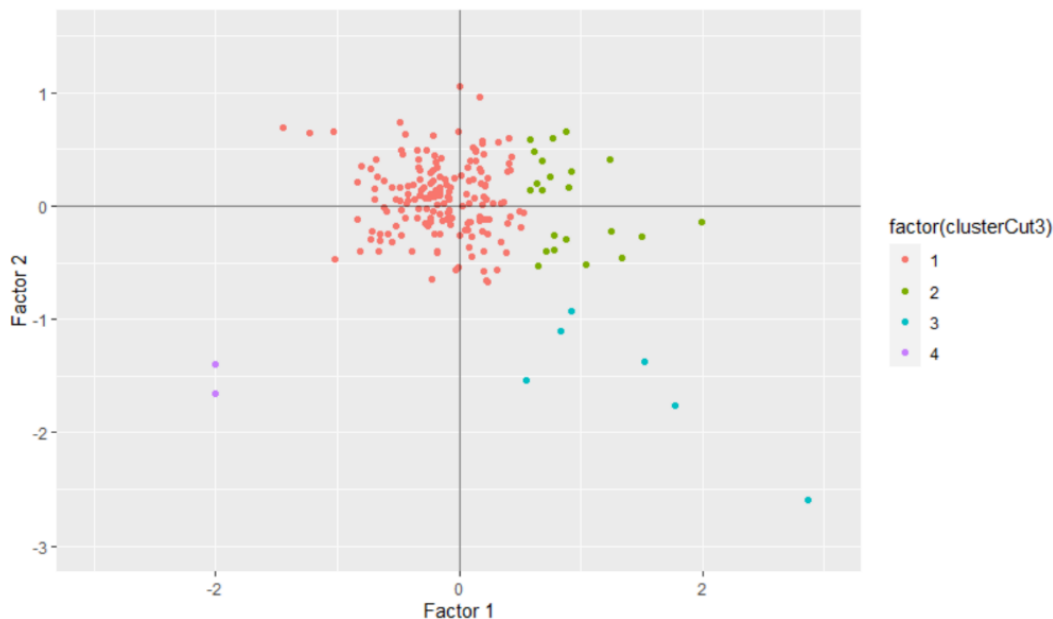
Source: our elaboration

Fig. 5: Factorial map of private hospital in 2012



Source: our elaboration

Fig. 6: Factorial map of private hospital in 2016



Source: our elaboration

Results of the centroids analysis. Finally, identifying the centroids of each cluster, we analyzed their trajectory over time (2008-2012-2016). Tab. shows the coordinates of the centroids and the number of each cluster identified in each period. In Fig. the coordinates of the centroids are represented on the factorial axes of the PTA and with an arrow we are highlighted the trajectories of the clusters over time. The size of the spheres tells us whether that cluster has grown in number or not, while the arrow shows us how it has moved over time. As we can see, there is a variation in the number of clusters. Cluster n°1, which we remember to be composed of companies with negative solvency, is populated, passing from 84 to 130 to 168 companies. Therefore, between 2008 and 2016, increased the number of private hospitals that became indebted and unable to meet their debts. Cluster n°2, on the contrary, empties, passing from 91 to 44 to 22 companies. Cluster n°2, on the other hand, represented the best companies from both a financial and economic point of view. This reduction highlights what has been the difficulty faced by these hospitals over the years due to the difficulties of the public sector in financing the healthcare services provided. Cluster n°3 which is made up of those companies in serious economic tension, first undergoes a strong population in 2012 and then returns to the initial number. This situation shows that the tension to which these private hospitals are subjected leads to constant imbalances especially for the economic performance. Cluster n°4, which represents the worst companies from both a financial and economic

point of view, suddenly decreases ($n = 18$ in 2008 $n = 2$ in 2012-2016).

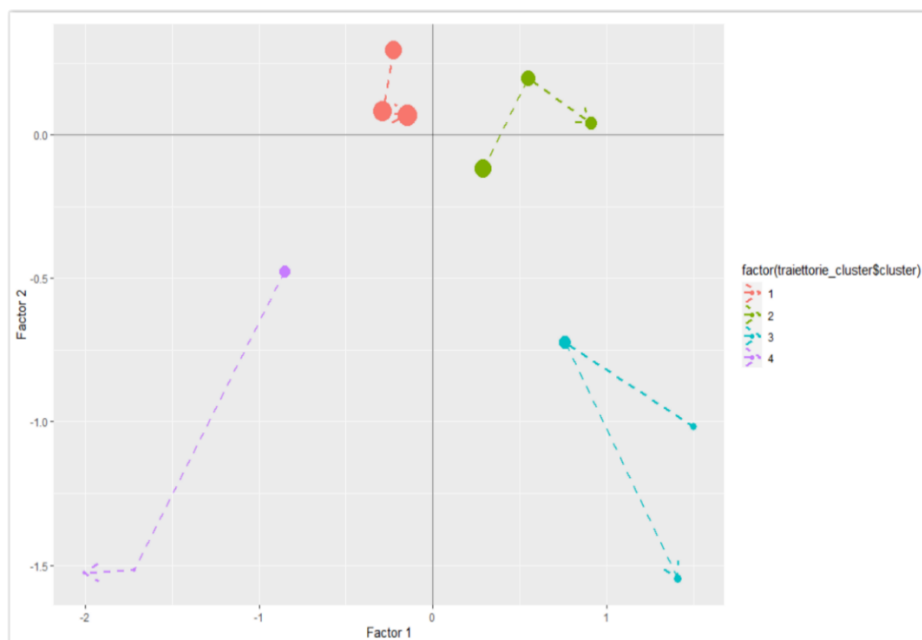
Instead, as regards the trajectories, we see that the four clusters move in different directions over the years. Cluster $n^{\circ} 1$ shifts down from factor 2 in 2012 and then shifts slightly to the right in 2016. This change is due to changes in the values that make up Factor 2, ie due to changes in the levels of profitability of firms. Therefore, the enterprises of cluster $n^{\circ} 1$ already characterized by financial stress are also starting to have economic tensions. Cluster $n^{\circ} 2$ rises along Factor 2, in 2012 and then moves decisively to the right, along Factor 1, in 2016. This change, on both axes, is due to a change in both profitability and solvency values. Therefore, the enterprises of cluster $n^{\circ} 2$, which we have said to be the best, continue to improve both financial and economic profile. Cluster $n^{\circ} 3$ moves upwards in 2012 falling lower than before in 2016. The final result of the displacements of this cluster on the plane is a worsening of the economic performance. Therefore, the enterprises of cluster $n^{\circ} 3$ that already had a reduced profitability see their economic tension increase. Finally, cluster $n^{\circ} 4$ moves decisively down, over time. This collapse is due to the worsening of both the economic and financial profile of the companies that formed this cluster. Therefore, the firms in cluster 4, which we said are the worst, continue to deteriorate.

Tab. 1: Centroids

2008	Cluster	Average Ax 1	Average Ax 2	Sd Ax 1	Sd Ax 2	n
	1	-0,2225487	0,29269345	0,22777408	0,23468525	84
	2	0,29145042	-0,1200571	0,33007207	0,39445972	91
	3	1,50185552	-1,018268	0,40560733	0,95051971	5
	4	-0,8520651	-0,4760954	0,3685302	0,34649442	18
2012	Cluster	Average Ax 1	Average Ax 2	Sd Ax 1	Sd Ax 2	n
	1	-0,2888035	0,07956118	0,30785852	0,32511005	130
	2	0,54935493	0,1970945	0,30184332	0,2920297	44
	3	0,76398626	-0,7262667	0,45352828	0,4844289	22
	4	-1,7174326	-1,5186223	0,40373301	0,0648922	2
2016	Cluster	Average Ax 1	Average Ax 2	Sd Ax 1	Sd Ax 2	n
	1	-0,1464898	0,06828224	0,36114775	0,3226437	168
	2	0,91574572	0,03962928	0,35293551	0,39454492	22
	3	1,41206753	-1,5479069	0,84242126	0,59277681	6
	4	-2,0042592	-1,5279097	0,00066634	0,18373098	2

Source: our elaboration

Fig. 7: Graphic representation and trajectory of the baryvcenters



Source: our elaboration

Research limits. *The limits of our research are related to the fact that having used a factor analysis (PTA) it is not possible to visualize which variable constitutes the change in the number and trajectory of the clusters. In other words, we can analyze the shifts on the 2 new factors that synthesize the 7 original variables, but we cannot specifically say which is the variable that generates the change. Future research may use an ANOVA test to address this issue.*

Practical implications. *Beyond the conceptual relevance, there is also a practical relevance. In Italy there are approximately 522 accredited private providers and they hold 30.2% of the hospital offer of total beds (PL) (Lega et al., 2018) divided according to the type of hospitalization: (i) in PL for acute 22.8%, (ii) PL for long-term care 53.0%, (iii) PL for rehabilitation activities 74.0%. These companies operate in support of the NHS and are subjected to a multiplicity of pressures both from a financial and regulatory profile, with significant management repercussions (Cuccurullo et al., 2017). The results of our study allow us to understand the profiles of intra-sectoral dissimilarities, with useful implications for policy makers and management. Furthermore, the results can also be useful for providing indications to analysts and evaluators, called upon to play a professional role in company concentration processes.*

Originality of the study. *The originality of this contribution is both in the setting (ie private hospitals) and methodological. In fact, an academic interest in private hospitalization has only recently emerged (Lega et al., 2018; Carbone, 2013; Cuccurullo, et al., 2017) regarding the characteristics and peculiarities of these companies in terms of expenditure, size and levels sectoral concentration (Cuccurullo, et al., 2017); no study, however, to date, has dealt with analyzing the economic trend, the financial and structural growth profiles that distinguish the sector, nor the presence of well-defined corporate configurations, nor their evolution over time. The present study aims to map these private hospital configurations, through PTA combined with clustering techniques. In addition of being of very practical importance, PTA is a robust technique that can be used to integrate multiple data tables collected on the same set of observations and when there are numerous observations as in our case.*

Key words: *Private hospital, PTA, financial profile, economic performance*

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How do employees support a new technology initiative?

The role of anthropomorphism and legitimacy 4.0

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Objectives. *Technological progress has emerged as the most powerful driver in shaping the future of our society. Effectively, technology has both re-defined and permeated the economic, social, and environmental fields (Pham, Huynh, & Nasir, 2020). The conjunction of different technological assets - such as Internet of Things (IoT), Cyber Physical System (CPS), Big Data Analytics (BDA)- has triggered a new industrial paradigm known as Industry 4.0 (I4.0). The major purpose of I4.0 is to integrate physical objects, human actor, and intelligent machines to constitute an integrated production system. Reflecting the several constituent parts of the I4.0, the debate on the new digitalization has covered different categories of interest. Chiefly, becoming 'I4.0 compliant' requires companies to embrace some changes in their organization (Tirabeni, Bernardi, Forliano & Franco, 2019). Specifically, technologies promote interactions and facilitate the integration of information from different resources. This interconnection between customers, employees and suppliers increases flexibility and empowers customized production (Muller, Kiel & Voigt, 2018). Since Industry 4.0 encourages 'networked production', the fitting business models will mainly be dynamic and open (Prause, 2015). Consequently, I4.0 is driving companies to change their attitude from product to service, using a network oriented and user driven approach (Ibarra, Ganzarain, & Igartua, 2017). Moreover, the substantial shift from mass production to mass customization would guarantee benefits in terms of environmental sustainability, resulting from emission reductions and a positive contribution to the development of the circular economy (Ford & Despeisse, 2016; Kamble, Gunasekaran, & Gawankar 2018; Stahel, 2016). Experts also mention economic sustainability: I4.0 supposedly creates new jobs, more efficient production systems and the emergence of new job profiles (Ghobakhloo, 2020). Though the debate on the benefits of Industry 4.0 is articulate and convincing, the actual implementation of this new paradigm remains obscure. Indeed, it seems that new digitalization is mainly focused on large companies (Mittal, Khan, Romero & Wuest, 2018). Nonetheless, most of the European socio-economic sector consists of small and medium-sized enterprises (SMEs). The challenge themes faced by SMEs in adopting I4.0 concern limited financial resources, knowledge resource limitations and technology awareness limitation (Masood & Sonntag, 2020). Notwithstanding, other economies have invested a considerable financial resource to this new technological paradigm, increasing markets competitiveness. Technological progress is unavoidable and will continue to foster social changes. Consequently, public institutions should support companies' growth by filling financial gaps; alongside, organizations should overcome their technology limitations by supporting employee's knowledge and education. Indeed, employees' role in the new industrial paradigm needs to be clarified. Specifically, researchers have focused on two main aspects: which are the processes of employees' new technology acceptance and how it changes the future of work. According to some contributions, problems of acceptance may derive from employees' general skepticism towards the virtualization of work (Murawski & Bick, 2017). Moreover, scholars mentioned that I4.0 may increase employees' alienation (Hirsch-Kreinsen, 2016). Employees may also feel threatened by technologies. The possibility of experiencing situations of work alienation has led some academics to consider the future of work. The main concerns relate to the loss of creativity and the lack of relationality. Indeed, employees are expected to interact with machines and computers, losing the human dimension of work (Rainnie & Dean, 2020). These approaches highlight the many critical issues connected with I4.0. However, it would be misleading to presume a standstill in digitization. Thus, the aim that scholars should pursue is finding concrete solutions to navigate through the digital perimeter, bridging the human-technology relationship. Accordingly, we take an interpretivist perspective to understand how employees perceive a new technological initiative and to verify how employees implement technological initiative. The positive perception of a new technology strategy may ensure employees' technology acceptance (Schneider & Sting, 2020).*

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Conceptual Framework. Drawing on the previous assumptions, we use the concept of anthropomorphism to answer how employees perceive a new technological initiative. Anthropomorphism is the attribution of human or behavioral qualities to non-human objects, processes, and events (Ashforth, Schinoff, & Brickson 2020; Epley, Waytz, & Cacioppo, 2007). Individuals anthropomorphize instinctively and naturally; this process has important implications in terms of organization identity (Ashforth et al., 2020; Miesler, Landwehr, Herrmann, & McGill, 2010). People naturally tend to anthropomorphize to describe their environment. This tendency has a strong impact on human behavior. The anthropomorphic form has been used to sell products and further to design industrial and service robots (Zlotowski, Proudfoot, Yogeewaran, & Bartneck, 2015). Some studies have tried to explain why humans tend to anthropomorphize. According to Epley et al., (2007), some psychological factors favor this process: the need to create mental models. Humans want to understand how the actions of non-human agents work, consequently, they tend to associate human features with inanimate objects. The aim would be to understand non-human operating model. Furthermore, an individual's social isolation can be compensated by treating inanimate objects as human beings. Therefore, agent knowledge, effectance motivation and sociality motivation are all psychological aspect that might influence anthropomorphism process (Epley et al., 2007).

The debate on anthropomorphism might generate some insights. People naturally tend to give human-like appearances to inanimate objects, such as their car, however, they know perfectly well that the car is not a human being. Is it possible to use the term 'anthropomorphism' in such circumstances? In this research we hypothesize that anthropomorphizing an entity formed by people is different to anthropomorphizing a car. According to Ashforth et al., (2020), if employees associate human features and characteristics to their company - as a multiplicity of human expressions and different cultures - the same employees will develop organizational identity as an effect of personifying. Thus, when individuals anthropomorphize the company in which they work, they identify themselves socially and personally. For this reason, employees will naturally tend to support processes and new initiatives, including technological ones. Substantially, we are not simply discussing anthropomorphizing a robot or a new technology, but anthropomorphizing the company, which guarantees employee support for the organization.

Individuals might associate human appearances with company departments following top-down and bottom-up logic. Top-down logics regard the statement from organizational subjects to present a more positive image of the company. Bottom-up ones, instead, entail members' interpretation of the stimuli they experience during their work-routine. Employees' sensemaking might depend on a multiplicity of motivations, such as social connection and anthropocentric motives. These two patterns generate anthropomorphism processes. Top-down and bottom-up processes involve top management and employees fostering organization identification and personification. According to Ashforth et al., (2020): "Anthropomorphism is necessary for members to experience a meaningful employment relationship because the transformation from "what" to "who" renders the organization interpersonally relatable. (p. 42)." We assume that corporate social responsibility (CSR) might explain the top-down process of organizational anthropomorphism (Martin, 2021). CSR is an important channel through which managers communicate a shared meaning to employees and stakeholders by focusing on social wellbeing and making the enterprise more humane (Boğan & Dedeoğlu, 2020). We selected CSR since it encompasses a set of practices and behaviors that the company wants to implement in order to make an ethical, environmental and social contribution. Moreover, CSR could have a strong impact on the study of new technological initiatives. Our measure of bottom-up process of organizational anthropomorphism are the employee opinions concerning the perceived external prestige (PEP) (Dutton & Dukerich, 1994). Employee's perceived external prestige could impact on individual identity enhancing their sense of importance and value. Having a good perception of external prestige because of CSR leads employees to behave more effectively in favor of the organization. According to some studies, employees' perceptions of external prestige are one of the main aspects in shaping their attitudes (Meynhardt, Brieger, & Hermann, 2020). First, we assume that CSR can positively influence PEP. Furthermore, we assume that CSR and PEP potentially generate employee legitimacy to the organization and to new strategic initiatives (Singh, Tucker, & House, 1986). According to Suchman (1995) legitimacy is a generalized perception that the actions of an entity are desirable and appropriate within a system of norms and values. Legitimacy could be seen as a key reason to engage in social responsibility behavior in order to have a higher corporate reputation or legitimacy (Moir, 2001). Since the focus is on industry 4.0, we will validate the legitimacy 4.0 scale. Indeed, CSR practices and external prestige foster anthropomorphism guaranteeing employees' support towards the organization. This recognition translates into legitimacy which in our context of analysis will be a legitimacy to 4.0.

Our variables conceptualize the process of anthropomorphism allowing employees to feel part of a human organization where they can find fulfillment. Legitimacy 4.0 would qualify as an antecedent of the Technology Acceptance Model (TAM) (Venkatesh, Speier, & Morris, 2002). The TAM model sheds light on the concept of employee technology acceptance and technology implementation. Our theoretical framework considers legitimacy 4.0 as the main variable that positively influence the intention to use a new technology.

Hence, we highlight our propositions:

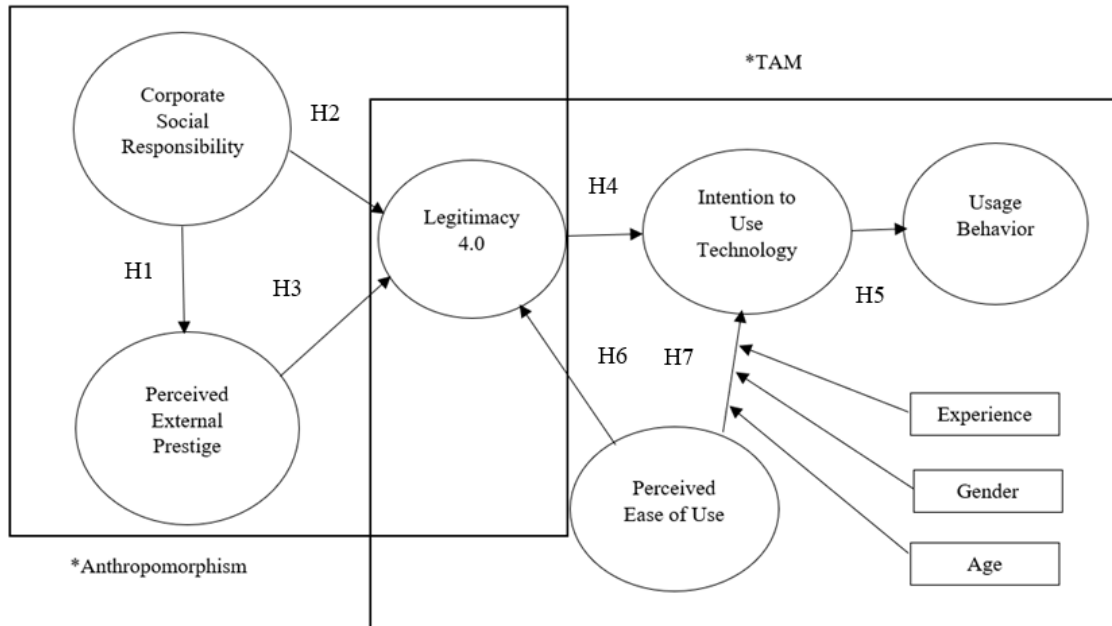
- H1: Corporate social responsibility has a positive impact on employees' Perceived external Prestige.
- H2: Corporate social responsibility positively influences Legitimacy.
- H3: Perceived external Prestige positively influences Legitimacy.
- H4: Legitimacy has a positive impact on employees' Intention to Use Technology.
- H5: Intention to Use technology exerts a positive influence on Usage Behavior.

Moreover, we assume *Perceived Ease of Use* as mediator. Thus:

H6: *Perceived Ease of Use* positively impacts on *Legitimacy*.

H7: *Perceived Ease of Use* positively impacts on *Intention to Use Technology*.

We propose *Experience*, *gender* and *age* as moderator.



Methodology. The aim of this research is to demonstrate the importance of increase employees' support to new technology initiative in order to justify their technology usage and acceptance. To achieve these proposals, we will use the concept of anthropomorphism and TAM model. Anthropomorphism allows employees to identify themselves with organization, legitimizing their company and supporting a new initiative. Tam model instead, will explore the dynamics of technology usage. The quantitative method used to test the research hypotheses included the development of a survey questionnaire to measure the perceptions and behaviors of the employees. Indeed, participants may include employees of large and medium size companies operating on national and European perimeter who are facing situations of technological change. In our conceptual framework there are three independent variables. Two constructs are able to explain anthropomorphism process: CSR and PEP. The other independent variable is *Perceived Ease of Use*. The instrument to measure CSR will be taken from Turker (2008). The scale contains 17 items and analyzes aspect such as CSR and stakeholders, CSR and employees. We will measure the second independent variable - PEP- using Mael and Ashforth scale (1992). Finally, we will test the role of *Perceived Ease of Use* using Venkatesh (2000) scale, composed by 4 items. Moreover, our model presents 3 dependent variables and 3 moderators. Legitimacy is our first dependent variable. Scholars have analyzed this construct identifying three type of legitimacy: Pragmatic, moral and cognitive legitimacy (Alexiou & Wiggins, 2019). Dart (2004) describes pragmatic legitimacy as the judgement of stakeholders in receiving something of value from the organization. Cognitive legitimacy, instead, emerges when employees classify organization's activity. We decided to use moral legitimacy because is an active evaluation of the level to which a company embraces social norms and shared values to promote well-being and public value. This conceptualization of legitimacy is coherent with the independent variables. Thus, we will use Alexiou and Wiggings (2019) moral legitimacy scale, composed by 9 items, however, we will adapt the items to Industry 4.0 by validating the legitimacy 4.0 scale. To measure *Intention to use Technology* we will use 2 items deriving from Gangwar, Date and Ramaswamy (2014) scale. The last dependent variable - *Usage Behavior*- will be measured using Venkatesh (2000) scale, formed by two items. Experience, Gender and Age, will be coded according to the measurement point.

To test the validity of the hypotheses outlined we will proceed to the construction of a structural equations model. SEM - Structural equation modeling- is a multivariate statistical analysis that allows us to model the causal relationships between latent variables, from a set of observed variables (items) (Byrne, 2016). SEM methodology also allows to perform an exploratory factorial analysis (EFA) and a confirmatory factorial analysis (CFA), both necessary to validate Legitimacy 4.0 scale and confirmed our assumptions. In this sense we will use AMOS statistical software. In order to investigate the multiple mediation relationships of our models, we will use the procedure proposed by Hayes (2013), SPSS PROCESS. Through the bootstrap method we will analyze the confidence intervals and the indirect effects promoted by the variables of our models.

Results and implications. Technological progress is unavoidable and will continue to foster social changes. Consequently, the challenge is to find a new ethicality in human-technology interactions. Public institutions have invested a considerable financial resource to Industry 4.0 paradigm, increasing markets competitiveness and suggesting companies to change their organizations. Adopting this new technological approach means re-thinking work

activity. Managers should operate following two perspective: receiving employees' support for a new technology initiative and leading the employee to implement and accept the technology. Indeed, employees should first support and understand a new challenge and then actually implement it. To solve the first aspect entrepreneurs should facilitate anthropomorphism process. Anthropomorphizing means giving human characteristics to companies or new technological initiatives allowing employees to feel part of a community and find his or her own social identity. This research might offer important contributions to anthropomorphism in terms of the employee-firm relationship. Through anthropomorphism the employee is able to give meaning to his or her work regardless of the potential change in working methods or the inclusion of new technologies. Anthropomorphism could humanize the enterprise by creating psychological contracts. According to some contributions we decide to conceptualize anthropomorphism process by using top-down and bottom-up processes. We have selected CSR and PEP as the main variables capable of explain these processes. Following this perspective, we suggest leaders to design and implement a strategy based on their understanding of the organization as human by choosing other variables in which invest. Employee's organization anthropomorphism could also enhance the external image of the organization. In word-of-mouth processes, an anthropomorphized employee will describe the organization as a human place, increasing the reputation of the company itself. In addition, as a result of increased social isolation due to emergency and post-emergency situations, employees increasingly need to identify themselves and feel part of an entity. Essentially, they might be more inclined to anthropomorphize. Referring to our specific topic, managers should invest resources to CSR, i.e., communicating to internal and external stakeholders that the company is human and sustainable. Subsequently the newly achieved sustainability will increase employees' perceived prestige and legitimacy towards the organization. Some research on Industry 4.0 has analyzed possible future scenarios of work permeated by machines and technology. Through this research we try to argue that such a debate does not offer important contributions to social and economic development. Technology and social progress, which cannot be stopped, require more concrete solutions. What we want to highlight is that through anthropomorphism employees do not enquire about the future of their work, because they identify with the organization by supporting it. Consequently, the whole debate about the future of work becomes meaningless and useless. Hence, it is necessary to let the employee perceive that his organization is human, kind, environmentally aware and people centered. Following this perspective, employees will be satisfied and will support potential organization's changes. This transition is crucial to ensure the successful acceptance and implementation of technology. In particular, the research we are proposing pursues the further objective of extending the tam model by identifying some variables that precede and influence the acceptance and use of new technological systems. Effectively, CSR, PEP, and legitimacy 4.0 translate into technology acceptance. Anthropomorphism is therefore a necessary condition for TAM unwinding. Moreover, anthropomorphizing leads employees to feel part of a wholeness eliminating the criticality of work alienation.

Limitations and Contributions. The study is a subject to several limitations. The first one that should be underlined is that the research try to conceptualize anthropomorphism by using CSR and PEP. However, scholars might define anthropomorphism differently by identifying other variables. Therefore, research on this topic is needed to further develop. The proposed conceptual model will be validated through a sample of Italian and European employees. This aspect could represent a further limitation. Indeed, the technological process is especially driven by non-European countries. Future research could test the model in a different context of analysis. The technological process is relentless, and it is important to understand how to manage it. Managers should find in anthropomorphism and in organizational identity an answer to promote employee acceptance of a new strategic initiative: identification means acceptance. Consequently, we have extended the Tam model by proposing anthropomorphism as an antecedent of intention to use technology and usage behavior. Another important contribution concerns the conceptualization of the legitimacy 4.0 variable. In fact, this research seeks to broaden the concept of legitimacy by exploring a new context of study: industry 4.0. The conceptual model and the proposed topics are new in the literature as they try to combine two different fields of study, i.e., business ethics and industry 4.0. Research on these topics needs to be expanded.

Key words: Anthropomorphism; Industry 4.0; CSR; PEP; Legitimacy 4.0; TAM model

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Are you talking to me? Exploring customer's use of artificially intelligent virtual assistants

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Objectives. *Conversational artificial intelligence ensures that the experience offered by the chatbot is almost human (Ma and Sun, 2020). The humanization of these tools is a fundamental step for strategic innovation (Go and Sundar, 2019; Castillo et al., 2020) and it is the reason why each chatbot is assigned a name, such as to make it a neutral subject rather than simply identifying it as the product of a machine. In this perspective, the virtual assistant is a chatbot equipped with artificial intelligence capable of answering even unforeseen questions. The present work addresses factors relating to the conversation between humans and a specific type of consumer targeted artificially intelligent machine, the virtual assistant (García-Serrano et al., 2004; Saad et al. 2016; Santos et al. 2016). In particular, the article is based on the research question 'which different factors of human-virtual assistant communication influence the use of artificially intelligent virtual assistants'. Therefore, our study examines different psychological factors that influence the customer's interactions with artificially intelligent virtual assistants. In order to do so, the study empirically examines the applicability of the Interpersonal Communication Competence perspective to human-artificially intelligent virtual assistant interaction context. This approach builds on Skjuve and Brandzaeg's (2018) recent proposal that a modified Interpersonal Communication Competence framework may be appropriate to examine human-machine conversations in the human-artificially intelligent agent context, recognizing that the virtual assistants of today also entail artificial intelligence and natural language interactions, with virtual assistants also being "capable of communicating with the user the same way humans communicate with each other-through natural language" (Skjuve and Brandzaeg, 2018, p.113). Originally examining how person-person interpersonal relationships in a communication context are managed (Rubin and Martin, 1994), Interpersonal Communication Competence focuses on the relationship between the fit of the behaviour with situational rules (i.e. appropriateness), behaviour sensitivity, effectiveness and the skills required to achieve a goal in a prosocial manner (Spitzberg, 1983; Spitzberg and Cupach, 1984).*

Methodology. *With the intention of examining the above mentioned research question, a cross-sectional study approach was undertaken. This was executed by means of an online questionnaire. For the study, an exploratory factor analysis was conducted to identify the latent variables. A principal axis factor analysis was executed on the 31 items with oblique rotation (direct oblimin). The Kaiser-Meyer-Olkin measure verified the sampling adequacy for the analysis, KMO=.829, in the "meritorious" area (Kaiser and Rice, 1974) and Bartlett's test of sphericity was significant with a critical value of .000. Principal axis factoring was used due to the fact that principal axis factor analysis is more commonly reported in social and behavioral science research reports than principal component analysis (Warner, 2012). First, an initial analysis was run to obtain eigenvalues for each factor in the data.*

In light of this, the questionnaire was developed based on the extant Interpersonal Communication Competence measures for evaluating interpersonal communication competencies perceived by the user in the interaction with the virtual assistant (Skjuve, Brandzaeg 2018). The Interpersonal Communication Competence scale comprised 32 factors specifically, which investigate the relation between the users and their virtual assistants, measuring the following different communication and interaction areas and features (Rubin and Martin, 1994): self-disclosure, empathy, social relaxation, assertiveness, interaction management, altercentrism, expressiveness, supportiveness, immediacy, environmental control. The first is self-disclosure, that means to reveal personality elements through communication, to share personal thoughts/experiences. The second one is empathy, one party's ability to demonstrate that they understand and/or feel with the other party if and when appropriate. Then we have the social relaxation, that means to feel comfortable and secure during an interaction, and not to be anxious. In other words, social relaxation leads to experience an appropriate level of stress when addressing another party's criticism or negative reactions. Furthermore, we face assertiveness, one party's ability to stand up for themselves and their own rights, and simultaneously respecting the other's rights. Also we consider interaction management, to handle the communication rituals associated with everyday conversation. Ability to take turns, and discuss and develop different conversational topics. Then we evaluate

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altercentrism, to demonstrate other-orientation and involvement in the interaction. For one party to make the other party feel that they are interested in what the other party has to say, adapt, appropriately ask questions and add content, express appropriate manners and emotional expressions. The expressiveness means to express feelings through verbal and non-verbal behaviours. Then we have supportiveness, one party's ability to confirm the other party, establish a sense of equality. In other words this leads not to judge the other party. Moreover we have immediacy, that is to say being approachable, available and open for communication. This leads to focus attention on the other party and directly answer questions. Finally we consider environmental control, that means to demonstrate ability to accomplish goals and objectives. This leads to cooperatively problem-solving and aim for win-win solutions.

In order to measure these factors, a five-point Likert scale was used anchoring at 1 = completely false; 5 = completely true.

In addition to the specific measures discussed below, some qualifying questions were used to determine whether respondents owned a virtual assistant and to determine at what frequency they used it. Further, general demographic questions (such as gender, age, and education level) were added in order to better analyse the sample. Respondents were adults (>18 years old) who self-reported owning a virtual assistant. Finally, also a set of control questions were included in order to aid in robust data analysis. Moreover, a pilot test was conducted to test the questionnaire in order to verify that the questionnaire comprehensively addressed the research question (Grimm, 2010).

Findings. Over a three-week period 323 questionnaires were collected. Following an initial data analysis, 136 responses were deemed complete and passed the control questions, these were retained for the subsequent statistical analysis.

The initial eigenvalues (tab.1) indicated that the first four factors explained 26,0%, 12,1%, 5,9% and 5,0 of the variance respectively. The further four factors had eigenvalues just over 1.0, and each explained more than 3% of the variance. Additionally, the scree plot was ambiguous and showed inflexions that would justify retaining both two or eight factors. In a case like this it is important to balance parsimony with sufficient representation of correlations (Hayton et al., 2004). Eight factors were retained due to the sample size (n=136) and the convergence of the scree plot and Kaiser's Criterion on this value. Furthermore, the eight factor solution, which explained 65,6% of the variance, was preferred to respect the complexity of the subject studied and thereby to ensure adequate representation of underlying correlations (Hayton et al., 2004).

Tab. 1: Total variance explained

Total Variance Explained							
Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings ^a
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	8,330	26,032	26,032	7,922	24,757	24,757	5,544
2	3,883	12,135	38,167	3,461	10,817	35,574	3,965
3	1,891	5,911	44,078	1,499	4,686	40,260	2,543
4	1,612	5,037	49,115	1,169	3,655	43,914	4,315
5	1,479	4,622	53,737	1,075	3,360	47,274	1,997
6	1,400	4,376	58,113	,969	3,030	50,304	3,305
7	1,371	4,285	62,399	,922	2,881	53,185	1,628
8	1,043	3,260	65,659	,559	1,747	54,932	2,511
9	,922	2,880	68,539				
10	,873	2,727	71,266				
11	,818	2,557	73,823				
12	,777	2,428	76,252				
13	,723	2,260	78,512				
14	,682	2,131	80,643				
15	,636	1,987	82,630				
16	,551	1,722	84,352				
17	,513	1,602	85,954				
18	,499	1,560	87,515				
19	,445	1,391	88,906				
20	,426	1,332	90,237				
21	,415	1,296	91,533				
22	,356	1,111	92,645				
23	,334	1,044	93,689				
24	,317	,992	94,680				
25	,294	,919	95,599				
26	,254	,793	96,392				
27	,229	,715	97,106				
28	,217	,678	97,784				
29	,211	,659	98,443				
30	,199	,621	99,064				
31	,164	,514	99,578				
32	,135	,422	100,000				

Extraction Method: Principal Axis Factoring.

In light of this, the latent variables recognized where identified as follows: latent variable 1 is Anthropomorphism (humanization of the virtual assistant); latent variable 2 is ease and clarity of communication; latent variable 3 is empathy; latent variable 4 is relax; latent variable 5 is assertiveness; latent variable 6 is supportiveness, latent variable 7 is altercentrism, latent variable 8 is egocentric bias. In light of the mentioned results, findings only in some part

support the use of the *Interpersonal Communication Competence model* for the human-virtual assistant interaction context.

Research limits. These findings are based on an exploratory research approach. The authors recognize that this current work has many limitations, and are hopeful that many of these may be addressed by further research. First, there are several limitations associated with generalizability. The study was conducted as a cross-sectional, single country study. This means that the frequency of use is reflected only at a point in time, additional research would need to be undertaken to confirm longitudinal assumptions. For example, to study if frequency of use varies over time, and what other factors- such as contrasting novelty and familiarity (Poppenk et al., 2010) may influence the frequency of use. Additionally, the potential impact of addressing personality differences, such as a sense of personal uniqueness (Longoni et al., 2019) on artificial intelligence adoption is not considered in this work. Finally, this work only addresses consumers using the virtual assistant for primary personal use, additional work would be required to ascertain findings related to business use, such as achieving business productivity goals.

Practical implications. Over the past 10 years, virtual assistant have emerged as promising applications capable of delivering artificial intelligence services. The category of virtual assistants includes software agents capable of performing actions or delivering services for an individual based on commands received in a voice manner. These systems, used more and more in corporate Customer Care, as the first level of assistance with the customer, are characterized by their ability to understand the tone of the dialogue and memorize the information collected.

Large global ICT companies (information technology and and communication) are starting to compete fiercely in this new market (Letheren et al., 2020). Products include Siri, Cortana, Alexa, and Google Home, all voice-enabled devices to answer user questions, make a phone call, send a text message, and search for specific information users want to obtain (Saad et al. 2016). When great expectations are placed in these tools and without a coherent implication, there is a risk of alienating customers and creating damage, or rather a new type of disservice (Bock et al., 2020), far beyond mere occasional disappointment. If clients perceive the emotional manifestations of these tools as not authentic they are less likely to experience large-scale adhesion (Bock et al., 2020). Luo et al. (2019) showed that, although these agents can be more effective than experienced salespeople and support operators, if it is communicated to the customer that he is conversing with a chatbot, the abandonment rates increase in the order of 75%. In other words, in addition to improving algorithms and humanizing these tools, it will be essential for companies to provide virtual assistants capable of breaking down the barrier between man and machine (Hoyer et al., 2020).

Voice is rapidly becoming consumers' preferred method to communicate with their virtual assistants (Jones, 2018; Chérif and Lemoine, 2019), yet only about 30% of the companies offering this kind of product are deemed to demonstrate maturity in their conversational interfaces (Capgemini, 2019). The organizations that currently outperform others, with regards to conversational interface maturity, demonstrate leadership from two different perspectives: having a customer centric approach (e.g. developing desired functionality and providing personalization) and appropriate organizational capabilities (e.g. strategies, processes and employee knowledge).

The work more comprehensively contributes toward responding to calls for implications of artificial intelligence to be examined from a marketing perspective (Dawar and Bendle, 2018; Davenport, et al., 2020; Eriksson et al., 2020; Feng et al., 2020; Paschen et al., 2020; Mustak et al., 2020; De Bruyn, A. et al., 2020), as well as studied cross-functionally, incorporating psychology and social science (De Graaf and Allouch, 2013; Rahwan et al., 2019).

Originality of the study. Today customer's broad access to a wide range of virtual assistant options is making insights into virtual assistant adoption essential for both scholars and practicing marketers (Skjuve, et al., 2021). More research is required for the marketer to understand the human-virtual assistant interaction context (Nordheim et al., 2019). The customers experiences regarding the artificial intelligence become more useful if the exchange takes place in the most natural way possible (Mende et al., 2019), which is why the trajectory traced needs continuous improvement with the aim of equipping the tools enabled by AI with anthropomorphic functions. In fact, many do not trust the decisions, recommendations and advice deriving from logical algorithms without a real personality (Rubin and Martin, 1994).The current work supports Davenport et al.'s (2020) call for further research into both factors influencing customer propensity to engage with artificial intelligence, and further inquiry into usage considerations. This includes both how artificial intelligence communicates with customers, as well as vice versa.

The research question guiding this work is which different factors of human-virtual assistant communication influence the use of artificially intelligent virtual assistants. To address this, the current study empirically examines the predictable and explanatory powers of *Interpersonal Communication Competence* in the human-virtual assistant interaction context. Skjuve and Brandzaeg (2018) proposed that an *Interpersonal Communication Competence* framework could be empirically validated for a natural language, human to artificially intelligent agent context, namely for human-chatbot interactions. Findings only in some part support the use of the *Interpersonal Communication Competence model* for the human-virtual assistant interaction context. The study aims to incrementally contribute toward moving the needle for effectively understanding and addressing this rapidly expanding market.

Based on the results of the exploratory factor analysis, a final model will be proposed in a future research, which will show the influence of the anthropomorphism (humanization of the virtual assistant), ease and clarity of communication, assertiveness and egocentrism, factors as determinants for consumer frequency of use of their VA.

Key words: artificially intelligent virtual assistant; human-virtual assistant interaction; exploratory factor analysis, *Interpersonal Communication Competency model*

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Towards the platformization of education: an explorative analysis

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Objectives. Education is globally undergoing critical changes, due to the fast technological development further accelerated by the current Covid-19 pandemic. To face the challenge coming from these disruptive phenomena, society is going towards the so-called platformization or “the socio-technical process of transforming a large-scale IS towards a platform architecture” (Törner and Henningson, 2020, p.3). This concept refers to the opening of architectural and governance control points, which makes platforms extensible and able to be used in different domains (Constantinides 2018; de Reuver et al., 2018; Plantin et al. 2018).

The notion of “platform” is not new; thus, it was used in the tech industry in the early 2000s as synonymous with “computer architecture”, lately used also in other domains to term those “digital intermediaries” that merge individuals, information, goods and services (Evans et al. 2006; Casilli and Posada, 2019). In recent times, platforms have been approached as an emergent organizational and technological paradigm, embraced by companies willing to change their business model enacting platform-based strategies (Fehrer et al., 2018), such as “winner-take-all” (Eisenmann et al., 2006), “direct network effects” (Cennamo and Santalo, 2013), “indirect network effect” (Zhu and Iansiti, 2012), “value creation” (Pagani, 2013; Clarysse et al., 2014), and “quality management” (Kim, 2016). In this sense, the development of the more specific “digital platforms”, considered as one of the most crucial technological and strategic innovations of the XXI century (Kim, 2018), have been approached as a two-sided market, shaped interacting with engaged suppliers and consumers (Ceccagnoli et al., 2013). However, these platforms are evolving from specific two-sided markets to those structures intended to sell goods and services or even to develop application programs (Rysman, 2009; Trabucchi et al., 2020). The exploitation of these platforms abilities and functions has been possible thanks to algorithms, which make them able to “organize ever-greater areas of social, political, and economic life” (Silva and Kenney, 2019, p. 37). Algorithms are executed in specific software and they code acts in the same way the law structures and directs human activities (Lessing, et al., 2004). It follows that both platforms and algorithms are not neutral, but they are designed for framing and driving socio-economic actions, boosting the emergence of the brand new phenomenon of platformization (Silva and Kenney, 2019), which scholars have used for approaching the diffusion of the platform model both at organizational and technical level. This model is also evolved into a dominant infrastructure and an economic model (Plantin et al., 2018; Gustavsson and Ljungberg, 2019) and, therefore, defined as “the penetration of infrastructures, economic processes, and governmental frameworks of platforms in different economic sectors and spheres of life” (Poell, Nieborg and Van Dijck 2019, pp. 5-6). This emergent phenomenon shed lights on the fact that platforms are not just “objects”, but rather the output of socio-technical and political-economic processes, being even more involved into the transformation of socio-economic dynamics (Van Dijck et al., 2019). It has to be noted that one of the effects of platformization is the increasing fusion of data and knowledge both in physical and cyber space, which has also influenced the evolution of Artificial Intelligence (AI) and its applications, which enhanced the rising of 1) hybrid intelligence systems that combine machines and humans, 2) new crowd intelligence systems, managed by machines, humans, and networks; and 3) more complex intelligence systems, merging together humans, societies, physics and cyber systems (Pan, 2016). This has led to shift from a physic space or reality (binary) to a so-called cyber, physics, and human society or CPH (ternary), based on new computing paradigms, including the cross-media computing as well as the augmented reality and intelligence (AUI) (Xiong et al., 2015; Losev et al., 2020). Focusing on education, it is “increasingly infused with digital games, apps, websites, social media, and learning environments” (Decuyper et al., 2021, p.). This has led scholars, practitioners and policy-makers to critically reflect upon how this digital platforms at the core of digitization are reshaping education. In this domain, AUI boosts human decision making, learning or planning processes, merging the human and the machine intelligence for creating new valuable knowledge thanks to the interaction of AI and human intelligence (Rouse and Spohrer, 2018). Being research on platformization in education still in its infancy (de Reuver et al., 2018; Decuyper and Landri, 2021), this study is

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aimed at contributing to bridge this gap analyzing both theoretically and empirically if and how platformization is pervading education as well as the effect that this phenomenon is having in changing the current pedagogical frameworks, and the network of intertwined, networked, and multileveled interactions occurring between different education actors (e.g., institutions, students, families, citizens, digital companies, etc.) to create value for themselves and other (Reed, 1999; Mayfield, 2005). In particular, the analysis has been focused on the recognition of which social, technical, and economic interactions can occur thorough digital platforms and which impact (positive or negative) can have on education.

Methodology. This work has been based on the theoretical framework of Viable System Approach (VSA) (Barile, 2009; Golinelli, 2010), which offers a double perspective to analyze any phenomenon (e.g., a problem or an entity): 1) objectively analyzing the parts and relations at the core of the “structure” of the investigated phenomenon (how it is made) and 2) interpreting its dynamic interactions as an open system settled into a specific context (how it behaves) (Barile et al., 2016). This lead to shift the focus from single parts to the whole and from the internal to the external context, that is the ability to integrate the interpretation of reality from individuals to organizations to networks of organizations (McDougal et al., 2016; Barile et al., 2016). This is possible thanks to two essential concepts at the core of the VSA, consonance (a relational harmony due to a structural compatibility, which facilitate networked interactions among actors) and resonance (related to the possible “alignment” of internal actors or to their reciprocal understanding), which can spread from consonance (Barile et al., 2013). Assuming this perspective, a case study method has been implemented to better understand under which conditions the platformization of education can have positive or disruptive effects on all the participant actors and therefore on the current and future society. This method has been chosen due to the inherently explorative nature of the study, conducted to investigate “a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident” (Yin 2009, p. 260). In fact, this qualitative method is particularly fitting for understanding “how” and “why” some emerging phenomena happen (Swanborn and Kohlbacher 2010), approaching different units of analysis and retrieving data from multiple sources. However, it has to be reported that the implementation of a qualitative methodology represents a first step of a wider analysis, aimed at merging both qualitative and quantitative techniques to explore and better assess the way different actors can enhance or constrain the creation of value interacting through education digital platforms. This work has been focused on a single and extreme case study (Gerring, 2007), set in the Italian education domain and represented by an advanced interactive proprietary platform dedicated to education.

Findings. The case study analysis led to better understand the effect of platformization in education, highlighting the importance that specific mechanisms such as the datafication and commodification of education, boosted by digital platforms, is deeply changing the current pedagogic paradigm, opening it to the new commercial logics. Thus, education is no more and not only a public good, but it is even more based on commercial logics (Van Dijck et al., 2019). This shifts the focus on the concept of “value” that a growing number of actors (e.g., institutions, education managers, teachers, students, families, digital companies, etc.) can contribute to create and share. In fact, each of these actors participate to processes of value creation pushed by different or personal goals. When these are not conflicting, but harmonic or consonant can support value creation in education, adding positive shades to the emergent digital pedagogy (Jackson, 2017). However, the existence of conflictual goals and the inability to find out a shared utility or value can lead to a personalistic and opportunistic use of education digital platforms, which can have a disruptive effect on the overall education domain and its pedagogical paradigm. It follows that the disruptiveness of platformization in education is often due to a number of undressed and conflictual issues, such as data ownership, privacy respect, permission for sharing digital contents (videos, photos, documents, etc.), the sharing of ethical arrangements, the digital divide, inclusion policies and several others (Lachney et al., 2021). This implies that digital platforms disruptiveness can be due to the actors’ that use them misalignment due, for example, to the lack of interest, of families and students’ involvement, technological constrains, cultural barriers, limited technological skills and several others.

Drawing on previous considerations, value creation can occur just when different human and non-human actors are open to conjointly interact; a situation which happens when these actors (especially human ones, such as teachers, school managers, students, families, administrators, etc.) are linked together by social relationship built upon a good structural compatibility or consonance (Barile et al., 2013). On the one hand, when this consonance occurs, platforms – made up of interfaces, protocols, discursive elements, visualized data, and specific renderings of (educational) times and spaces (Decuyper and Landri, 2021) – can act as an enabler (or intermediaries) of a conjoined production of value, “activating interaction and committing actors toward a resonant achievement of their goals” (Barile and Saviano, 2013, p.69). On the other, when this consonance does not occur, interactions can be conflictual and, therefore, can hinder value (co)creation, having a disruptive effect on education outcome and causing problems to each of the actors who participate to education network. The lack of consonance can be often due to the persistence of different values among actors, who are not committed to one or more shared intentions, constrained by opportunistic behaviors as well as by too different material, structural, and institutional realities (Searls, 2010).

Research limits. The qualitative nature of this analysis somewhat limits it, even though it provides meaningful insights about the mechanisms that can make the educational experience mediated by platform valuable or disruptive. In this sense educational research still call for better understanding the performative and social effects of digital platforms on current and future pedagogical paradigm (Decuyper et al., 2021).

Practical implications. This work offers interesting insights for both scholars and practitioners (e.g., digital engineers, school managers, pedagogists, etc.) in terms of how an educational platform could be assembled and which

interactions should be boosted to achieve good and shared educational outcomes. In fact, the today overconnected world is dominated by social media, apps, digital platforms and the related algorithms as well as AI and AUI applications, which play an even more critical role in everyday life (Nichols and LeBlanc, 2020). In fact, digital platforms (merging together several of the aforementioned digital applications) support, register and share different and often complex social, technical and economic dynamics. It follows that digital platforms “at once envision and create different social possibilities” (Decuyper et al., 2021, p. 5), constructing new imaginaries and narratives about what education is and should be (Knox, 2019; Pavlou, 2020), about the identity and the role that each actor can perform, about new expertise and professionalism, and, finally, about new educational needs (He et al. 2020; Puttick, 2020). However, it is worth noting that Covid-19 pandemic has further accelerated the evolution of education towards platformization; thus, the central role of digital platforms is now clear for policy makers, teachers, students and families, which are even more pushed into an even more pervasive online space, in which education – as well as a growing number of social activities and interactions – take place. It follows that especially after the Covid-19 pandemic digital platforms are going to become a vehicle for social practices, which often remain contradictory (Nichols and LeBlanc, 2020). This also implies the emergence of a “normative question of how the evolving ‘edtech’ landscape can be restructured as a system that benefits the common good” (Kerssens and Dijck, 2021, p. 7). In this sense, to maintain education traditional orientation towards the public interests and value, tech and digital companies should be more willing to open their platform to the interoperability principles and to participate to the creation of an education digital ecosystem (Bakhouyi et al., 2017; Manna et al., 2018). However, this aspiration still succumbs to the so-called intra-operability that big tech companies impose for commercial reasons; therefore, as Kerssens and Dijck (2021) maintained “to fully serve the interests of online education as a common good, national and supranational governance levels should be addressed in conjunction” (p.10). This is even more important after the Covid-19 pandemic outbreak, which has led to the spread of new ‘emergency pedagogies’, which should be based both on the existing pedagogical paradigm and on the new digital one, in order to finally overcome the current “emergency online education” (Marinoni et al., 2020).

Originality of the study. The originality of this study lies upon the aim to contribute to a nascent research trend in education, responding to the calling for better understanding the performative and social effects of digital educational platforms (Decuyper et al., 2021). In this sense, the work offers some original insights about the influence that positive or negative (consonant or not) relationships can have on those interactions essential to create an educational outcome valuable for all the involved actors.

Key words: Digital platform, Platformization; Agumented Intelligence (AUI) Education; Covid-19.

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Perceived technological usability in Higher Education Organizations: a pre-test study for a post Covid-19 agenda

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Objectives. Due to the Covid-19 pandemic, the economic and social fabric of the Italian system-country struggled in reshaping its structure (Murgante et al., 2020), both in private and public sectors. Organizations went through several systemic changes in their internal work processes, as well as in their services/products offer/delivery. Whilst businesses and institutions were forced to adopt new work methodologies such as smart (Hu, 2020), remote (Leonardi, 2020) and virtual team (Whillans et al., 2021) working, on the other hand they have had to rethink their business models (Priyono et al., 2020), leveraging technologies to survive the crisis and meet consumer's needs.

A particularly interesting case is that of the Higher Education Organizations (HEOs). Scholars provide an almost thirty-year tradition of studies of HEOs (Parker and Jary, 1995; Simsek, 1997; O'Mahony and Garavan, 2012), referring to academic and "institutionalized social contexts populated by groups of people who collectively share responsibility for knowledge resources on which they are dependent" (Roxå and Mårtensson, 2014, p.304). This definition originates from Elinor Ostrom studies (2005; 2010), that consider social contexts in which HEOs operate: adaptive, complex, dynamic. HEOs can be considered as "among the most complex known" organizations. In fact, over time they have developed "maddening structures, procedures and other cultural attributes" (Kelles, 1995, p.458) according to the existing relationship between the various actors that populate them. Literature trend classifies HEOs particularly for their global reputation and aspiration to climb global academic rankings (Mizrahi-Shtelman and Drori, 2021). That occurs because societies require high quality educational standards.

Worldwide HEOs went through drastic changes over the last decade, "under the conditions of globalization and rapid technological changes that require new skills and training of people" (Živković et al., 2017). Therefore, nowadays the existing relationship between University and students is shifting and requires organizational inputs/outputs adaptation (Dee and Leisyte, 2017).

The student-HEOs connection is addressed by Service Dominant Logic (SDL) theory (Vargo & Lush, 2004; 2008) scholars, which configuring service as value creation vector through resource exchange between different actors (Vargo & Akaka, 2009). In addition, the idea of education as co-created dynamic service (Diaz-Mendez et al., 2019) is jointly promoted by Lush and Wu (2012), which argue that in SDL all actors involved in the service supply and use are "resource integrators" or "service bundlers". As noticed, a student attending a class "is bundling many resources such as other students in the classroom, their notepad, snacks they may be eating, pharmaceuticals they may have taken before or during class, and more". So literature (Edvardsson et al., 2011), understands value as a social construction emerging in social context, place in which customers (students) act influencing the value cocreation process. Value can be differently perceived according to service users, which operate as resource integrators "rather than individual actors" (Botti et al., 2017). In other words, students are not simple passive users, but exploring the service, sharing it among colleagues, releasing feedback on its effectiveness, satisfaction, and usability, contribute to improve it by giving HEOs managers insights to perform it better in future (Cavallone et al., 2019). Through this value co-creation process, students' experience interacts with university faculty and staff to "further create more integrated and superior outcomes than if only one group tried to satisfy the needs of the other alone" (Dollinger et al., 2018, p.212).

This mutual relationship was totally turned upside down by the Covid-19 pandemic, thus forcing HEOs facing the need to adopt new tools for their services delivery. In fact, not being able to provide in-presence courses, all universities, and public high schools have had to gear up online teaching, using new e-learning software to allow students to continue their studies. Several recent studies emphasize the new universities teaching methodologies, as well as the interaction between HEOs and students (Alqahtani et al., 2020; Daniel, 2020; Radha et al., 2020), but only a few investigate whether or not these methodologies are useful to bring out value from these interactions and how this value can be perceived. This gap clashes with new advancements and needs for a service research agenda in a post-

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coronavirus world. Mele, Russo-Spena and Kaartemo (2020, p.195), in this sense, formulate a three-key priorities model to build a bridge between theory and practice on services development for consumers, organizations and societies in the post Covid-19 scenario:

- (1) **Essential service conceptualization on three different level (micro, meso and macro).** Treating the essential services as the service provisions that are necessary, even during a pandemic, means focusing on the beneficiaries.
- (2) **Models and metrics to configure an essential service.** New methods and tools to help decision-makers determine essential services during a crisis.
- (3) **Smart technologies to foster essential service provision.** Specific industries (food, housing, medical care, and education) have been listed as essential. Still, technology is changing how these services are delivered and experienced. Therefore, researchers must focus on how new technologies could impact on the essential service provision. "Service science could be a ground to foster conversation on the social waves of new technologies" (Mele et al., 2020, p.195).

Following the third priority and focusing on the higher education context, this study represents a starting point aimed, on the one hand, at understanding how HEOs have changed their service delivery and interaction with students through new technologies; on the other, it proposes an exploratory study of survey items adaptation on a small test sample, to understand the effectiveness of the available tools in evaluating e-learning as facilitator of value co-creation between HEOs and students.

Methodology. A quantitative exploratory study that measures perceived usability of Microsoft Teams is conducted. It is structured into two validated surveys to reach a twofold aim:

- 1) to evaluate the answers of an Italian student's sample to scales created and validated in a different cultural contexts;
- 2) to understand whether these investigations can explain whether technology acts as a facilitator of the relationship between universities, students, and digital platforms.

To meet this aim, a double strategy adopting the System Usability Scale (SUS), which consists of a Human Computer Interaction (HCI) based approach, and the Technology Acceptance Model (TAM), which is an Information Systems (IS) based approach is used, adapted from Pal and Vanijja (2020) study.

2.1 The System Usability Scale (SUS)

SUS is one of the most popular tools used by HCI researchers to assess the perceived usability (Lewis, 2014; 2018). SUS consists of 10 items and previous literature shows that it has a high degree of reliability (normally the Cronbach's alpha coefficient exceeds 0.90), validity, and can be adapted to different contexts (Peres et al., 2013).

2.2 The technology acceptance model (TAM)

TAM is one of the most popular and widely used model by IS researchers for predicting the future use of a product or technology. However, since the core aim of TAM is to measure the likelihood of usage (and not the effective system usage), for their study Pal and Vanijja (2020) re-word the original TAM version to make it effective in measuring the real user experience, rather than the likelihood of usage. TAM divide usability through two different dimensions:

- (1) the degree to which a person believes that using technology will be easy and free from any efforts - the so called PEOU (Perceived Easy Of Use, Davis, 1989);
- (2) the degree to which a person believes that using technology will improve his/her work performance - the PU (perceived usefulness, Davis, 1989).

Therefore, PU and PEOU are the two core constructs of TAM, that possesses 6 items each (no.12 in total). The survey details for SUS and TAM versions are provided in Table 1.

Tab. 1: Questionnaires Details

Instrument	Item	Questionnaire Details
SUS	SUS01	I think that I would like to use this application frequently
	SUS02	I found the application unnecessarily complex
	SUS03	I thought the application was easy to use
	SUS04	I think that I need the support of a technical person to be able to use this application
	SUS05	I found the various functions in the application were well integrated
	SUS06	I thought there was too much inconsistency in this application
	SUS07	I would imagine that most people would learn to use this application very quickly
	SUS08	I found the application very awkward to use
	SUS09	I felt very confident using the application
	SUS10	I needed to learn a lot of things before I could get going with this application
TAM	TAM01	Using this application in my studies enables me to accomplish tasks more quickly than other applications in its class
	TAM02	Using this application improves my study performance
	TAM03	Using this application in my study increases my productivity
	TAM04	Using this application enhances the effectiveness of my study
	TAM05	Using this application makes it easier to do my studies
	TAM06	I have found this application useful in my study
	TAM07	Learning to use this application was easy for me
	TAM08	I found it easy to get this application to do what I wanted it to do
	TAM09	My interaction with this application was clear and understandable
	TAM10	I found this application to be flexible to interact with
	TAM11	It was easy for me to become skillful at using this application
	TAM12	I found this application easy to use

Source: authors' elaboration

The survey is made of two questionnaires containing respectively 10 items the first, and 12 the second one. All the items are Likert-type statements, the first ones on a five-point scale, while the second on a seven-point scale. Nevertheless, it must be considered that scales created to test a construct in a specific cultural context may not accurately describe individuals experience belonging to another one. Therefore, specific steps are necessary to ensure that the evaluating tool is culturally appropriated (Amaturo, 2012; McGorry, 2000). Translation of SUS and TAM scales from English to Italian led to define a new tool (see Appendix), using one of the translation methods adopted by researchers in the field (McGorry, 2000), according to international translation recommendations and cultural adaptation (Wild et al, 2005):

- 1) the original English tool is first distributed among the research group, which produces a first series of translations merging later into a single version;
- 2) the version is then submitted to three mother tongue scholars for the evaluation;
- 3) the requested changes are made,
- 4) the survey is then evaluated by a methodologist, who inform authors of some issues regarding the adaptations of the statements (e.g. *I think, I find that, I discovered*), and the tenses to use.

Since the COVID-19 scenario forces to shift the focus towards an online education service orientation, perceived usability become an important asset to consider, and it is used in this work as an impactful indicator of value co-creation process, facilitated by technology. The primary condition to assert the effectiveness of value co-creation process in service education should be (at least hypnotized) students' satisfaction after using the online learning platform Microsoft Teams.

Lastly, the translated items are pre-tested to assess their comprehensibility on a small, reasoned choice sample made up of no.35 university students, before submitting the survey to a larger one. Students are requested to give to each item of the first survey a rating from "strongly disagree" (1) to "strongly agree" (5). For the second set of 12 items, instead, the ranking scale is from "extremely disagree" (1) to "extremely agree" (7).

Findings.

Pre-test Participant demographics

Initially, the survey is sent to 50 Italian students from University of Salerno. However, some of the participants either not respond or complete the full survey. To the pre-test data analysis no.35 tests are analyzed. In the pre-test sample, the proportion of male (17) and female (18) students is almost equal. Almost 74,2% of the students' age it is between 19 and 24 age, with an average of 23 years. Around 91% of the participants run Microsoft Teams on their laptops, whereas the remaining less considerable percentage access from their smartphones. The first interesting observable data concerns the quality of the Internet connection: many participants (no.30) replied that their quality connection, on a rating from 1 to 10, is 7 points or more, with an average of 7.8. Therefore, students' response on Microsoft Teams usability is objective and not affected by personal internet connection. A further interesting aspect is that the pre-test sample lives geographically close to the university. In fact, the 54.2 % of students affirm that they usually reach the university in less than half an hour, thus the evaluation concerns the platform utility and technical usability discarding any logistical and physical advantages that this online learning methodology allows to reach. Furthermore, most of them (74.2%) have experience in using other online learning platforms (e.g. Zoom, Google Classroom, Moodle, etc.), to consistently compare university services usability among the various e-learning platforms. This is important to understand that they already have experience on e-learning tools, and they are competent on this issue.

Pre-test data analysis

Responses' average of SUS and TAM scales is reported in tables 3 and 4. SUS scale positively worded items (1, 3, 5, 7 and 9) possess a score average of almost 4, whereas for the negatively ones (2, 4, 6, 8 and 10) the average of the score is 1.3. Concerning the SUS scale, most of the respondents show a good degree of usability of the tool and understanding of the survey. This results also from the SUS scale quality of the statements control question. In fact, all respondents state that items are clear and understandable. Only one respondent expressed concern about the first item ambiguity.

Tab. 3: SUS Pre-test responses

SUS Items	Mean
I think that I would like to use this application frequently	3,171428571
I found the application unnecessarily complex	1,542857143
I thought the application was easy to use	4,257142857
I think that I need the support of a technical person to be able to use this application	1,228571429
I found the various functions in the application were well integrated	3,685714286
I thought there was too much inconsistency in this application	1,4
I would imagine that most people would learn to use this application very quickly	4
I found the application very awkward to use	1,342857143
I felt very confident using the application	3,914285714
I needed to learn a lot of things before I could get going with this application	1,457142857

On the other hand, TAM involves all positively worded items, and the six first items concern the PU dimension, while the last six the PEOU dimension. TAM items average trend shows a flattening effect from a score of 4 to 4.8 on

items TAM03-TAM04-TAM05. This may suggest that a polarization occurs on participants responses, due to the redundancy perceived by the interviewees on those items. The control question seems to convey a coherent picture in line with the previous results. Some respondents, in fact, specify that they find this scale statements suffering ambiguity in the first dimension (e.g. TAM03-04-05), and redundancy in the second (TAM07-TAM08-TAM09)

Tab. 4: TAM Pre-test responses

TAM Items	Mean
Using this application in my studies enables me to accomplish tasks more quickly than other applications in its class	4,857142857
Using this application improves my study performance	4,342857143
Using this application in my study increases my productivity	4,171428571
Using this application enhances the effectiveness of my study	3,914285714
Using this application makes it easier to do my studies	4,085714286
I have found this application useful in my study	4,571428571
Learning to use this application was easy for me	5,942857143
I found it easy to get this application to do what I wanted it to do	5,857142857
My interaction with this application was clear and understandable	5,828571429
I found this application to be flexible to interact with	5,457142857
It was easy for me to become skillful at using this application	5,342857143
I found this application easy to use	5,342857143

Research limits. The main limitation of this work concerns its preliminary nature. Item's translation and their consequent clearness for Italian students represents only a first step in the survey validation for the purpose of future studies. The scale, indeed, needs to be empirically validated through a construct factorial analysis asserting its nomological validity. Nevertheless, if it is true that this study limitations are strongly affected by the small and, therefore, not quantitative relevant sample interviewed, it also true that it can contribute to paves the way for further studies. In a nutshell, this work can be considered as a first step to build a survey to assess e-learning tools usability among Italian students and evaluate if they improve value co-creation in Higher Education Organizations. This process needs to be further empirically investigated through a confirmatory factor analysis (CFA), in accordance with Taherdoost (2016).

Theoretical and practical implications. The research findings can contribute to improving both managerial and scholarly understanding of the direction taken in the education sector during the Covid-19 pandemic. Moreover, in line with Mele, Russo-Spena and Kaartemo research agenda (2020) on technological innovation as a driver of value co-creation between students and HEOs, this study aims at fostering the development of a future framework on SDL applied to HEOs. The dyadic relation that occurs between universities and students, in fact, could be considered as a triad which includes digital platform as third actor of service exchange (Walker et al., 2002).

Originality. Starting from the recognized need to investigate, due to the Covid-19 pandemic, the usability of technologies to "foster essential service provision", this work, by measuring service perceived technological usability, intends to contribute to the SDL research stream focused on HEOs. Therefore, for its specificity, it represents an original attempt to merge technological - driven value cocreation in Higher Education through the lens of the Service Dominant Logic.

Keywords: Service-Dominant Logic; Higher Education Organizations; Covid-19; Universities; value co-creation; Microsoft Teams

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Appendix.

Instrument	Item	Questionnaire Details
SUS	SUS01	Mi piacerebbe usare Teams spesso
	SUS02	Trovo la piattaforma Teams inutilmente complessa
	SUS03	Penso che Teams sia facile da usare
	SUS04	Avrei bisogno di un supporto tecnico per riuscire ad utilizzare Teams
	SUS05	Ritengo che le varie funzioni di Teams siano ben integrate
	SUS06	Trovo che Teams sia inefficace
	SUS07	Immagino che la maggior parte delle persone potrebbe imparare ad utilizzare Teams molto rapidamente
	SUS08	Trovo Teams molto difficile da usare
	SUS09	Mi sento molto capace nell'utilizzo di Teams
	SUS10	Ho dovuto di imparare molte cose prima di riuscire ad usare Teams
TAM	TAM01	L'utilizzo di Teams per i miei studi mi consente di svolgere più rapidamente ciò che devo fare rispetto ad altre piattaforme dello stesso genere
	TAM02	L'utilizzo di Teams mi permette di studiare meglio
	TAM03	L'utilizzo di Teams migliora la produttività del mio studio
	TAM04	L'utilizzo di Teams migliora il rendimento finale del mio studio
	TAM05	Usare Teams facilita il mio metodo di studio
	TAM06	Ho trovato Teams utile per il mio studio
	TAM07	Imparare ad usare Teams è stato facile per me
	TAM08	Ho trovato facile padroneggiare Teams per svolgere le attività di cui necessitavo
	TAM09	Interagire tramite Teams è stato facile e comprensibile
	TAM10	Ho trovato che l'interazione con Teams fosse versatile
	TAM11	È stato facile per me diventare esperto nell'utilizzo di Teams
	TAM12	Ho trovato Teams facile da usare

Entrepreneurial university and entrepreneurship labs: insights from a European experience[♦]

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Abstract

Objectives. Research has traditionally focused on research-driven activities and mechanisms universities rely on to become entrepreneurial leaving out those inspired by problem-driven approaches, such as entrepreneurship labs. In this paper, we remedy this gap by investigating an e-Lab focused on health and well-being involving European universities.

Methodology. We adopt a qualitative and exploratory research approach based on a longitudinal case with both primary and secondary data. Our analysis provides ground for an in-depth reflection at both theoretical and practical levels.

Findings. E-Labs allow universities to create multi-disciplinary classrooms, involve people with heterogeneous educational qualifications and diverse scientific backgrounds, and trigger innovative open-ended processes. In so doing, they complement traditional research laboratories to promote the so-called third mission.

Research limits. Our research is exploratory in nature and additional research is needed to assess e-Labs' impact on the entrepreneurial mindset and regional development.

Practical implications. Our findings support that universities may develop an entrepreneurial strategy by employing different tools. Our findings also highlight the importance of opening the university to other stakeholders, and that the active involvement of companies in e-Labs makes it possible to bring the world of education closer to the industrial one.

Originality of the study. Our study innovates the traditional notion of research-driven laboratories that aim to find commercial application to research output, often through spin-offs with the support of university technology-transfer offices.

Keywords: Entrepreneurial university; Entrepreneurial mindset; Entrepreneurship lab; Problem-driven approach; Research-driven approach

1. Introduction

The role of universities in promoting societal development and economic growth has evolved over time. Since the Second World War, the so-called Humboldt model, which emphasizes freedom and independence of scholarly inquiry and 'knowledge for its own sake' and is only loosely coupled with economic growth, has been progressively replaced by a model in which universities are expected to provide knowledge that produces economic growth and innovation (Audrescht, 2014; Kirby, 2006). Today, universities are perceived as having a dual mandate-to produce new knowledge and facilitate the transfer of technology and knowledge spillover. In other words, universities are required to be 'entrepreneurial', with teaching, research, and technology transfer activities complementing one another for the benefit of regional development (Kulkov et al., 2020). The policy language reflects this view and is filled with optimistic narratives about universities, such as Stanford or MIT, being bridgeheads of innovation in modern societies (Jacob, Lundqvist and Hellsmark, 2003). The implicit assumption seems to be that knowledge produced either by companies or by universities will eventually result in innovation and new ventures, contributing to economic growth and societal development.

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Interestingly, the adjective 'entrepreneurial' is traditionally attached to a person rather than an institution (Ezkowitz, 2013): An entrepreneur is in fact an individual who undertakes a risk-smaller or greater depending on her propensity for risk-taking-to start a new business (Carland, Hoy and Carland, 1988). In contrast, organizations are understood as tools to institutionalize and perpetuate an activity. Therefore, the combination of these words seems to produce an oxymoron. A closer look into the existing literature reveals that entrepreneurship has also been portrayed as an organizational phenomenon: In the early 1950s, Schumpeter (1951) offered the first example of an entrepreneurial research institution in his reconstruction of the birth of the US agricultural research system within the Department of Agriculture. We can conclude that the notion of the heroic individual entrepreneur may be misleading, as it overemphasizes individual traits at the expense of organizational factors. Both are crucial for entrepreneurial development.

When referring to a university, the adjective entrepreneurial evokes an institution that entertains university-business partnerships, places great emphasis on and efforts into securing external sources of funding, and displays a managerialist ethos in institutional governance, leadership, and planning (Subotzky, 1999). Entrepreneurialism thus entails increasing market-like behaviour among both management and faculty. Empirical research on the practice of entrepreneurial universities documents that there is no universal blueprint (Delanty, 2001; Jacob and Hellström, 2000) and that such practice often involves some assisting institutions helping universities to perform the 'third mission'. The majority of empirical research draws on case studies that document different formulas that arise from the interaction among research, teaching, and innovation (Kirby, Guerrero and Urbano, 2011), are shaped by idiosyncratic institutional factors (Gibb, 2012) and rely on different tools, often in conjunction with external partners. The experiences of MIT in Cambridge (O'Shea & Allen, 2005), Chalmers University of Technology in Sweden (Jacob, Lundqvist and Hellsmark, 2003), the University of Twente in the Netherlands (Lazzeretti and Tavoletti, 2005) and many others evidence the variety of ways universities across the globe are be(com)ing more entrepreneurial (Etzkowitz and Zhou, 2008).

Beneath this heterogeneity stands a repertoire of activities and tools, such as research laboratories, university technology-transfer offices, and incubators (Byers et al., 2013). The existing literature has primarily dealt with research generation and dissemination tools, largely overlooking the role of entrepreneurship laboratories (e-Labs) as engines for economic development. Today, an increasing number of universities are enriching their repertoire of technology transfer activities with e-Labs, which complement the traditional research-driven approach, disseminate an entrepreneurial mindset, and nurture a problem-driven approach. However, there is only scant evidence on how they work and the benefits accruing to universities engaging in such activities.

In this paper, we remedy this gap and provide evidence on an e-Lab that involves several European universities under the umbrella of the Health-Net network. Health-Net is a European network that encompasses universities from different countries and mobilizes regional and multi-regional resources to promote local development and entrepreneurial ventures through a broad set of initiatives, including entrepreneurship programmes. In this work, we analyse an experience that involves Italian, Polish, Estonian, and Swedish universities and is specifically devoted to improving health and well-being.

Our work makes multiple contributions. First, we enrich the literature on the variety of entrepreneurial universities by specifically focusing on e-Labs as important tools for delivering innovation and promoting an entrepreneurial mindset that complement the repertoire of mechanisms universities rely upon. Second, we highlight how the Health-Net model mobilizes innovative capabilities by bringing together different backgrounds and territories, thus providing a unique solution that fosters local development by deploying international resources. Our findings provide important managerial implications that offer guidance for the pursuit of the third mission in a university setting.

The remainder of this paper is organized as follows. First, we analyse what an entrepreneurial university may look like and the repertoire of mechanisms universities have to become entrepreneurial. Then, we describe the method for the study, offering details about the research setting and data collection and analysis techniques. Next, we present the findings and discuss the research and managerial implications.

2. Theoretical Background

2.1 Entrepreneurial universities across the globe

The entrepreneurial university refers to an institution that possesses a wide range of innovative infrastructural support mechanisms to foster entrepreneurship within the organization as well as package entrepreneurship as a product. In this latter case, the university engages in courses in entrepreneurship or other initiatives that actively promote entrepreneurship among students and faculty (Jacob, Lundqvist and Hellsmark, 2003). The transition of universities from the traditional to the entrepreneurial model has involved stages and phases that vary a great deal among institutions and countries. Ezkowitz (2013) identifies as many as three phases/stages in the development of an entrepreneurial university.

The initial phase, which he labels University Entrepreneur One (Ezkowitz, 2013), is marked by a progressive reduction in the governmental provision of financial resources that forces academic institutions to define strategic priorities and raise their own resources, often by forming alumni associations to connect with their graduates and establishing fundraising offices, long a staple of US academia (Clark, 1998). During the second phase (University

Entrepreneur Two), universities start commercializing the intellectual property arising from the activities of faculty, staff, and students by establishing their own technology-transfer capabilities. This phase has marked a bifurcation between universities with significant intellectual property potential and universities with fewer resources to commercialize (Ezkowitz, 2013). The former, such as Stanford (with the Stanford Project on Emerging Companies, see Baron and Hannan, 2002) or MIT (O’Shea et al., 2007) in the US and Oxford or the Imperial College in the UK, received an immediate boost in income from placing their own staff in more direct relationship with the faculty (Gibb, Haskins and Robertson, 2013). However, universities with modest resources, such as Arizona State or the University of Utah, made tech transfer and firm formation priorities on par with education and research and achieved higher rates of valorisation than many of their resource-rich counterparts (Ezkowitz, 2013). The third phase (*University Entrepreneur Three*) sees universities playing a proactive role in promoting a regional innovation environment, often in collaboration with industry or government actors.

Not all universities have followed the same path. For instance, MIT pioneered most of the current formats for academic-industry relations, introducing consulting, patenting, and firm formation into a knowledge-based regional development strategy (O’Shea et al., 2007). Stanford applied this model to the liberal arts research system through its engineering school, which had close personal and academic ties to MIT in the early 20th century. Stanford also had a strong incentive to take steps to create a new industry around the university to establish an employment base that would make its engineering school viable. At the time Stanford was founded, in the late 19th century, the surrounding area was an agricultural region, decades away from the complex of technology firms known as Silicon Valley, which eventually grew out of this academic development strategy (Lenoir et al., 2007).

European universities have followed a different path, establishing training programmes in entrepreneurship designed to create firms as well as to educate students in the new discipline. Although US universities increasingly offer entrepreneurship training programmes in their business schools and ‘greenhouses’ to encourage student entrepreneurs, there is a greater focus in Europe on students rather than faculty as potential entrepreneurs (Altman and Ebersberger, 2013). These differences reflect differences in academic norms and cultures. Not only does the European entrepreneurial university educate and graduate individuals, but it also nurtures the entrepreneurial spirit in organizations. The focus on educating entrepreneurs and training groups of students as firms may explain to some degree the rapid rise in firm formation in Sweden, a country renowned for its complex of large technology firms tied to a comprehensive social-welfare system. Many Swedish academic spin-off firms have arisen from teaching programmes in entrepreneurship rather than from faculty research. For example, the Entrepreneurship Center at Linköping University produces 100 spin-offs per year through its training activities and through extensions of its programme at other Swedish universities (Ezkowitz, 2004; Klofsten, 2000). In the Linköping model, students move from courses into pre-incubator facilities, where they can try out their ideas and develop their business plans with advice from consultants recruited from the industry. The best prospects are then invited into an incubator facility, often with funding arranged. The Entrepreneurship Center at Chalmers University in Gothenburg trains groups of students, who first go through a recruitment and application process that encourages the development of a firm formation concept and then evaluates it as the basis for acceptance into the programme (Berggren, 2011).

More recently, developing countries are producing another wave of entrepreneurial universities. Among the BRICS countries – Brazil, Russia, India, China, and South Africa – Brazil seems to be the one following the US model the most closely. In Brazil, industry and academia have traditionally evolved separately, although in recent years, government policies have pushed companies and universities to cooperate through technology parks or business incubators (Dalmarco, Hulsink and Blois, 2018). The promotion of innovation and entrepreneurship through innovation ecosystems is playing an important role in generating socio-economic change, particularly in emerging countries (Guerrero and Urbano, 2017; Yigitcanlar et al., 2019).

From this brief reconstruction, we can conclude that the entrepreneurial university is not a homogeneous phenomenon; rather, it varies a great deal across the globe. The different models described above are either linear, that is, research-driven, reverse linear, that is, problem-driven, or a combination of both. The first model begins with research and moves to utilization by seeking opportunities for commercialization, while the second identifies problems in industry and society and seeks solutions in science. These models should not be seen as mutually exclusive; rather, they can coexist within the same institution (see, for instance, the Swedish experience at Linköping). More importantly, the two models draw upon different technology transfer activities and tools, which we analyse in the next subsection.

2.2 Mechanisms for building an entrepreneurial university

The variety of models for the entrepreneurial university rests on a wide range of technology transfer activities and tools. These perform different functions and complement one another during the idea generation and utilization process. In Table 1, we present the primary tools that support technology transfer activities within a university setting. The table can be read from the left to the right or from the top to the bottom. Read from left to right, the table describes the primary aim of the tool, whether it reflects a linear or reverse linear model, whether the geographical scope is regional or multi-regional, to whom it is targeted and what the expected outcomes are. Read from top to bottom, the table identifies the mechanisms through which universities pursue knowledge transfer activities, primarily following a linear model. The different mechanisms complement one another rather than being mutually exclusive.

Tab 1: Entrepreneurial university's tools

Tool	Aim	Model	Geographical scope	Target	Expected outcomes
Research lab	To exploit research results and pursue knowledge spillover	Linear model (Research-driven)	Regional	Internal faculty and Ph. D students	Patents
TTO	To develop relations with an industry, in terms of partner search, management of intellectual property, and business development	Linear model (Research-driven)	Regional	Internal faculty and Ph. D students It works in conjunction with different research labs within a university setting	Licensing agreements Royalties from agreements
Incubator	When they are affiliated with a university, incubators provide services related to intellectual property; the university may also use them to transfer knowledge from faculty members to firms that are commercializing the university's intellectual property. In addition, they provide mentorship and consultancy services	Linear model (Research-driven)	Regional	Internal faculty and Ph. D students	(Performance of the incubator and performance of the firm in the incubator) Business incubation
Science Park	When located within a university, science parks are the intermediate organizations that provide the social environment, technological and organizational resources, and managerial expertise for the transformation of a technology-based business idea into an efficient economic organization	Linear model (Research-driven)	Regional	Internal faculty and Ph. D students	(Performance of the incubator and performance of the firm in the incubator) Business incubation

Source: Authors' elaboration

The linear model starts with idea generation, mostly within traditional, research-driven laboratories, and proceeds by favouring knowledge spillover. The primary tool is a research laboratory, where knowledge creation takes place and innovative ideas emerge. For patented technology, the Technology Transfer Office (TTO) helps to negotiate a licensing agreement with an external party that produces royalties. A new venture creation represents a further conduit for science commercialization, often when valuable knowledge is tacit and not patentable. In this situation, creating a new venture is the only way to transfer this technology. A new venture can also be created in cases involving a patented technology invented in the university's laboratory. The license is granted to an entrepreneur who can launch a startup firm based on the transferred technology (Siegel and Phan, 2005). The university scientist could be the entrepreneur who founds the startup, or s/he could serve on the board of directors or as a technical consultant. These new ventures may also benefit from support structures such as incubators or science/research parks within the university (Phan, Siegel and Wright, 2005), which may deliver different services and provide a social environment that favours the birth and development of a new firm. Technology transfer offices, incubators, and science parks perform partially overlapping roles and may adopt different business models to deliver their value and contribute to the university's so-called 'third mission' (Baglieri, Baldi and Tucci, 2018; Tak and Sabidussi, 2015).

In addition to these mechanisms, there is an emerging trend of pursuing problem-driven research and nurturing an entrepreneurial mindset in both academic staff and students. One example is the Langer laboratory at MIT, named after its director, Professor Langer. The laboratory combines research, education, and technology transfer (Seligson, 2012) by mixing training and more traditional academic and industrial jobs. Professor Langer typically works as a consultant but remains rooted in the university. Far from being in conflict with each other, research, entrepreneurship training, and knowledge spillover are knitted into a seamless web. European examples include Swedish experiences at Chalmers or Linköping University that emphasize the importance of training as an antecedent of incubation and financing activities and collaboration among a range of partners outside university institutions.

These experiences reflect the importance of entrepreneurship education as an important and complementary engine for innovation-driven research and collaboration among different partners to facilitate knowledge spillover to the surrounding region. Additionally, these findings signal the opportunity to redesign the mission of research laboratories, which can increasingly become contexts where the different 'missions' of universities blend through a repertoire of

activities in a variety of ways. Below, we present evidence from two different experiences of e-Labs that involve different European partners.

3. Method

3.1 Research approach and setting

In this paper, we adopt a qualitative and exploratory research approach based on a single longitudinal case (Yin, 1989) of an e-Lab funded by Health-Net (a disguised name to protect anonymity). Access to the field was secured by the involvement of the three authors, to different extents and at different points of time, in the programme. The choice to employ an exploratory case study method is warranted by the lack of established evidence on this topic and the importance of investigating the phenomenon of interest—the e-Lab—from the perspective of the actors involved at different levels. In our cases, the e-Lab is hosted by departments/business schools scattered across Europe under the umbrella of the Health-Net network. As a consequence, we account for the individual, organizational, and inter-organizational levels of analysis. The e-Lab under investigation promotes an entrepreneurial mindset through a problem-driven approach and involve distant partners.

3.2 Data collection and analysis

We amassed a mix of both primary and secondary data (see Table 2) and ensure that all relevant perspectives were accounted for. First, to provide a chronological reconstruction of the activities, we collected minutes from meetings, archival data, and all relevant information about Health-Net's strategic priorities from the Health-Net institutional website. These data served to reconstruct the contextual conditions that facilitated the launch and development of the initiative and the contribution made by the network. At this stage, the third author, who was involved in the Health-Net network decision-making process, also served as a source to verify the accuracy of the reconstruction and the internal consistency of the data.

Additionally, we collected primary data by interviewing participants, project partners, and Health-Net management. Interviews were open-ended and focused on interviewees' experience in the programme. When possible, they were recorded; in other circumstances, notes were taken by the interviewer, and accuracy was ensured through debriefing (Schoepfle and Werner, 1999). In addition, at the end of the programme, participants were administered questionnaires to assess their overall satisfaction with the programme and suggestions for improving future iterations. Participant bias was avoided through open-ended questioning and the guarantee of anonymity to encourage candour (Hallen and Eisenhardt, 2012).

Tab. 2: Data sources

Data	Amount	Source	Topics covered
Archives	2	Media, corporate materials	Strategic orientation, impacts
Institutional website and press-release	1 official website and 2 press releases	Health-Net website	Strategic goals, strategic pillars, organizational structure
Minutes from Meetings	10	Project partners Health-Net Management	e-Lab structure and timetable, teaching modules and materials, KPI – key performance indicators
Interviews	36	Program participants	Expectations, motivations and experience
Questionnaires	14	Program participants	Participants' satisfaction and suggestions

Source: Authors' elaboration

In analysing the data, we initially focused on the reconstruction of the context (the Health-Net network) and the e-Lab. During this stage, as in the data-gathering process, the analysis was performed by the first two authors and reviewed by the third author to ensure accuracy. Next, we move on to the identification of themes emerging from the data.

4. Findings

4.1 The context: Health-Net and e-Labs

Health-Net, formed in 2015, is one of the Knowledge Innovation Communities (KIC) of the European Institute of Innovation and Technology (EIT). Its mission is promoting a sustainable health economy, improving citizens' health, and strengthening healthcare systems in Europe through the integration of skills and experiences among participants. To achieve these goals, Health-Net supports projects and activities inspired by strategic values such as the promotion

of innovation and employment in the health sector. These projects involve reforming care pathways, facilitating healthcare transformation, harnessing real-world data, bringing care home, improving health in the workplace, and fostering healthier lives.

EIT communities are funded in part by the European Union through the Horizon 2020 framework and in part by partners, who contribute an annual fee and pay for services. To ensure survival and competitiveness, the proceeds of commercial activities are reinvested within the organization.

Health-Net involves almost 200 partners, including universities, companies, and research institutions, located in Europe. This represents a crucial feature of the network, as it puts in relationship different actors with different competencies and expertise from different regions. Core and associated partners contribute substantially to the Health-Net strategy through their project proposals, which are periodically assessed by Health-Net experts. Additionally, external partners may be involved in project proposals. The supervisory board, the management board, the advisory board, and the partner assembly guarantee the functioning of Health-Net by defining its strategic orientation and operational decisions. More specifically, Health-Net manages four different programmes: education, acceleration, innovation, and think tank programmes. Health-Net partners are called to propose initiatives within these programmes on an annual basis based on the business plan.

The e-Labs are developed under the Health-Net education programme. These initiatives are training programmes focused on entrepreneurship and involve a heterogeneous and wide audience that includes students, professionals, researchers, entrepreneurs, and citizens. The e-Lab approach is practice-based, with activities aimed at the identification and development of concrete solutions to health-related challenges. The training programme revolves around two key activities: The analysis of concrete cases and the analysis of testimonies of companies, innovators, and researchers.

Each year, Health-Net supports dozens of e-Labs in Europe. While they share the aim of promoting the strategic objectives discussed above, they vary widely in terms of organization, the partners involved, the target audience, and impact. People who benefit from the Health-Net initiatives become part of the alumni network. Network members have access to special initiatives launched by Health-Net and to career opportunities within the community.

As part of the education pillar, Health-Net e-Labs are programmes that provide structured training sessions based on entrepreneurial creativity and aimed at identifying business solutions to the main challenges of healthy living and active ageing. E-Lab programmes emphasize the practical side of the training because of the involvement of managers and experts from business and research fields and the use of innovative and highly interactive teaching methodologies. Dozens of e-Labs are approved and operate within the Health-Net network, with the joint participation of several and different partners in the network.

In this study, we specifically analyse an e-Lab experiences developed within a large university in Southern Italy, which we label e-Lab Alpha. The university in Southern Italy in which the e-Labs are managed is also responsible for other education and innovation projects under the Health-Net framework. Therefore, the university has gained significant experience in designing and managing healthcare projects and enjoys numerous relationships with international partners within the network.

Both its focus and geographical vocation make this laboratory unique vis-à-vis other experiences. Specifically, it is thematic rather than generalist and has a dual geographical vocation, that is, it mobilizes resources and competences at a European level and promotes regional, local development. These traits represent a source of competitive advantage for the universities involved. With these considerations in mind, we now move on to the description of the two experiences.

4.2 The E-Lab Alpha project

The e-Lab Alpha project involves the broad cooperation of universities and industrial partners. It consists of a training course on entrepreneurship targeting individuals or teams with an entrepreneurial idea who intend to refine and validate it in a specialist context through interaction with other attendees, mentors, experts, or researchers. Participants in e-Lab typically hold a degree or postgraduate degree and work in the fields of research and innovation. Many of them have a medical or engineering educational background.

The courses take place in parallel and are hosted at each partner's location, with classrooms remaining essentially separate. However, the course design and structure are discussed among partners to achieve a common training path; moreover, the programme offers opportunities for interaction/challenges among different classrooms to internationalize the course to a certain extent.

The programme consists of periodic (on a weekly or biweekly basis) face-to-face meetings, during which thematic seminars and mentorship sessions are offered. During the programme, participants address numerous issues concerning the entrepreneurial path in healthcare, from the conception phase to the formalization and communication of a proposed solution. Additionally, participants have access to a repertoire of online tools. Along the training path, students are stimulated to create a team and develop concrete solutions to real-world problems in the healthcare field by applying the acquired tools. If participants (researchers, for example) already have a business idea, the course offers the opportunity to improve and refine it through the entrepreneurial and managerial tools acquired during the e-Lab.

The courses are not intensive but require a diluted commitment over time, approximately 7 months, so that participants have the opportunity to process the concepts learned and to refine and test their business ideas. They work

in groups, which may be relatively large (up to 5-6 people per group), and, as in e-lab Alpha, tend to focus on digital health solutions. Ideas include applications for improving patients' daily routines or apps for improving the flow of communication between patients and healthcare professionals. At the end of e-Lab Alpha, participants have the opportunity to present their business solutions to their peers and a local jury, and the best ideas are also presented to an international audience across the project partnership.

4.3 E-Lab Alpha: preliminary findings

The programme analysed here is primarily problem-driven. The involvement of industrial partners and the adoption of challenges and hackathons during the programme are crucial in this respect. While research-driven innovation generally benefits from the input and intellectual curiosity of researchers, a problem-driven approach requires an engine to foster an entrepreneurial mindset, and industrial partners are important actors and initiators of this process. E-Lab Alpha is also research-driven, as it often hosts researchers with already mature business ideas. This means that they continue to develop/refine these ideas during the programme with their team, obtain feedback, and benefit from interacting with other participants. In other words, this programme mixes linear and reverse linear processes of innovation, as echoed in the words of one participant:

"I think that this programme can help me to understand how to place in the market the product that I'm developing through my research activity."

In terms of geographical scope, the e-lab is concurrently local and multi-regional: The e-Lab involves several partners from different regions; programmes are developed by each partner independently, but each programme provides opportunities for meeting or interacting with other groups. The opportunity for participants to interact at a multiregional level contributes to increasing the creative and innovative potential of the programme. This is expressed by another participant:

"The best part would be to meet new and interesting people who are from different countries to get new perspectives."

In terms of participants' profile, E-Lab Alpha is open to citizens, thus contributing to the effective implementation of the so-called third mission of universities. The university is no longer an ivory tower; rather, it is a space where different actors and stakeholders cooperate to benefit society. Besides, the prolonged duration enables participants to develop mutual knowledge. As a consequence, the likelihood that new business teams decide to follow a common business idea even after the end of the programme increases.

In terms of outcomes, while we cannot account for long-run outcomes, such as the number of new ventures originating from ideas developed during the programme, we can still identify intermediate results. First and foremost, one important result is the ability to attract a large number of participants with different qualifications. Participation is an important condition for building interdisciplinary teams, and this increases the likelihood of developing innovative ideas.

The wide target of e-Lab Alpha translates into a set of Key Performance Indicators (KPIs) that expressly refer to reaching and involving citizens in the initiative. Furthermore, the programme duration and the presence of participants with more mature business ideas translate into the inclusion of a KPI that specifically refers to the creation of new startup companies.

"I have the opportunity to talk about my idea and to improve it, as well as to meet professionals who may mentor me and provide me with insights and different perspectives about my rationale and point of view. If all goes well, I would like to see my project go into a limited beta phase."

5. Discussion

Our study enriches the existing literature on entrepreneurial universities by presenting an experience that innovates on the traditional notion of research-driven laboratories that generally find commercial applications for research output, often through spin-offs, with the support of university technology-transfer offices. In contrast, the e-Lab presented here promotes the entrepreneurial mindset with business ideas developed as a response to societal problems related to health and well-being. While similar in many respects to other experiences, this e-Lab differs from existing formats in that it is thematic and focused on health and well-being and it is multiregional, that is, it involves universities and participants from different countries and participants with different qualifications and at different stages of their educational path. As such, the experience examined in this paper represents a distinct format for nurturing an entrepreneurial mindset and stimulating innovation to improve health and well-being and makes several important contributions. Our findings support that e-Labs allow universities to create multi-disciplinary classrooms, involve people with heterogeneous educational qualifications and diverse scientific backgrounds, and trigger innovative open-ended processes. The contributions that research, business, and innovation experts make to the programmes are essential to stimulate the entrepreneurial creativity of learners, who are challenged to provide concrete solutions to real-world problems in the healthcare sector.

The affiliation of the e-Lab with the Health-Net network ensures the international scope of the initiatives in terms of partnership and planning and draws students from various European countries. As a consequence, the e-Lab under

investigation mobilizes innovative capabilities, knowledge, and competences embedded in different, distant geographical areas, thereby amplifying opportunities for cross-fertilization, mitigating regional differences, and promoting local growth and development. This solution effectively responds to the call for universities to promote regional development in a broader sense involving citizens and local communities. By joining and actively participating in an international institutional network such as Health-Net, entrepreneurial universities may enhance their role within the ecosystems of innovation and international entrepreneurship, activating interactions and synergies with other actors. An additional important feature is that these e-Labs are thematically focused on health and well-being. This is a peculiarity vis-à-vis the horizontal nature of other European experiences.

5.1 Research implications and limitations

Our study offers multiple contributions to the scientific debate. First, we enrich the literature on the variety of entrepreneurial universities by specifically focusing on e-Labs as important tools to deliver innovation and promote an entrepreneurial mindset. We underline how some peculiarities play a crucial role in the effective achievement of the goals of entrepreneurial universities by augmenting the repertoire of tools that they traditionally rely upon. Second, we highlight how the Health-Net model mobilizes innovative capabilities by bringing together different backgrounds and territories, thus providing a unique solution that fosters local development through the mobilization of international resources.

While we think that this paper is definitely a step forward in entrepreneurial university research, we can see many ways to develop this line of research further. A first issue is related to the generalizability of our results. Our study is based on a single case study, which limits the generalizability of the findings. One way to increase the generalizability is by investigating additional cases. Alternatively, the findings from the present study could also be tested in large-sample studies to determine the impact of various variables and their explanatory power. For instance, the degree of multiculturalism and participants' scientific background or academic qualifications have emerged as important antecedents to entrepreneurial intention.

The e-Lab under investigation reflects the institutional and cultural conditions in which they are developed, which limits the generalizability of the research findings to other contexts. Future research could remedy this issue by conducting a multi-country study that focuses on the quality of the research, the socio-economic context or the commitment of the administrative structure (O'Shea et al., 2007).

An additional important line of inquiry regards the measurement of social impact. The e-Lab analysed in this study provide only a limited number of observations (between two and three iterations), and we are not able to measure their social impact and contribution to the implementation of the Health-Net strategic priorities. The increase in the number of observations over time could provide further information regarding their societal impact.

5.2 Practical implications

Our study also offers some relevant practical implications. First, it shows that universities may develop an entrepreneurial strategy through the implementation of different tools that are complementary to each other and thereby strengthen their entrepreneurial profile. Together with the more traditional tools, such as technology transfer offices or entrepreneurship training programmes, e-Labs may contribute to universities' multi-disciplinarity, multiculturalism, openness, and problem-driven orientation. Second, our study confirms the essential role of opening the university to other stakeholders (research institutions, companies, supranational bodies) to better achieve entrepreneurial university goals. Through interactions with external partners on an international basis, both in the design and delivery phase of the e-Labs, it is possible to emphasize a problem-driven orientation and ensure that they have the concrete and practical bearing that facilitates the idea generation phase, the rapid validation of ideas, and above all the opportunity for participants to continue the entrepreneurial path through other initiatives promoted by stakeholders. Third, the active involvement of industrial partners in e-Labs reduces the gap among research, teaching and practice (Calza et al., 2020). The joint design of the challenges presented to students and the participation of companies in the competitions that characterize e-Labs (for example, hackathons) favour the formation of human capital that responds effectively to the competitive challenges that companies face.

6. Conclusion

Entrepreneurial university is an umbrella term that encompasses a broad set of activities and mechanisms to promote the so-called third mission. In this paper, we have focused on a particular mechanism and the associated activities, namely, the entrepreneurship lab and programme. We have provided evidence from a thematic e-Lab and programme involving European universities under the Health-Net framework. E-Labs complement traditional knowledge transfer activities that facilitate problem-driven innovation and local development by leveraging multicultural and multidisciplinary competences.

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Intersection between public engagement management and social sustainability: the “soft” and “hard” approaches to widening engagement in sustainable Higher Education

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Objectives. For many universities around the world, the issue of sustainability is no longer one of the many options available but has become a necessary and responsible development strategy. Paletta and Bondi (2019) analyze how universities are rethinking courses and curricula, teaching, research programs, campus operation and partnerships to achieve the goals of the 2030 Agenda. Many universities around the world have embraced the values of sustainability, such as the enhancement and conservation of the territory, the improvement of community well-being, economic development based on knowledge, social equity and the ability to collaborate effectively with stakeholders for the common good. Sustainable development goals are a key aspect of social responsibility understood as the set of duties and commitment of universities to society through their activities (Ketschau, 2015). Universities can and must provide a holistic approach to achieving the goals of the 2030 Agenda. The idea is shared that the University must intervene on the didactic, research, and services level to guarantee meaningful training aimed at sustainable development (Gomez et al., 2014). Above all with reference to social responsibility, the purpose of universities is to help people, regardless of their gender, age, race, sexual orientation, and vulnerability, to overcome the obstacles that limit the full development of the person in society and help them in supporting their development. By involving stakeholders, universities can provide services with two main purposes: to educate the younger generations to develop an inclusive mentality and, at the same time, to support their cultural development with concrete engagement actions in order to create more inclusive societies oriented towards collective wellbeing. In this sense, activities with educational (training and research) and substantial purposes (financing activities, social inclusion projects, regulations) can be the main contribution to the achievement of these objectives. Public engagement, i.e. the myriad of activities aimed at an academic and non-academic audience through which universities communicate the benefits of their research and education activities, have an important educational, cultural, and societal development value. Among the various dimensions that characterize the construct, the widening participation dimension aims to address the differences in accessibility and progress in higher education between students, citizens, and individuals from different social groups. As Laing and Maddison (2007) argue, widening participation must not only mean access to existing courses but if it is true that university public engagement, through its resources, has positive effects in terms of health, stability, and happiness, then perhaps one should imagine a set of situations in which all citizens and all social groups should be able to access intellectual capital, and its resources. In light of these considerations, public engagement is the lens through which it is possible to achieve the objectives of accessibility and social justice. There are several institutions created to coordinate, support and help universities to ensure sustainable development (such as Global University Network for Innovation (GUNi). Also in Italy there is RUS (Rete delle Università per lo Sviluppo Sostenibile) dedicated in recent years to directing the efforts of universities towards achieving the objectives of the 2030 Agenda. In particular, within the Justice and Social Inclusion Group, the universities involved are taking action to effectively monitor and support social inclusion initiatives to promote sustainable and inclusive social contexts capable of evolving and launching innovations focused on social justice.

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Despite the decisive role recognized by the university in achieving sustainability goals and the profound commitment of universities in achieving the Third University Mission, obstacles and structural limitations prevent the full achievement of the sustainable development goals. In this regard, Leal Filho et al. (2017) individuated the main obstacles to the integration of Social Development into HEI: lack of support from management; lack of appropriate technology; lack of awareness and concern; lack of environmental committees; lack of buildings with a sustainable performance; government barriers. To date, there does not seem to be a clear classification of the main areas of intervention adopted by the Universities for an increase in social sustainability and capable of indicating the main areas of intervention regarding the involvement of stakeholders, the resources available to the Universities and the territorial context. In this paper, consistent with Hart and Northmore (2011), according to which widening participation in the university is inevitably linked to the concept of public engagement, we investigate the importance of the subject of inclusion and social justice in universities in light of the opportunities offered by public engagement management. Public engagement is therefore the lens through which we can observe the possible goals to be reached by the University in terms of social sustainability. Therefore, in this paper, we propose a systematization of the concept of widening participation in order to identify the main areas of intervention that will allow the university to guarantee the development, implementation, and maintenance of the principles of justice and social inclusion in line with the objectives of social sustainability. The exploratory study, currently underway, aims to explore social sustainability in the light of public engagement through the work carried out by European universities to achieve the objectives of the 2030 Agenda.

Methodology. To evaluate the potential of the widening participation dimension as an important public engagement tool capable of guaranteeing the sustainable social development of the university, a qualitative-quantitative approach was used (Marino and Lo Presti, 2018; Schmidt et al., 2008; Perry and Bodkin, 2000). The websites of the top 50 European universities were chosen from the list of the best European universities published on webometrics.com. To check the dissemination of widening participation activities an analysis of the content of the websites was carried out, a method already widely used in the literature on higher education (Marino and Lo Presti, 2018; Lo Presti and Marino, 2020). Starting from the study by Hart and Northmore (2011) which frames widening participation in two macro-areas (diversity and accessibility), the initiatives proposed by the Italian Working Group on Social Justice and Diversity (RUS) were taken into consideration to operationalize the dimension. This phase led to the identification of a set of 22 items. After an initial verification of the proposed items, 5 items were eliminated as they had too much difficulty in operationalizing the construct. From this stage onwards, those items correctly categorized and validated by both experts were maintained, thus reaching a set of 17 items. The procedure adopted is the one illustrated by Marino and Lo Presti (2018), Lo Presti and Marino (2020).

The websites were examined in terms of completeness of content and communicative effectiveness, access to information, quality, and navigability in order to obtain an assessment of the visibility of the items. Moreover, the stakeholders involved and the beneficiary stakeholders were detected for each item. The outcomes reflect an assessment of the consistency or effectiveness of the contents to which the item relates, as well as the site's usability in relation to each item. Before evaluating the website, the evaluators were "instructed" to follow some formal criteria developed during the research planning stage, and the idea of the "visibility of the objects" was clarified to them during this process. The findings were documented in an "assessment chart" that included the items to be assessed as well as the codification criteria given in the "codebook". A pilot test on some websites was used to verify the accuracy of the procedure. The pilot test was also performed in the presence of the authors of this article. Finally, an exploratory factor analysis was conducted in order to identify the main dimensions of widening participation in European universities (maximum likelihood method, Varimax rotation criterion). The aim of the factorial analysis was to find some latent variables (factors) that could be used to illustrate the connections, interrelationships, and dependencies between the observed statistic variables (Fabrigar et al., 1999). A reliability analysis was conducted on the data collected by calculating the item-to-total correlation (ITC) and Cronbach's α . The exploratory factor analysis returned a 4-factor model.

Findings. The factorial model and loading are shown in Table I (loadings less than 0.35 are not shown). Both Bartlett's sphericity test, significant result, and the KMO index for the measurement of sample suitability equal to 0.588 confirmed the appropriateness of the development of a factorial analysis (Lattin et al., 2003). Cronbach's coefficient of reliability for single factors is sufficient (Table 1). All of the variables have a commonality of at least 0.50, indicating that the study created a four-factor structure with strong overall significance: (1) Initiatives in defense of diversity; (2) Access; (3) Cultural awareness of diversity and social justice; (4) Protection of diversity and the principles of social justice.

Tab. 1. The results of exploratory factor analysis

Items	Factor			
	(1) Initiatives in defense of diversity	(2) Access	(3) Cultural awareness of diversity and social justice	(4) Protection of diversity and the principles of social justice
Equal access to universities through various measures (university fees, scholarships and other measures)		.568		
Equal access to the university through accommodation (student residences and other measures)		.725		.366
Measures to reduce the knowledge gap at entry between students from different socio-economic backgrounds (e.g. preparatory courses, supplementary courses) and to facilitate the completion of their studies		.489		
Training on constitutional principles and the European Union		.441		
Contracts and service contracts with social clauses or in any case with guarantees for male and female workers		.522		
Common general culture courses on sustainable development (for example: as defined by the objectives of the UN 2030 agenda) and on the different meanings of social justice			.809	
Promotion of interdisciplinarity			.971	
Internships aimed at promoting inclusive skills			.378	
International initiatives in areas characterized by poverty or marginalization			.358	
Intercultural journeys with European and extra-European students	.362			
Actions to close the gender pay gap and promote top management roles for women	.520	.375		
Ongoing formation	.371	.436		
Measures to facilitate access and satisfaction in the right to study by students with vulnerabilities (people with disabilities or SLD, prisoners, migrants)	.726			
Promotion of a language that is attentive to gender differences and inclusion	.352			
Access and quality of basic services (school, mobility, health, housing, communication): initiatives with local organizations of active citizenship for the benefit of people with vulnerabilities	.875			
Formation of an inclusive, equitable mentality, attentive to multi-gender equality and one's constitutional rights / duties	.439			.838
Construction of an analogical / dialogical space where the comparison between knowledge and opinions takes place in an open, informed and reasonable way (access to social networks and the possibility of sharing on issues concerning knowledge and guaranteeing debate)				.356
Eigenvalue	2.398	2.132	2.112	1.297
Percent of variance	14.107	12.539	12.425	7.630
Cumulative percent of variance	14.107	26.646	39.071	46.700
Alpha di Cronbach	.684	.698	.671	.599

Note: Extraction Method: Maximum Likelihood. Rotation Method: Varimax with Kaiser Normalization.

Source: our elaboration

In light of the considerations that emerged from the literature on social sustainability (Colantonio, 2010; Vellaince et al., 2011) which distinguishes between the traditional “hard social sustainability” activities and emerging activities linked to changes that affect the cognitive-behavioral sphere of a broader public (“soft social sustainability”), we can distinguish two macro areas of intervention for universities in terms of inclusion and social justice: a “hard engagement” approach and a “soft engagement” approach (Table 2).

Tab. 2: Type of engagement approach for each factor

Factors	N of items	Mean	Min	Max	Variance	Stakeholder involved	Beneficiary stakeholders	Type of engagement approach
Initiatives in defense of diversity	5	2.844	1.020	3.640	1.089	Student, Staff, public, institutions, firms, University institution	Student, staff, university community	Hard engagement
Access	6	3.213	1.400	4.320	1.155	Student, university community, institutions, firms, university institution	Student, staff, university community	
Cultural awareness of diversity and social justice	4	2.280	1.680	3.280	.557	University community; University institution; Public institution	Student, university community, public	Soft engagement
Protection of diversity and the principles of social justice	2	2.010	1.560	2.460	.405	University community; University institution	Student, university community, public	

Source: our elaboration

Hard engagement approach - initiatives in defense of diversity and which guarantee access: all those "traditional" activities in favor of a wide public (academic and non-academic) are included and which are embodied in initiatives aimed at equal access to the university through diversified and concrete training measures (e.g. supplementary courses, lifelong and continuous learning) and economic-structural measures (for example university fees, scholarships, facilitated access to housing, etc. but also measures aimed at accessing study for students with vulnerabilities) which mainly involve students, but also academic staff. These activities require the joint commitment of the university institution, mostly the proponent of the initiatives, but also the engagement of other stakeholders such as companies and public institutions.

Soft engagement approach - initiatives to increase cultural awareness and the protection of social justice: these initiatives integrate the more traditional ones and include those connected to the formation of an inclusive mentality, fair and attentive to gender equality through the promotion of interdisciplinarity, cultural integration, comparison between opinions and knowledge via the diversified communication channels that are available. These activities are less measurable despite the fact that their objectives have substantial and medium-long term effectiveness and are aimed at changing the attitude and behavior of university stakeholders. By comparing the results of table 2 between hard engagement and soft engagement activities, we can see that while for hard engagement activities, the university seems to have consolidated an approach aimed at giving evidence of its ability to be fair and open to the defense of diversity (gender inclusion, race, religion, income etc.) (average of the quality of the initiatives provided equally to about 3 on a 5-point Likert scale), those activities related to the development of an inclusive and equitable mentality is an approach that has not yet been acquired by European universities (average of about 2 on a 5-point Likert scale). Furthermore, the stakeholders involved are still less as compared to the more traditional approach to widening participation. Finally, the exploratory research made it possible to observe that the universities that adopt a hard engagement approach are also those that adopt a soft engagement approach (e.g. University of Oxford; University of Cambridge; UCL University College London; Imperial College London). Specifically, the research made it possible to identify 3 university clusters that outline different public engagement strategies: universities that adopt a high "hard-soft engagement approach"; universities that adopt a sufficient "hard-soft engagement approach" and finally universities that adopt only a low "hard engagement approach".

Research limits. The research represents the first attempt to look at the achievement of sustainable development goals through the opportunities offered by university public engagement. Although the paper proposes a systematization of the concept of widening participation in order to identify the main areas of intervention that allow the university to guarantee the development, implementation, and maintenance of the principles of justice and social inclusion in line with the objectives of social sustainability, the research results cannot be generalized.

Practical implications. Specifically, the new managerial perspective of university social sustainability, as proposed in this article, needs to strengthen public engagement activities on the basis of two complementary approaches: a "hard engagement approach" which includes "Initiatives in defense of diversity" and "Access" and a "Soft engagement approach" which provides for the organization of activities and initiatives aimed at expanding culture and protecting diversity and the principles of social justice. As the literature on social sustainability demonstrates, the activities and initiatives should be approached in a logic of inclusion of stakeholders. The management of public engagement activities in order to develop the initiatives, connect the communities to the objectives of the third university mission and finally maintain the correct performance of these activities can be implemented in the light of the main areas of intervention. The adoption of these approaches results in the need to define specific strategies and tactics that can best exploit the opportunities offered by the Third Mission. It is therefore proposed to address the different approaches to managing social sustainability by placing it in a relational perspective and on two levels: a strategic plan and a tactical plan. From a strategic point of view, it will be necessary to: a) manage the varied range of training products and services offered to stakeholders in a logic of enhancing the resources and skills (tangible and intangible) available to the University and in a vision of incremental development of those more linked to the university vocation; and b) develop medium and long-term networks and relationships through the careful identification and involvement of university stakeholders. On the tactical level, on the other hand, it will be necessary to: a) create ways to constantly measure and monitor the levels of engagement and above all in consideration of the selected sustainable development goals; and b) set up mechanisms and tools for verifying the effectiveness of hard and soft engagement activities with its beneficiary stakeholders in order to maintain, develop and/or create an open mind to diversity and social inclusion (Vallance et al., 2011).

Originality of the study. The results make it possible to frame social sustainability in the light of public engagement and propose two macro-areas of intervention: a soft engagement approach and a hard engagement approach. The former is aimed at changing the mentality and must therefore intervene with initiatives aimed at training future generations in a greater awareness of the importance of guaranteeing justice and social inclusion; the latter, on the other hand, which is much more widespread, includes all those activities that actively generate massive interventions by universities towards a conscious implementation of policies in defense of gender equality. From a university public engagement perspective, while the latter actively involves other players in the area, associations, companies, and public institutions, the former, on the other hand, still sees little involvement of external stakeholders. It is, therefore, necessary to give more space to cultural change if one wishes to radicalize the results of the hard engagement approach activities in the society. As Laing and Maddison (2007) argue, widening participation in higher education must not only mean access to existing courses but if it is true that university engagement, with their resources, has positive effects in terms of health, stability, and happiness, then perhaps we should imagine a set of

situations in which all citizens and all social groups should be able to access intellectual capital and resources. This research is the first attempt to systematize social sustainability in the light of the public engagement starting from the conceptualization of Hant and Northmore (2011). The university can enrich the value of its offer and of the services perceived by stakeholders by increasing, simultaneously, the value obtained by the hard and soft engagement approaches. Not just “social-washing” but the university’s real commitment to a better society through soft engagement activities. A social university is therefore envisaged, a university with a responsible orientation towards greater inclusion and social justice that acts concretely through the opportunities offered by public engagement. In practice, we propose a Sustainable Public Engagement Management that takes into account the university system and a relationship orientation that today cannot ignore a serious consideration of the objectives of the Third Mission.

Key words: widening participation; public engagement; social sustainability; higher education; agenda 2030; social justice

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University technology transfer: exploring the role of academic entrepreneur and emerging skills in university spin-offs

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Objectives. *Universities and higher education institutions are the main drivers of new knowledge and innovation within the socio-economic system (Visintin and Pittino, 2014; Vesperi et al., 2018). One of the most relevant mechanisms universities use for the economic exploitation of research outcomes and the consequent transformation of knowledge into new businesses is the creation of Universities Spin-offs (USOs).*

On this ground, USOs become potential drivers for regional and national development as they can foster economic growth (Di Gregorio and Shane, 2003), create employment in science-based sectors (Clarysse et al., 2005; O'Shea et al., 2008), and bridge industry to science (Debackere and Veugelers, 2005).

This growth in venturing has given rise to a concomitant upsurge in research activity focused on USOs. Reviews of this body of work (Mustar et al. 2006; Rothaermel, Agung, and Jiang 2007; Siegel, Veugelers, and Wright 2007; Colombo, Mustar, and Wright 2010) have shown that previous studies have largely focused upon economic performance at the university or spin-off firm levels with little analysis of the individual academic entrepreneur or team.

With few exceptions, therefore, studies of academic entrepreneurship have tended to omit consideration of the role or behavior of the entrepreneurs (Knockaert et al. 2011). In USOs, management experiences complex challenges owing to the integration of academic and non-academic cultures, prompting an increasing interest in the micro-foundations of academic entrepreneurship (Ankrah et al., 2013; Jain et al., 2009). Adopting a micro-foundational approach (Barney and Felin, 2013) by emphasizing the role of individuals, processes, and structures of companies in the acquisition of internal competencies and competitive advantage (Barney and Felin, 2013; Felin and Foss, 2005; Felin et al., 2015) may shed some light on additional factors that need to be investigated. Emerging research on the micro-foundations of strategy and entrepreneurship stresses the importance of individual behavior and the interaction of this behavior with firm attributes (Barney, Ketchen, and Wright 2011). Increasingly, the cognitive aspects of entrepreneurship are being analyzed and codified by researchers. The influence of heuristics and biases on internal information acquisition and the processing challenges faced by entrepreneurs are being recognized empirically (King, Garbuio, and Lovullo 2011). Nevertheless, prior literature highlights a limited view of the interaction of context with the micro-foundations of entrepreneurship as studies mainly examine founders of independent businesses.

A gap in the literature, therefore, exists in the understanding of the cognitive and behavioral drivers of academic entrepreneurship.

We argue that the focus on academic entrepreneurship has to date been overly narrow and that this has important implications for the socio-economic competitiveness. The importance of universities for creating local economic development through spin-offs may be considerably underestimated by looking exclusively at faculty spin-offs where absolute numbers are much smaller than those created by alumni (Åstebro and Bazzazian 2010).

According to Link, Scott, and Siegel (2003), academics and policy-makers are searching for theoretical and empirical evidence on the economic impact of external knowledge flow on individual researchers, universities, firms and even regions. Yet we propose that important additional insights into economic competitiveness can be obtained by recognizing that academic entrepreneurship can occur in a wider range of contexts than previously examined and that the context has a considerable influence upon the economic outcome (Link, Siegel and Bozeman, 2007).

Accordingly, this work tries to analyze the different manifestations in which the technology transfer process occurs from an academic context to a business environment, using a methodological approach able to frame the phenomenon both in the macro and meso dimension, and by giving a considerable emphasis on the micro dimension.

Particularly, this work wants to explore the processes through which the individual skills useful for structuring and developing spin-offs are modeled, the necessary interactions between the organizational actors that unfold in the

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articulated processes of negotiation of roles and functions, the complex and articulated links of interdependence which arise between the spin-offs and the related institutional environments. This approach was necessary for the analysis of the concrete action system of the spin-offs. Indeed, their strategies and practices take place in relation to different areas: university, market, socio-economic and political context, and the scientific-cultural horizon they interface and relate. This contextualization was particularly useful for reconstructing and describing the forces that tend to shape the patterns affecting the organizational actions.

Prior literature has shown that university spin-offs operate between different institutional environments and contexts, such as the universities they belong to, the related market or, more generally, the social, economic, political and cultural context in which they operate. In this complex scenario, it is easy to understand how institutional pressures tend to shape those patterns of decision-making premises that structure the organizational field of action (Gherardi, 1990).

It follows, therefore, that institutional pressure is itself the contingent and dynamic outcome of processes of interaction and negotiation between the different institutional environments. At the same time, the interactions between the organizational actors and the related "occupational communities" (Van Maanen, 1973; Van Maanen and Barley, 1982), the negotiation processes between these communities for the appropriation of internal resources and the assignment of roles, the activation of social and professional networks by each member shape and institutionalize over time a complex negotiation of routines and premises which in turn regulate and constrain interpersonal relationships.

In light with these considerations, the objective of the following analysis consisted in the exploration of two cases of spin-offs located in Southern Italy and operating in the life-sciences sector, in order to inductively bring out the cognitive processes activated by the organizational actors in the transition from a scientific environment to a context closer to market and entrepreneurial logic. It was also intended to try to reconstruct the emerging network of relationships in which these spin-offs operate and the ways in which these networks feed back on organizational contexts, influencing the internal configuration of resources, decision-making processes and individual skills.

The choice to analyze the organizational context from the inside is the result of a theoretical-epistemological reflection that frames the organizational changes not as the result of a slavish adaptation to a changed regulatory-institutional framework, but as a complex social phenomenon in which multiple factors come into play, including the normative-institutional aspects (Crozier and Friedberg, 1978; March and Olsen, 1989).

Methodology. Due to the emerging nature of the present research, we adopt a narrative approach (Eisenhardt, 1989; Eisenhardt and Graebner, 2007), as this qualitative methodology is well suited to the study of new business ventures operating in dynamic contexts such as university spin-offs (Czarniawska, 1997, 2004). As already known, the use of stories to make sense of an experience has gained attention in various research areas (Holloway, 2005). The choice of the narrative method was preferred as it is valid for providing a representation of the events that participate in the emerging process of the companies analyzed, as well as the motivation of the main start-ups. The choice to focus the study on two spin-offs operating in the life-sciences sector comes essentially from the intrinsic complexity of these markets, characterized by a strong dynamism of users' needs and preferences, a marked uncertainty about the technologies to be used and the scientific feasibility of the projects. It is understood, therefore, how in such contexts the activity of the researcher-inventor takes the form of a continuous problem-solving process with opaque boundaries and uncertain tasks.

The two spin-offs are at different stages of their life cycle. The spin-off K., established as a company in 2016, has already undertaken a series of specific activities and projects with local and international partners as well as having acquired a consolidated experience in the sector. Otherwise, the spin-off E., established in June 2020, is found to go through the embryonic stage of birth and development. At this stage, the activities related to the organization and management of roles and skills are decisive, as well as the activation of the first informal networks based on current and previous professional experiences. The period of interviews with academic managers lasted for about two months, starting from October 2020 (given the circumstances caused by the COVID-19 emergency, all the interviews took place electronically). During this period of research, in a preliminary phase prior to the actual investigation work, there was the opportunity to find documents from the official websites and institutional channels, reports and regulations for a better understanding of the formal structure of the field related to the technology transfer process as well as intra-organizational dynamics related to the research field.

Findings. Our expected findings confirm that USOs operate in highly differentiated institutional and cultural environments. On this ground, they could be framed as "boundary organizations" or "relays" (Crozier, 1978), as they can intercept the demands of the related market, thus lowering the information asymmetry between the two different institutional environments. However, this ability is the result of two different streams of action. On the one hand, institutional pressures tend to influence the structuring of organizational practices, shaping USOs' decision-making and internal processes (Gherardi, 1985). On the other hand, the organizational setting can be considered as the negotiated outcome of the processes of dynamic interpretation of the institutional pressures by the organizational actors. On this ground, USOs' rules and routines are the result of a complex process of negotiation between the premises relating to the two different institutional environments of reference. This aspect is supported by the growing interest of universities for third mission activities which implies the internalization of guidelines, evaluation criteria, and practices that go beyond the traditional configuration.

Moreover, in dynamic contexts such as the life-science sector, the complexity of the related-environment does not allow the immediate replication of the work practices of research laboratories, nor it outlines a clear path for the acquisition of the skills necessary for the management of technology transfer processes.

In this scenario, the concept of role and capacity cannot be framed as a predetermined characteristic, but it is the result of the complexity of experiences and knowledge of which every organizational subject is a bearer.

More specifically, in USOs' particular configuration, the diversified skills of the actors involved can be remodeled with unexpected and emerging results. In this sense, in fact, the members of the entrepreneurial team are linked by a double bond of belonging; in part they will respond to the institutionalized practices of the academic community to which they belong but, at the same time, they will be influenced by the related socio-economic environment which can follow, in many cases, different rules and norms.

Therefore, the rise of organizational skills and their relative reconfiguration is the emergent and contingent outcome of the dynamic interaction between the external dimension of the spin-off and the personal interpretation of the premises and orientations activated following the opening relations with the market context. These continuous processes of interaction between institutions and USOs' actors and the subsequent mechanisms of reproduction and reinterpretation of the institutionalized rules in organizational processes can be framed as the core capabilities of the university spin-off.

Finally, it can be argued that the organizational learning process is path dependent (Ciborra, 1995), and it actually protects any key competences from their imitation by similar organizations. The activity of the academic entrepreneur is confused between different activities, expectations, behavioral norms, responding both to the expectations of scientific research and to the satisfaction of the needs of the related market.

On this ground, the academic entrepreneur tries to encode two complex systems of meaning, one deriving from the "culture of scientific research", the other deriving from the "business culture". Managing this "boundary spanning" activity (Feldman, 1989) allows academic managers to foster their own strategic behavior. The observation that situational and contextual aspects are strongly present within the strategic behavior of the actors, induces an image of the organizational action as more "flexible" in the relationship with the environment, and thus offering a greater range of activated environments and responses.

Research limits. *Our study has some limitations. Above all, the low number of USOs observed limits the generalizability of our empirical results. In addition, we did not consider whether USOs members have similar previous work experiences and/or past working experience in the same team.*

Given these limitations and consistent with our empirical study, we suggest the following topics for future research: (1) analysis of the academic founders' tendency to be shareholders and its impact on economic performance and innovation readiness; (2) exploration of how the USO research team members are hierarchically bound to academic careers or are willing to exploit their knowledge and capabilities in a business context; and (3) clarification from a TTO perspective of whether improving academics' managerial skills may enhance their entrepreneurial self-awareness, which is essential for problem solving in current socio-economic scenarios such as those faced by USOs.

Practical implications. *The expected findings shown in the previous discussion suggest a "research agenda" to strengthen organizational learning processes in university spin-offs.*

First, an important tool for integrating skills is the improvement of transversal projects between spin-offs and users, as they can involve numerous organizational subsystems and generate temporary forms of organizations parallel to the permanent ones. The uncertainty relating to the design of scientific technologies with a highly innovative content can in fact incentivize spin-offs to undertake forms of collaboration with others operating in the same market context or to engage the users-customers in the design of technologies. Transversal projects therefore generate more integrated inter-organizational forms, reduce environmental uncertainty and are the vehicle for the formation of new skills, often resulting from the innovative recombination of those originally settled in the individual organizational subsystems.

Nonetheless, the external context dynamism implies a more open and flexible vision of the internal tasks. As highlighted by the interviews, the academic manager is a confusing role within a multiplicity of other roles, with indefinite and contingent characters with respect to the specific activity practiced at the moment. Therefore, we assume that university spin-offs are not structured around predetermined tasks or roles, but around interorganizational and interpersonal relationships. This supports the combination of multiple scientific, technological, managerial and market skills that sometimes determine the success of a scientific project or the acquisition of a competitive advantage.

Our study also has relevant implications for the management and policy support of academic entrepreneurship programs. In accordance with Pöhlmann et al. (2020), the managers of university technology transfer offices (TTOs), in the design and implementation of their scouting, coaching, and consulting activities, should assess different strategies according to USOs' peculiarities, distinguishing those having a pronounced market orientation from those aimed at enlarging and deepening researchers' scientific and technological competences (Colombo and Piva, 2012). Moreover, TTOs should provide to USOs' academic members adequate managerial skills for the effective commercialization of products and services. This would imply that TTOs should be more focused on "educating" academic entrepreneurs, making them capable at gaining knowledge and abilities coming from practical backgrounds.

Originality of the study. *This ongoing work is part of the research field on academic business ventures, taking for the first time a micro-foundational perspective to analyze individual-level factors that shape USOs' emerging competences. Particularly, this work tries to bridge a research gap in the USO literature, shedding light on the cognitive processes activated by the organizational actors connected to the transaction from a typically scientific and academic environment to another connected to the logic of the market and the business (Barney and Felin, 2013). Our expected findings also contribute to the general literature on entrepreneurial teams in new ventures and suggest a mean to reconcile some inconsistent results of the literature on academic entrepreneurship. Moreover, exploring the links*

between the USOs and the diverse related-institutional environments allowed us to reconnect the micro dimension, relating the academic entrepreneur skills, to the macro dimension, concerning USOs' socio-economic environment.

Key words: university spin-off; third mission; technology transfer; academic entrepreneurship; organizational capabilities; life-science sector

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Analyzing the signals of academic spin-offs: some insights from Italy

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Objectives. *The number of academic spin-offs has increased considerably over the years (Netval, 2018). Concerning Italy, currently the number of these companies is 1,972 (<https://www.spinoffitalia.it/>). Academic spin offs are well-known examples of the commercial exploitation of academic research (Mansfield and Lee, 1996; Chiesa and Piccaluga, 2000; Leitch and Harrison, 2005; Fini et al., 2009, 2017). These new ventures (mainly registered as “innovative start-ups”) face several typical hurdles of new businesses such as the scarcity of financial resources and the absence of track records to show to third parties (e.g. initial lack of financial statements or first economic results) (Vohora et al., 2004; Sleptsov e Anand, 2008; Sorrentino, 2008; Matricano, 2015).*

Academic spin-offs traditionally can leverage low initial capital endowments and therefore do require external support for their initial growth and subsequent development stages (Troise et al., 2019). As highlighted by Gubitta et al. (2016, p. 368) these companies “operate in a context characterized by marked information asymmetries that limit their chances of obtaining financing”. In this uncertain and challenging scenario, signals about the quality and the potential value of academic spin-offs could play an important role in capturing the attention of third parties and in influencing their judgment on, for example, investment decisions in these companies or their acquisition. Given the frequent absence of initial performance measures or other observable quantitative parameters, academic spin-offs therefore have to resort to other types of information (or alternative indicators of future business performance) (DiMaggio and Powell, 1983; Podolny, 1993)

The signaling theory (Spence, 1973) represents a renowned framework for investigating the observable signals on the quality of the company that can be sent to third parties to reduce information asymmetries and positively influence their investment decision or acquisition process (Cosh et al., 2009; Connelly et al., 2011; Robb and Robinson, 2014).

In the specific case of academic spin-offs, the founders of the company - and in some cases also the Technology Transfer Offices (TTOs) of Universities - are the informed parties that can send signals to the less informed parties to increase their knowledge about the company. The latter may have limited capability to assess the underlying qualities of these initiatives and, at the same time, face high due-diligence costs. In this uncertain scenario, founders of academic spin-offs need to find ways to clearly signal the value of their initiatives to third parties. In these cases, the well-known signaling theory has often been used to explore useful information to alleviate information asymmetry.

Signaling theory is used in many marketing studies to explain the behavior of parties when they have access to different information (Price and Dawar, 2002; Mavlanova et al., 2012, 2016; Troise, 2020).

The characteristics and qualities of academic spin-offs are poorly investigated and their examination deserves further attention (Powers and McDougall, 2005; Van Looy et al., 2011). In the current literature only a few studies focus on this specific type of company through the lens of signaling theory (see among others Gubitta et al., 2016). This represents a relevant research opportunity as these companies are spreading rapidly - thanks to the support of specific government and ministerial interventions - and they need to be valued and promoted appropriately.

The communication of the venture quality, i.e. its attributes useful to increase the knowledge of third parties, is vital for academic spin-offs. Communication represents a factor of significant strategic importance for the TTOs to maximize the impact of research and the outputs of technology transfer outside Universities (Troise and Ferrara, 2018), in particular in specific events such as business plan competitions. At the same time, communication is a key driver for the founders of these new ventures to intercept a large audience.

Studies in the literature that focus on these specific types of companies and analyze their signals are very few. These studies mainly refer to professional investors such as venture capitalists (Wright et al., 2006; Knockaert et al., 2010; Gubitta et al., 2016). The recent advances in the entrepreneurial finance landscape and the advent of new players such as crowdfunding (Block et al., 2018) - in particular equity crowdfunding (Troise and Tani, 2020; Troise et al., 2020a, 2020b) - underline the needs for further investigations and to extend current literature.

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Thus, focusing on a specific type of company, namely academic spin-offs, this research aims to shed some lights on the type of signals that these ventures can send to reduce information asymmetries with third parties in order to fuel their initial growth.

Methodology. For this type of research a qualitative approach was used (Yin, 2017). We conducted 22 semi-structured interviews with entrepreneurs and investors with specific experience in the field of academic spin-offs and innovation. In particular, it is important to underline that the interviews were carried out with entrepreneurs and investors who have already had experience with the specific type of companies examined, i.e. the academic spin-offs of Italian universities. The interviewed group of experts, in fact, is made up of individuals who have invested in this type of companies or - in some cases - they have acquired them.

The interviews focused on open questions related to the main qualities and characteristics that an academic spin-off must possess in order to be of interest to the interviewee, i.e. to increase their knowledge - thus reducing information asymmetries - and positively influence their investment decision or acquisition.

The content of the interviews was transcribed and the main concepts were grouped and divided into categories (Glaser and Strauss, 1967; Gioia et al., 2013). We used the "Gioia method" to examine the qualitative data and present the inductive research (Gioia et al., 2013).

Findings. The inputs provided by the experts revealed interesting indications about the main qualities and characteristics of academic spin-offs that can act as signals. We obtained 5 main groups as described in Table 1: innovation, projections, human capital, certifications and social identity.

The first category identified is "Innovation". Three main elements make up this category, i.e. the characteristics of the product or service offered with the relative advantages over competitors, the innovativity of products or services (compared to already existing solutions), and eventually the experiments in progress and/or the patent assets (Gredel et al., 2012; Hottenrott et al., 2016; Zheng et al., 2010; Lee et al., 2001). The second category, namely "Projections", includes market feasibility and economic / financial forecasts (Michael, 2009). Market feasibility includes aspects such as an examination of the market on both the supply and demand sides, the analysis of competition and the analysis of potential customers; while economic / financial forecasts, on the other hand, provide useful prospects related the future prospects of the company and the related risks. The third category is formed by the "Human Capital". It includes the skills and competences of the founders, their previous experiences, education and background (Levie and Gimmon, 2008; Unger et al., 2011). The last two categories are "Certifications" and "Social identity" respectively. The first is related to awards, loans and grants received by the company (such as awards or grants that derive from specific competitions or public projects) (Lerner, 2000; Jiang et al., 2008), while the second is formed by the mission of the company and its potential social impacts (Tajfel e Turner, 1986, 2001).

Tab. 1: Academic spin-offs: categories of qualities/characteristics

Characteristics - qualities of the academic spin-offs	Categories
Features and advantages of product or service	Innovation
Innovativity of the product or service	
Experimentation and patent assets	
Market feasibility	Projections
Economic - financial forecasts	
Education and background	Human Capital
Skill and competences	
Entrepreneurial experience	
Awards	Certifications
Loans and Grants	
Mission	Social Identity
Values and social impacts	

Source: elaboration of the authors

Research limits. The research has some limitations to underline. The first limitations lies in the qualitative approach used. Even if the study provides new insights, further investigations are needed to assess the relevance of the findings and a quantitative method could further enrich the initial results. The second limitations, which is related to the previous one, refers to the limited number of interviews. As more data become available through new interviews, as well as the implementation of additional secondary data, it will be possible to extend the current research. The third limitation is represented by the context. The interviewees had experiences with academic spin-offs in the Italian context, i.e. born from universities of this country. Therefore, our study provides useful insights mainly for founders and TTO in Italy. Probably, in order to extend the results, the research will also need confirmation from foreign investors and the study will have to be replicated in other contexts. This last aspect, i.e. the extension of the research to further contexts, represents a strong and interesting opportunity for future research. Eventually, the study does not offer distinctions

between the different types of investors. As previously anticipated, the rise of new systems (for example the different crowdfunding models) requires more in-depth examination. In sum, future studies should address these limitations by further extending the data sources and sample, especially in new contexts, and by providing new insights based on quantitative or mixed methods.

Practical implications. The study offers useful implications for several actors and in particular for the founders of academic spin-offs and the TTOs of universities. The study highlights some types of signals that the founders of academic spin-offs and the management of TTOs could carefully consider to increase the interest of third parties for these companies and reduce information asymmetries towards less informed parties. In particular, by leveraging these signals, the two actors could better promote academic spin-offs and provide observable and useful information related to the quality of these companies.

The findings of the research can play an interesting role especially when considered within the innovation ecosystem that surrounds university technology transfer activities. Currently, universities are increasingly involved in promoting their spin-offs and patents, and frequently both founders of academic spin-offs and TTOs proactively participate in specific events related to the valorization of research results (Huffman e Quigley, 2002; Siegel et al., 2003; Thomas et al., 2014; Siegel and Wright, 2015; Watson et al., 2018). For example, some events that periodically see their active participation are the business plan competitions (e.g. the regional Start Cups), the innovation fairs (e.g. Tech Share Day, and Innovagorà), and the specific meetings to foster contacts between the world of university research and the main stakeholders (e.g. Borsa della Ricerca). On these occasions, spin-offs founders and TTOs present the academic spin-offs through specific marketing sheets. In light of the importance of the signals that emerged in this study, the five categories of characteristics and qualities (i.e. innovation, projections, human capital, certifications and social identity) could be appropriately highlighted in these sheets and - at the same time - they could be widely disseminated through social networks and the institutional website. Hence, our results could also enhance universities communications strategies (as well as improving those of founders and TTOs in general). A potential “showcase” within the institutional sites could facilitate the meeting with interested third parties and increase the academic spin-offs visibility and credibility (Vohora et al., 2004; Sorrentino, 2008). To date, such dedicated spaces in universities are absent or underdeveloped (sometimes preferring only the presentation of patents). Universities could thus encourage founders to show the key characteristics/qualities in their presentations and to update information provided in the main communication channels.

Originality of the study. The research enriches the current literature and offers interesting insights. First, it provides useful categories of signals that academic spin-offs can leverage to increase their impact on third parties as well as to improve the knowledge of the less informed actors. Second, this study could provide a contribution to the emerging literature that explores marketing or communications for new ventures and entrepreneurship in universities. In this sense it contributes to these emerging debates by focusing on academic spin-offs. Third, the findings of the study may represent an opportunity for spin-off founders and TTOs to implement new actions related to the diffusion of research results and to communicate the main characteristics/qualities to other stakeholders. The study contributes to the debate on the importance of signals in the field of new ventures, in this specific case companies born within universities. In light of the numerous activities related to technology transfer that have distinguished Italian universities in recent years, this study is particularly topical and has potential practical and managerial applications in many universities.

Key words: Academic spin-offs; Universities; Signaling theory; Technology transfer offices; Entrepreneurship; Investors

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Students' entrepreneurial intentions in the Covid era: balancing leadership and innovation aptitudes for sustainable entrepreneurship

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Objectives. *Entrepreneurship is an essential driver of societal health and wealth (GEM, 2020) because it enables benefits to economies, such as greater competitiveness, innovation to markets, exploitation of new opportunities, creation of new jobs and support to the employment rate (Shane and Venkataraman, 2000; Zhao et al., 2005; Cubico et al., 2010). Moreover, from a personal standpoint, entrepreneurship is connected to the prospective of a meaningful career, and opportunities of personal and economic development (Fritsch and Müller, 2004; Kuckertz and Wagner, 2010). The emerging stream of research on sustainable entrepreneurship (Dean and McMullen, 2007; Wagner, 2012) suggests that benefits are not limited to an economic dimension, but that entrepreneurship for sustainable development offers potential contribution to environmental problems and social welfare, creating value that produces economic prosperity, social cohesion and environmental protection (Shane and Venkataraman, 2000). In other words, sustainable entrepreneurs are willing to and capable of balancing economic wealth, environmental preservation and social equity from a triple bottom line perspective (Hooi et al., 2016).*

Considering the advantages related to entrepreneurship, scholars have long since begun to study the factors that lead individuals to become entrepreneurs and how their intentions to start or own a business are formed (Krueger et al., 2000). The literature on entrepreneurial intentions has rapidly grown since the early nineties (for a review see Liñán and Fayolle, 2015), until more recent studies that include drivers, antecedents and intentions for sustainable entrepreneurship (Kuckertz and Wagner, 2010; Schaltegger and Wagner, 2011; Vuorio et al., 2018; St. Jean and Labelle, 2018).

Within this stream of research, consistent attention has been paid to students (Lüthje and Franke, 2003; Zhao et al., 2005; Souitaris et al., 2007; Kuckertz and Wagner, 2010; Wagner, 2012), given that they are about to choose their jobs and make their career commitment (Super, 1980). Although career decision making, and entrepreneurial decision making, can happen at any age, university students are obviously faced with their future career (Harren, 1979). The GEM findings (GEM, 2009) also indicate the appropriateness of studying students' samples, given that students' orientation towards entrepreneurship for sustainable development should be more pronounced compared to the general adult population (Wagner, 2012).

Previous literature has shown that both personal and contextual factors influence the development of entrepreneurial intentions, choices and even business success (Baum et al., 2007). Entrepreneurs are characterized by specific psychological traits, such as risk-taking propensity, self-efficacy, need for achievement, innovativeness, autonomy, optimism, locus of control, creativity, passion and leadership (Lee et al., 2004; Zhao et al., 2005; Zhao and Seibert, 2006; Rauch and Frese, 2007; Antonakis and Autio, 2007; Cardon et al., 2009).

Among personal traits, previous studies examining employees and entrepreneurial profiles have also highlighted the key role of individual aptitudes towards entrepreneurship (Silzer and Church, 2009; Stemler and Sternberg 2013). Aptitudes are individual capacities to acquire competence or skill through training (APA, 2009), and entrepreneurial aptitudes can be described as the potential toward creating and developing enterprise and self-employment (Cubico et al., 2010). The entrepreneurial aptitude test (TAI) is well-established instrument to identify and describe individual potential for becoming self-employed or entrepreneur (Favretto et al., 2003a;). The instruments dates back to the 90s and in its reduced version (Cubico et al., 2010), the TAI includes 23 items referring to five factors or dimensions,

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namely: leadership, self-capability, innovation, problem solving and goal orientation. Many studies (Favretto et al., 2003b; Favretto et al., 2007a; 2007b; Cubico et al., 2008; Cubico et al., 2010) have adopted the TAI to successfully analyze entrepreneurial aptitudes of different samples of the population such as: entrepreneurs who started a business and non-entrepreneurs, seniors and juniors, students and workers. According to the predictive validity of this instrument, it is possible to argue that:

HP1: There exists a positive relation between individual entrepreneurial aptitudes and entrepreneurial intentions.

With respect to the more recent stream of research on entrepreneurship for sustainable development, it is important to consider also an individual's orientation toward sustainability and sustainable entrepreneurship (Schaltegger, 2002; Schaltegger and Wagner, 2011; Wagner, 2012). Since sustainable entrepreneurship may offer a solution to social and environmental problems, it is important that future entrepreneurs display a strong individual orientation toward sustainability and sustainable entrepreneurship. Previous literature has already found a positive relation between students' entrepreneurial intentions and their sustainability orientation, in terms of being oriented toward sustainable entrepreneurship (Kuckertz and Wagner, 2010). Similarly, another study reports that university students' positive attitudes toward sustainability have a positive impact on their sustainable entrepreneurship intentions (Vuorio et al., 2018). In other words, students that display a strong commitment to environmental preservation are also more willing to become sustainable entrepreneurs. Interestingly, Wagner (2012) found that students' sustainability orientation is positively associated with some business ideas related to sustainable development, but negatively associated with students' entrepreneurial intentions. According to the Social Cognitive Career Theory (Lent et al., 2002), an individual has greater motivation to accomplish a task when a) he believes that the outcome is valuable, b) he believes that his actions will contribute to achieve the outcome, and c) he has the necessary capabilities to accomplish that task. In other words, when people value environmental preservation, they may consider sustainability as instrumental in achieving the outcome of becoming a sustainable entrepreneur. In another study on students' entrepreneurial intentions, St. Jean and Labelle (2018) found that the positive relation between sustainability orientation and entrepreneurial intention was even stronger for those who believe in the instrumentality of entrepreneurship, namely the idea that entrepreneurship can improve society in different ways, such as having a more fair and balanced society, increased people autonomy and dignity, reduced suffering, etc. (St. Jean and Labelle, 2018). Based on these reasonings, we posit that:

HP2a: There exists a positive relation between individual orientation toward sustainable entrepreneurship and entrepreneurial intentions.

HP2b: There exists a positive relation between instrumentality of entrepreneurship and entrepreneurial intentions.

Over time, contextual and environmental factors have been integrated to personal characteristics to explain the development of entrepreneurial intentions (Baum et al., 2007). These contextual factors include, among others, family characteristics and expectations, perceived social and institutional support, perceived barriers to entrepreneurship (Steele, 2004; Lüthje and Franke, 2003), as well as the level and quality of education and training on business, job placement and entrepreneurship (Zhao et al., 2005; Soitutaris et al., 2007; Kuckertz and Wagner, 2010). Individuals that received formal learning on entrepreneurship in their academic activities are generally given the opportunity to observe successful business models, they are exposed to entrepreneurs' lectures and case studies, and therefore are expected to display higher levels of entrepreneurial self-efficacy (Zhao et al., 2005). For these reasons, it is possible to argue that:

HP3: There exists a positive relation between received training on entrepreneurship and entrepreneurial intentions.

Finally, the current economic uncertainty is a contextual factor that cannot be overlooked when analyzing entrepreneurial intentions. On 11 March 2020, the WHO officially declared Covid-19 as a universal pandemic (WHO, 2020), and almost each and every country in the world has had to - and is still - facing multiple challenges. The Covid-19 pandemic represents not only an epidemiological crisis, but it has severe economic and psychological consequences (Mahmud et al., 2020). The outbreak of the Covid-19 has resulted in an unprecedented challenge to industries and economies worldwide (OECD, 2020). Many people lost their jobs, the global demand for products has plummeted, economy is shrinking worldwide, and current and future workforce is obviously getting anxious about their career (Mahmud et al., 2020). Anxiety, which is defined as a state of mental feeling of tension and worries about the future (Banerjee, 2020) clearly influences career development and plays a key role in career decision making (Chang, 2011; Tsai et al., 2017). Hence, there is reason to believe that future career anxiety has a negative impact on the decision to become entrepreneur in the current economic uncertainty.

HP4: There exists a negative relation between future career anxiety related to the outbreak of Covid-19 and entrepreneurial intentions.

Methodology. The research is conducted through an online survey, which is part of a wider research project dealing with entrepreneurial intentions. For the purpose of this preliminary step of the research, only some variables are taken into consideration, and mainly: entrepreneurial intentions, entrepreneurial aptitudes, received training on entrepreneurship, sustainable entrepreneurship orientation, instrumentality of entrepreneurship and future career anxiety due to the outbreak of Covid-19.

Entrepreneurial intentions were measured using a 6 items scale, (My professional goal is to become an entrepreneur), similar to the operationalization of Lüthje and Franke (2003) and Kuckertz and Wagner (2010). The scale possesses excellent internal reliability and Cronbach's $\alpha = .96$.

Entrepreneurial aptitudes were assessed using the reduced version of the TAI (Cubico et al., 2010) which includes 23 items belonging to 5 dimensions, namely: Leadership (At work I feel I can command others); Self-capability (Since I

am a skilled and competent person, I continually succeed in my work); Innovation (I am attracted and stimulated above all by the new); Problem-solving (I solve problems thanks to my creativity); and Goal orientation (In order to reach an objective that I consider important, I am willing to use all the means at my disposal). Also this scale displays good internal reliability and Cronbach's $\alpha = .88$.

Individual training on entrepreneurship was assessed through 2 items, referring to training and education on job placement in general and training on entrepreneurship in particular. In this case Cronbach's α is lower (.76) but still acceptable (Nunnally, 1978).

Sustainable entrepreneurship orientation was measured using a 6 items scale proposed by Kuckertz and Wagner (2010) and further replicated by St. Jean and Labelle (2018) (I think that entrepreneurs and companies need to take on a larger social responsibility). Internal reliability is adequate and Cronbach's $\alpha = .81$.

Instrumentality of entrepreneurship was measured through a single question aimed to understand if respondents believe that entrepreneurship allows social improvements such as having a fair and balanced society, increased people autonomy and dignity, reduced suffering, etc. (St. Jean and Labelle, 2018).

Future career anxiety due to the outbreak of Covid-19 was measured using a 5 items scale originally developed by Tsai et al., (2017) in order to assess students' future career anxiety and further adopted by Mahmud et al. (2020) after the outbreak of the pandemic (I worry about future employment because of a potential economic recession due to the outbreak of COVID-19). Internal reliability is excellent and Cronbach's $\alpha = .93$.

All questions were presented using a 5 point Likert scale ranging from 1 - strongly disagree to 5 - strongly agree. The questionnaire was pre-tested to ensure that scales were valid and reliable, and that they could be well understood by respondents and preliminary data were collected during October-December 2020, during the second wave of the pandemic.

The actual sample includes 103 complete questionnaires. The majority of respondents are female (87%), the average age is 26, with minimum age of 20 and a maximum of 54; almost all respondents are Italian (97%), and 3% comes from other countries, although living and studying in Italy. The sample is made of both students (67%) and working students (33%).

Due to limited sample size, descriptive statistics and correlations were deemed as appropriate analysis technique in this preliminary step of the research.

Findings. The data collected so far, although part of a work in progress, show rather interesting results.

Respondents display quite low entrepreneurial intentions (INT); on average they do not have benefitted adequate levels of formal training on entrepreneurship (TRA); and their overall entrepreneurial aptitudes (TAI) are around the midpoint of the scale ($=3$). However, considering the different dimensions of entrepreneurial aptitudes separately, important distinctions should be made, since rankings vary from 4.25 for item: We should have the spirit of children, always attracted by new things that appear in the environment that surrounds them (Innovation), to 2.47 for item: At work I feel I can lead others (Leadership). Respondents display a strong orientation toward sustainable entrepreneurship (SEO), and, on average, they agree with the idea that entrepreneurship can allow societal improvements (IoE). Lastly, respondents do not display high levels of anxiety about their future career, despite the outbreak of the Covid-19 pandemic (FCA). Main descriptive statistics are reported in Table 1.

Tab. 1: Descriptive statistics

Variable	Mean	SD
INT	2.12	1.20
TAI	3.15	1.01
TRA	2.49	1.18
SEO	4.03	0.91
IoE	3.88	0.91
FCA	3.17	1.26

Source: authors' elaboration

The correlation matrix shows that entrepreneurial intentions display mixed results with respect to entrepreneurial aptitudes. In particular, significant positive correlations between intentions are found only with some aptitudes that belong to the factor Leadership, such as: I enjoy taking on leadership roles (.315, $p < 0.05$). HP1 is only partially supported by the data. Some significant and negative correlations emerge between entrepreneurial intentions and sustainable entrepreneurship orientation, e.g.: I think that entrepreneurs and companies need to take on a larger social responsibility (-.308, $p < 0.05$). No correlations were found with the instrumentality of entrepreneurship. Future entrepreneurs do not seem to be concerned about actual environmental challenges and nor to conceive entrepreneurship as a way to allow environmental and social improvements. HP2a and HP2b therefore cannot be supported. Entrepreneurial intentions are significantly but weakly correlated with received formal training on entrepreneurship (.228, $p < 0.05$), hence HP3 is only weakly supported. Lastly, no correlations were found between future career anxiety due to the outbreak of the Covid-19 and the intention to become entrepreneur. According to these results, the current economic depression plays no role in shaping students' career decision making and HP4 cannot be supported. The verification of research hypotheses is shown in Table 2.

Tab. 2: Hypotheses verification

Variables	Correlation	Hypotheses
INT → TAI	Mixed	
INT → TAI - Factor Leadership	Positive	1: Partially confirmed
INT → SEO	Negative	2a: Not Confirmed
INT → IoE	None	2b: Not confirmed
INT → TRA	Positive	3: Confirmed
INT → FCA	None	4: Not confirmed

Source: authors' elaboration

The analysis of the data, however, provides other interesting findings besides the research hypotheses. The correlation matrix shows some significant and positive correlations between respondents' orientation toward sustainable entrepreneurship (The environmental performance of a company will in future be considered more and more by financial institutions) and their received training on entrepreneurship (.390, $p < 0.001$), meaning that the more students are educated and trained about business environment and entrepreneurship, the more they are aware about the potential sustainable implications of entrepreneurship. This reasoning is further supported by the fact that received training on entrepreneurship is also significantly, however weakly, correlated with the instrumentality of entrepreneurship (.264, $p < 0.05$). Interestingly, sustainable entrepreneurship orientation and instrumentality of entrepreneurship are also correlated with entrepreneurial aptitudes that belong to the factor Innovation, such as: We should have the spirit of children, always attracted by new things that appear in the environment that surrounds them (.381, $p < 0.005$). These additional results are reported in Table 3.

Tab. 3: Additional results

Variables	Correlation
SEO → TRA	Positive
IoE → TRA	Positive
SEO → TAI - Factor Innovation	Positive
IoE → TAI - Factor Innovation	Positive

Source: authors' elaboration

Research limits. The present research is still a work in progress, and several limitations can be listed. First, the limited sample size and the limited scope of the analysis do not allow for generalization of results. Moreover, the sample simultaneously considers both students and working students and respondents belong to a narrow group of few university departments (mainly law, social sciences, humanities, and physical therapy). Further steps of the research should consider students from other university courses, such as business administration, or compare different results among respondents' subsamples (e.g. student, workers, working students).

Practical implications. The data collected so far, although being limited in size and scope, open the way to interesting research opportunities. Our findings reveal a future entrepreneurial profile that, unfortunately, is not sufficiently committed to environmental preservation, to a sustainable interpretation of entrepreneurship, nor that believes in the idea that entrepreneurship can allow improvements from environmental and social perspectives. However, according to this profile, future entrepreneurs display strong leadership aptitudes and are not afraid to get involved and attempt an entrepreneurial career despite the uncertain economic scenario we are facing at the moment.

On the other hand, findings provide evidence that orientation toward sustainability and sustainable entrepreneurship are more prerogative of those with an aptitude for innovation and creativity. These findings are more encouraging, since clearly sustainable development requires innovation, and sustainable entrepreneurs can make substantial environmental progress thanks to their innovative solutions (Schaltegger and Wagner, 2011). Research on sustainable entrepreneurship (Weitzel et al., 2010) has already highlighted the distinction between business and creative talents of entrepreneurs, providing evidence for the key role of creativity in pursuing productive, rather than destructive, business opportunities.

Considering these preliminary results, several practical implications can be outlined. First, there is a need for improving education and formal training on entrepreneurship in general and on sustainable entrepreneurship in particular. In line with previous research (Zhao et al., 2005), students that are exposed to adequate learning on entrepreneurship display higher entrepreneurial intentions, but in addition to that, present findings show that formal training is related to students' development of sustainability orientation and contributes to reinforce the idea that entrepreneurship can benefit society from a triple bottom line perspective.

Moreover, previous research has reported that both leadership and innovation are important aptitudes of successful entrepreneurs (Cubico et al., 2010). Although aptitudes are the capacities to acquire a competence or a skill through

training, and not the competence itself, training and education are nevertheless necessary for the exploitation of individual aptitudes.

Originality of the study. Although a work in progress, this research offers interesting potential contributions to the streams of literature dealing with entrepreneurial intentions, sustainable entrepreneurship, and students' career development. First, previous research has stressed the importance of improving and integrating the TAI with multidisciplinary models (Cubico et al. 2020) and this study is actually the first attempt of combining this useful tool with sustainable entrepreneurship and respondents' orientation toward sustainable development. In this regard, preliminary findings are interesting in that they highlight important distinctions between leadership and innovation aptitudes in the context of sustainable entrepreneurship. Second, the study aims to replicating and validating the link between students' sustainability orientation and their entrepreneurial intentions, in a cultural context different from Germany (Kuckertz and Wagner, 2010) and France (St. Jean and Labelle, 2018). Moreover, this research further reinforces the idea (Baum et al., 2007) that both personal and contextual factors influence the decision of becoming entrepreneur. The former has been examined as entrepreneurial aptitudes and individual orientation toward sustainable entrepreneurship; the latter in terms of received formal training and perceived contextual barriers. This research goes one step further by incorporating into contextual factors the existing economic downturn due to the outbreak of the pandemic. Lastly, a positive and hopeful meaning of the research is that future entrepreneurs do not fear too much for their upcoming career, despite the current uncertain environment. This represent a significant result that gives us hope for the best.

Key words: Entrepreneurial intentions; sustainable entrepreneurship; entrepreneurial aptitudes; sustainability orientation; students; future career anxiety.

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Entrepreneurial intention among students: a bibliometric review and an empirical analysis

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Objectives. *Student entrepreneurship has received growing attention from many international scholars (Tomy & Pardede, 2020; Anjum et al., 2021). Within this abundant and recent literatures, some have investigated the role of external factors, such as the environment and the ecosystem of innovation (Anzivino et al, 2020); others have studied academic contexts in-depth, acknowledging their relevance in creating the right context for student entrepreneurship (Grimaldi et al., 2011). Others have focused on micro factors such as personality traits, locus of control and personal values (Bienkowska-Klofsten, 2012). However, despite the relevance of the phenomenon, both in the academic literature and among practioners, no recent analysis offers a literature perspective on student entrepreneurship. Thus, this paper aims to systematize the scientific production published to date in the business and management fields. Moreover, policy makers and practitioners could find the overview as a useful baseline for fostering the development of an entrepreneurial university and addressing its technological, managerial, and organizational implications. In this vein, a bibliometric analysis has been conducted to answer the following research questions:*

RQ1. How has the business and management literature addressed the evolution of student entrepreneurship?

RQ2. What are the possible future trends for research on student entrepreneurship within the business and management research fields?

Bibliometric analysis represents an appropriate solution to achieve these objectives since it empowers scholars to identify a discipline's most influential studies and relevant scientific activities (Merigò et al., 2015). Hence, it can become important to understand the role of the territorial context, both as regards regional policies on entrepreneurship and the determination of the scenario in which students operate (Salomaa, 2019; Pugh et al., 2018; Budyldina, 2018). Thus, stemming from the bibliometric analysis, we attempt to answer another research question:

RQ3. Which are the main factors that impact on EI in developing regions?

Thus, we propose an empirical assessment by investigating the impact of different key factors, on student Entrepreneurial Intention (EI) in an Italian developing Region (that is Calabria).

Methodology. *We propose a literature review with a bibliometric analysis, to detect the main studies on the topic of student entrepreneurship and identify future emerging research trends. Bibliometric analysis allows to identify changes both in terms of number of published articles and content, within the research on student entrepreneurship, and offer state of the art research, providing useful information for those carrying out scientific activities. Specifically, we propose a Bibliographic Coupling that occurs when a reference is used by two articles as a coupling unit between these two articles (Kessler 1963) and the intensity of the strength of the Bibliographic Coupling depends on the number of references that the two articles have in common (Egghe & Rousseau, 1990). Our analysis has four main steps: First, for this research we used the "Scopus" database as it covers 20,000 main journals. It is also widely used in the field of entrepreneurship to examine a collection of articles (Ferreira, 2018). The second one 'Identification of keywords' were "student" and "entrepreneurship" with the aim of identifying all articles related to the topic of student entrepreneurship. Moving to 'the selection of documents, we considered articles published in English, to ensure international relevance, published in the last ten years (2010-2020), which refer to the managerial area to focus the analysis object only on student entrepreneurship. In the last one, we selected the "VosViewer" software (Van Eck et al., 2010). Through these passages we have selected 1,812 articles, which filtered for a minimum of 4 citations of a document, result in 773 articles. Subsequently, each author independently researched and classified the article*

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abstracts primarily by identifying the keywords for each article; finally, the researchers discussed together and defined five main clusters:

- Cluster 1: Entrepreneurial intentions
- Cluster 2: Personal Characteristics
- Cluster 3: Entrepreneurial education
- Cluster 4: Competence building and soft skills
- Cluster 5: The role of the ecosystem

The bibliometric analysis suggests the identification of 5 cluster and several factors that have an impact on the probability to develop EI. More concretely, stemming from the bibliometric analysis' results, we identified some micro factors that can influence the EI of students (Table 1):

Tab. 1: The cluster and the related factors

CLUSTER	RELATED FACTORS
Cluster 1	Individual creativity refers to the need to create something new (Engle, Mah, and Sadri, 1997).
	Locus of control refers to the believe of entrepreneur who has the ability to affect the success or failure of his venture (Brockhaus, 1975; Ahmed, 1985).
	Needs for achievement that is an individual's desire for significant accomplishment, mastering of skills, control, or high standards (Hansemark, 2003).
Cluster 2	Demographics variables. They are often associated with the male rather than the female gender Gupta et al. (2009).
Cluster 3	Self-efficacy refers to "people's beliefs about their capabilities to exercise control over their own level of functioning and over events that affect their lives" (Bandura, 1992).
Cluster 4	Openness to experiences of individuals can be explained with unconventional and innovative behavior (Van Auken, 2013).
	Conscientiousness considers the level of organization, precision, attention, and efficiency (Gosling et al, 2003).
	Nevroticism that represents emotional stability and different propensity to adapt (Gosling et al, 2003).
	Extroversion in terms of people who tend to settle within groups, seeking for stimuli (Gosling et al, 2003).
	Personal values like "selfish" or "altruistic" orientation (Vuorio et al, 2018). There is also a scale of values and at the same time there are several expressions of the self-concept, therefore values are in a trade-off with personal priorities.
	Environmental responsibility (Qazi et al., 2020) refers to the attention to the environment.
	Family environment (Falck et al, 2012)
	Educational system (Duval and Couetil, 2013)
Cluster 5	Ecosystem and innovation and entrepreneurial infrastructures (Mowery and Ziedonis, 2002)

Source: authors' elaboration

Thus, stemming from the results of the bibliometric analysis, we attempt to propose an explorative analysis to investigate the effect of some key factors on EI. The empirical analysis has the aim to analyze the effect of some key factors on the EI of a sample of university students belonging to University of Calabria. In particular, we sent a structured questionnaire to all the population of students attending University of Calabria in the academic year 2019/20. We get 162 replies from students attending bachelor, masters and PhD programs. The aim was to identify a structure underlying all the observed variables, which were assessed by respondents on Likert 7-point scales, expressing the degree of agreement and disagreement with respect to some statements. The first question asked to the interviewees concerns the EI, coherently with the cluster 1: intention to start a new business; going to become an entrepreneur, going to develop a business idea that is currently in an embryonic state, going to grow a family business (Rueda et al., 2015). The questionnaire takes into consideration the personal characteristics of students, their aspirations and the role they intend to play in 5 years. The educational path was also investigated, as well as participation in business plan competitions, considering them as important factors in determining whether they encourage respondents to build new business activities. As regards entrepreneurship courses, respondents were asked to identify the type of course followed, in order to investigate which, type of courses most influence the student's intention. Respondents were asked if they studied or worked abroad; if they had a reference teacher within the university context; if they had ever attended religious associations and if they had ever held a role of responsibility within those associations if they had ever practiced an individual or team sport. As suggested by the previous literature, the propensity to build an entrepreneurial activity can also be conditioned by the ecosystem and by the family background. There are purely demographic variables such as gender, age, educational qualification, degree course, academic year, as well as the place of birth, the province of birth, the place of residence and the province of residence.

Factor Analysis. The Exploratory Factor Analysis is used to obtain a reduction in the complexity of data, resulting from the questionnaires administered. The first index that is taken into consideration is the KMO index, which is constructed by comparing the correlation coefficients with those of partial correlation. This ratio varies between 0 and 1 and the model obtained has a KMO index of 0.7, at the significant level of 0.000. The second value taken into

consideration is the Bartlett Sphericity Test, which is used to test the hypothesis that the correlation matrix is an identity matrix. The significance of this test is 0.000, so we can conclude that the model is adequate. (Table 2).

Tab. 2: KMO & Bartlett's Test Factor Analysis

KMO Test & Bartlett	r	
KMO Test		0,700
Bartlett Sphericity Test	Chi-square	2659,197
	df	703
	Sig.	0,000

Source: authors' elaboration

Therefore, analyzing the factors in this research model is appropriate. After studying the Eigenvalues table and the Extraction Sums of Squared for the dependent variable, the results showed that the total value of extracted variance = 69.987% > 50%, so the study confirms that the extracted variance is satisfactory, and these 12 groups of factors explain 69.987% of the data variation (Table 3).

Tab. 3: Eigenvalues table

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of variance	% cumulative	Total	% di varianza	% cumulativa
1	5,798	15,257	15,257	4,250	11,185	11,185
2	4,014	10,564	25,820	3,825	10,065	21,250
3	3,314	8,722	34,542	2,753	7,246	28,496
4	2,429	6,393	40,936	2,381	6,267	34,763
5	1,916	5,041	45,977	2,122	5,584	40,346
6	1,643	4,324	50,300	1,926	5,070	45,416
7	1,540	4,053	54,354	1,870	4,921	50,337
8	1,367	3,596	57,950	1,843	4,850	55,187
9	1,354	3,564	61,513	1,508	3,967	59,154
10	1,137	2,992	64,506	1,436	3,779	62,933
11	1,056	2,780	67,286	1,399	3,680	66,613
12	1,027	2,701	69,987	1,282	3,374	69,987

Extraction Method: Principal Component Analysis.

Source: authors' elaboration

The factorial analysis extracted 12 factors, which were assigned a name based on the variables related to them:

- **Factor 1: Entrepreneurial Education (EE).** It summarizes all the items related to the student's educational background. These variables express the perceptions about the skills gained through entrepreneurial courses and activities.
- **Factor 2: Personal Value (PV).** It summarizes the variables that express the set of values of an individual, in particular the importance of the social and environmental impact of a business activity.
- **Factor 3: Family Background (FB).** It summarizes all the opinions declared regarding to the family context, in particular the importance that it has in the student's decisions.
- **Factor 4: Neuroticism (NEV).** It summarizes the set of variables that affect the personality; in particular they express the degree of nervousness, anxiety and moodiness.
- **Factor 5: Conscientiousness (CON).** It summarizes the set of items that concern the organization, the hard work and the sense of responsibility.
- **Factor 6: Need of Achievement (NoA).** It summarizes the variables that express the subject's desire to be more independent.
- **Factor 7: Extroversion (EX).** It summarizes inside the variables that express both the trait of friendship, the level of understanding and courtesy and the extroversion.
- **Factor 8: "Open-mind (OM)".** It summarizes the variables that concern openness to new experiences. Therefore, the factor will be called;
- **Factor 9: Self-efficacy (SE)".** It summarizes the variable "I only trust myself in achieving a task".
- **Factor 10: External locus of control (ELC).** It summarizes the statements concerning the attribution of a consequence to external and non-subjective causes.
- **Factor 11: Creativity (CR).** It summarizes a single variable that expresses the degree of creativity of the individual.
- **Factor 12: Non-Environment responsibility (NAR).** It summarizes the statement "business activities should not take into consideration the environment".

Linear Regression. Once an acceptable factor model solution is reached, the factor scores are saved and used as input for the linear regression. The linear regression studies the dependence of the EI on the factors that emerged in the factor analysis. The coefficients of the regression line describe the variability of the dependent variable explained by the independent variables, which are represented by the factors. The linear regression model considers as dependent variable the EI and as independent variables it keep all the factors listed above and it is represented as below:

$$EI = \alpha + \beta * EE + \beta * PV + \beta * FB + \beta * NEV + \beta * CON + \beta * NoA + \beta * EX + \beta * OM + \beta * SE + \beta * ELC + \beta * CR + \beta * NAR + \varepsilon$$

Findings.

Descriptive statistics

The descriptive statistics of the sample show that the 50% of the students are female and male; the average age is 26 years old. The sample is made up of 15.4% of students with a high school diploma; about 44% of the individuals have a bachelor's degree, 32% have a master's degree, 1.2% of students took a specialization course and 7.4% have a PhD. Almost the 35% of students belongs to Business Administration disciplines, the 15,4% studies Economics, the 38% studies in the Scientific disciplines and the 12% of students belongs to Management Engineering. Almost the 19% of students have a self-employed father and only the 15,4% is an entrepreneur. Regarding to the employment of the mother, the highest percentage of the women is unemployed, with a percentage of 32%, followed by the 29,6% which is employed. Only the 7% of the mothers started a business independently. The 14,2% of students have participated to Business Plan (BPC) in the province of residence and only the 28% of students have participated to BPC at the University of Calabria. The 16% of students attended to entrepreneurship courses provided by the University TTO and only the 37% of the sample showed interest in patenting. The descriptive statistics show that the 34% of students aspire to the role of manager, followed by 17.9% of the students who intend to become a researcher. The 15.4% aspire to become an employee in a firm, the 6.8% desires to become an entrepreneur; the 6.2% wants to become a freelance professional and the 3.7% a teacher. A number of 22 subjects, equal to 13.6%, are uncertain about the future and cannot identify their future career yet. Therefore, the percentage of subjects who intend to build a business in the future is very low. The study also focuses on personal life experiences, such as playing a sport and religious beliefs. In particular, respondents were asked to indicate if they have ever played a sport, if they have ever practiced it at a competitive level, the type of sport and if they have ever played a team leader role. What emerged is that 92% of the respondents played sports and the 44% at a competitive level. The 53.7% of the sample practiced an individual sport, the 65.4% of students practiced a team sport. Only 32% of respondents played a leading role in a team sport.

Bivariate analysis

Bivariate analysis was conducted on pairs of variables, in order to study some relationships of particular interest. T-tests and the One-way anova were conducted in order to assess the relationship between the EI and qualitative variables; the correlation analysis was conducted between the EI and quantitative variables and the crosstab analysis was conducted between qualitative variables. On average, the individuals who are aware of entrepreneurship programs organized in their province of residence have an EI of 5.08 on a scale of 1 to 7. The difference with subjects who are not aware of these programs is 1.272. The students who participated in a BPC in their province of residence have an EI of 4.83 on a scale of 1 to 7 and the difference with the subjects who did not participate is -0.840. On average, the individuals who participated in a BPC in their university have an EI of 4.58 on a scale of 1 to 7. The difference with the subjects who did not participate is -0.655. The ones who participated in entrepreneurship courses in their university have an EI of 4.81 on a scale from 1 to 7. The difference with the subjects who did not participate is -0.915. Those who participated in entrepreneurship courses at the TTO have an EI of 4.92 on a scale from 1 to 7; the difference with the subjects who did not participate is -0.975. Students interested in patenting have an EI of 4.50 on a scale of 1 to 7 and the difference with those who have never been interested is -0.627. Finally, women have an EI of 3.69 on a scale of 1 to 7. The difference with men is 0.827. The analysis of the differences between the means of the quantitative variable "Do you intend to build a business" in the observation groups defined by the qualitative variables has produced one statistically significant result. The students whose mother is a teacher have more EI than the ones who have a mother unemployed. The students who participate the most in Business Plan Competitions are business administration students (17 individuals), followed by Industrial Engineers (14 individuals) and then by Scientific Degree students (9 individuals). Among the Economics students there were only 5 subjects who participated in a Business Plan Competition. The analysis of the correlations between the EI and the quantitative descriptive variables did not produce statistically significant results.

The linear regression model considers as dependent variable the EI and as independent variables it keep all the factors listed above. The variability of the dependent variable explained by the regression model (R-squared) is equal to 0.595, approximately 60%. This result indicates that 60% of the variability of the EI of the students of the University of Calabria is explained by the 12 factors included within the regression model. The following table shows the F test conducted on the coefficients associated with the independent variables of the model (Table 4).

Tab. 4: R-squared Linear Regression Model and F-test

Model	R	R-squared	Adjusted R-squared	Standard Error	F	Sig.
1	,771 ^a	0,595	0,562	1,233	18,239	,000 ^b

- a. Predictors: (constant), Entrepreneurial Education, Personal Value, Family Background, Neuroticism, Conscientiousness, Autonomy, Extroversion, Open-mind, Self-efficacy, External Locus of Control, Creativity, Non environment responsibility
- b. Dependent variable: Entrepreneurial Intention.

Source: authors' elaboration

Below there is the table with the non-standardised and standardised coefficients associated with each factor and the significance level of each beta.

Tab. 5: Standardised and non-standardised coefficients- Linear Regression Model

Variables	Non-standardised coefficients		Standardised coefficients		
Entrepreneurial Intention	B	Standard error	Beta	t	Sig.
(Costant)	4,105	0,097		42,376	0,000
Entrepreneurial Education	0,869	0,097	0,466	8,939	0,000
Personal Value	0,306	0,097	0,164	3,152	0,002
Family Background	0,200	0,097	0,107	2,061	0,041
Neuroticism	0,040	0,097	0,022	0,415	0,679
Conscientiousness	-0,077	0,097	-0,041	-0,792	0,429
Need of Achievement	1,023	0,097	0,549	10,525	0,000
Extroversion	0,082	0,097	0,044	0,848	0,398
Open-mind	0,189	0,097	0,101	1,944	0,054
Self-efficacy	0,222	0,097	0,119	2,284	0,024
External Locus of Control	0,063	0,097	0,034	0,653	0,515
Creativity	0,170	0,097	0,091	1,749	0,082
Non environment responsibility	-0,010	0,097	-0,005	-0,100	0,920

Source: authors' elaboration

The empirical analysis suggests that some personal factors, like personality traits, subjective values of each individual, demographic and educational factors, are not significant. According to our results, EI for student is based on four-legged stool consisting of: Open-mind, Self-efficacy, Creativity, Need of Achievement. These characteristics denote skills that are more challenging to teach and learn than more concrete operative areas. Thus, helping students develop these skills is an important endeavor (Kauffman Foundation, 2011). More concretely, open-mind understood as the ability to put together vertical and horizontal skills to achieve entrepreneurial readiness (Rippa et al., 2020). Moreover, students' entrepreneurial self-efficacy is a driving force of students' entrepreneurial intentions (Martiz et al., 2014; Kassean et al., 2015). In addition to self-efficacy, also creativity influence EI. Indeed, according to Zampetakis et al., (2009) the statement has a positive effect on the entrepreneurial intentions of the students. Finally, the needs of achievement in terms of achievement motivation, autonomy, and personal wealth influence EI. Indeed, according to Robert, (2010) the need of achievement is the motivation which can be described as the need, or value, of being successful (McClelland, 1987) and it's as a key motivator of entrepreneurial activity.

Entrepreneurial education is another relevant element that can improve students' skills as well as increase their motivation to start a business (Barr et al., 2009; Chandra et al., 2020). Von Graevenitz, Harhoff and Weber (2010) argue that helping students discover that entrepreneurship is not for them is as valuable as helping students find that they are high in entrepreneurial orientation. Then, the educational programs and the role of university represent crucial issues, since they contribute to enhance soft skills, useful for entrepreneurship. Also, family background and daily life experiences represent crucial issues to develop EI among students, in fact, from the analysis comes out that soft skills such as the ability to be creative, to recognize opportunities, to create network and to be able to work in teams, are particularly important to stimulate EI. As Hamidi et al., (2008, p. 306) state, "There are both theoretical and practical reasons to move beyond the focus on business planning to a focus on other activities that can be key ingredients of future entrepreneurship programs."

Research limits. However, the study is not without limitations. The empirical analysis is not exhaustive in terms of variables. It considers only some personal characteristics of students. Further research will focus also on biological factors (Nicolau and Shane, 2014; Passarelli et al., 2020), by combining biology and entrepreneurial behavior among

students. A recent field of literature, in fact, focuses on the relationship between hormones, physical characteristics, health conditions and entrepreneurial dimensions (Heaphy & Dutton, 2008; White, Thornhill, & Hampson, 2006). The stimulation of such hormones among student could help them to increase their alertness, their motivations, and their entrepreneurial orientation. Another contribution for the analysis would be offered by adding factors related to neuroscience (Gatto et al, 2020), as another microfactor that can influence EI among students.

This study is limited to a single university, but we believe that these conditions may represent the reality of other developing regions as well, not only constrained to the Calabrian case. Further empirical research, in fact, will be applied to a larger sample involving several experiences with a cross-country analysis. Moreover, other further research focus on the role of education and concentrate on new teaching methods, able to enhance student soft skills.

Practical implications. The empirical results stimulate important implications for public policies and gave implications for researchers, universities, and public governments that operate in developing countries. Most of EI is related to the building of hard and soft skills, implying that educational programs become crucial for EI of students. This can be strictly related also with innovating teaching methods such as training, case study method, behavioral modeling, play projects, the method of peer feedback, metaphor game, storytelling, the method of action learning, basket-method, design thinking, role playing. Active learning methods, in fact, modify the role of the professor from the translator of information to the organizer and coordinator of the educational process and make it possible to form complex competences in future professional specialties via student activities that manifest as closely as possible the content of professional work. Thus, students have the necessity to acquire both business competences and soft skills, to consider the opportunity to build new ventures based on scientific knowledge. In this perspective, according to Jessop (2017), we are strongly convinced that universities have a crucial role and a high level of responsibility in the innovation ecosystem. Specifically, they can provide specific courses with new methods of teaching and research, exploit new or enhanced information and communication technology infrastructures. They can open new markets, for example, by validating degrees awarded by other institutions at home or abroad or engaging in the internationalization of entrepreneurial education. This occurs by diversifying also the source of students (Wildavsky, 2010), opening international branch campuses (whether alone, through twinning, partnerships, consortia and franchising), introducing courses with 1 or 2 years spent in the home country and 2 in the host country or creating new kinds of regional education hubs (Knight and Morshidi, 2011).

In addition, at the macro level, could be useful to involve successful entrepreneurs also in undergraduate courses to develop new circuits of knowledge that move away from peer review and professional judgement as arbiters of excellence (Slaughter and Cantwell, 2012). In this way, especially in developing regions, University can contribute to the development of regional innovation ecosystem. The quadruple/quintuple Helix model is in fact the best tool to make the entrepreneurial environment grow (Carayannis et al., 2018). Public government should finance students 'grants and should also invest in infrastructures to reinforce in entrepreneurial educational programs.

Originality of the study. Our studio is one of the first to apply bibliometric analysis with statistical software to the topic of student entrepreneurship. The identification of micro and macro factors encourages scholars to initiate increasingly specific and focused research paths, identifying times that have not yet been adequately investigated. Moreover, according to our results, EI for student is based on four-legged stool consisting of: Open-mind, Self-efficacy, Creativity, Need of Achievement. These characteristics denote skills that are more challenging to teach and learn than more concrete operative areas.

Key words: entrepreneurial intention; student entrepreneurship; bibliometric analysis; entrepreneurial education fourth

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A new capacity building model for entrepreneurs: “Win-Win UNESCO experience”

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Objectives. *Humanistic Management as well as the International Institutions UNESCO, ICCROM, ICOMOS and IUCN (2013), UNWTO (2015, b) UNDP (2010) and Agenda 2030 Goal 17.9 (sustainability) underline the importance of using the Capacity Building (CB) as an essential tool to introduce empowerment dynamics within the local stakeholders, to foster long life learning, to protect human dignity and well-being as an economic driver for local communities in tourist destinations. The article presents a new methodology, the “Win-Win UNESCO Experience” - which has been developed and applied by the author since 20 years ago-, in order to design and execute CB according to the principles of Humanistic Management (HM) as well as to develop Community well-being, fair cooperation among local firms and intersections between private-public stakeholders; CB will also lead to the co-creation of a long-term tourism products that enhance local heritage (tangible and intangible) in World Heritage Sites (WHS). By taking part to the CB, local stakeholders have also the opportunity to re-invent themselves and to play a new social role, full of dignity based on the dissemination of their traditional knowledge to creative cultural tourists who wish to connect with local people during their visits to WHS. The article also provides an innovative contribution to the debate on how CB should restart tourism in UNESCO areas,- still badly hit from the pandemic- as well as to academic and practitioner debate on how CB represents an essential tools to develop human creativity, to design long-term cooperation and relationships between destination’ stakeholders that lead to the well-being of the participants. The CB new model also represents an opportunity to re-design a new model of tourism’ development and to reignite tourism based on the enhancement of local traditions linked to tangible and intangible heritage.*

The research objectives are the following:

- (a) To explore theoretical intersections among HM and Tourism;*
- (b) To explore theoretical intersections among CB, Community Capacity Building, HM and Collaborative entrepreneurship in order to become active tools to develop individual and social well-being, to foster the development of long-term cooperation among firms;*
- (c) To explore how CB, Community Capacity Building, HM and Collaborative entrepreneurship theoretical framework can be implemented into a practical new CB model to foster human development, long life learning, long-term social relationships, and promote the well-being of the participating stakeholders and how the model can be disseminated to Students to train future manager generation.*

Methodology. *The new CB method named “Win-Win UNESCO Experience” is based on the following methodologies: dialogue-based teaching methodology, the Win-Win Partnership, the co-creation of the tourist product as well as on the Community Capacity Building (CCB) approach included in the Community-Based Tourism (CBT) as a tool for empowerment of local populations and on the relationships that exist between HM and collaborative entrepreneurship.*

- (a) The teaching methodology is set up with the “dialogue-based” (Pirson, 2017 p. 202) approach in which all of the participants can actively contribute to the common creation of the tourist product using self-organization on all levels, coordinated by the lecturer. In addition, the trainer introduces and enforces the rules that ensure dignity within the organizations (Kostera & Pirson, 2017): all of the participants have the same value, equal opportunity of expressing their ideas, even with a variety/plurality of language (formal, informal style), in a non-judgmental atmosphere.*
- (b) The “Win-Win UNESCO Experience” model is based on the development of Win-Win Partnerships as an essential tool to develop alliances among the stakeholders of the destination. “PPPs bring together stakeholders with different objectives and skills, and resources in a formal or informal voluntary partnership to improve the attractiveness of a regional destination, its productivity, associated market efficiency, and the overall management of tourism” (UNWTO 2015 b, p. 12). “Collaborative product development takes place where many stakeholders work together to deliver on customer needs. This is vital for a successful PPP. Often, clustering of smaller businesses into a collaborative tourism effort is an effective way to develop a sound tourism product” (UNWTO 2015 b, p. 69). The Win-Win Partnership (PPP), as intended by the lecturer, is an essential tool that introduces the concepts of equality, fairness and impartiality into the working group (Pirson 2017): all of the actors must win in a fair manner, without exploiting the weaknesses of the partners in order to maximize their own competitive advantage.*

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The Partnership is also one of the “six core components for successful capacity building programs: (1) building local ownership and self-reliance; (2) practicing genuine partnership; (3) understanding the context specificity of capacity and its development; (4) examining capacities in a context of systems and strategic management; (5) having a long-term commitment of partners; (6) exercising the process thinking in all phases of capacity building”. Milen, (2001, p.1 in Loza, 2004 p. 302).

- (c) During the CB participants have the opportunity to experiment the (Tiwari, 2014 p. 261) “co-creation, co-design or co-production of knowledge, and/or systems and/or outcomes. The emphasis here is on bottom-up discourse formation, as opposed to traditional authoritarian, imposed definitions and parameters. Co-production aims for collaborative ways to create knowledge and address problems occurring in specific contexts (Fontan et al. 2013 in Tiwari, p.261)”.
- (d) CB is conceived by the author as an essential tool to develop “the ability of individuals, organizations or systems to perform appropriate functions effectively, efficiently, and sustainably”. This involves “the continuing process of strengthening of abilities to perform core functions, solve problems, define and achieve objectives and understand and deal with development need” (Milen, 2001, p.1 in Loza, 2004 p.302). The importance of CB is also affirmed by the international organizations UNESCO, ICCROM, ICOMOS, IUCN (2013), UNWTO (2015 b), UNDP (2010). UNESCO designed a specific guideline “World Heritage Strategy for Capacity-Building” and indicates “CB as a tool for the effective management for World Heritage site. Capacity-building - whether of practitioners, institutions or communities and networks - is seen as a form of people-centred change that entails working with groups of individuals to achieve improvements in approaches to managing cultural heritage, for the benefit of broader heritage conservation and management needs and ensure a mutually beneficial dynamic between heritage and society”. The same guideline affirms that CB will: “(1) strengthen the knowledge, abilities, skills and behaviour of people with direct responsibilities for heritage conservation and management; (2) improve institutional structures and processes through empowering decision-makers and policy-makers; (3) introduce a more dynamic relationship between heritage and its context and, in turn, greater reciprocal benefits by a more inclusive approach, such that the OUV of the properties will be protected effectively and in a sustainable way” UNESCO (2013, p. 50). UNDP states that they are broadly five areas for CB: (1) human resource development (leadership and skill and knowledge development); (2) research and advocacy; (3) information access, use and dissemination of information; (4) organisational development (networking, building alliances and coalitions); (5) financial sustainability (UNDP web site).
- (e) Community Capacity Building (CCB) is conceived as a necessary condition for improving tourism development, for bringing benefits to local communities (Reid & Gibb, 2004) and it is crucial to empower local communities to take advantage of the opportunities fostered by the tourism development (Lavarack & Thangphet, 2007). There are several definitions concerning CCB. “Community capacity (CC) is the interaction of human capital, organizational resources and social capital existing within a given community that can leverage community capitals, and organizational resources existing in a community that can solve collective problems and improve or maintain the well-being of a given community” (Chasking 2001 in Aref, 2008 p. 806-7). “CCB was defined as the extent to which a community can generate, implement and sustain actions for strengthening community health (Smith et al. 2001 in Aref, 2008). A definition of close to the principle of Humanistic Management is formulated by Labonte et al. (2002 in Aref, 2008 p. 807): CCB like the related concepts of community development and empowerment, is about increasing the capabilities of people to articulate and address community issues and to overcome barriers to achieve improved outcomes in the quality of their lives”. Empowerment plays an essential role in community-based tourism. Several studies have investigated the characteristics concerning community capacity building including: motivation and confidence; knowledge to understand and propose solutions for problems; competence to analyse proposed projects and to critically evaluate them; local entrepreneurs and leadership; specific managerial skills in target area; ability to build cohesive networks and communities; Win-Win Partnership with external organization; (Balint, 2006; Hounslow, B. 2002; Lavarack, 2005; Simpson, Wood, & Daws, 2003; Woodhouse, 2006). The CCB is based on the Community Based Tourism approach (CBT).
- (f) Community Based Tourism (CBT): Font (2013) and Manyara (2007) states that CBT is community-driven and community - based economic and social priorities, grassroots development, resident participation, equity, empowerment, local entrepreneurship and small-scale enterprise. CBT uses qualitative indicators plus quantitative to monitor and evaluate social sustainability, social and environmental justice, improving well-being of marginalized, disadvantaged groups, racism, gender equity democratic participation and local control, social cohesion and inclusion of local knowledge (Jamal 2006, Rossell, 2013). CBT is commonly understood to be managed and owned by the community for the community” (APEC, 2010). Font (2013, p. 2) affirms that “CBT refers to tourism that involves community participation and aims to generate benefits for local communities in the developing world by allowing tourists to visit these communities and to learn about their culture and the local environment”. The approach is very close to the Humanistic Management based on Community wellbeing, cooperation among firms as well as on the individual dignity, lifelong learning.
- (g) HM is “conceived in a very broad sense, deals with concerns for person and human aspects in managing organization. Its aims are not only focused to obtain results through people, but also, above all, towards people themselves, showing care for their flourishing and well-being” (Melé, 2016 p. 33). Among the others, the third HM approach is centered on the business enterprise as a real community of person that remain together for several reasons among which the identification, commitment and loyal to the mission and values of the firms.

“Firms have to cooperate between themselves in order to reach the society common good, and nowadays the sense of cooperation is even more necessary since the organizations tend to be flattened” (Melé, 2003 p. 83). Melé affirms that (2016 p. 48) “the firm, in essence, is a community and communities can be built up through the sense of belonging, the awareness of common purposes, the links among those who form the community and the willingness to cooperate for achieving common goals”. Cooperation is an essential aspect for business, and cooperation needs communication, motivation, and leadership (Bernard 1968 in Melé, 2016 p. 47).

- (h) *Intersections between HM and CCB. HM is based on Community wellbeing, cooperation among firms as well as on the individual dignity has several connections with CCB. Jamal (2016, p. 11) identified a number of critical success factors (CSFs) for community-based tourism that are common worldwide and representative of commonly cited CSFs in the tourism development and management literature. They are structured in four areas of community empowerment identified by Scheyvens (1999, 2002) as well other contributions concentrated on public good and community well-being, which are highly correlated with HM.*
- (i) *Intersections between HM and collaborative entrepreneurship: HM deepened the concept of collaborative entrepreneurship and brings a contribution to the human motivations behind the collaboration among firms. Community-building practices within and across firms are developed in order to face managerial and market barriers, which led to innovation in markets when product or service ideas are developed and/or adopted to new expanded markets uses (Rocha and Birkinshaw, 2007 in Rocha 2009).*

Findings. *The CB “Win-Win UNESCO Experience” Model is based on voluntary cooperation among multi-sectorial entrepreneurs located in World Heritage Site. It reaches the following goals for the common goods of the entrepreneurs and of the destination:*

- a) *The entrepreneurs actively participate in the CB since the lecturer identifies their main motivations and entrepreneurial’ main aims;*
- b) *The entrepreneurs become Heritage Ambassadors since they are trained on tangible and intangible heritage concerning local WHS;*
- c) *The long-term alliances and Win-Win Partnerships are based on trust among stakeholders;*
- d) *The co-production of new tourism products is reached by the stakeholders, through a clear negotiation, conducted during the CB;*
- e) *The tourism product is jointly promoted through the entrepreneur’s websites.*

We quote the finding into details generated by the five training sessions of the CB Model.

- a) *The entrepreneurs actively participate in the capacity building. The lecturer identifies, through the use social research tools, their real reasons that make them to take part in the CB. Subsequently, the trainer designs the training contents, in order to reach the objectives established with the Institution (i.e., Destination Management Organization -DMO’s-, Chambers of Commerce, and Employer Trade Association) as well as with the entrepreneurs who took part in the training sessions. In this model the lecturer must achieve the goals provided by the two clients, the financing institutions and the entrepreneurs participating to the seminar.*
- b) *The entrepreneurs become Heritage Ambassadors. They are trained on the tangible heritage concerning the local WHS as well as on the intangible heritage, represented by the entrepreneurial activities developed within the network; this training generates the knowledge in order to become Heritage Ambassadors and to develop interpersonal relationships with their own customers based on the discovery of the WHS (UNESCO, 2013). The entrepreneurial training takes place through visits to the WHS as well as to the local handicraft laboratories, complying to a specific format based on experiential activities. At the end of this stage, the entrepreneurs identify and learn about opportunities of collaboration among themselves, and also try the services offered by their peers related to the WHS.*
- c) *The Long-term alliances and Win-Win Partnerships among stakeholders (PPPs) ensure the development of relationship based on trust. At the end of this CB module, entrepreneurs know and develop collaborative relationships with each other based on the “Win-Win Partnership”, long-term alliances reached by negotiation, which generates the creation of a new product, which equally satisfies all the stakeholders. This training methodology can be applied in order to create experiential products and itineraries in cultural, natural, landscape WHS and within the network of UNESCO creative cities.*
- d) *The product-experience between stakeholders is created during the capacity building. During this training session, the public stakeholders (for instance Chambers of Commerce, Museum Institutions, National Parks, DMOs, World Heritage sites’ managers...) and private stakeholders (entrepreneurs within the destination, professionals such as Mountain guides...) divided in cross-sectoral thematic working groups, identify the local activity and the ways to create sustainable experiential tourist’s product (Richards and Wilson 2007, p. 18). This step involves the identification of high qualitative standards, “and the design of effective processes, including behavior protocols (Rocha 2009, p. 454)” that must always be guaranteed by every service provider, with the aim of encouraging the development of mutual trust among actors, essential to ensure the long-term network. During the seminar, the entrepreneurs create the product-experience and the cultural itinerary. The results of the methodology are assessed even by the spontaneous introduction of processes of social, product and business innovation (Vasile, 2019). During their CB, the entrepreneurs are stimulated by the creative session to spontaneously generate innovation processes of the product among the participating SMEs that will carry on the experience far beyond the end of the training (Basile, 2018 a b). At the end of this training session, the stakeholders elaborate a sustainable tourism-experience*

product based on cultural heritage. The operator draws up a draft of the brochure that aggregates the tourist product-experience generated in the classroom through the capacity building sessions. The brochure contains all the information concerning the experiential offering proposed by each stakeholder who took part in the CB; the tourist-product is supervised by the instructor, in order to make sure that it is attractive to potential cultural clients.

- e) The experience-product is jointly promoted by the networked entrepreneurs' web sites. During the seminar, the actors feign or simulate the rehearsal the application of the model, in which the entrepreneurs and cultural institutions - participating to the network - mutually send their customers to each other. Moreover, the promotion of the "Win-Win UNESCO Experience" product is delivered directly on the entrepreneurs' websites, in particular hoteliers, who in this model play a major role as Ambassadors of the World Heritage site together with all of the services provided by the other "colleagues" of the network. At the end of these capacity building sessions, the effectiveness of the training is tested through anonymous questionnaires, with excellent outcomes (Basile 2020 a).

The five CB model has the total duration of 16 hours, and usually reaches the following results. The group of entrepreneurs together with the trainer managed to: analyze the changes in the tourism market, identify the experiential tourist as the primary target to jointly promote all the cultural services, deepen the services provided by the colleagues of the network located in the WHS, developing fair Win-Win Partnerships. The "dynamic" training, which listens to the participant's needs of knowledge and then transforms them into reality (not planned at the beginning of the course, but emerged during the training process), allowed to further extend the project, by even including the transport sector within the network.

This methodology ensures that all of the actors involved win: the destination gets a new tourism-experiential product in order to re-launch the low season, resident entrepreneurs re-invent their own activities at the WHS linked with tourism, and very importantly tourists can experience authentic moments with the cultural heritage of the area. (Richards and Wilson 2007, p. 18).

Among the several experiential-tourism products created by the author with this CB method, we briefly mention some case studies which have already been discussed in previous publications (Basile 2015, 2018, a-b) in order to showcase that the collaborative relations among firms and tourism product, co-designed through this training model, still persist effectively ten years after the end of the training. We quote the voluntary stable cooperation among Hoteliers specialized in hiking excursions in The Dolomites (WHS 2009), called "The Dolomites Walking Hotels", created in 2008 by the Hotel Association of Trentino, Federalberghi Trentino, Italy (Basile, 2008, 2020 b). Secondly we quote the food and wine itinerary based on cooperation of local businesses named "Discover Valtellina", created in 2007 by the Chamber of Commerce of Sondrio (Italy), in order to increase the awareness of local products and small businesses to the tourists that visit Italy, by the Rhaetian Railway in Abula, Bernina Landscape (WHS 2008) to support the conservation of the art of dry stone walling, knowledge and techniques (WHS 2018) (Basile 2018 a, b).

Thirdly we quote the development of stable cooperation among local firms located in province of Perugia, well-known for the presence of "San Francis and other Franciscan Sites (WHS 2000) as well as the Places of Power (568-774 A.D.) (WHS 2011) (Basile 2020 a).

In addition, the author also gives a second level contribution to the HM education since she also trains students of University Masters in International Tourism and Heritage Management to use this Capacity Building model, including the University of Paris 1 Panthéon Sorbonne. Since academic year 2019/2020 Master Students have been trained by the author to apply the theoretical part of the model to the development of a destination. We quote the communication published on the 16th February 2021 by the University concerning the seminars.

"Covid-19 recovery strategies: Restart cultural tourism in UNESCO Sites". University Paris 1 Panthéon Sorbonne offered students the opportunity to apply academic knowledge to real work situations in the tourism and cultural industry in UNESCO destinations, strengthening their skills and competencies required by the labour market. The guest lecturer designed a seminar consisting of three sessions entitled: "Covid-19 recovery strategies: Restart cultural tourism in UNESCO Sites". The focus on Covid was linked to the "Win-Win UNESCO Experience" a local development model she conceived, in which local residents and entrepreneurs in UNESCO areas adapt their businesses to include authentic experiences linked to the local culture, and doing so by cooperating with the public sector. Students were encouraged to activate their critical thinking and creativity in a safe and guided context. Through the "Learning by doing" methodology of role-playing, they worked, on the local development model, becoming the ambassadors of the destination's public and private stakeholders. The MIT (Management of International Tourism) Master students represented private entrepreneurs and those of the Master GVTP (Gestion et Valorisation touristique du Patrimoine) the public cultural institutions. They interpreted the dynamics of the stakeholders, understood each other's points of view, negotiating innovative solutions to co-create a new experiential tourist product linked to World Heritage. The lecturer believes that the proposed objectives have been achieved, she appreciated the active participation of the students and their keen desire to use the model presented to design tourist products during the role-play and examine how they can put it into practice in the real tourist market". (University Paris 1 Panthéon Sorbonne sitography 2021). Also during the previous academic year, Master students had the opportunity to learn and apply the model to real UNESCO Destination reaching excellent results in terms of skills and knowledge acquired. We quote the communication published by the University on the 15th December 2019 concerning the seminars.

"Comment créer un produit touristique durable mais rentable dans les destinations UNESCO? Comment les entrepreneurs peuvent-ils relancer leurs activités et promouvoir le Patrimoine UNESCO? Les étudiants des deux Masters du MIT (Management of International Tourism) et du GVTP (Gestion et Valorisation touristique du Patrimoine) de l'IREST, de l'Université Paris 1 Panthéon Sorbonne, ont appris de l'enseignante Monica Basile, Global

Tourism Expert de l'OMT et de l'OCDE, le nouveau modèle de développement local qu'elle a conçu nommé "Win-Win UNESCO Experience" dans lequel les entrepreneurs jouent un rôle très actif dans la promotion du Patrimoine matériel et immatériel. Les participants ont ensuite simulé l'application du modèle à une destination UNESCO: dans des séminaires interactifs et créatifs, qui se sont tenus les 2 et 3 décembre 2019, ils ont créé des produits touristiques représentant les vrais acteurs publics (musées, parcs naturels "UNESCO") et privés (hôtels, artisans, producteurs alimentaire, agriculteurs) et ont négocié les conditions de réalisation pour faire vivre aux clients des expériences uniques liées au Patrimoine mondial de l'UNESCO ». (University Paris 1 Panthéon Sorbonne sitography 2019).

Research limits. We focus the attention on two main research limits of the project: how local culture could influence the output of the Model and how other trainers could further implement it through a new training session "training of the trainers". The CB Model has, so far, been applied to European destinations and collaborative entrepreneurs, which voluntarily joined the project. We hypothesize that outstanding final output will be generated, if the CB Model is applied to non-European cultures in which common goods and well-being play a stronger social values. For example, the author noticed that, during her lectures to Worldwide Tourism Master Students based on this CB Model, students coming from Islamic countries showed particular interest on it. In particular, two graduate students from University Paris 1-Panthéon Sorbonne applied the CB Model in their thesis to WHS in Egypt (academic year 2019/2020) and in WHS in Petra, Jordan (academic year 2020/2021), as well as the PhD students from the University of Tehran, Iran applied it to their WHS. Secondly, this CB Model has always been conceived and applied by the author, and never by another trainer. The CB model in order to be transferable and applicable also by other trainers should be implemented by introducing a third level of HM education contribution such as the "training of the trainers" Model in order to transfer to other instructors skills, knowledge and methodologies to understand, interpret and solve well-being and business problems and achieve the project goal. We show it by explaining a frequently occurred problem.

The CB analysis on the "training needs" of the participant it is always carried out at the beginning of the first day, highlighting the goals that the lecturer have to reach by the end of the capacity building modules: the Institution usually aspires to create fair cooperation among local firms in order to lead to an experiential product or thematic itineraries among the participating local businesses; the entrepreneurs usually want to innovate the traditional tourism product and to relaunch the destination through the creation of experiential products as a way to attract a new client target with a greater spending capacity and pinpointing new long-term and stable commercial tourism channels. Anonymous questionnaires usually show that almost all the entrepreneurs already have some kind of ongoing collaboration with other local businessmen (craftsmen, producers, industry sectors, services and museums). However, they declared that these interactions were not effectively active due to the lack of: (1) a real knowledge of the service provided by the partner and, therefore, it was not possible for hoteliers to promote it to their guests, (2) a real involvement between producers, handicraftsmen and hoteliers, (3) the agreements were barely sponsored or developed, and were based mainly upon the only exposure of the brochure at hotel receptions.

The "training of the trainer" will allow to understand and to solve the difficult situation among collaborative firms.

Practical implications. The CB model has always generated short, medium and long-term positive effects on the destinations where it has been introduced. In the short term, companies develop relationships of knowledge, of mutual cooperation based on the Win-Win strategy, (Basile 2020 a). The output in terms of long term partnership among multi-sectorial stakeholders still persist effectively ten years after the end of the training. The model fosters sustainable development in a destination meeting the requirement of Agenda 2030 SDG 17.9.

Originality of the study. The CB "Win-Win UNESCO Experience" is a very innovative model since it is based on HM approach (of well-being of the individual, cooperation among firms, dignity, lifelong learning) as well as the CBT and its final goal aims to foster sustainable development in a destination. It puts together the academic approach with the practitioner one, in order to actively involve local entrepreneurs to develop long term cooperation during the CB.

Key words: capacity building; entrepreneurs; heritage; partnership; hotels; World Heritage Sites (WHS)

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The (ecologically) biased entrepreneurial decision process: a review

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Objectives. *Entrepreneurs are always involved in Entrepreneurial Decisions (EDs), such as choosing the market or country to enter; in performing them, they systematically deviate from the rational behavior of classical economic models due to their innate bounded rationality (Simon, 1947; Tversky and Kahneman, 1973; Shepherd et al., 2015; Cristofaro, 2017; 2018; 2019; 2020; Zhang and Cueto, 2017; Adinolfi, 2020). Following cognitive psychology literature and terminology, initially adopted by behavioral economists (Tversky and Kahneman, 1974; Tirole, 2015) and then accepted by one stream of management and entrepreneurial research (Abatecola et al., 2018; Battaglio et al., 2019; Caputo and Pellegrini, 2019), these deviations are driven by biases. Biases, always following these cited studies, is an umbrella term that is comprehensive of both heuristics - rules of thumb (also called 'cognitive shortcuts') that can lead to positive or negative effects on choices (Artinger et al., 2015) - and cognitive traps - mental errors that always have a negative effect on decisions (Hammond et al., 1998). On these premises, the study of heuristics has pervaded the entrepreneurial literature over the last 30 years (e.g., Keh et al., 2002; Bernoster et al., 2020; Fatma et al., 2020), arriving at the following (almost) definitive conclusions: i) entrepreneurs heavily rely on heuristics in their decision making more than managers of established firms and non-entrepreneurs; ii) heuristics are likely to be the product of cognitive-emotional intertwinement within and between decision makers; and iii) the reliance on heuristics mainly depends on personal experience, an entrepreneur's social network, and personal capital.*

However, despite the high amount of literature produced about heuristics and traps in EDs, witnessed by related review articles (Cossette, 2015; Shepherd et al., 2015; Zhang and Cueto, 2017; Arend, 2020a; 2020b; De Winnaar and Scholtz, 2020), some important questions still need answers. Specifically, as maintained by Shepherd et al. (2015; p. 22): "future contributions are likely to come from research detailing the types of heuristics used, how these are formed and triggered, and the benefits generated [...]. To the extent future research reveals benefits from heuristics, we can worry less about biases and focus more on when to use heuristics and how one develops, learns, adapts, and communicates heuristics". This call has been supported later by Zhang and Cueto (2017), who reclassified cognitive errors in make-happy, sketchy-attribute, and psycho-physics biases, opening new avenues of research. According to these scholars, the implications of many biases in entrepreneurship are still unknown, together with the investigation of the interaction among biases, and also their multi-level link with other contextual and inner factors (e.g., prior experience).

Stemming from the future research highlighted by the above-mentioned reviews, a deeper investigation on the use of heuristics in entrepreneurship is needed to answer the following open-ended research question: How can heuristics positively or negatively affect entrepreneurial decisions?

Methodology. *In order to fill this gap, a Systematic Literature Review (SLR) is proposed. The steps of the implemented SLR are depicted as follows:*

- 1) The databases used for collecting scientific studies are: a) Business Source Premier (EBSCO); b) ISI Web of Science; c) Scopus, d) ProQuest's ABI/Informs, and e) PsycINFO;*
- 2) Only peer-reviewed journal articles published in English have been considered to enhance the quality control (see Tranfield et al., 2003);*
- 3) The relevance of contributions to the topic has been attested by ensuring that the selected abstracts contained one of the following six words: "heuristic*" or "cognitive shortcut*" or "shortcut*" or "rule of thumb*" or "mental rule*" or "cognitive rule*" (used synonymously by Kahneman, 2003). 99,180 results were generated;*
- 4) The substantive relevance of contributions to the entrepreneurial theme has been ensured by requiring that the selected abstracts contained at least one of the following five words: "entrep*" or "start-up*" or "startup*" or "ventur*" or "new business*". At this stage, databases have been merged and duplicates eliminated; 365 results were generated;*
- 5) The resulting articles were scanned by reading all the abstracts by all the authors to ensure their coherence between their 'research question' and 'investigated variables' were within the aim of this review. 89 results were generated;*
- 6) The remaining papers were fully read to ensure their alignment with the research objective; 58 results were generated;*

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7) Lastly, 5 contributions were added according to the snowballing technique. The final sample is composed of 63 papers.

With regard to the data analysis, the 63 papers were thematically analyzed. In general terms, thematic analysis is a widely used qualitative research technique consisting of analyzing written, verbal, or visual communication messages. In particular, the six steps of Braun and Clarke (2006) have been followed. First, familiarization with data: the entire sample of papers was initially read and some notes have been initially taken in order to become familiar with the depth and breadth of the contents. Second, generating initial codes: communication messages have been coded according to a mixed approach (Braun and Clarke, 2006) based on both deductive analysis (by which communication messages are thematized according to an initial codebook) and inductive analysis (by which new themes are free to emerge). The initial codebook was composed by the type of heuristic (availability heuristic, representativeness heuristic, affect heuristic, and anchoring-and-adjustment heuristic; Shepherd et al., 2015; Zhang and Cueto, 2017), while the emerging codes were related to the features of the decision context (N. of issue-related cues, N. of not-issue-related cues, social environment). Third, searching for themes: codes were analyzed and combined to form overarching themes that, in this case, have been found as the outcome of the implementation of heuristics - i.e., positive, negative or mixed. Fourth and fifth, reviewing and defining themes: the mixed effect of heuristics was not recognized as an established theme per se (no papers within the sample dealt with ambivalence of heuristics' outcome); so, this theme was dropped from the initial list of themes. Sixth, producing the report: as will be shown in the results' and discussion section, a "concise, coherent, and interesting account of the story the data tell (within and across themes)" (Braun and Clarke, 2006; p. 96) has been provided. To achieve the sixth step, the proposed interpretation takes the types of EDs into consideration: a) entrepreneurial opportunity recognition (e.g., identifying potential markets to enter), b) entrepreneurial opportunity assessment (e.g., assessing potential markets to enter), and c) entrepreneurial opportunity exploitation (e.g., decisions of how to enter targeted markets and/or resource acquisition).

It is worth noticing that each author analyzed the sample papers individually and the inter-rater reliability between them was high (Cronbach's Alpha = 0.84); however, when disagreeing, the authors made a more in-depth analysis in order to find a shared vision of the sentence meaning and related theme. Evidence of this analysis are shown in the following sections.

Findings. the 63 contributions collected through the conducted SLR help identifying similarities and differences among the influences towards entrepreneurial opportunity recognition, assessment, and exploitation decisions. Those alignments and discrepancies are included in the proposed ecological rationality framework of heuristics in EDs. In brief, the framework explains how heuristics can turn into being beneficial, or not, for EDs. In particular, affective states, which substantiate the intervention of the affect heuristic, are the main driver of EDs. Indeed, depending on the affective disposition that pervades the decision maker, the choice environment is differently framed (i.e., framing heuristic), such that: positive affective states lead to the positive framing of the initial decision context, while negative affective states lead to the negative framing of the context (Sadler-Smith, 2016; Martina, 2020). However, the affective disposition of the entrepreneur may directly influence the outcome of EDs (Fodor et al., 2016; Fodor and Pinteá, 2017; Nouri et al., 2018), such that: positive affective states lead to high performance in EDs; while, negative affective states lead to low performance in EDs. In the first case (the direct influence on EDs), the entrepreneur that positively (negatively) frames the starting situation feels more (less) confident about the environment (Barbosa et al., 2019). Consequently, the entrepreneur is: i) less (more) oriented towards labeling cues according to new cognitive categories (Busenitz and Lau, 1996; Baron, 2008; Keh et al., 2002); ii) less (more) prone to collect new cues (i.e., availability heuristic); and iii) less (more) alerted to investigate the context (i.e., alertness heuristic) (i.e., representativeness heuristic). As a result, the number of both the issue-related and not issue-related cues decreases (increases) (Holcomb et al., 2009; Awais Ahmad Tipu and Manzoór Arain, 2011).

The number of cues, however, varies according also to the exposure of the entrepreneur to the social environment in which is embedded as well as to the type of ED to be made. Indeed, in EDs regarding opportunity recognition and assessment, if the entrepreneur is in contact with the social environment when collecting cues, the number of considered cues increases (Vandekerckhove and Dentchev, 2005), but the time spent in collecting them compensates the time saved through the use of heuristics as well as the risk perception of the entrepreneur being raised due to the collection of confirming and non-confirming cues. In EDs regarding opportunity exploitation, instead, if the entrepreneur is in contact with the social environment when collecting cues, prior assumptions on cues are likely - through a strong application of the representativeness/availability/non alertness heuristic - to be reinforced, with the consequence of restricting the information base for the ED (Bowey and Easton, 2007; Aldrich and Yang, 2014). Without any regard whether cues are issue-related or not, the not numerous amount of cues leads to a sense of certainty, which leads to forecast a low risk of failure for a venture; on the contrary, a numerous amount of cues leads to uncertainty and, as a consequence, forecasts a high risk of failure (Barbosa et al., 2019). The low perception of risk has the effect of increasing expectancy in the outcome of the ED, while the high perception has the counter effect of decreasing expectancy (Martina, 2020).

Reading the model according to the ecological rationality lens (Todd and Brighton, 2016), it can be said the information features that can positively or negatively influence the judgement conveyed by the heuristics are: i) the number of cues, and ii) the cues' relation to the issue. These two features substantiate the ecological validity of cues in helping heuristic inferences, such that: i) if the number of cues is scarce, the entrepreneur tends to assign a positive evaluation towards the ED (i.e., the criterion); ii) when the number of cues is ample, the entrepreneur is oriented towards a negative evaluation of the ED. The aforementioned effect is mediated by the risk perception of the

entrepreneur. In fact, the heuristic influence of the risk perception, together with the affect, framing, representativeness, availability, and alertness heuristics, substantiate the vicarious functioning of entrepreneurial judgement in EDs. These are, indeed, the cognitive shortcuts that replace systematic decision-making models when making inferences on (and from) cues (Gigerenzer and Gaissmaier, 2011). In this last regard, and different to what has been postulated by ecological rationality scholars (Kozyreva and Hertwig, 2019), the cues' reciprocal connections (i.e., redundancy) have not been found from studies on the role of heuristics in EDs (Barbosa et al., 2019).

Research limits. One main limitation of the proposed framework is not having been able to distinguish the influencing role of different affective states on heuristic processing and, in turn, on EDs. In fact, the considered affect heuristic, at the basis of the proposed model, can be determined by moods, emotions, and temperaments - different sub-categories, with distinct effects, of affective states (Delgado-García et al., 2015). This has not been done on purpose; in fact, only a few papers have tried to break down the affective heuristic into its facets (e.g., fear, surprise, excitement) and parcel out the effects (e.g., Cacciotti and Hayton, 2015).

Practical implications. According to a practical reading of the insights of this contribution, entrepreneurs are more aware of the chain of heuristic reasoning that is activated by their positive or negative affective disposition when facing the decisional situation. In brief, positive affective states seem to foster better EDs outcomes rather than negative affective states; this, indeed, would help the entrepreneur in analysing only some relevant cues and take the plunge according to them, with the consequence of saving time and being the first mover when catching/exploiting an entrepreneurial opportunity - in practice, the faster the better. However, entrepreneurs should consider that the proposed framework and the outcomes of EDs extracted from the sample of papers do not distinguish between beneficial effects in the short and long term. So, the initial decision of entrepreneurs to take (or not) the plunge, when inspired by positive (negative) affective states, should be constantly revised over time in order not to fall into a lock-in effect for which the initial decision is justified by the only presence of a specific affective state.

Originality of the study. The proposed ecological rationality framework of heuristics in EDs gives a first response to the research avenues issued by Shepherd et al. (2015) and Zhang and Cueto (2017). These authors investigated how heuristics are formed and triggered and also identified the interaction occurring among biases and their multi-level link with other contextual and inner factors. In this vein, this work proposes that EDs are the product of make-happy (e.g., affect heuristic), sketchy-attribute (e.g., representativeness heuristic), and psycho-physic (e.g., framing) heuristics (Zhang and Cueto, 2017). In particular, it is advanced that make-happy heuristics are the antecedent of other cognitive shortcuts, establishing a sequence for their emergence. This assumption helps in identifying prior undiscovered connections among biases as well as proposing a third emerging way of seeing the dynamics of entrepreneurial (and also managerial) decision making, which is in contrast with the established default-interventionist theories (e.g., Tversky and Kahneman, 1981; Teece, 2007) and parallel-competitive theories (Pacini and Epstein, 1999).

Key words: decision making; entrepreneurial decision; heuristic; ecological rationality; affect; cognition; review.

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Do what you can, with what you have: entrepreneurial orientation and bricolage within artistic-artisan firms

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Objectives. Artistic craftsmanship represents a composite reality, including firms that realize products of high aesthetic value, combining manual techniques with a high professional content (Cavalli, 2011). Since artisan enterprises are often the result of a secular artistic and productive tradition, rooted in the territories they belong to, craftsmanship constitutes a unique cultural heritage and an important factor shaping territorial identity (Micelli, 2011). Furthermore, craftsmanship represents a fundamental economic and productive resource and a form of widespread employment that feeds local economy and small productions, creating social stability and sustainable development possibilities. According to Gordini and Rancati (2015), there is a distinction to be made between craftsmanship and artistic craftsmanship: “a product can be defined as belonging to the artistic craftsmanship when it does not rely exclusively on technical ability, on site-specific tacit knowledge, on traditions petrified in repetitive activities and routine. Instead, it hinges on innovation, creativity, inspiration, genius, creation of new models, on the effort to contaminate and hybridize tradition with new and contemporary ideas” (p. 170). Therefore, entrepreneurial dynamics and behaviors can play a crucial role within this peculiar productive fabric, mainly made up of micro- and small and medium-sized enterprises (Cavalli, 2011). Nevertheless, artistic-artisan firms have been largely neglected by entrepreneurship scholars and scant research efforts have been made to explain the interplay between logic and outcomes of entrepreneurial practices in this specific context (Gordini and Rancati, 2015). The present paper aims to bridge this gap by empirically investigating the role of Entrepreneurial Orientation (EO) and Entrepreneurial Bricolage (EB) in the performance of artistic-artisan microfirms. More specifically, the paper addresses the mediating effect of EB on the relationship between EO and the subjective performance of these firms, focusing on Friuli Venezia Giulia, a region of northern Italy.

EO is one of the most stabilized concepts in the field of entrepreneurship and finds its roots in the work of Miller (1983), who defined an entrepreneurial firm as the one that “engages in product-market innovation, undertakes somewhat risky ventures, and is first to come up with proactive innovations, beating competitors to the punch” (p. 771). This definition entails the core dimensions of EO, that is innovativeness, risk-taking and proactiveness (Covin, 1989). Innovativeness relates to the extent that firms are able to innovate their business operations, engaging in new ideas, products and approaches to take advantage of consumers’ changing tastes and desires. Risk-taking indicates the degree to which a firm can push its desire to take actions even when the outcome is unknown and uncertain. Proactiveness refers to a firm’s ability to anticipate and predict future products and services, and make efforts to provide them. According to Lumpkin and Dess (1996), who expanded the original conceptualization, EO “refers to processes, practices and decision-making activities that lead to new entry” (p. 137). Over the last decades, much empirical evidence has been provided regarding the positive impact of EO on organizational performance and growth (Zahra and Covin, 1995; Dess et al., 1997), also in the context of small and medium enterprises (Wiklund and Shepherd, 2003; Riviezzo et al., 2013; De Clercq et al., 2015). But yet, studies aimed at investigating the relationship between EO and performance of artistic-artisan firms are to a large extent still lacking. Actually, the importance of artisans to the entrepreneurship literature has been recognized only in recent years (Ratten et al., 2019), when the emerging field of artisan entrepreneurship has begun to make its way within the wider field of cultural entrepreneurship (Crowley, 2019). This growing interest towards artisan entrepreneurship has brought some insight into artisans’ goals, personal characteristics and their role to regional development (e.g., Gordini and Rancati, 2015; Hoyte, 2018; Marques et al., 2018). Nevertheless, as highlighted by Crowley (2019): “there is limited research on how entrepreneurial behavior

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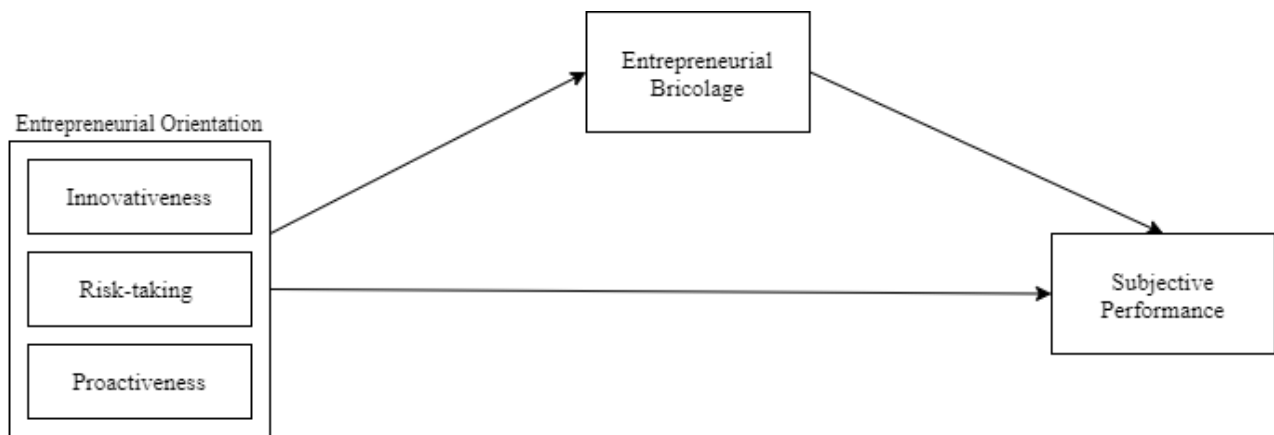
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manifests within this particular domain of contemporary entrepreneurship” (p. 262).

The concept of ‘bricolage’ was first used by Lévi-Strauss (1966), who described it as “making do with what is at hand” (p. 17). Later, this definition was successfully introduced in the field of entrepreneurship and developed into the concept of EB, identified as a creative approach to resource application that helps new ventures to survive and succeed (Baker and Nelson, 2005). In line with this concept, as new ventures typically lack the resources they need, EB may help them to survive and even flourish through recombining and reusing resources at hand. Indeed, extensive empirical evidence has highlighted that new ventures engaging in bricolage are better able to manage resource constraints and achieve superior performance (Baker and Nelson, 2005; Cunha et al., 2014; Senyard et al., 2014). Even if creative work generally requires forms of experimentation with different combinations and processes, the perspective of entrepreneurial bricolage has been widely neglected in the context of creative industries (De Klerk, 2015). In the nascent field of artisan entrepreneurship, EB is commonly associated with networking, as small firms are likely to be significantly constrained in terms of internal resources and thus may benefit from links with external organizations (Crowley, 2019). As noted by De Klerk (2015), bricolage seems particularly well fitted to investigate behaviors and performance within creative industries, but literature has widely neglected it as an analytic tool of entrepreneurial activity. More specifically, few efforts have been made to investigate the interface between EB and EO (Hooi et al., 2016), while no scholarly attention has been paid to understand how their combined effect shape the outcomes of small firms in the field of artistic craftsmanship.

Based on these assumptions, the present study aims to investigate the links between EO, EB and subjective performance, integrated in a conceptual model tested on a sample of Italian artistic-artisan microfirms (Fig. 1).

Fig. 1: Conceptual model



Methodology. The data collection took place in Friuli Venezia Giulia, a region in the north of Italy, between July 2020 and September 2020. A structured questionnaire was administered face-to-face to craftsmen at the head of microfirms, that is firms with less than 10 employees (according to the European Union definition). The firms involved in the survey produce handicrafts in wood, glass, stone, bridal wear, jewelry and other products listed in the artistic craftsmanship (Cavalli, 2011). A total amount of 181 usable responses were collected. All the items used in this study were adapted from previous studies and relied on five-point Likert scales. The EB scale was a 9-items scale adapted from Davidsson et al. (2017). The extremes were anchored respectively to “never” and “always”. The EO scale was a 9-items scale adapted from Covin and Wales (2012). Each item was scored on a five-point Likert scale. In this case, extremes were anchored to two opposite statements. Details can be found in Table 1. As independent variable, subjective performance was used. Subjective performance scale was developed by the authors based on a five-point Likert scale, with the extremes anchored respectively to “not satisfied at all” and to “very satisfied”.

The proposed model was estimated using Smart PLS software (Ringle et al., 2015). PLS-SEM is particularly fit for small sample size and non-normal data (see Ringle et al., 2012). In the current investigation, bootstrapping (5000 samples) and blindfolding procedures were employed to calculate confidence intervals for factor loadings and path coefficients, and to determine model predictive power. In the model, Subjective Performance and EB were modelled as first-order constructs. Differently, EO was modelled as a second-order construct following the two-stage approach.

Tab. 1: Questionnaire items, means, SD, and Cronbach's Alpha

Code	Measurement items	Mean	SD	α
BRICO	Bricolage scale			.81
BRI1	<i>We are confident of our ability to find workable solutions to new challenges by using our existing resources.</i>	4.00	0.94	
BRI2	<i>We gladly take on a broader range of challenges than others with our resources would be able to.</i>	3.26	1.15	
BRI3	We use any existing resource that seems useful to responding to a new problem or opportunity.	3.96	0.99	
BRI4	We deal with new challenges by applying a combination of our existing resources and other resources inexpensively available to us.	3.66	1.04	
BRI5	When dealing with new problems or opportunities we take action by assuming that we will find a workable solution.	4.11	0.96	
BRI6	By combining our existing resources, we take on a surprising variety of new challenges.	3.91	1.03	
BRI7	<i>When we face new challenges, we put together workable solutions from our existing resources.</i>	4.20	0.84	
BRI8	<i>We combine resources to accomplish new challenges that the resources were not originally intended to accomplish.</i>	3.33	1.15	
BRI9	<i>To deal with new challenges we acquire resources at low or no cost and combine them with what we already have.</i>	3.30	1.18	
EO	Entrepreneurial orientation scale			.798
(INN) EO1	In general, my firm favors a strong emphasis on the marketing of tried-and-true products or services.	3.12	1.41	
(INN) EO2	How many lines of products or services has your firm marketed in the past three years? no new lines of products or services.	3.22	1.43	
(INN) EO3	Changes in product or service lines have been mostly... of minor nature.	2.80	1.39	
(PROA) EO4	In dealing with its competitors, my firm... typically responds to action which competitors initiate.	3.01	1.09	
(PROA) EO5	In dealing with its competitors, my firm... is very seldom the first business to introduce new products/services, administrative techniques, operating technologies, etc.	3.21	1.18	
(PROA) EO6	<i>In dealing with its competitors, my firm... typically seeks to avoid competitive clashes, preferring a "live-and-let-live" posture.</i>	1.92	1.19	
(RISK) EO7	In general, my firm has a strong proclivity for low-risk projects with normal and certain rates of return.	2.67	1.24	
(RISK) EO8	In general, my firm believes that owing to the nature of environment, it is best to explore it gradually via cautious, incremental behavior.	2.88	1.22	
(RISK) EO9	When confronted with decision-making situations involving uncertainty, my firm typically adopts a cautious, "wait-and-see" posture in order to minimize the probability of making costly decisions.	2.42	1.23	
	Subjective Performance			0.891
SP1	Subjective assessment of increase in turnover	2.98	1.14	
SP2	Subjective assessment of firm's growth	3.07	1.12	
SP3	Subjective assessment of profitability of investments	2.77	1.12	
SP4	Subjective assessment of profitability of investments, net of taxes	2.40	1.08	
SP5	Subjective assessment of profitability of sales	2.96	1.03	

Note 1: Items in *italic* were not used in the following analyses due to low loadings in the measurement model.

Following the guidelines proposed by Hair et al. (2020), we assessed measurement model validity. Item reliability was confirmed since each factor loading surpassed the threshold of 0.70. Internal consistency was also confirmed since composite reliability values (CR) and Cronbach's α for each construct exceeded the commonly accepted threshold of 0.70. Third, AVE values were higher than 0.50 for each construct, confirming that a sufficient portion of variance is shared between constructs and indicators. Thus, convergent validity was validated. Lastly, to establish the discriminant validity, heterotrait-monotrait ratio of the correlations (HTMT) method (Henseler et al., 2015) and Fornell-Larker criterion (Fornell and Larcker, 1981) were used. As HTMT values were lower than 0.85 and the square roots of the AVEs were higher than the correlations between the latent constructs, discriminant validity was also confirmed. Details can be found in Table 2 and Table 3.

Tab. 2: Measurement model assessment: items, reliability, and convergent validity

Measurement items	SL	α	CR	AVE
Entrepreneurial Orientation		.67	0.82	0.60
EO: Innovativeness	0.84			
EO: Risk-taking	0.68			
EO: Proactiveness	0.80			
Entrepreneurial Bricolage		.78	0.85	0.60
BRI3	0.76			
BRI4	0.75			
BRI5	0.74			
BRI6	0.82			
Subjective Performance		.89	0.89	0.75
SP1	0.89			
SP2	0.93			
SP3	0.75			
SP4				
SP5				

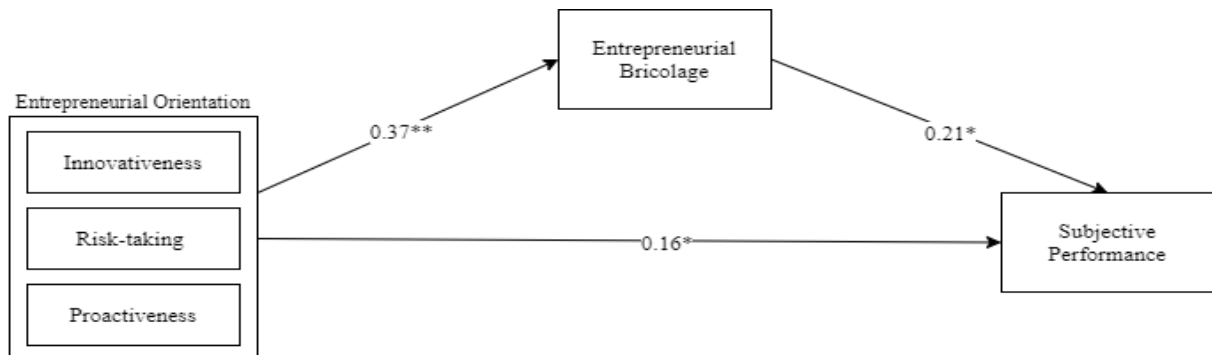
Tab. 3: Discriminant validity: Fornell-Larcker Criterion and HTMT

Theoretical Constructs	1	2	3
1. Entrepreneurial Bricolage	0.77	0.49	0.32
2. Entrepreneurial Orientation	0.37	0.77	0.29
3. Subjective Performance	0.30	0.27	0.82

Note 1: Diagonal and bold elements are the square roots of the AVE (average variance extracted); below the diagonal elements are the correlations between the construct values; above the diagonal elements are the HTMT values.

Findings. After ensuring measurement model validity, we examined the estimated structural model. Path analysis revealed that the direct effect of both EO (coeff. = 0.16; $p < 0.05$; 95% C.I.: 0.00 to 0.31) and EB (coeff. = 0.21; $p < 0.05$; 95% C.I.: 0.02 to 0.40) on firm's performance was positive and significant. Furthermore, also the mediation effect of EB between EO and firm's performance was deemed significant (coeff. = 0.08; $p < 0.05$; 95% C.I.: 0.00 to 0.17). At last, we assessed the predictive power of the model by looking at R^2 , and Q^2 . Concerning EB, R^2 was about the 14%, while for firm's performance it was about the 10%. Lastly, the Q^2 values reported for EB and firm performance were respectively about 7% and 4% (blindfolding procedure, omission distance = 7). Since both Q^2 values were higher than 0, support for model's predictive relevance was provided. More details can be found in Table 3 and the estimated model is displayed in Figure 2.

Fig. 2: Estimated model



Note 1: To obtain a clearer representation of the estimated model, indirect paths estimates were not included in the scheme. Estimated coefficients can be found in Table 4.

Tab. 4. Path analysis

Direct paths	To Entrepreneurial Bricolage					To Subjective Performance				
	Coeff.	T-stat	p.	95 % CI		Coeff.	T-stat	p.	95 % CI	
Entrepreneurial Orientation	0.37	5.64	>0.00	0.24	0.50	0.16	2.12	>0.05	0.00	0.31
Entrepreneurial Bricolage	-	-	-	-	-	0.21	2.20	>0.05	0.02	0.40
R ²	0.14					0.10				
Q ²	0.07					0.04				
Indirect paths	Indirect effects									
	Coeff		T-Stat		p.		95 % CI			
EO →EB→SubPerf	0.08		1.96		<0.05		0.00 0.17			

Our findings indicate that entrepreneurial orientation is positively associated with performance of artistic-artisan microfirms, and is mediated by entrepreneurial bricolage. By employing EB as a mediator, the present study demonstrates that EO, intended as the complex of processes and practices of decision making promoting new opportunities, is a determinant of the bricoleur's behaviors of artisan entrepreneurs. In fact, their originality and creativity are not only essential for obtaining satisfying outcomes, but must also be exploited by pursuing innovative and risky ventures. In this line of thought, the results of our empirical study suggest that the EO of artisan entrepreneurs leads them to undertake any steps which are required for the business, even if in unfavorable situations and without possessing the necessary resources. In other words, a strategic posture based on innovative and bold entrepreneurial behaviors supports small artisan firms to adopt bricolage, that is to deal with new challenges by recombining and transforming whatever is in their possession.

Research limits. The present study is not without limitations. First, the investigation is limited to 181 small firms, that is a relatively small sample. Second, the study was restricted to a small Italian region, which is characterized by specific productive traditions. Therefore, caution needs to be exercised while generalizing the findings of this study to other regions and countries. Interesting insights could derive from analyses extended to different territorial contexts. Another limitation is related to the variables measurement validity. Following a widely accepted approach in entrepreneurship research, we used a structured questionnaire to collect only perceived data from artisan entrepreneurs. In particular, since the firms under investigation are not required to file financial statements, we only relied on subjective measures of performance. Since this measure is reductive, future studies should put some efforts into identifying objective data to be used in the analysis.

Practical implications. Due to the economic, social and cultural value of artistic artisan entrepreneurship, our study has implications for both enterprises and territories.

From a managerial perspective, our study highlights that the performance of artisan microfirms can be enhanced if these 'masters of art' innovate and develop strategic perspectives of running their business. Thus, by transiting from traditional approaches to processes and practices based on a high EO, artisan entrepreneurs can also better exploit their creativity and convey their inspiration to identify workable solutions for emerging challenges. These insights seem of crucial importance in this moment, since the crisis linked to Covid-19 has hit the artisans worldwide, especially because of the blockade of tourism. Therefore, today more than ever craftsmen operate in an uncertain and resource-constrained context, where being entrepreneurially oriented is essential to take full advantage of limited opportunities. These insights seem in line with a view of bricolage as a means to explore creativity in the organization, especially within a time pressure and a crisis context (Le Loarne, 2005). Artistic craftsmanship, with its long tradition, is made up of multiple production areas in which professional qualities, creativity, originality, ability to transform and business flexibility stand out. In a society that increasingly proposes the standardizing model of production and distribution, the artisan workshop represents the best expression of individuals creativity to be fostered through EB. Indeed, while retaining techniques typical of the traditional one, artistic craftsmanship stands out for the elaboration of new forms, original proposals of creativity and culture. The long tradition of manual dexterity is enriched by a precise artistic meaning, today increasingly influenced by the fruitful combination of local artisan cultures and new technologies.

From a territorial perspective, artistic craftsmanship may play a central role in revitalizing communities by championing individual interaction in the business venture creation process that incorporates sustainable decision making. As highlighted by Ratten et al. (2019), artisan entrepreneurs are motivated by economic and lifestyle goals in building their businesses by engaging with the community and developing their crafts. Therefore, the survival and growth of artistic craftsmen also contribute to preserve the cultural heritage of a region. Furthermore, authentic and original products realized by artistic-artisan microfirms are part of the tourism experience. Their workshops, generally located in historic centers, represent a potential destination of great charm for national and foreign tourists, who can discover through these alternative paths a know-how that cannot be found elsewhere.

Originality of the study. Our study contributes to the entrepreneurship research and more specifically to the scant literature on artisanal enterprises in several ways. First of all, the present study extends our understanding of the conditions under which an EO might be associated with performance of artistic-artisan firms. In fact, we establish a comprehensive theoretical framework that incorporates EO, EB and subjective performance to explain the underlying mechanism of EO's influence on the outcomes of artistic-artisan microfirms. Despite the abundance of studies providing evidence about the relationship between EO and performance, as far as we know, this relationship has been not investigated in the context of small artistic-artisan firms. In doing so, we also address the need of studies aimed at enriching the nascent field of artisan entrepreneurship (Crowley, 2019; Ratten et al., 2019).

Furthermore, while much empirical evidence has been provided on the effects of bricolage in the context of new ventures (Baker and Nelson, 2005), scant attention has been paid on established artisan firms. But yet, we think that these firms represent an ideal research setting to examine the effects of bricolage in addressing resource constraints through creative solutions. Dealing with the mediating role of EB in the relationship between EO and performance, to the best of our knowledge, this is the first study that explores this link in the context of artistic-artisan microfirms.

Key words: entrepreneurial orientation; entrepreneurial bricolage; artistic craftsmanship; microfirms; Italy.

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Entrepreneurship during the Covid-19. The Saudi Arabia Narrative

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Objectives. *This study explores the effects of entrepreneurial orientation (EO) and of managers' values on firms' capability to keep doing business and get performance in spite of the COVID-19 pandemic. It focuses on the food and beverage industry, and more specific on the restaurant business in Saudi Arabia: an industry with a great exposure to effects of the pandemic, in a low resilient economy. The paper is part of a larger study on the moderating role of CEOs value on the EO-performance link.*

Covid-19 has been dramatically affecting global economy, reinforcing the idea that we live in a VUCA (volatile, uncertain, complex, and ambiguous) world. The shock risks to have long and deep effects in the most of the countries, and the effects are even stronger in low resilient countries, where the rigidity of the system makes changes slow. All economic activities have been affected by the pandemic, but tourism and services in general seem to experience the most dramatic effects. According to the UTWO, in the most of the countries, the loss in the touristic sectors will lead to a decrease of 2-3% of the GDP in 2021, decrease which will be added to the negative effects registered in other industries.

Saudi Arabia is part of this scenario. Saudi Arabia has been trying to diversify its economy for decades, and in Vision 2030 tourism has been recognised as a key part of the diversification project, with a target of 100 million visitors a year by the end of the decade. This project has led to many investments both in the hospitality and in the food industry, and optimism was justified by the increase both the sectors have had in the last years thanks to the increasing purchasing power of the population. Casual and luxury dining have become profitable business, with expected growth rate higher than 10% per year. However, the COVID-19 and tumbling energy prices have impressively changed the situation, with a decline in tourism of 35-45 percent, and a drop-in revenue of \$28bn in 2020. According to many international and local agencies, for 2021 the expectation is worse.

When crises arrive, Entrepreneurial Orientation (EO) becomes a key resource to increase economic resilience and reduce the effects of external shocks on firms' growth and sustainability (Cannavale et al., 2020). Firms can increase economic resilience through their capability to find flexible solutions, to adapt to complex and new scenario, and to realize innovation which can revitalize their business. At the firm level, EO is defined as the strategic process (Lumpkin and Dess, 1996), and a driver of performance and success (Gupta and Wales, 2017). Miller (1983) believed that a firm is entrepreneurial only when it adopts innovative, proactive, and risk-taking strategic orientations simultaneously. EO is consequently meant as one-dimensional strategic orientation including innovation, proactivity, and risk-taking at the same time (Miller, 1983; Covin and Wales, 2012). It can be defined as willingness to risk taking, proactivity, and innovation (Miller, 1983; Wiklund and Shepherd, 2003),

Scholars have analyzed in depth the relationship between EO and performance (Rezazadeh and Nobari, 2018; Engelen et al., 2014). Galbreath et al. (2019) analyzed this relationship and firm performance in a specific context, the Italian one, which is considered as one of the oldest economies. The authors confirm the positive association between EO and performance, adding that competitive strategy operates as a moderator: a low-cost strategy negatively influences the relationship, while a differentiation strategy positively influences the relationship. Moretti et al. (2020) underlined the importance of EO-oriented strategies as an element of renewal for the business and the adopted perspective showed how EO is not only perceived in firm's boundaries but can surpass them, reflecting the perception of the company by external entities.

While the literature on the connection between EO and firm performance is rich (Gupta and Gupta, 2015; Kantur, 2016; Wales, 2016; Jiang et al., 2018; Kohtamäki et al., 2019), still little is known about the effects of managers' values on this connection (Tang et al., 2017; Palmer et al., 2019; Cannavale et al. 2020). Adomako et al. (2016) studied this link, analyzing the interaction between individual characteristics and EO affects firm's performance. The authors claim the importance of managers' passion for work as a factor which positively moderates the EO-performance link. EO was not only studied as the element from which performance is originated, but is also analyzed to understand why firms differ in their performance and their willingness to change.

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During the last years, scholars have posed more attention on the psychology of organizational leaders as a factor affecting the EO-performance link (Lee and Chu, 2017; D'Angelo and Presutti, 2019; Liu et al., 2019; Conz et al., 2020). Psychological analysis is wide, and within the wide variety of psychological factors we have decided to focus on 'values', and to verify if managers' values moderate the effect of EO on performance.

Values are originally defined as personal desirable goals of being and preferable modes of behavior (Rokeach, 1973). According to Schwartz (1992, 1996, 2006), values transcend specific actions and situations, and guide the selection and the evaluation of situations and behaviors. Values consequently influence actions and decisions. Scholars claim that values and personalities affect how they perceive the environment and eventually make decisions (Hambrick and Mason, 1984; Hambrick, 2007), and more specifically that CEOs values affect the success of entrepreneurial activities (Tang et al., 2017).

Schwartz' value theory (1994, 2012) introduced the system of values that are structured according to two bi-polar dimensions, one of which is the dichotomy of values related to "self-enhancement" vs. "self-transcendence". CEOs higher in self-enhancement values evaluate managerial alternatives through the lens of cost and benefit balances relevant to their own achievement and power, while self-transcendence value is attributed with benevolence, universalism, altruism, and social concerns (Schwartz, 2012; Tang et al., 2017). A previous study confirmed that EO-performance link is positively moderated by the level of CEOs' self-transcendence value in Iran (Cannavale et al., 2020). The other bi-polar dimension is the dichotomy of values related to "openness to change" vs. "conservation". The effects of this dimension on the EO-performance link have not been explored, yet. However, either the values connected to "openness to change (hedonism, stimulation, and self-direction) either the values connected to conservation (tradition, conformity and security) could affect the relationship. This study aims at contributing to the debate about the effects of values on the link between EO and performance. Starting from the results of a previous work on the moderating effect of Iranian CEOs self-transcendence values on the EO-performance link, we want to understand if the EO-performance link is verified under the shock derived from the COVID-19 pandemic, and if managers' values moderate the effect of EO on performance in the same way. The analysis focuses on the restaurant industry in Saudi Arabia, so to develop the analysis in a different low resilient economy and to focus on an industry which has been impressively affected by the COVID-19 pandemic.

Methodology. This is a quantitative research that employs hierarchical regression analysis. This is a quantitative research. Hierarchical regression is suitable for theory-based hypotheses testing in a sequential manner (Cohen, 2001), and allows evaluating and comparing the influence of each specific variable on the dependent variable's prediction power (Petrocelli, 2003). Regression analysis is still considered useful as well as rigorous specifically in the field of entrepreneurship. Recent publications in the leading outlets of entrepreneurship are continuously employing regression analysis to test their theory driven hypotheses about entrepreneurship, entrepreneurial orientation, and firm performance as a robust tool (Titus Jr et al., 2020; de Mol, Cardon et al., 2020; Michaelisa et al., 2020; Duran and Ortiz, 2020; Cacciottia et al., 2020; Anglin et al., 2020).

The sampling process has taken place by sending emails, including an explanation of the purpose of the research together with a link to the online questionnaire, in order to ensure homogeneous sample data from all the possible areas of activity and from all the geographical districts of the country.

The analysis is based on three measurement tools to be able to test the hypotheses that were developed about the relationships among these variables: one for entrepreneurial orientation, one for performance, and one for values. The three measurement tools are derived from standard questionnaires with approved validity and reliability in the literature explained below. These three measurement tools are gathered together in one questionnaire including 6-point Likert type questions (from 1 indicating completely disagree to 6 indicating completely agree).

EO. To measure entrepreneurial orientation of the firms, the questionnaire of Hughes and Morgan (2007) was employed, including 18 multiple choice Likert items (1 for indication of completely disagree and 6 for indication of completely agree choices). According to Principal Component Analysis, the EO resulted in a unidimensional variable that behaves as the conceptualization of EO presented by Miller (1983). This is in line with the fact that various conceptualizations of EO construct behave differently based on the data from countries other than the US (George, 2011). Thus, we utilized the previously tested measure of EO among Saudi firms in this study since it has shown high reliability and validity.

Performance. Following Yukl (2008), we focused on the three determinants of organizational long-term financial performance as: efficiency, adaptation, and human capital by 13 six-point Likert items. The three dimensions of performance are mostly important in the field of entrepreneurial entity performance, since they conceptually bring about better financial performance and therefore survival of these firms (Cannavale and Nadali, 2019). The instrument for measuring performance according to the Yukl's (2008) conceptualization was adopted from the work of Sanjaghi et al. (2012) who operationalized the instrument.

Values. We used the PVQ 21 items by Schwartz (2006), largely employed in the international literature about entrepreneurship (Sotiropoulou et al., 2019; Choongo et al., 2019; Linan et al., 2016). The 21-Item PVQ consists of 21 items, which express objectives, attitudes or wishes that can be explicitly assigned to one of the ten basic value (universalism, benevolence, conformity, tradition, security, power, achievement, hedonism, stimulation, self-direction). The respondents are asked to compare the statements with themselves on a 6-level Likert scale (1 = not like me at all; 6 = very much like me), and items do not refer directly the basic values, so that a truthful answer can be assumed.

The questionnaire was structured in a way not to develop common method bias by breaking the sections related to each of the above-mentioned items, explaining each item to the respondents. This method reduces the possibility of

common method bias since it separates the sections and the respondents are aware of the differences among all the items under investigation (Podsakoff et al., 2003). We have applied the Harman's single factor test to check the explanation of variance, and Cronbach alpha and Composite Reliability (CR) for the three variables. Also, in a Confirmatory Factor Analysis (CFA) all the items were loaded significantly to the corresponding constructs. Before developing the analysis, we performed a PCA to reduce the dimensionality of the variables under investigation and also to control the unfavorable effects of probable multi-collinearity (Reiss and Ogden, 2007).

Findings. The research is still in progress, but the first results confirm the moderating role of values on the EO-performance link in Saudi restaurant firms. EO is confirmed to be a key factor of firms' competitiveness. Entrepreneurial firms are ready to adapt and to change their business model in order to overcome the crisis. The first results also reinforce the idea that managers' values are vitally important in overcoming the difficulties of doing business during the COVID-19 pandemic. The problems faced by Saudi Arabian managers are similar to those faced by other managers in the same industry in other countries, and so that the probability to find similar results in other contexts is high.

Research limits. While interesting the study suffers from important limitations. The sample is limited, and the analysis is focused on specific industry posing important doubts about the generalization of results. Another limitation derives from the focus on one country, given that the institutional context could affect managers' cultures, and consequently impact on the intensity of some values and on their effects on the EO-performance link. Last but not least, another limitation refers to the complex definition of EO. There are two salient types of EO constructs in the literature. One is the Miller's (1983) unidimensional construct, the other is the multidimensional construct proposed by Lumpkin and Dess (1996). There is a debate in the relevant literature about dimensionality of EO and some researchers suggest considering single and combined effects of different dimensions of EO in order not to produce a gestalt variable out of EO (Hughes and Morgan, 2007; Lomberg et al., 2017; Cannavale and Nadali, 2019).

Practical implications. In spite of the limitation, the study has some interesting implication. Understanding more about the values which help manager facing and overcoming difficulties, the education system could try to develop these values in the programs focused on management. The development of soft skills could be oriented by these findings. At a company level, organizational practices, career plans, and reward systems could be oriented to the right values, and also in the selection process more space could be given to the personality traits which can influence individual capability to become effective leader in a VUCA world. Regarding to the COVID-19 pandemic, the decrease of international tourism and the problems connected to transports and mobility have created conditions of low resilience in many countries, and this reinforces the necessity to take decisions inspired by values, which can lead firms in the right direction, and reach high performances are very crucial in such situation. This is particularly true in industries which are deeply affected by this phenomenon, such as the restaurant and hospitality business which are registering huge losses in many countries.

Originality of the study. This paper addresses a major gap in the traditional EO-performance relationship which is related to the role of managers' values. The analysis is developed in Saudi Arabia, a country on which only a few cultural analyses have been developed and updated data on managerial culture are missing. Saudi Arabia is undergoing big economic reforms, and this analysis sheds new light on the effects of managers' values on the EO-performance link in a context which is particularly complex and uncertain because of the transition it is going through. Our results are interesting both from a theoretical and practical point of view. From the theoretical point of view, they confirm the opportunity to investigate managers' personality to understand more about the EO-performance relationship. From an empirical point of view, they suggest the importance of specific values for managers who want to overcome crisis and shocks, and to produce good results in complex situation. Although related to the COVID-18 pandemic, the results can be easily generalized to other kind of global shocks.

Key words: Entrepreneurial Orientation; Schwartz values; restaurant industry, Saudi Arabia, COVID-19.

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Understanding the role of risk capital providers in entrepreneurial ecosystems

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Objectives. *Venture Capital is a key figure in entrepreneurial processes and in stimulating innovation. In the field of innovation, our interest focuses on the founding dynamics of innovation ecosystems. It has been observed that the most successful innovation ecosystems are those characterized by the strong presence of venture capitalists; figures crucial for the birth and growth of start-ups, especially high-tech ones, the lifeblood of innovation.*

For this reason, our goal was to explore the role of Venture Capital (VC) within Innovation Ecosystems (IE).

An innovation system is characterized by important structural elements: the heterogeneity of actors, their spatial proximity, the relationships and ties between them, the framework of infrastructure endowments, and the policy incentives within which they operate. Therefore, our work investigated the role of VCs with respect to each of these dimensions. To address this issue, we conducted a literature review, thanks to which we were able to develop some interesting propositions.

Given the crucial relevance of VCs within ecosystems, we set out to develop a framework that would be able to guide managers and policy makers. Important practical implications arise from our work.

Methodology. *To answer our research question on the role of Venture Capital within an Innovation Ecosystem, we conducted a systematic literature review, through which we wanted to understand the breadth and depth of the current state of the literature and identify gaps to explore (Xiao, 2019). For this reason, we conducted a stand-alone literature review (Templier and Paré 2015).*

This type of systematic literature review aims to define meaning to an existing body of literature through aggregation, interpretation, explanation, or integration of existing research (Rousseau, Manning, and Denyer 2008). We decided to conduct a descriptive review (Templier and Paré 2015) that examines the state of the existing literature with reference to a specific concept. The purpose is not to expand the literature but to provide an overview of everything that has been written on a specific topic.

For data collection, we used the Scopus database which is the largest online database of peer-reviewed literature. We performed a keyword-driven search strategy. Since the concept of an ecosystem is often blurred and many scholars discussing it often use alternative terms as synonyms, we considered it useful to also adopt other vocabulary to further our topic, as innovation system, network and cluster.

Keywords were selected in such a way as to include the concepts of actor heterogeneity, networks of relationships, and geographic proximity, all of which are common to the definitions of all constructs encompassed in the research.

Our research was conducted as follows: "venture capital" AND "innovation system*" OR "innovation ecosystem*" OR "innovation network*" OR "entrepreneurial ecosystem*."*

The database showed us 100 results.

Furthermore, we included the following keywords: TITLE-ABS-KEY ("the role of venture capital" AND "innovation system*" OR "innovation ecosystem*" OR "innovation network*" OR "entrepreneurial ecosystem*"). The result is 25 articles.*

An initial skimming was done by reading the abstracts. At the end of this operation the articles that were salient to the object of our research were 16.

We read all the articles and developed our work by identifying contributions that discussed VCs with respect to one or more of the structural features of an IE. Specific sections corresponding to each of the four characteristics are provided in the body of the article. After screening and skimming and identifying the main topics that scholars focused

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on when discussing VC within ecosystems, we developed some propositions synthesizing the main variables and evidence that emerged from the literature.

Findings. We classified our results according to the four main structural characteristics of an innovation ecosystem. We discuss each of them in the following sections.

IE Actors Heterogeneity: how VC interacts with IE stakeholders

Our results suggest that VCs play an important direct role towards startups; an indirect one for the labor market and for all the service companies that revolve around startups, especially in the embryonic phase of their foundation; and a complementary role towards public forms of financing and MNEs.

Direct Functions

The first main role of VC is that towards startups. We refer primarily to the functions outlined by Granovetter and Ferrary (2009). These are:

- **Financing function**

First of all, they provide a fundamental financing function for startups. In particular, these actors intervene at certain stages in the life cycle of start-ups in which they seek external funding because they are unable to finance themselves. VCs' unique professional skills and expertise enable them to identify and evaluate entrepreneurs who engage in innovative activities; in addition, they specifically target high-tech business opportunities and motivate entrepreneurs to move from traditional to high-tech sectors

- **Selection function**

Among the informal functions, there is that of selection. VCs gather information, identify and select the projects that seem most promising. The likelihood of a startup surviving without the help of VCs is very low. In addition to financial risk, VCs also assess technology, market risks and those strictly related to the entrepreneur.

- **Signaling function**

Linked to the selection function, we find the signaling function. Startups are seen by service providers or workers themselves as unstable and unreliable entities. In this regard, VCs play an important role in terms of reputation

- **Collective learning function**

The fourth informal function attributed to VCs is that of collective learning. Moreover, they are still involved in the companies they have funded. All of this provides access to an immense wealth of knowledge to the startup that makes a connection with a VC.

- **Incorporation function**

The last of the functions identified by Ferrary and Granovetter (2009) relates to that of incorporation. VCs are active nodes within networks, and this promotes the incorporation of startups into the ecosystem.

Indirect VC functions

They also play an important indirect function towards service firms (as those of consultancy, recruitment, legal firms etc.) and labor market: by injecting capital into startups, VCs also indirectly fund a whole range of other agents that are part of the network as startups will face numerous expenses in the embryonic stage such as those related to legal services, consulting, recruitment agencies. They also indirectly finance the ecosystem's labor market through the recruitment of professionals trained at universities in the same cluster.

Complementarity VC function

In addition to these more popular roles of VCs, we also found that they have a complementary role with public funding and MNEs. With regard to the former, Samala et al. (2010) highlight the complementarity of public funding and VC. They, in fact, explain that while public research funding is usually used for basic research, VC is instead commonly used for applied research that enables subsequent commercialization (Cooke, 2001a, b). In the absence of local supply of venture capital, the effect that public funding has on patents and new firms is almost nil. The complementarity of the two sources of funding is also given by the fact that they are different for a number of reasons. As the authors explain, first, "academic institutions would probably not engage in the same levels of research in the absence of government funding. Individual researchers typically do not have the financial resources to pursue their own research, and academic institutions depend primarily on revenues from educating students and not from commercializing the innovations they incubate" furthermore, VCs provide not only capital, but also expertise and knowledge (Samala et al. 2010).

Moreover, these types of funding intervene at different stages of maturity: government grants fund the creation of ideas while VCs fund the development of ideas, stimulating and encouraging entrepreneurs to bring their ideas to market.

During the processes of IE emergence and evolution, VC undertake relationships with other organizations, among them multinational corporations (MNEs) have similar logics especially in terms of investments and innovations. Although they differ in structure and goals, Sun et al. (2019) emphasize the importance of their complementarity, arguing that linkages between MNEs and VCs can play an important role in fostering innovation, especially within emerging markets where both fill institutional gaps and weaknesses in market structure. Both types of organizations make resources flow within networks; VCs mobilize resources and facilitate collective learning processes by providing professional expertise; MNEs can influence knowledge generation through foreign managerial experience. In addition, both assume similar investment risks as they provide capital to local firms in the form of debt or equity.

These mechanisms allow MNEs and VCs to co-create resources and connections between companies within the ecosystem to facilitate innovation.

Proposition 1

The VC performs direct, indirect, and complementary functions depending on the actors with whom it interacts.

IE geographic proximity: the role of physical distance in VC

Within an innovation ecosystem, and in general all the constructs we discussed above that involve more or less strong connections between a variety of agents, a key element for exchange and interactions is the geographical proximity of the actors.

Calza et al, (2020), exploring the case of one of the most famous and ancient EIs, namely the Biopharma Innovation Ecosystem in Greater Boston Area (USA), wanted to investigate the role of ecosystems as an effective mechanism to overcome the Valley of Death, the “place” where all ideas that fail to get out of the labs and get funded and commercialized end up (Frank, 2019). The results of the study demonstrate that cooperation and interactions help biopharma companies to overcome the Valley of Death. Interviews suggest that close proximity to investors makes a difference for startups because repeated and frequent relationships allow for a network of industry players to rely on that can act as a talent validation mechanism, particularly important when deals are highly risky. VCs themselves tend to share office space with their portfolio companies, this benefits the relationships themselves which are usually long-term. Due to the micro-proximity of VCs and entrepreneurs, there is increased opportunity for learning which would make it easier to overcome the Valley of Death.

In addition to overcoming specific barriers, as in the case of the Valley of Death, the geographic variable and proximity help in stimulating knowledge-based ecosystems. Langeland (2007) in his work states that VC investments are usually clustered geographically in cities and urban areas, which are referred to as innovation hubs. The tendency to locate in large cities is explained by the fact that in addition to having a diversified knowledge base, these areas are home to numerous research and development institutions, specialized financial services, and business services that constitute agglomerations characterized by high proximity.

Therefore, thanks to the geographic proximity that stimulates and encourages formal and informal relationships which, in turn, allow the continuous exchange of information and knowledge, once again the importance of the role of VCs as intermediaries between investors and entrepreneurs, between the market and research institutes, thus promoting knowledge and innovation, is underlined.

Proposition 2

The VC spatial proximity to the other actors of an IE is a crucial motivation for the localization decision of VCs

Proposition 3

The spatial proximity between VC and other actors facilitates knowledge and information flows either by formal or informal ties

Proposition 4

Micro-proximity of startups with VC can be critical to avoiding failure at early stages of the startup life cycle

IE policies and infrastructures: What voids does VC have to fill?

One of the most important figures in an IE is the VC, but sometimes there may be obstacles to creating a thriving VC industry.

Some of the strongest institutional barriers to the VC establishment in a precise region are those relative to the inefficacy in government policies and weaknesses in legal and judicial regulation leading to weak financial tools for VC financing (Shoiaei et al., 2018). This condition particularly affects emerging economies that are characterized by certain structural weaknesses.

Many scholars have documented the fundamental importance of VCs in developed markets, emphasizing their nature as catalysts in innovation activities (Haarmeyer, 2008; Samila & Sorenson, 2010; Lerner, 2012). Samila and Sorenson (2010) in their study conducted from panel data in metropolitan areas of the United States from 1993 to 2002 demonstrated that VC can be defined as a fundamental catalyst for the commercialization of innovations; that is, for the transfer of innovations from the laboratory to industry and then to consumers.

In fact, VCs can be defined as catalysts for commercialization because, in addition to funding projects, they help develop a pool of entrepreneurial talent within an area.

Sun et al. (2018), argue that in emerging economies VCs need to be more proactive in their behavior and call them “Ecosystem Engineers”. By translating an ecological metaphor, that of the biological ecosystem, to the concept of the innovation ecosystem, two main functions of ecosystem engineers are identified: governing resource flows and selecting deviation

In an emerging market, due to the weaknesses of the market itself, it is difficult to encourage innovation activities; the resulting environment is an unstable and fragmented market that discourages the entry of new entrepreneurs and thus also limits financing activities, which is why VCs cannot play the role of catalysts as they do in developed markets.

As engineers, they will be able to mobilize resources within the ecosystem, as Bergek et al. (2008) also point out. The other function of VCs in emerging markets is that of selecting deviation, which in ecology means “the temperature differential from its equilibrium value” (McKelvey, 2002). Also, Ahlstrom, D., Bruton, G. D. (2006), through an

analysis conducted on East Asian economies, state the different role that VCs play in emerging economies, emphasizing the substantial difference from more developed economies.

Thus, the role of the VC changes depending on whether we are talking about established or emerging EIs. Because of the inherent weaknesses of an emerging IE, many governments have developed policies aimed at attracting VCs.

Governments should promote growth and development by shaping an entrepreneurial ecosystem (EE) consisting of a knowledge sub-system and a business sub-system that often remain disconnected. Through targeted public policies, they should stimulate the establishment of a funding support network (FSN) in which startups and VC investors are able to connect the two sub-systems. When there are “weak network” problems in economies where the financial community is not strong, VCs act as network brokers as they establish relationships with other ecosystem actors (van Rijnsoever, 2020), much more than other capital providers (such as Business Angels who invest early in the venture and are difficult to identify as they are often not institutionalized).

Many countries are implementing or have previously implemented public policies to encourage VC diffusion, not many of which have achieved the desired results (Lerner, 2009), perhaps in part because of the structural incompatibility of the VC model with some characteristics of the institutions that implemented them (Samila, 2010). Among the failures, however, there are also cases of success, such as that of Silicon Wadi one of the most fruitful ecosystems of innovation, second only to Silicon Valley.

What Wonglimpiyarat (2016) wanted to highlight in his work is that the thriving VC industry, a result of the many policies aimed at development, has contributed strongly to creating cluster effects to support the high-tech cluster in Silicon Wadi.

The government program was able to effectively support investment in ICT and life sciences, especially. And government funds along with other private funds have attracted additional sources of funding for business growth. The attraction of external companies, including foreign ones, also fostered a collective learning process, through collaboration between VC firms.

Proposition 5

In a mature economy the VC is a catalyst of commercialization, while in emergent economies VC mobilizes resources and select the deviation.

Proposition 6

VC performs the functions of formal institutions, replacing them, in weak ecosystems. Proposition 7

VC performs better when supported by public incentives and ad hoc government policies.

IE organizational networks: the role of VC in favoring connectivity

Through an active role of VCs, defined by the ability of these individuals to establish relationships with universities, research centers, and businesses, VCs are able to identify ideas and verify their value. Public funds are also able to finance innovation; they are usually employed for basic research, while VCs fund applied research, which is precisely what gets innovations out of the labs.

VC establishes relationships with actors within a region and in this way “modulates the flow of resources within a spatial region that allows for symbiotic relationships among existing members of the focal region, so that existing groups of actors, such as companies, are selected to divert their stock of knowledge and capabilities. and results in increased survival, over time and in relation to other actor groups within the region” (Sun et al, 2018); thus, through the role of VC engineers, one can witness the transformation of an inefficient ecosystem into a productive one.

As noted above, a foundational element of an ecosystem is the ability of actors to co-evolve within an ecosystem. Two or more species of actors, by sharing habitats, influence each other’s evolution (Ehrlich & Raven, 1964; Levin, 1983; Dieleman & Sachs, 2008), becoming part of each other’s environment, i.e., creating an innovation ecosystem. And VCs shape IEs, especially in an emerging market: the stronger the presence of VC activity, the greater the innovation.

Notably, VCs in less robust ecosystems monitor firms through informal ties to entrepreneurs and their families (Ahlstrom, 2006).

These types of informal ties to customers, businesses, and government facilitate entrepreneurial processes and the innovation that results.

Mason and Pierrakis (2013) find that government programs supporting the venture capital industry have a strong impact on the entrepreneurial ecosystem because they significantly increase the supply of venture capital financing. Pierrakis et al. in a recent article (2019) argue that increased availability also triggers more interactions and networking activities that extend to other players in the innovation ecosystem, such as university incubators, research institutions, and business support organizations.

Moreover, it is true that public capitals show the most interaction, but they are also the ones that show a lower success rate than private ones, so interaction alone does not lead to success.

In light of these considerations, co-investment activities in which investments are made between public and private funds have a twofold benefit: first, a learning process for public venture capitalists to gain more capacity, and second, a process for private VCs to become part of the overall innovation ecosystem.

Proposition 8

The more the availability of VC increases in a region, the more the number of relationships in an IE increases.

Proposition 9

Relationships foster a two-way process in which is VCs leverage the networks of other actors and other actors gain more managerial and professional skills.

Research limits. *First of all, our work was conducted by consulting only one source, the analysis could be enriched by using other reference databases, such as Web of Science.*

Another limitation concerns that we did not consider the life cycle of the ecosystem, or of the startups (main actors with which the VC interacts) which could be an additional element through which understand the dynamics associated to VCs in an IE, along a time axis.

Related to the above is another limitation: VCs are not the only venture capital providers in an IE, perhaps it is worth investigating what is the role of VCs compared to that of other alternative sources of funding, such as Business Angels, Private Equity and so on.

In addition, we have not taken into account the barriers that exist within an innovation ecosystem; in fact, these can hinder the generation of a thriving VC industry. It would be interesting in future research to focus on the barriers to VC, to better understand how to overcome them or what elements are needed to prevent a VC firm from becoming discouraged and avoiding investing in a given region.

We encourage future research starting from these observations because we strongly believe in the importance of these kinds of actors within an innovation ecosystem. based on our limitations, we invite scholars in this field to further investigate this under-explored role in order to provide interesting insights to those charged with creating efficient innovation ecosystems.

Practical implications. *Our work aimed at grouping all the contributions of scholars who analyze innovation ecosystems, focusing on the role of a specific actor: the VC.*

Our main contribution relates to the fact that until now no literature review had been conducted on this topic.

Moreover, having integrated all the most relevant contributions into a single document, we extend the literature on ecosystems and also the literature inherent to VCs, which have been too little studied from an ecosystem perspective.

In addition, this work can be inspirational for managers in stimulating relationships, and spatial proximity to VCs having understood their rich benefits.

Policymakers should leverage not only the formal and direct functions that VCs perform but could also stimulate the informal and indirect relationships that as we have seen turn out to have high positive effects for the business community, for the VC firms themselves and for the whole innovation ecosystem that becomes more robust through a dense number of connections and the two-way learning processes between actors.

Originality of the study. *Our findings suggest a range of evidence that allowed us to construct 9 propositions that form the foundation for a theoretical framework within which to orient ourselves. From this analysis, we learned that an ecosystem functions effectively and generates innovation and growth when all the actors necessary for this purpose co-exist and co-evolve. The lack of any one of them can weaken the ecosystem. Of all the nodes in the network, the VC serves multiple functions and we believe it is crucial for both policymakers and startups and other companies to understand its importance. We reviewed what are the formal functions attributed to them, namely funding functions, which are accompanied by other valuable resources that VCs can provide.*

We have studied these functions in relation to the main structural characteristics of an ecosystem, which in our view better frames the understanding of what needs to be done by institutions to attract VCs at the local level and of the richness of the “VC bundle” for startups and indirectly for all other organizations present in an innovation system. We have found that depending on the actor with whom it interacts, the VC performs different functions, and this is also true depending on whether we are talking about established and complete ecosystems or emerging ecosystems that have weaknesses.

Indeed, they act as catalysts for commercialization in mature economies or as ecosystem engineers in emerging economies, playing a more proactive role. They mobilize resources, transfer knowledge and improve, through collective learning, those of others; they also select deviation, shaping the ecosystem toward new equilibria. All this thanks to the relationships that are triggered with other VC companies and especially with the other actors of the ecosystem that, thanks to the heterogeneity that distinguishes them, participate in different ways to innovation. In particular, proximity and sometimes micro-proximity allow an easier flow of information, and their importance can be seen in the importance that VCs themselves give to spatial proximity, electing it as the main reason for their establishment in a given region. Again, repeated interactions and face-to-face meetings have proven to be an important lever to avoid the failure of a startup in its embryonic stages, to be able to overcome the Valley of Death.

In addition, the presence of VCs within a region has been shown to attract other players; the greater availability of VCs increases the likelihood of a large number of relationships.

For all these reasons the VC is a key figure in the entrepreneurial processes, in fact these agents not only make possible the financing of entrepreneurial ideas and the birth of startups, but they also shape the innovation ecosystem, stimulating its development and defending it from external shocks. Governments in some Countries have understood the value of VCs and have designed specific policies for their attraction, while others have not done enough.

Key words: *Innovation ecosystem; Innovation networks, Venture Capital, Entrepreneurial process*

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Does culture matter for social innovation? Investigating the role of national culture for the generation of social innovation

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Objectives. Today, scholars widely recognize culture as a critical factor in innovation (Tian et al., 2018). However, this topic is still debated and there is still no complete agreement among researchers on how culture specifically influences innovation. Empirical studies also show mixed results. Building on this literature, our study aims to understand the potential impact of culture on a particular type of innovations, namely social innovations (SI).

Theoretical background. Most of the research published about SI are conceptual paper (Phillips, Lee, Ghobadian, O'Regan and James, 2015; João-Roland and Granados, 2020; Farinha et al., 2020), because of different reasons. Firstly, SI literature, while has received many attentions from scholars in the recent years (Lettice and Parekh, 2010; Farinha et al., 2020), it is still fragmented (Cajaiba-Santana, 2014) and not-cumulative (Van der Have and Rubalcaba, 2016). In addition, there is still a lack of consensus from a definitional point of view (Pol and Ville, 2009). Secondly, the social innovation concept easily overlaps with similar subjects, such as the Social entrepreneurship (Dawson and Daniel, 2010). Thirdly, there is not yet a defined measurement tool for Social Innovation. Indeed, within the SI topic, “there is a dominance of qualitative research, especially case studies” (João-Roland and Granados, 2020; p. 6).

This paper is part of a larger research project aimed at contributing to this still underdeveloped field of studies. The research project addresses to main research questions: 1) how national culture (i.e., cultural values) may inhibit or facilitate the creation and design of social innovations and, further, 2) how culture may influence the diffusion of social innovations. More specifically, it aims to understand the extent to which cultural values influence the diffusion of social innovation from less advanced to more advanced countries, i.e., how they impact the reversal of flow, which increasingly characterizes the diffusion of innovation across countries. This trickling-up process is well known in the global innovation literature as Reverse Innovation (RI) (Zeschky et al., 2014).

The paper focuses on the first research question and advances some theoretical proposition on the effect that different traits of national cultures can have on the development of SIs.

As starting point we adopt the notion of SIs as innovations born to address customers' social and health issues (Mulgan et al., 2007), and the notion of culture as “the collective programming of the mind that distinguishes the members of one group or category of people from others” (Hofstede et al., 2010; p.6). Accordingly, cultural values are beliefs, standards, or criteria, which refer to desirable goals, ordered by importance from everyone's perspective (Schwartz, 2012).

The paper links together two different streams of literature: the literature on the effect of the culture on innovation and the literature on the effect of the culture on socially responsible practices.

The effect of culture on innovation

The authors give different classifications of cultural values and explore the effects they have on the different stages of innovation, such as creation, and diffusion or transfer, and they investigate how culture affects knowledge sharing among actors. The relationship between innovation and national culture is vital, but at the same time complex (Tian et al., 2018). One of the most popular models applied to cross-counties analysis is Hofstede's (2010) framework. According to Hofstede et al. (2010), cultures can be compared according to six cultural dimensions: Power Distance (PD); Individualism (IDV); Uncertainty Avoidance (UA); Masculinity versus Femininity (MAS); Long-Term Orientation (LTO); and Indulgence versus Restriction (IND). Power distance measures how people accept an unequal distribution of power within a country (Hofstede et al., 2010). Power distance, apparently, is the dimension on which scholars seem mostly to agree: finding out a negative relationship with the generation of new ideas (Shane, 1993; Kaasa and Vadi, 2010; Tian et al., 2018).

Individualism refers to the extent to which individuals feel independent and free; it is the opposite to collectivism, which refers to a society in which individuals are highly integrated with the group, large or small (Hofstede et al., 2010). Individualism apparently promotes the ideation of innovations, enabling individuals to be more creative and free

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(Shane, 1993; Tian et al., 2018), and boosts the adoption of new products (Kumar, 2014). However, scholars get to different results. Kaasa and Vadi (2010) found the relation between individualism and patenting as statistically weak, while based Rhyne, Theagarden and Van den Panhuyzen (2002) argue that the relation is not supported.

Masculinity averages the importance attributed to income, assertiveness or achievement (Hofstede et al., 2010). In masculinity societies, a higher level of new product innovation is expected than in feminine societies (Rhyne et al., 2002), in reason of the achievement and success orientation. Kaasa and Vadi (2010), though, demonstrate a negative relation, since feminine societies enhance the collaborations and, as a consequence, alliances for innovations.

Uncertainty avoidance indicates if members of a society feel comfortable with ambiguous situation, or rather, they try to control it with bureaucratic practises and rituals (Hofstede et al., 2010). This dimension has a negative relation with patenting (Kaasa and Vadi, 2010), and with new product innovation (Rhyne et al., 2002): overall, the higher is this values, the less innovative will be a society (Shane, 1993).

The fifth dimension of the model is the Long-term orientation: it evaluate how easily people implement planned behaviour and long term investment (Hofstede et al., 2010). Findings about the Long-term orientation dimension are just a few and results are not statistically supported (Rhyne et al., 2002). Probably this is due to the lack of data, which are missing for many countries (Kaasa and Vadi, 2010) or because it was earlier labeled as Confucian Dynamism dimension, untill 1988 when Bond discovered a correlation between the Confucian Dynamism and the Asian countries rapid economic growth (Hofstede, 2011).

The last cultural dimension is Indulgence versus Restraint: it express the degree by which people prefer gratification or commonly tend to control their basic desires (Hofstede et al., 2010). It was introduced only in 2010, after Minkov's work based on the World Value Survey. Because of its newness, it presents very limited studies within the innovation research (Tian et al., 2018): there is barely one study regarding Indulgence and technology innovation, completed by Griffith and Ribera (2014). For this reason, we decide to exclude it from our analysis.

The effect of culture on socially responsible practices

Cultural values explain not only the inclination to innovative, but also the socially responsible practices that firms may implement and tend to use. Within the business ethic field, different authors investigate how culture could alter what is perceived as ethically right or wrong and how morality changes across countries. Particularly the firms' propensity to adopt the explicit and implicit CSR behaviour could change, because of culture (Canestrino et al., 2015). However, the relation among national culture and firms' social behaviour is not as immediate as it appears.

Studies dealing with the interplay of culture and socially responsible practice have especially analysed how cultural traits may influence Corporate Social Innovation and Responsibility at level of organizations.

The term Corporate Social Innovation usually refers to Social Innovations, when adopted at a corporate level (Canestrino et al., 2015; Dioniso and de Vargas, 2020). Canestrino et al. (2015) found out that individualistic cultures are more likely to innovate and to adopt explicit socially responsible practices, affecting both the innovation rate and the nature of the innovation itself. In a similar vein, femininity cultures, more than masculinity context, are more likely to create social innovation, rather than the traditional one. According to Herrera (2015), among the institutional elements enabling Social Innovation, the organizational culture plays a focal role: a risk-taking approach is more likely to encourage Social Innovation. Thus, it is reasonable to affirm that low uncertainty avoidance rate fosters the generation of social innovation, by means of adopting a risk-taking behaviour. This result is coherent also with what Halkos and Skouloudis (2017) discovered: the uncertainty avoidance index has a significant negative impact on the Corporate Social Responsibility. In opposition to the assessment of Canestrino et al. (2015), Halkos and Skouloudis (2017) prove a negative impact of the individualism dimension on the CSR. In our opinion, although the individual initiative promotes the technological innovation, social innovation concerns more the collective interest, addressing social and health needs of the group. This result is also in line with Waldman et al. (2006) who demonstrate a positive relation with institutional collectivistic societies and CSR. Referring to the Power Distance dimension, only few works look at its influence on Corporate Social Responsibility. Among them, Halkos and Skouloudis (2017) demonstrate that this dimension is statistically non-significant. Instead, the study by Waldman et al. (2006) and Ringov and Zollo (2007) both agree on how highly power distance culture are negatively related with CSR values. This outcome is congruent with the discussion about SI. Regarding the last cultural dimension of the model, according to Halkos and Skouloudis (2017), Long-Term Orientation has a positive effect on Corporate Social Responsibility.

Methodology. In this study, we adopt the lenses of cross-cultural studies to shed light on how SI is developed in different countries/cultural settings. We argue that this perspective may help in developing a more consistent and integrated framework to understand SI. Indeed, SI is by nature socially embedded and thus largely culture specific. As noted by Canestrino et al. (2015), what is social within a context, will not necessarily be recognized as such in another. Innovations that are perceived in a context as technologically oriented can have a social connotation somewhere else, depending on values and beliefs (Baek et al., 2019). Moreover, economic, or general wealth conditions may also shape what is social or not in a specific geographic area.

Accordingly, in the present work, we develop a conceptual framework made of different propositions based on a deductive reasoning that starts from three theoretical bodies: (a) the Hofstede's framework with the cultural traits that characterize different national cultures; (b) the Corporate Social Responsibility and Corporate Social Innovation studies; (c) the Social Innovation stream of literature.

Findings. In this section, we present the conceptual framework developed and the related propositions about the effects of cultural values on SI. Culture is considered at a country level, and cultural dimensions are employed as a

proxy of cultural values (Hofstede, 1980).

Looking at the *Power Distance* dimension, we suppose a negative relation with Social Innovation. When power distance value is high, there is a lack of concern for minorities. Thus, agreeing with previous authors, we believe that this value could logically discourage social innovation too. Our first proposition is the following:

- High levels of Power distance would hinder the generation of social innovations.

Further, we expect to find that collectivistic cultures support both the innovation at national level, in accordance with Taylor and Wilson (2012) and the generation of social innovation. The positive relation between collectivism and social innovations is thus consistent with SI's and CSI's definitions. On one side, Dawson and Daniel (2010) define SI as improvement of the collective wellbeing; while Cajaiba-Santana (2014) as "practise created from collective, intentional, and goal-oriented actions" (Cajaiba-Santana, 2014; p. 44). The focus is on the group and the collectivity, in either cases. On the other, following Canestrino et al.'s word (2015), CSI can be considered as a "system (innovation) to meet collective needs in a social responsible manner" (Canestrino et al., 2015; p. 3). Our second proposition is the following:

- Collectivism would boost the generation of social innovations.

We believe that within low uncertainty avoidance context, the less people depend on rigid and strict rules, the more there is space for creativity and innovative initiative. Whether this is true for traditional innovation, it is also true for social innovation, which most of the time represent even more a risky choice compared with technological innovations, in terms of market share and acceptance. Based on these assumptions, we formulate the following proposition:

- High levels of uncertainty avoidance would inhibit the generation of social innovations.

With regards to masculinity, we endorse a negative relation with SI. This thesis is strongly sustained in several works about CSR: before Ringov and Zollo (2007) and later Peng, Dashdeleg and Chih (2012) and Thanetsunthorn (2015) demonstrate that countries with low masculinity level show lower level of CSR. It is acceptable to believe that the opposite of masculinity – namely femininity - is positive associated also with SI, since this kind of culture pays attention to the quality of life, or to the assistance of others. These aspects are perfectly in line with the social mission of a social innovation, while traditional technological innovations seem to be more conforming to masculine societies, where status and income represent the key elements. According to these premises, we state the third proposition:

- Masculinity would discourage the generation of social innovations.

Last but not least, *Long-Term Orientation*. Compared with the other dimensions, there are fewer works questioning its impact. Therefore, while there are no other research considering its effect on CSR or on CSI, we believe that LTO has a positive impact also on SI. Indeed, Social innovations, even more than the traditional ones, call for long-term planned behaviour, since SI is far more embedded in the geographical area where it was born and, as discussed before, depend more on the institutional context. The last proposition articulated is the following:

- Long-Term Orientation would promote the generation of social innovations.

In conclusion, we assume that power distance, uncertainty avoidance, masculinity and individualism have a potential negative impact on social innovation. On the contrary, Long-term orientation has a positive effect on SI.

Research limits. This paper is conceptual in nature and offers a conceptual framework for analyzing SI through the lens of the cross-cultural theoretical perspective. Its main limitation stems from the choice of the theoretical models used to construct the framework (Hofstede for the classification of cultural traits and CSI and CSR for the interaction between culture and socially responsible practices). Using a different theoretical background could possibly lead scholars in future research to advance different propositions that could further enhance our understanding of SI.

Moreover, being theoretical, our propositions require future studies to test them empirically.

Practical implications. Successful Innovations provide interesting and efficient solutions to daily challenges. This becomes even more true when dealing with social innovations, because of the kinds of problems that they address to. Considering the positive impact that Social Innovation could have globally, especially due to the actual pandemic situation, it now became fundamental for scholars, managers, and policymakers to deeply understand the underlying mechanism of social innovation. As several scholars agreed to, the institutional context promote the emergence of the ideation of a social innovation (Harrison et al., 2012).

Understanding how culture could boost social innovation represents a huge help for multinationals which want to pursue this strategy; indeed, managers will be aware of the optimal location for the generation of a social innovation. This will further contribute to understand how to implement effectively social innovation and where they should be later launched, in order to have a strong acceptance and adoption. For instance, according to Newth and Woods (2014) the

national context shape also the manner in which innovation survive and success because of the resistance of a specific context.

Taking into account social innovation as a process-oriented strategy (Ashta, Couchoro, & Musa, 2014), it seems necessary to date moving from the successful case studies approach to a more comprehensive understanding of how this phenomenon emerge in distant cultures.

Our research, in line with the purpose, tries to fill the gap in the literature, exploring the impact of cultural values on the generation of social innovation.

Beside these, from a practical point of view, the implications stemming from SI have a huge potential, improving the global wellbeing. Indeed, Social innovations represent “a new solution that addresses a social problem in a more effective, efficient, sustainable, or fair than the existing solutions and for which the value created focused on the society, rather than on individuals” (Farinha et al., 2020; p. 79). Hence, due to the potential benefits arising from these innovations, it is required to scholars and managers to be aware of how SI can be exploited as much as possible.

Originality of the study. *In accordance with previous research, Social innovation literature is still thin and poor. The concept is relatively recent, and scholars’ interest is rapidly growing (Lettice and Parekh, 2010; Canestrino et al., 2015; Van der Have and Rubalcaba, 2016; Farinha et al., 2020). Our work tries to give insights about the topic, focusing particularly on cultural values as the aspects encouraging or inhibiting the SI. It is surprising to note that although cultural setting is widely recognized as a key environmental factor impacting on social behaviour, only a small portion of the literature deepen it (Razavi et al., 2014). Much of the extant literature is mostly based on the concept of Social Entrepreneurship (SE): among these, some scholars investigate how cultural values trigger or reduce SE (Canestrino et al., 2020). Nevertheless, SE antecedents still require a careful analysis, including the effect of societal variables (Zahra et al., 2009). Moreover, while the role of the social entrepreneur has been proved as essential to the process of SI, there is a lack of awareness regarding the other factors affecting the SI. In particular, the institutional context, with reference to cultural values and norms, is completely under investigated when dealing with social innovations. This study is an attempt to present some propositions regarding the relationship between cultural values and the generation of a new social innovation.*

Key words: *social innovation; culture; Hofstede; national context; generation of innovation.*

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Purpose-driven Companies for Common Good: Managerial Characteristics and Dynamics

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Objectives. *In recent years, several contributions have regarded the need to reimagine the current capitalist system (Henderson, 2020a), given the dysfunctionalities of the value creation process (Mazzucato, 2018) and the need to address environmental degradation, social injustices and economic inequalities (Pope Francis, 2015). As a matter of fact, empirical data clearly demonstrate how capitalism is globally accelerating income inequality, which reached its peak in OECD countries for the past half century, where the average income of the poorest 10% of the population is about nine times lower than the average income of the richest 10% of the population (OECD, 2021). About the environmental conditions of our planet, the data from the World Bank Group show that the carbon dioxide emissions in the atmosphere have been constantly raised since 1960, reaching the highest level of 36 000 kiloton of CO₂ in 2016, which is the most recent year where data are available (World Bank Data, 2021).*

Unsurprisingly, business is largely considered the main cause of such economic, social and environmental dysfunctions, due to the negative externalities coming from the business activities performed by companies (Mazzucato, 2018). The production of negative externalities, and the consequent market failure to solve today's societal challenges, traces back its foundation on the so-called "shareholder primacy" or "Friedman's dogma" (Friedman, 1970), which is the obligation of companies to maximize shareholder value (i.e., profits), even when this happens at the expense of other parties, that are broadly referred to as society and planet (Mayer, 2020). Thus, companies' activities of shareholder value maximization have been preferred to activities of societal value creation, leading to a profound crisis of our capitalistic system (Henderson, 2020a).

The consequent erosion of trust towards businesses is accelerating the design of new models and rules through which companies may again contribute to prosperity (Mayer, 2018). From this perspective, it is promising that significant changes have been observed in some companies - both large public companies and small ones, often family owned - that have adopted purpose-driven strategies, attributing more importance to value creation rather than short-term profits (Asselle and Piccaluga, 2019). Indeed, some companies have implemented some concrete changes and are adopting more conscious and humanistic approaches (Rey et al., 2019). These companies are often referred to as Purpose-driven Companies (Rey et al., 2019), since their objective is "to produce profitable solutions to the problems of people and planet and not to profit from producing problems for people or planet" (Mayer, 2020, p. 6). More concretely, Purpose-driven Companies aim at improving social wealth and meeting social needs (De Clercq and Voronov, 2011; Lumpkin, Moss, Gras, Kato and Amezcua, 2013; Zahra, Gedajlovic, Neubaum and Shulman, 2009).

The fulfillment of companies purpose will also lead to the production of common good for society: eventually, this will lead to create the conditions for society members to achieve their personal goals (Argandoña, 1998). More concretely, we affirm that common good in society is built by the members of society; it is realized in society; and it is shared by members of society. In particular, companies are organizations that relate and interact with the rest of society and they generate common good by achieving their purposes.

Despite the recognized relevance of Purpose-driven Companies by different authors (Henderson, 2020b; Mayer, 2018; Rey et al., 2019), still few studies have emphasized management dynamics of Purpose-driven Companies and their role in society. Thus, this paper aims to answer the following research questions: what are the management dynamics of purposeful companies? How purpose-driven companies create common good for society? To address these research questions, we reviewed both purpose-driven companies (Harrison et al., 2020; Henderson, 2020b; Mayer, 2018; Rey et al., 2019) and common good literature (Hollensbe, 2014; Peeters and Martin, 2017). Based on this literature we identify the main dimensions (e.g. vision and alignment; effort and creativity; trust and relational contracts) that can be considered to characterize Purpose-driven Companies' actions.

Consequently, we elaborated a conceptual framework that combines these dimensions and applied it to 5 emblematic cases of Italian Purpose-driven Companies. Specifically, after a description and discussion of the above-

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mentioned literature, we analyze evidence from five medium and large Italian companies (Aboca, BB, Enel, Faac, Loccioni) which are well known for the adoption of purpose-oriented strategies.

Characteristics of PCs

Colin Mayer (2020) proposed eight characteristics of Purpose-driven Companies, which specifically regard company law, regulation, ownership, corporate governance, measurement, performance, finance and investment. In our research, we are interested in the four characteristics that are neither inherent to policy issues nor to measurement issues, but instead are directly accountable to the commitment of corporate managers and owners. Therefore, we take in consideration: 1) ownership, Purpose-driven Companies are characterized by anchor shareholders that guarantee long-term responsibility to fulfil corporate purposes; 2) corporate governance, the role of corporate boards in Purpose-driven Companies is to define the corporate purpose and align it with managerial interests, ensuring that corporate values and strategy are directed towards the creation of long-term value creation for different parties, such as employees, communities, and environment; 3) corporate finance should allow Purpose-driven Companies to raise investments that generate positive, measurable social and environmental impact; 4) investment, Purpose-driven Companies have care to invest in other purpose-driven organizations belonging to the private, public or not-for-profit sector in order to jointly realize the above-mentioned business purpose of solving the problems of people and planet.

Dynamics of PCs

According to Henderson (2020b), the presence of a strong and shared corporate purpose is positively associated with the PdC ability to implement architectural innovation, which is referred to as “innovation that changes the architecture of a product or a system while keeping many of its components relatively unchanged” (Henderson and Clark, 1990). In particular, we believe that the output of architectural innovation applied to societal problems is the production of common good.

Henderson (2020b) suggested three managerial dynamics of Purpose-driven Companies that allow the implementation of architectural innovation. First, purpose drives both vision and alignment across the organization. Second, purpose increases engagement, effort and creativity across the organization. Third, purpose increases trust and relational contracts across the organization. Henderson (2020b) speculates that “the adoption of high-performance work systems requires the development of deep levels of trust across the organization or the development of relational contracts” (p.5), as in the empirical case of the Toyota production system. If present, a shared and authentic purpose may enhance company credibility and clarity, which in turn are likely to increase trust and foster relational contrasts across the organization.

These managerial dynamics are hypothesized to facilitate the capability of Purpose-driven Companies to see and seize architectural innovations, which we believe to have as output the production of common good.

Methodology. We validated the elements of Purpose-driven Companies and their relations by conducting an inductive, exploratory approach in our empirical analysis (Lee et al., 1999). On the basic principles of theoretical sampling (Eisenhardt, 1989), we searched for the units for research, based on characteristics or attributes that are important to the evaluation (Yin, 2018): firms that, in Italy, have two of the three characteristics analysed in the previous literature 1) small family businesses or joint-stock companies large part of shares where the shares are held by foundations or by families that perpetuate the purpose 2) companies that clearly express a long-term value creation in their mission 3) companies that attract sustainable and/or ethical funding.

As mentioned above, we have selected five companies based on the presence of two of these three characteristics: 1) small family businesses or joint-stock companies' large part of shares where the shares are held by foundations or by families that perpetuate the purpose 2) companies that clearly express a long-term value creation in their mission 3) companies that attract sustainable and / or ethical funding. Based on the criteria analysed above, we select 5 companies. In particular, ABOCA is a family company where the mission of creating long-term value for all stakeholders is shared. Loccioni is a family company that has received several sustainable / ethical loans and has a clear vision of long-term value creation for all stakeholders. Enel is a joint stock company that has adopted a Creating Shared Value approach, shared within the company and externally. BB is a company very focused on long-term value creation for all stakeholders and in particular between employees and the local context. Finally, FAAC is the company that established a TRUST FAAC fund given by the diocese.

Given the aim of this paper (i.e. how purposeful companies create common good and what are the management dynamics of purposeful companies), we adopted a methodology that has a confirmatory aim (Casprini et al., 2014). This approach led us to examine the rich body of data collected, thus building and refining the theory from the case study data (Eisenhardt, 1989). More specifically, we validated our data by conducting an inductive and confirmatory approach in our empirical analysis (Lee et al., 1999). Confirmatory approaches tend to confirm a researcher's preconceived notions and they are well recognized in the literature (Ruddin, 2006; Yin, 2018).

Findings.

Purpose drives Vision and Strategic alignment.

Loccioni is a family-owned for-profit company founded in 1958 by Enrico Loccioni and his wife, Graziella. From an artisan company that operated in local markets, Loccioni became a well-structured business operating in international markets. The key dynamic that allowed Loccioni to not lose its identity and vision during its growth is a strong commitment towards a shared purpose, as declared by the current CEO, Enrico Loccioni.

In addition, pursuing a pro-social purpose enables Loccioni both to seize new business opportunities that competitors may miss (Porter, 2019) and to generate common good by implementing architectural innovations (Henderson, 2020b). For instance, their project “2 Km di futuro” initially originated from the necessity to create public value for the fluvial area where the power park of Loccioni stands, close to the river Esin. By reinvesting their profits, Loccioni successfully realized a laboratory of social innovation and design that allowed to generate hydropower for the Loccioni industrial sites, as well as to deliver common goods for the entire local community, such as river safety, a new cycle path and a renewed landscape design (Loccioni, 2021).

In the case of ENEL, the largest global private company in the sector of renewable energy, the business model has been fully built around the purpose of solving the challenge of climate change by producing green energy, expressed in the company's purpose statement of “Open Power for a brighter future. We empower sustainable progress.”

Directly from this purpose it derives the company vision through which the around 70.000 employees are strategically aligned.

Purpose drives Engagement, Effort and Creativity

Purpose increases engagement, effort and creativity throughout the organization. This dynamic refers to the increased intrinsic motivation of employees resulting from the alignment between employees' personal values with corporate values. This dynamic is evident in all the cases highlighted, but has particular emphasis in two cases.

The first is ABOCA, an Italian healthcare company that deals with health care through 100% natural products that respect the body and the environment. ABOCA replicates the natural logic to preserve the health of the planet and man. In order to demonstrate its orientation to employees and external stakeholders, it chooses to become a Benefit Company, a new legal form of business, introduced in 2016 in Italy, the first country in the world after the United States.

Aboca tries to stimulate the involvement of employees in various ways, both by updating employees on the evolution in terms of results, strategy and objectives, and by meeting a representative of the workers to explain the relevance of the transition to a “purposeful” company action strongly desired by CEO Massimo Mercati. It is stated in ABOCA's annual report:

Indeed, ABOCA is committed to creating a positive and inclusive work environment by focusing on well-being a) financial, offering over 720,000 euros in company bonuses in 2019 b) physical, offering a smart working program for employees who needed it, c) professional and social, offering 150,000 hours of training and on the job training to employees of all levels but also d) tracing aspects such as company benefits, health and safety of workers, opportunities for professional development.

The second is FAAC, an Italian company specializing in automation for gates and barriers, automatic entrances and doors, parking and access control. In particular, FAAC invests in the future of its employees and the contexts in which it operates. FAAC's hiring strategies strive to create attractive career plans for young people, shunning recommendations or political influences. This helps to create long-term sustainability, where employees feel responsible for the longevity of the company in an environment free from short-term personal productivity logics. And the serenity of the work environment generates wealth for the company as demonstrated by the economic results of the last 7 years, which show a marked increase in turnover, which went from 283 million euros in 2012 to 460 million euros in 2019.

Purpose drives Trust and Relational contracts

BB Spa is a Tuscan for-profit manufacturing company that produces high-quality clothing accessories for the fashion industry. His founder and current CEO, Marco Bartoletti, gave to the company the purpose of restoring dignity to vulnerable people by providing them long-term employment. To achieve it, Marco Bartoletti hires terminally ill, disabled, autistic and fragile people that work together and pursue the same shared purpose. This established a work environment characterized by strong trust and relationship of reciprocity among employees.

Alongside with internal trust between employees, purpose may also drive trust between owners of the company and managers, as in the case of the industrial group FAAC, which is a multinational group that is totally owned by the diocese of Bologna. In 2015, the cardinal Carlo Caffarra entrusted the management of the entire company to three trustees that are in charge of the strategic decisions of FAAC.

Integral Human Development

The literature on purpose-oriented companies has shown that purpose a) drives both vision and alignment within the organization b) increases engagement, effort and creativity across the organization c) increases trust and relational contracts within the organization. However, the analysis of the cases reveals a still little investigated aspect of the companies concerned. The orientation towards a new business model, in fact, aims to create an integral human development of the person (Turkson, 2018; Mongelli, 2018). The integral human development of the person is the holistic development of the human person, which covers all aspects of life: social, economic, political, cultural, personal and spiritual. It promotes the dignity of the human person, equality between each person and the common good of all people in the community.

Research limits. *This study also has limitations. Indeed, we analysed a limited sample of 5 medium and large Italian companies, but this represents a first version of the research that will be enriched with more cases. We also did not analyse with a quantitative approach the presence of the managerial dynamics under investigation and the*

production of common good. Further research may contribute to investigate the type of architectural innovations implemented by Purpose-driven Companies and to evaluate how they produce common good with a quantitative approach.

Practical implications. This study offers important practical implications for managers and entrepreneurs. First, based on our analysis, we argue that maximizing profit can no longer be the only one of those running a business. The purpose of a company is to become aware of the great responsibility towards its employees, the environment and more generally in the community. More concretely, the company's purpose is "to save the world and its community". (Henderson, 2020a). Second, the model proposed by purpose-oriented firms does not presuppose the absence of profit, but binds them to society (Henderson, 2020b). Indeed, in many cases, companies pursue profits and implement community benefits (for example, as examples of corporate philanthropy illustrate) (Hollensbe, 2014). Finally, focusing on purpose therefore poses the challenge for all businesses in terms of promoting the common good (Daly and Cobb, 1994) by aiming solely to provide products and services for the benefit of the community (Hollensbe, 2014).

Originality of the study. Since only a few management studies concretely analyse cases of Purpose-driven Companies which generate common good, in this study, we attempt to investigate their characteristics and managerial dynamics in a number of emblematic cases. Specifically, we analyse evidence from five medium and large Italian companies (Aboca, BB, Enel, Faac, Loccioni), which are well known for the adoption of purpose-oriented strategies.

The study is still ongoing, however it represents one of the first empirical analyzes of purpose-driven companies. Our analysis reveals an element that has not yet been investigated in the literature of Purpose-driven Companies: "Integral Human Development". More concretely, in order to combine the common good and the business, it is necessary to start from the needs of the people and the needs of the people are naturally and intrinsically ethical and social: therefore, if satisfied, they allow companies to generate the common good. The companies shown in this study are proof that the orientation towards the goal guides towards the integral development of the person: BB protects fragile employees, Loccioni creates schools for local children, Aboca creates natural medicines for the natural health of the person, Faac donates profits to poor people to reintegrate them and Enel creates clean energy to allow mankind to continue to thrive on earth.

Key words: Purpose-driven Companies; Common Good; Integral Human Development

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Is social entrepreneurship the vaccine against exogenous shocks for non-profit organisations?

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Objectives. Social entrepreneurship has emerged as an important research topic in the recent literature of entrepreneurship (Zahra et al., 2008; Defourny and Nyssens, 2010; Desa, 2012). However, there are many differences in how social entrepreneurship is conceptualized. Some scholars have identified social entrepreneurship as ‘a process involving the innovative use and combination of resources to pursue opportunities to catalyze social change and/or address social needs.’ (Mair and Marti, 2006: 37). Part of this literature underlines indeed that social entrepreneurship surface from the opportunities open up by social changes (e.g., unmet needs, demand or market failure) (Austin et al., 2006), “Some others argue that social entrepreneurship does not refer to new market mechanisms, but it relates to effective and sustainable solutions resulting from the exploitation of different combination of institutional means (Santos, 2012; McMullen and Bergman, 2017). In such debate, commercial and social entrepreneurship is a continuum and organizations fluctuate from social initiatives performing in profit-seeking businesses to entrepreneurial behaviour undertaken by non-profit organizations (Mair and Marti, 2006). These insights do not suggest a dichotomous distinction between social and commercial entrepreneurship but point to hybrid organizations as dominant forms of this realm (Billis, 2010; Shepherd, Williams, and Zhao, 2019). Moreover, organizations adopting a social entrepreneurship approach have not a static nature and depending on external and internal shocks, their social entrepreneurship attitude vary. Today, global tendencies reinforced by Covid-19 pandemic seem to lead to an increase of such hybrid organizational forms, emerging from innovative business models addressing the contemporary social emergencies. Museums have faced the emergency in an unordered fashion as their ability to deal with exogenous shocks varies much across institutions. It is now clear that from March on, directors have been wondering whether in a Covid-19 setting it is still possible enhancing museums’ resources and competences and producing meaningful value for the society. In this scenario, this explorative study aims to answer the question: “do the choices made by museums in response to Covid-19 emergency lead to such consequences that enable museums’ business model change from a non-profit to a social enterprise?” To answer this question, this research looks into the choices made by museum institutions during, and right after, the Covid-19 lockdown and it analyzes their main consequences on value creation, delivery and capture. Despite museums are mainly defined as “a non-profit, permanent institution in the service of society”, some scholars have recently conceptualized museums as social enterprises rather than non-profit organizations (Eid, 2019; Janes, 2013; Weil, 2012, 2014). They match social and environmental goals to economic objectives driven by the market-based methods of for-profit firms. Moreover, - they argue - the lack of funding (e.g. scarce resources like grants, philanthropic contributions, and donations) as well as changes in the society (i.e. lack of voluntarism) have transformed the nature of museums and made the traditional non-profit framework unsustainable. Covid-19 emergency provides a testbed to understand whether there exist the conditions for museums to substantially innovate their logic and adopt a social entrepreneurship approach.

Methodology. This research looks into the choices made by museum institutions during the Covid-19 pandemic in order to understand its impact on value creation, delivery and capture. Following Eisenhardt (1989), Eisenhardt and Graebner (2007), and Yin (2009), we employ a multiple case design to identify and discuss the key choices and consequences in the innovation of museums’ business models following an exogenous shock (i.e. the Covid-19 healthcare emergency). We aim to identify legitimations strategies in the establishment of different institutional logics by exploring the same phenomenon in different settings, achieve abstraction in the use of data, and consolidate the validity of the study. As in Eisenhardt and Graebner (2007), in this research the individual cases serves as “a distinct experiment that stands on its own as an analytic unit”. Multiple experiments subsequently become discrete experiments serving as replications, contrasts, and extensions to the emerging theory (Yin, 2009), “For this reason, we selected cases not to map the population of Italian museums but rather to create a multiple and diverse set of cases and cover problems of data generalization in at least two ways. First, cases include museums, monuments, and archeological sites

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as to identify main trends within each categories. Second, cases differ in terms of e.g. location, type, number of visitors. To confirm the reliability and validity of analysis' results and strengthen the generalizability of main findings, the research team has engaged in active discussions with field experts including industry and public institutions representatives. The research also uses secondary data sources for triangulation. Finally, this research employs the definition of business model as "a unit of analysis to identify a firm's key strategic choices and their consequences (Casadesus-Masanell and Ricart, 2010).

We carried out research in three main steps. In the first step, we identified the sample through multiple channels, including publications, websites, reviews, and internet searches. Our data sample includes 8 Italian public museums of which 6 depending from the Italian Ministry of Cultural Heritage and Activities and Tourism (i.e. MIBACT) but with scientific, organizational, financial, and accounting special autonomy, 1 depending from a provincial public authority, and 1 from the National Office for Ecclesiastic Cultural Heritage. Differences in the sample are also significant in terms of location (i.e. northern, central and southern Italy), type of collection (e.g. Greek, Egyptian and Roman art, natural history, historical sites), and number of overall visitors (ranging from about 60,000 to over 4 Million in 2019).

In the second step, we collected, accessed, and read secondary data published on the web sites of museums, articles published in specialized magazines and industry reports. Moreover, we collected and categorised secondary data, such as annual reports, statutes and strategic plans, for the 8 selected museums referring to a pre Covid-19 emergency period. This corpus of secondary data helped us enriching our knowledge on single cases, better conduct the interviews and increase the granularity of information collected with our informants, but also to map the three main BM pillars over time.

In the third step, we complete the dataset with 15 interviews to experts of the sector, directors and employees of the selected museums produced during or after the Covid-19 emergency. Primary data for multiple-case studies have been collected through: a) semi-structured interviews to most knowledgeable informant for each case or the person with an holistic understanding of the set of choices made by museums during the Covid-19 emergency (Eisenhardt and Graebner, 2007) (e.g. museum director or head of communication and marketing department) to leave room for emerging issues and for personal interaction beyond the topics of the questions (Mason, 2002); b) semi-structured interviews to museums experts and representatives of the Italian National Museum system. All interviews lasted on average an hour and are digitally recorded to facilitate the use of transcripts for data analysis.

Findings. In 2019, about 55 million people visited Italian public museums, confirming a steady growth from 2010 (i.e. +1.7% average annual increase). However, the Covid-19 emergency has heavily impacted on this process of growth. In the lockdown aftermath scenario, the Italian Ministry of Cultural Heritage and Activities and Tourism (i.e. MIBACT) released the first figures on the impact of pandemic on the national museum system: 19 million visitors less than 2019 with a loss of revenues worth EUR 78 million. The new settings in which public museums acquire, conserve, research, communicate, and exhibit the tangible and intangible heritage is thus changing fast and requires action in order to meet health rules and visitors' encounter emerging needs. For about a decade, debate on digitalization has in fact catalysed the attention of scholars and practitioners but it now seems not enough to grasp the epochal change museum management goes through. The analysis of the 8 case studies revealed the basic choices made by each museum and their main consequences. More in detail, all of the cases have highlighted that the sudden start of the lockdown in March 2020 has forced museums to close their premises mostly unexpectedly as many interviewees confirmed. The implementation of a coding procedure supported by NVivo software, allow us to recognize six second order categories: understanding the new emergency situation and adopt first measures to react to it; mobilization of resources unused before Covid-19 emergency; digitalization as a means and not as a goal; rethink museum services to provide contents to people; definition of new social role of the museum as virtual place for sharing ideas; create a stronger link to local communities for physical access to museum' premises. These categories reveal three main patterns of choice: 1) the rethink of internal resources to keep offering museum services; 2) the use of digitalisation to better reach people and combine the enhancement of museums' social goal and efficient provision of services; 3) enhance museums' social values within the local community. Each of those patterns of choices correspond to specific patterns of consequences that influence the set of activities run by museums, the overall value created for people and communities, and a change in their identity.

Research limits. We employed a limited set of cases routed in the Italian public museum industry. For this reason, we aim to broaden our data set in order to include non-Italian and private museums in order to reach a higher degree of generalizability of our findings. Moreover, we explored the phenomenon in one country. Despite the advantages to control for national policies and legislation, we did not have propose a cross countries analysis. This limits our practical implications since we can not refer to a phenomenon taking place globally.

Practical implications. The International Council of Museums (ICOM) defines a museum as "a non-profit, permanent institution in the service of society and its development, open to the public, which acquires, conserves, researches, communicates, and exhibits the tangible and intangible heritage of humanity and its environment for the purposes of education, study and enjoyment". It is well known indeed that arts help people connect with the community, and by this fertilization promote diversity, social inclusion and civic pride (Guetzkow, 2002; Australia, 2019). However, it is true as well that art and culture contribute and, in some territories, drive economic development and employment. This double face of culture makes museum to favour a social entrepreneurship approach.

Our research may concur in elaborating a new definition of museums that takes into consideration the hybridisation of their role and acknowledges their contribution to social cohesion and identity. Finally, our research helps reflecting on the impact of digitalisation in the museum industry. For longer than a decade, digitalisation has been interpreted as

one the main strategic priorities of museums rather than a means to implement new ways of creating, delivering, and capturing value.

Originality of the study. Scholars in museology have vastly published on the history of museums and the development of specific kinds as well as on the history of collecting and the significance of objects in collections (Falletti and Maggi, 2012; Simmons, 2016; Marini Clarelli, 2005). Research has lately focused on the opportunities offered by digitalization of both contents (i.e. innovation of value creation activities due to the new services) and the customer engagement (i.e. innovation of value delivery activities) as well as the identification of alternative mechanisms of monetization (Bautista, 2013; Bertacchini and Morando, 2013, Lampis, 2018; Colombo, 2020; Mandarano, 2019; Parry, 2013). However, more recently scholars have been researching the role of social enterprise in museum innovation management. The interest is due to the need of grasping to what extent museums as social enterprises can become a fertile environment for innovation by matching the satisfaction of social needs for the community with the generation of earned income that leads to financial resilience and sustainability, even in adverse environmental conditions. Our research goes in that very direction and it is a first step to understand the process of hybridisation of non-for-profit organisations in order to respond to emerging challenges stemming from exogenous shocks as well to grasp novel opportunities of value creation.

Moreover, our findings respond to recent call for research by Spieth et al. (2019: 13) who asked to apply [...] business model frameworks, such as Casadesus-Masanell and Ricart (2019) understanding of a business model as a set of choices and consequences, to the social business model context. By answering Spieth et al.'s (2019) specific call, this research also contributes to the: a) business model literature by framing the conceptualization of business model change as a reaction to exogenous shock for non-profit institutions; b) the understanding of the relationship between strategy and identity from the specific perspective of public institutions.

Key words: COVID19; Social entrepreneurship; non-profit; Museum; Culture; Digitalization

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Social inclusion in museums and visual disabilities: the state tactile museum Omero of Ancona

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Abstract

Objectives. *This study analyzes the new role of museums which aims at a greater social inclusion and at an active involvement of a wider audience, including non-visitors. The focus is on people with visual impairment and on how museums make themselves accessible to this audience and on the museum experience of different types of visitors.*

Methodology. *Social inclusion in museums, with particular attention to the visually impaired people, is analyzed in the case of the State Tactile Museum of Ancona using secondary and primary data collected from multiple sources of case evidence (Yin, 2014) through qualitative methods and tools analysis in the period November 2020 and January 2021.*

Findings. *In addition to solutions involving and engaging visually impaired visitors, the results show large participation of the so-called central audience and of occasional visitors too. The museum offers an escapist experience where the audience has an active role and is completely involved in the visit.*

Research limits. *This exploratory study shows limits that can be overcome by analyzing a larger sample of museums and a larger number of people who have visited the museum to delve into various aspects of the museum experience and be able to better frame the visitor type.*

Practical implications. *The study offers a dashboard of solutions and best practices that adds to the broader international debate to make the museum experience accessible to a wider audience, breaking down not only physical barriers but also sensory and cognitive ones.*

Originality of the study. *This research offers an exploratory contribution to the international debate on greater social inclusion in places of cultural interest such as museums. Leveraging interactions between museum collection, audience, and management is the key to providing a full experience to all kinds of visitors.*

Key words: *museums; inclusion; visual impairment; accessibility; Tactile Museum Omero of Ancona*

1. Introduction

In recent years, social inclusion and accessibility are the objectives that museums are aiming at. The way to achieve these goals is to become visitor-oriented and change from “being a static storehouse for artifacts into active learning environments for people” (Hooper-Greenhill, 1994, p.1). The creation of new experiences and sustainable development, including social inclusion, are new functions being added to the traditional ones of education and preservation. This because culture is now understood not only in its purely cultural role, but also in its social purposes (Da Milano, 2010), able to promote democracy, participation, dialogue, and social integration (Da Milano, 2017). As cultural institutions, also museums are called to respond to this renewed need for social inclusion by redefining their goals, developing new strategies and tools for access and participation. Museum’s audience development and engagement strategies aim not only at increasing the number and target of visitors from a quantitative point of view, but also at building the loyalty of regular and occasional visitors by actively involving them in cultural life and bringing together audiences normally excluded from fruition (Bollo, 2014). Potential, occasional, and non-public audiences are traditionally excluded from cultural enjoyment for a variety of economic, cultural, or physical reasons (Bollo, 2014). Visually impaired people are among the excluded.

This paper analyzes how museums make themselves accessible to blind and visually impaired people and how different types of visitors experience the museum visit. Building on the relevant bodies of managerial literature on museum social inclusion, visitors of museum and museum experience, the case of the State Tactile Museum of Ancona is

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analyzed. Case evidence from multiple sources collected through qualitative analysis (Yin, 2014) shows that cultural institutions can count on a variety of solutions to best involve their visitors in the experience and reach a greater audience. The discussion and conclusion outline some preliminary managerial recommendations and suggestions for improving social inclusion in museums.

2. Theoretical background

2.1 Social inclusion in museums

Post-industrial societies are facing several transformations and changes, including climate debate, inequality, sustainability, discrimination, and social inclusion. Culture plays an increasingly important role in addressing these challenges, in particular fighting social exclusion, by fostering inclusion and integration, as well as promoting democracy, participation, rights, and sustainability (Da Milano, 2017). Museums are cultural institutions (KEA, 2006) that can help reaching these objectives keeping up with the societal transformations and changes and implementing their functions: becoming more visitor-oriented rather than product-led is key (Reussner, 2003). Visitor-oriented museums must continue to pay tribute to their educational purpose; at the same time, they must fulfill their social mandate, that is, providing access, enabling social inclusion, and promoting cultural diversity (Da Milano, 2017). In turn, museums must know the visitors to whom they are addressing and their needs so that they can be able to better represent them and allow them to live a significant experience.

Museum's audience development and engagement strategies build customer loyalty with the central audience of museum and involve and reach other audience, including occasional visitors and potential and non-visitors (Bollo, 2014) (Fig. 1). Audience research and evaluation of both visitors and non-visitors is an important instrument that cultural institutions may lever for this purpose (Reussner, 2003). Knowing and labelling the type of audiences is essential for the museum for creating experiences addressed to hypothetical visitors belonging to social groups that suffer from exclusion dynamics.

Fig. 1: Audience analysis



Source: our elaboration on Bollo, 2014

Central visitors are those who regularly attend museums and already know the cultural institution; occasional visitors sometimes visit a museum depending on the presence of barriers they can easily address. On the other hand, potential audiences could visit a museum but are not stimulated to do so and need to be addressed through focused interventions and projects. Finally, non-visitors do not visit museums for different reasons (economic, architectural, social barriers, or only because of lack of interest). Solima (2008) underlines how the digital economy also marked the growth of a new type of audience of museums users, increasingly using online tools as a source of education, prompting the innovation of museums to show and publicize the contents of their collections, but also to be accessible remotely.

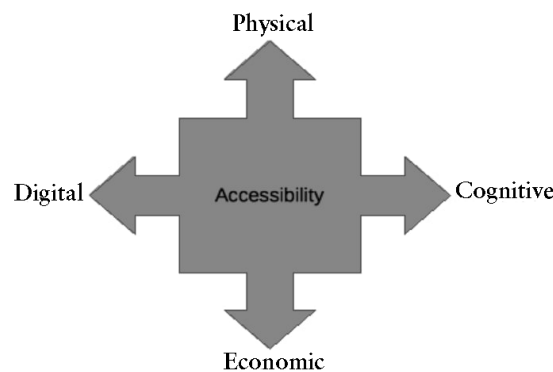
2.2 Museum experience and visual disabilities

Redefining and diversifying museum offer and collections is key to reach and engage a wide range of audiences, including those who are generally excluded. The development of different experiential dimensions motivates audiences to come back to the museum, or to visit it, as the experience they expect to live will fulfill their needs and expectations.

An escapist experience is the engaging experience that visitor-oriented museums should provide (Pine & Gilmore, 1999): to simply be there is not enough to visitors; they want to be completely immersed and involved in the experience. The immersive experience allows visitors to take an active role in the visit and to be both mentally and physically involved. The dimension of socialization should also integrate the escapist experience (Conti et al., 2017). Socialization is understood as "the ability for / possibility of social interaction, that is, the exchange of information and views of visitors with museum staff and among themselves" (p. 24). In this dimension the visitor has an active role and is immersed in the museum visit (like the evasion experience of Pine & Gilmore model), but he/she also interacts with other people, unlike the evasion experience, which may be individual.

Providing experience to people with visual disabilities is a new challenge for museums (Miglietta, 2017). As the great majority of museums mainly require sight as the sense essential for the understanding of the collections, blindness and visual impairment strongly affect the museum experience. Very few museums are equipped with appropriate measures to overcome barriers and make their exhibitions accessible to visually impaired visitors (Miglietta, 2017). Solima (2012) identifies four types of accessibility that the museums should take into consideration when creating specific measures (Fig. 2). Physical accessibility is about pulling down architectural barriers, which prevent visitors from physically enter the museum or to experience the visit in its entirety. Cognitive accessibility means working on the so-called sensory barriers: for example, providing visually impaired visitors with orientation guides written in Braille and with panels alongside the works written in Braille or in large print and by organizing guided tour, both with a physical guide or an audio guide. Economic accessibility should guarantee the access to all type of visitors, regardless of the social group. Digital accessibility means not only a museum must have an adequate presence on the internet, but it must also exploit the potential offered by the web and reach all visitors.

Fig. 2: The four dimensions of accessibility



Source: Solima, 2012, p. 34

All these solutions are necessary but not sufficient. According to the “aesthetics of tactility” (Grassini, 2016), a tactility-based approach to the fruition of art brings all the senses into play and leads to a total relationship with what is beautiful. Educating the senses to touch, where possible, always respecting the works displayed, enriches the cognitive and aesthetic baggage of visually impaired visitors (Rovidotti, 2004). This goes together with the education of museum workers (conservators and staff) of the various aspects of the world of blind people, both in terms of mobility, orientation, and personal autonomy, as well as in terms of communication (scientific, written, and oral content) (Carpino et al., 2017).

3. The State Tactile Museum Omero of Ancona

The State Tactile Museum Omero of Ancona is one of the three entirely tactile Italian museums in Italy and the only state museum in Italy. Compared with the Museo Anteros in Bologna and the Tactile Museum in Varese, its competitive advantage relies on free admission and the diversification of the works. Internationally, a tactile experience is offered by the Museum Tiflogico in Madrid and the Tactual Museum in Athens. The Museum Omero follows the Madrid museum in terms of the presence of digital tools, which are not yet present but will be introduced in the new exhibition design.

Founded in 1993, this Museum was the brainchild of a blind couple who, frustrated by their inability to understand and appreciate art, decided to create a museum addressing people generally excluded from the visit. Even though it was born for visually impaired people, the mission of the Museum, repeatedly underlined by the President Grassini, is to be a museum for everyone: every type of barriers must be overcome to allow everyone to access the museum and enjoy the visit. The museum originality lies in the possibility of touching all the works, so that also visually impaired visitors understand what stands in front of them. The current exhibition offers about 100 works divided into four floors. However, the Museum plans to set up a new collection in the future with at least 300 works on display, creating an innovative, multisensory, and technologically advanced itinerary.

In 2019 more than 34,500 visited the museum with an increase 244.9% compared to 2010 (around 10,000 visitors). Most people visiting the Museum are sighted individuals. Blind people represent small percentages and about 5% of the total number of visitors are people with various disabilities, both motor and intellectual.

3.1 Methods and material

Social inclusion of visitors including visually impaired people in the State Tactile Museum of Ancona is analyzed through qualitative methods and tools collecting secondary and primary data from multiple sources of case evidence

(Yin, 2014) in the period November 2020 and January 2021. Qualitative analyses seemed effective to analyze this case because they are more exploratory, direct, and thick-descriptive: the researcher obtains in-depth responses from the respondents to questions about how they constructed and evaluated their experience regarding the topic in question (Camara et al., 2007) allowing a rich and detailed discussion (Camara et al., 2007).

In particular:

- Two open-ended in-depth interviews were carried out with the Museum Manager Aldo Grassini and the Museum guide Manuela Alessandrini, with the aim of identifying the tools used by the Museum to engage the target audience (blind and visually impaired) and evaluating whether, and to what extent, the visiting experience differs between blind visitors and other audiences – whether, for example, the sighted visitor is given the opportunity to experience the visit as if he or she were a blind visitor. The four dimensions of accessibility (Solima, 2012) is used to identify and discuss the tools implemented by the museums to overcome barriers. The interviews were recorded, and notes were taken during the interviews.
- Eighteen in-depth semi-structured interviews were conducted with a sample of Museum visitors, as categorized by Alessandro Bollo (2014), with the aim of assessing the visit experienced at the Museum Omero based on Pine & Gilmore's (1999) matrix and socialization (Conti et al., 2017), also analyzing the physical, cognitive, economic, and digital barriers (Solima, 2012) visitors perceived.

The sample was suggested by the Museum Omero based on visitors' interest and participation in the cultural life of the Museum: eleven sighted people and seven blinded people were involved. The interviews were conducted online (call or video call). The interview consists of five sections devoted respectively to: a) the visitor's socio-demographic profile and how they came to know about the museum; b) the visitor's general interest in museums and annual attendance at cultural institutions; c) the experience of visiting the Museum Omero; d) their evaluation of the museum accessibility; e) the strengths and possible weaknesses of the museum, as well as any advice the visitor feels to give the museum.

The combination of the interviews also allowed to shed light on the tools used by the Museum to stay in touch and maintain the engagement of its audience during the lockdown months (from March to May 2020) caused by the Covid-19 pandemic.

4. Main results

4.1 Tools for engaging visitors in museum experience

The Museum uses tools to guarantee a visit that can also be enjoyed by a blind audience. These tools concern both architectural solutions to allow physical accessibility to visitors with motor disabilities, organizational and exhibition solutions that guarantee greater mobility within the rooms for blind and visually impaired people and tools to support the visit that aim to break down sensory barriers.

The economic accessibility for the visitor is achieved through free admission. This state-owned Museum receives public funding that allows its economic sustainability and enables it to offer and guarantee high standards of service. The physical accessibility of the structure is guaranteed not only inside the building that houses the Museum and the exhibition rooms, but also along the entire stretch of road to reach the Museum itself. Inside the collection rooms, the collocation of the works is reasoned and studied so that the statues are at the right distance from each other to allow the visitor to walk around them and not have physical obstacles during the visit. The Museum uses an elevator to allow visitors to touch the highest points of the statues.

The removal of cognitive and sensory barriers involves the use of tools and solutions to make the experience and the visit accessible to all social categories, regardless of the age, presence, and type of disability of the visitor. During the visit, in addition to the possibility of touching the works of art with one's own hands, visitors may count on the presence of signs in Braille and enlarged characters next to each work in the collection and informative material, both in black and in Braille, to orient the visitor inside the rooms. A guided tour is also provided.

During the lockdown due to the Covid-19 pandemic, the Museum was able to keep in touch and maintain engagement with its audience by organizing several online events with cultural and playful topics through its social media, primarily YouTube and Facebook.

4.2 Museum visitors and experience

Most of the interviewed, eleven sighted people and four blind people, can be framed as central audiences (Bollo, 2014): these are people who already routinely visit museums and are characterized by knowledge and assiduity. These people affirm to visit between five and twenty museums per year and the blind ones affirm to visit them even if they cannot touch works or there are not labels written in Braille or there is not a guided tour, as learning about art is important to them no matter how they do it. Only a small number of interviewed, all blind, can be included in the potential audiences and the almost involved. They want to visit museums, but they are limited by the presence of cognitive and/or physical barriers that do not allow them to live the museum experience in its entirety. The physical obstacles such as steps are not correctly signaled, there is not an elevator to reach different floors, the works of art cannot be touched and there is no information available in Braille. Some of these potential audiences stated that they

would visit museums only if they were aware of the possibility of touching the works of art or of the presence of a trained guide who could lead them through the visit step by step.

The type of visitors and the presence of different barriers do not affect the experience in terms of enjoyment of the museum visit. This because, the Museum knows the types of audiences it is addressing, frames their needs and their expectations and removes barriers to offer the experience visitors expect. Exceptional, surprising, exciting, beautiful, and rich are the main adjectives used by both the central sighted and blind audience and the potential audience to describe their visit experience of the Museum Omero. They underlined the importance of using all the senses, something that allows to explore the work in its entirety and to discover detail from another point of view. In this escapism experience (Pine & Gilmore, 1999), the visitors are physically involved in the experience and take an active role, exploring the works with their own hands and activating all the senses at their disposal. Sighted people may do the visit with a blindfold living the same experience as that of the blind people.

The dimension of socialization (Conti et al., 2017) is an important issue emphasized by both the central and the potential audience to fully live the escapism experience. Talking with the staff and with other visitors, carrying out the visit in small groups of people who do not know each other and the care and attention that the museum guide gives to individual visitors is key to directly involve visitors and create an intersection between the museum and the audience.

5. Conclusion

The paper analyzed social inclusion in museums, focusing on the way museums make themselves accessible to blind and visually impaired people through the removal of physical, cognitive, and sensory barriers and the provision of engaging experiences. Cultural institutions as museums may use various instruments to overcome the existing barriers and to make them accessible to a greater audience, including the potential visitors and the non-visitors. Knowing and profiling the audience through direct analysis (in the museum) and market research of central, potential, occasional and non-public audiences allow to define effective audience development and engagement strategies. The reasons for exclusion from the museum of some visitor categories and the creation of projects and experiences that meet the needs of all the audiences are mandatory for a museum aiming to be visitor-oriented and inclusive.

The State Tactile Museum of Ancona offered interesting insights. The Museum broke down architectural and sensory barriers to ensure full accessibility for all audiences and to offer an immersive experience (Pine & Gilmore, 1999): the visitor becomes an active and integral part of the visit, is involved, fully immersed and discovers through all the senses the objects that are in the exhibit.

The integration of the tactile experience within the traditional museum visit experience seems to be effective to attract different categories of audiences and to bring all the senses into play leading to a total relationship with artworks. The sighted visitors have become the reference co-audience together with blind and visually impaired people, initially identified as the main target. These different types of visitors encountering different barriers may enjoy an escapism experience as the museum addresses their needs and allows them to encounter into the museum visit. The esthetics of tactility (Grassini, 2016) finds catalysts in human relations within the museum: socializing and interacting with other visitors, but also with the staff and the museum personnel, allow fully living the escapism experience. The more the museum is an inclusive place, the more it will be able to attract different categories of audience, the more they will enjoy their visit. The online presence of museums is also an aspect to be taken care of considerably. Regardless of the pandemic situation, museums should invest more on their digital tools and should be able to redefine themselves also in a virtual reaching and including also the so-called “digital audience”.

Leveraging interactions between museum collection, audience and management is the key to providing a full experience to all kind of visitors. The study offers a dashboard of solutions and best practices that adds to the broader international debate to make the museum experience accessible to a wider audience, breaking down barriers and enhancing visitor experience. First, museum managers should invest more in the integration of ad hoc paths within the exhibition route intended for the target audience. This integration allows the blind visitor having the feeling of being included into the traditional visit and allows each visitor, even the sighted, to choose the sensory experience that is most congenial to him or her, introducing him or her to a new way of discovering art. Second, dealing with people with disabilities, whether visual or not, also means investing in the training and management of human resources. The development of the professional skills of reception staff, guides and other human resources is fundamental not only in the pre- and post-visit phase, but also throughout the visit. It is through human resources that a connection and relationship is made between the museum experience and visitors and investing in this could also signal an increase in visitor satisfaction. Third, suggestions and advice from visitor interviews emphasize the importance of investing more in the museum's communication and online presence while also considering its potential audience of blind users. The site should be accessible, the information clear, and where there is a virtual section of the museum's collection, it should be properly accompanied by a detailed audio description that explains to the visually impaired user what they are looking at.

Further research in this area is needed to overcome the limitations of this exploratory study and develop its main ideas. First, a larger sample of museums must be analyzed and compared to identify engaging tools and experiences; this sample must include fully accessible museums to blind people and museums that in recent years provide exhibition paths specifically dedicated to people with visual disabilities. Second, a larger number of people who have visited the museum must be interviewed to delve into various aspects of the museum experience and be able to better frame the

visitor type. Key questions to be addressed in the future include: how will museums recreate themselves and make themselves accessible to people with visual impairments? To what extent will museums be able to integrate digital and technological tools into the visit to enhance the visit?

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Stakeholder engagement and social innovation.

An analysis of the network created by “GAL Terra è Vita”

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Objectives. *In the last decades, there has been much fuzz on “open innovation” in terms of its effects on both organizations and business models. Therefore, evolutions on this topic have led to consider open innovation both as a new paradigm of innovation (Chesbrough, 2003; Gassmann, 2006) and as a new business model (Lecocq et al., 2010; George & Bock, 2011; Schneider & Spieth, 2013).*

It has been considered as a source of business model innovation as it is based on the company's ability to both create and “capture” value. The open innovation stimulates business model changing leveraging the company's characteristics needed and targeted, at continuously exchanging knowledge with stakeholders engaged, within a network-ification process (Teece, 1986; Teece et al., 1997; Vrontis et al., 2020).

If until the end of the last century the company was recognized as the place of innovation and, according to the “first mover” model (Chandler, 1992), the internal activities of the company were the object of innovation in a “do-it-yourself”-like process (Cohen & Levinthal, 1990; Chandler, 1992); the new century marks the advent of the Open Innovation model, in which the knowledge sets of the other social and economic actors have the same role of the internal one, in the new context that favor the creation, the establishment, and the ability to maintain over time a wide network of exchanges and, at the same time, reduce the relevance of hierarchical processes (Langlois, 2003; Almirall & Casadesus-Masanell, 2010).

The current COVID-19 pandemic coupled with the cuts in public spending, drive towards a rising interest towards the link between profit business models and social issues as a way to tackle community needs.

Even before the last year phenomenon, demographic trends showed that the population of the European Union is aging. Therefore, in 2030 there will be 88 million people over the age of 65 in Europe. The percentage of this age group is expected to increase from 17.5% of the population in 2010 to 29.5% in 2060 (https://ec.europa.eu/info/research-and-innovation/funding/funding-opportunities/prizes/horizon-prizes/social-innovation_en).

There is therefore the need to strengthen basic welfare policies such as public transportation, remote health services, and all other measures necessary to meet the needs of the elderly (Chávez-Ávila and Monzón-Campos, 2005). At the same time, there is the need to fight social exclusion and to support an independent life, especially for the weakest social groups (Avelino et al., 2019).

Developing new solutions or improving existing ones, to reach ONU 17 Sustainable Development Goals, is providing new opportunities for innovative small businesses, social economy start-ups and NGOs at local, regional or national level.

In this scenario, the responsibility of actors involved in innovation emerges as an uncertain, often complex and always collective endeavour in which are involved both economic and social stakeholders, such as companies, scientists, NGO's, etc. As a collective endeavour, all actors involved in the innovation process share the responsibilities and are co-responsible (Freeman, 2010; Blok et al., 2015).

This collective feature finds his scientific framework in a systemic vision in which the company can be represented as a partially open system that lives in network and survives, creating social and economic value, thanks to the relationships ability with other social and economic actors/stakeholders (Chandler et al., 2000; Barile, 2008; Golinelli, 2011; Lichtenthaler, 2008; Greve, 2007; Bernal et al., 2019).

In this context, the relationship network becomes the source of an “innovation spillover” coming out of engaging stakeholders to know their needs and their interests, and helping them to enhance mutual understanding favoring win-win solutions.

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In these relational dynamics, sharing information and knowledge processes are a way to stimulate innovative solutions and build trust among stakeholders (Andriof and Waddock, 2002; Chesbrough and Rosenbloom, 2002; Tani, 2020).

If in the traditional open innovation concept, the focus is on economic stakeholders like suppliers, and sometimes competitors as well, as they try to innovate collectively; in social, or responsible, innovation processes the open processes may leverage on both economic and non-economic stakeholders, like NGOs, letting them to broaden their perspective and to assess the socio-ethical dimensions in evaluating the impacts of the social innovation (Franke & Lüthje, 2020).

These trends are contributing to modify the definition of social innovation provided by O'Sullivan and Dooley (2009). The scholars see social innovation as the process of making changes to something already established by introducing something new that adds both social and economic value to the company, the customers, and the community as a whole.

When social entrepreneurs overemphasize the economic business dimension of their enterprises, this is often described as a "mission drift" (Cornforth, 2014). Empirical evidence suggests that entrepreneurs adopt particular strategies such as stakeholder engagement, to mitigate the effects of this drift (Ramus & Vaccaro, 2017).

Freeman's (1984, p. 25) initial, and still widely accepted, definition of a stakeholder was "any group or individual who can affect or is affected by the achievement of the firm's objectives", describe a firm at the center of a broad range of interconnected stakeholder groups.

Stakeholder engagement, defined by Greenwood (2007, p.315) as the set of "practices the organization undertakes to involve stakeholders in a positive manner in organizational activities", represents one of the main elements of the stakeholder management (Clarkson, 1995).

In Freeman's (1984) perception, the stakeholder approach deals with the need to define the nature of the relationship with the stakeholders, and it aims to create a positive link between the management's action and the stakeholder perception of the business activity in order to reduce the conflict between the various actor perspectives.

So much so that, Freeman advocates for capturing the strategic and ethical benefits of authentic interaction with the full range of organizational stakeholders. In this view, strategic concerns and moral ones cannot ultimately be separated, as the purpose of the increasing "social economy" and the social and economic players is "the creation of social and economic value for all stakeholders engage" (Noland and Phillips, 2010; Wayne Gould, 2012).

Mainardes et al (2012) stated that stakeholder engagement is a two-way process in which it is not only the company that takes action to influence the behavior of the stakeholder, but it is also the stakeholder who can agree to interact with the company to try to influence its behavior. On the same page, other authors (Payne & Calton, 2002; Devin & Lane, 2014) see stakeholder engagement as a two-way relationship in which stakeholders can express their requests to the company and to the whole of other stakeholders in order to create a common vision within the network of stakeholders. Thanks to these bi-directional interactions, stakeholder engagement activities allow the company to increase its total social capital (Nahapiet & Ghoshal, 1998; Lin, 2002). Stakeholder engagement practices help companies in creating a series of stable relationships, they facilitate both tacit and explicit knowledge flows between the company and the other local actors, and they create a stabler and stronger network that, as a consequence, is easier to coordinate and foster actor's interaction.

Accordingly, these practices help to create a community where the various actors participate to satisfy their mutual interests, out of these dyadic relationships (Freeman and Leidtka, 2007). As a consequence, the network as a whole will be able to create more value than what would have been possible by each network subgroup by itself.

At the same time Maak and Pless (2006) hold that without a stable interaction network, companies will not have the needed resources and capabilities to get the most out of the relationships with the other local stakeholders such as the ONGs, or the local communities.

De Colle (2005) considers the stakeholder engagement process as central in managing stakeholder relationships and considers it as a bi-directional flow of information between the company and the stakeholders. Furthermore, stakeholder engagement activities are analyzed as a meta-process, i.e. a process that, on the one hand, allows management to obtain valuable information that can be used to better meet stakeholder requests and, in this way, they also allow the company to achieve better economic, social and environmental performance. It follows that stakeholder engagement is helpful in defining the goals to target with social innovation and in shaping the related activities in an effective way.

Noland and Phillips (2010) hold that stakeholder engagement is at the center of the discussion on stakeholder theory as management needs to go beyond interacting with the stakeholders if they have to respect their interests, and leverage their skills and knowledge assets in defining their strategies.

Management must be able to understand the economic, social and environmental effects that the action of the company has on the various communities of reference and, therefore, must be able to initiate a process of full interaction with the subjects who may be affected.

A first advantage of stakeholder engagement practices is linked to knowing the other actors better. Creating a stable relationship with the stakeholders also creates a sense of reciprocity reducing the general level of attrition among the system actors (Fassin, 2012).

The reduction of uncertainty is linked to shared experiences and dialogue between the different subjects within the stakeholder network that helps in exchanging knowledge; it creates a shared knowledge platform to understand, and

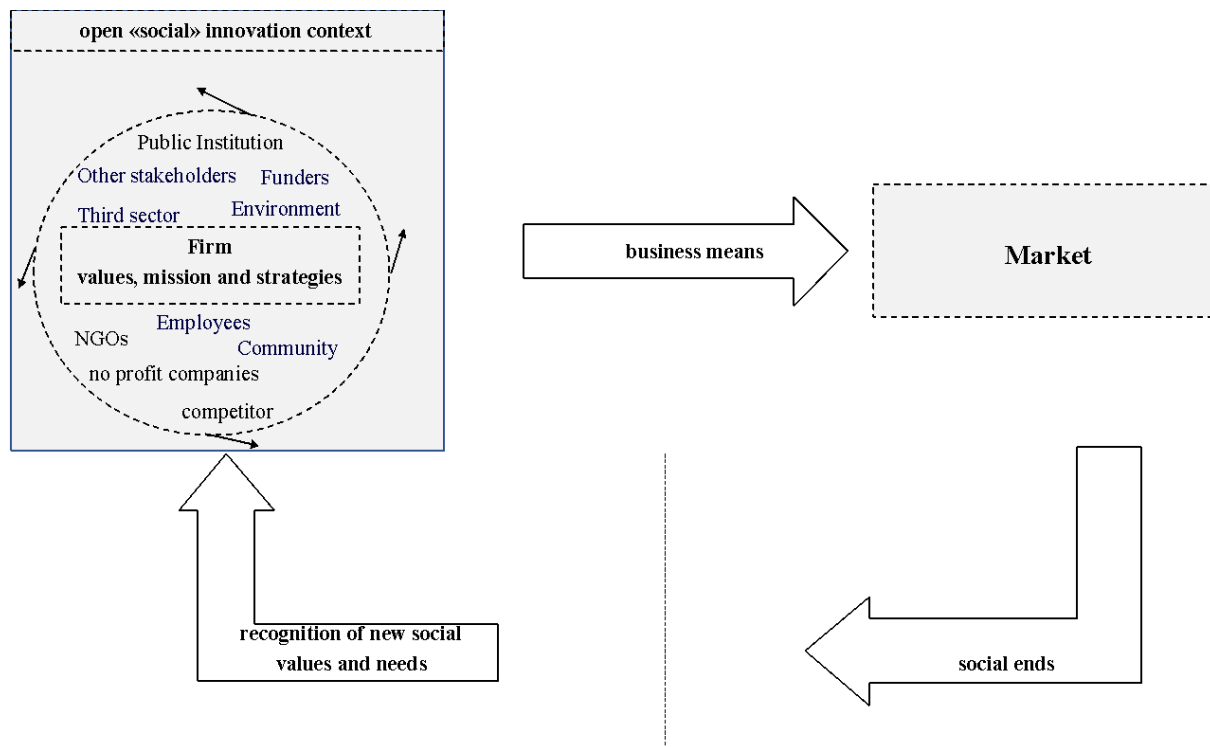
mediate, the various actors' perspectives (Morsing & Schultz, 2006) and, at the same time, create a deterrence-based trust (Shapiro et al., 1992).

A second stakeholder engagement advantage is related to the continuous, shared activities with stakeholders letting them to have a deeper comprehension of the company and its activities. According to Burchell and Cook (2006), when management manages to maintain over time many relationships with several stakeholders, and it is able to engage them, it is possible to increase the company legitimacy as its activities get widespread recognition in the relative communities of reference.

According to O'Riordan and Fairbrass (2006), these knowledge flows create a process that could be defined as a coupled open innovation practices as, while the company learns from its stakeholders, the stakeholders will be able to learn more about the company, increasing the general level of trust within the network (Morsing & Schultz, 2006). Through these stakeholder engagement processes, an organization has the opportunity to make its assumption of responsibility towards the context in which it operates manifest, and to express the bond of trust with the different classes of subjects involved by increasing its legitimacy towards them (Post et al. 2002; Hart & Sharma, 2004; Sciarrelli & Tani, 2016).

Several authors (Vanderkerckhove & Dentichev, 2005; Harrison et al., 2010; Aarikka-Stenroos et al., 2017) hold management may use the interaction with stakeholders to discover the resources available within the stakeholder network and, therefore, it may have a greater chance at understanding the real potential of designing new value creation processes to venture outside of the known-known realm of (un)knowledge (Waloth, 2016) paving the road to the opportunities in the known-unknown and in the unknown-known realms.

Therefore, aiming to change society and making business work well are not actions that are linked automatically. Regarding that, entrepreneur/manager activities, based on values, mission and strategies, will produce social and economic value by means of capabilities to diffuse these aims in stakeholder connections (see fig. 1).



Source: our elaboration

On these premises, social commitment asks to satisfy an array of additional stakeholders that, at first, may not be seen as salient to traditional entrepreneurs. Further, the stakeholder map of an enterprise committed in social issues is typically more complex than a “normal” one and, as a consequence, it may require special efforts to bridge all the disparate stakeholder positions in a coordinated whole (Maguire et al. 2004).

Moreover, in most social services, the beneficiaries (the needy), are not the same as those who pay for services (donors). Nonetheless, entrepreneurs should rely on stakeholders to justify the need for their products/services, to generate community support, to provide access to resources, and to create policies that enable them to enact positive social change, as will see in the following research.

In this scenario enterprises affect stakeholders through their business activities but at the same time, they cannot exist without getting support from a broad set of stakeholders.

Stakeholders, as a result of their engagement practices, will interact among them and they will start a knowledge exchange process where they will learn from the other stakeholders while teaching them at the same time. The other agents may participate in the social value creation process buying products and services provided by the other stakeholders. They will come to recognise significant social problems, share their values and then become involved with

community and social problem-based activities. In other words, social value is realised through peoples' experience and practise (Tanimoto, 2012).

Regarding that, the authors present a research carried out on Local Action Group (LAG) named GAL Terra è Vita situated in the Southern Italy in Salerno province, composed of 9 villages, to highlight the role that this private and no economic organization has in the network creation and maintaining between economic and no economic agents, stimulating and supporting them toward innovation and sustainability processes useful to better territorial quality life.

Methodology. To reach research objectives of this still in progress research, the authors started distributing 1500 questionnaires, to the companies in the LAG (mostly manufacturing SMEs), during public meetings managed by a specific LAG "Terra è Vita" (in Italian it is G.A.L. Gruppo di Azione Locale) in which were discussed environmental and economic issues and were presented financing opportunities.

In the meetings participated an heterogeneous group of actors (civil people, entrepreneurs-manufacturer, scholars, third sector, practitioners, public and political (regional) people).

The questionnaires we are submitting are composed of six sections designed in order to understand the stakeholders perception of the LAG, and of its role in local development (the six section are: Firm generic information; Relationships between firm, place and public institutions; Internationalization strategies; Environmental innovation processes; Firm and networks; LAG policies contributing to firm growth).

In this part of the research project, we are analyzing, using the tools of social network analysis, the role of the various actors in the LAG and how it is related to the scope of the LAG activities and the drivers behind stakeholder relationships. We try to understand the reciprocal influences between social and economic actors in the local area.

Expected Findings. In this part of the research project, we expect to be able to connect the various actors and the content of the relationships between them. In particular we are trying to investigate the themes related to the various LAG activities linked to the information and awareness enhanced by them in the local area.

We expect to identify the different ways these activities help the various stakeholders in satisfying their mutual interests, leveraging these dyadic relationships (Freeman and Leidtka, 2007). As a consequence, we should be able to assess how the network as a whole will create more value than what would have been possible by each partner by itself.

Research limits. The research was focused on a specific territory and on the participation by the social and economic agents that characterize one LAG activities, albeit one of the most successful of them. Moreover the questionnaires were distributed within meetings organized by LAG so we do not have access to the stakeholders that decided to not participate in these meetings limiting, as a consequence, the access to the whole set of stakeholders' interests in the local area.

Practical implications. The results of this research project should help in identifying how local area development can be helped adopting a bottom-up process. In this approach the LAG is not only an actor, but it gets the ideal role of the convenor (Svendsen and Laberge, 2005). This role is linked to the need to help the creation of a stable and mutually reinforcing network of relationships among a broad set of local area stakeholders-community members (connecting even those actors outside of the local area that may influence its development) and avoiding the creation of structural holes (Burt, 1992) that may driver some actors in a controlling position that may hinder the place development as a whole.

At the same time our finding should be able to highlight the more effective practices by the structure of the LAG and, as a consequence, it should help in finding a more effective way to approach the various stakeholders according to their role and their interests/needs.

Finally, our research can have interesting practical implications for the social actors as we should be able to highlight how the various actors have participated, actively and effectively, in these activities and how their participation has influenced the local network evolution reaching some of the 17 SDGs fostering social innovation processes.

Originality of the study. In the literature on territorial management and sustainability are not very diffuse studies on LAG roles and their effects on social innovation effects. This LAG's role is less acknowledged in Italy than in other member states within the Leader /CLLD (Community-Led Local Development) european project.

Key words: Stakeholder engagement, Social innovation, territorial management

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Humanistic education: an analysis of students' attitudes towards sustainable ski tourism

ANNA IRIMIÁS* SERENA VOLO•

Objectives. *The complex issues related to sustainable tourism challenge the way tourism businesses and destinations operate (Ioannides and Gyimóthy, 2020), but also the way higher education in tourism is conceived in most cultural and geographical environments (Wilson and von der Heidt, 2013). Teaching, and thus learning, about sustainability is nowadays part of most tourism courses, a must for many universities and institutions (Boyle et al., 2015). Traditionally, the triple bottom line (environmental, economic, social) approach to sustainable development has been at the core of such curricula. However, this approach has been increasingly criticized for its narrow focus on continued growth and progress (see e.g. Sheldon et al. 2008; Scott, 2011). To enrich the vision of tourism educators and the perspective of students, different approaches can be considered. In this line Springett (2010) argued that social responsibility should be at the center of the debate on sustainable tourism education. Hence, tourism scholars have integrated the triple bottom line approach with concepts of responsible tourism, societal ethics, and values in the framework of the Tourism Education Futures Initiative (TEFI) (see e.g. Sheldon et al. 2008). Furthermore, Thomas and Day (2014) claimed that sustainability skills -understanding environmental sustainability, understanding social and ethical issues, skills in cooperation and participatory approaches among others- should be incorporated into the competences to develop in undergraduate courses. The need to educate the future generations of tourism and hospitality managers, leaders and stakeholders has permeated the last two decades of research in sustainability and education in our field.*

This paper seeks to contribute to the debate on tourism education and sustainability by introducing the concept of humanistic tourism education in the field of Alpine tourism. The aim of this study is threefold: (1) explore younger generations' understanding of tourists' responsibilities with respect to preserving ski-destinations; (2) identify the actors in charge of promoting responsible behavior at the destination and in the wider context of skiing; and (3) contribute to theoretical development of humanistic tourism education. Based on qualitative data collected with a cross-cultural sample of undergraduate students, the study attempts to answer the following research questions:

RQ_1: What kind of "social responsibilities in the area of sustainability" do younger generations attribute to ski-tourists?

RQ_2: What is -in the mind of the young generation- the role of influential figures (e.g.: ski champions, instructors) in stimulating ski-tourists to behave responsibly?

RQ_3: What aspects of humanistic education in tourism can be successful across different cultures?

Theoretical background

Tourists' social responsibilities

The role that a single tourist plays in sustainable tourism development has often been overlooked in tourism education research. At business level, much attention has been given to corporate social responsibilities (Garay and Font, 2013) but less to individual responsibilities (Fennell, 2017). Tourists' social responsibility refers to the behavior, which is respectful towards the host destination built, cultural and natural environment. Thus, it is without doubt that tourists are central stakeholders in winter sport tourism (Steiger, 2011). Prior research show that tourist interpretation of their own responsibilities varies according to their cultural background and based on the value they attribute to responsibility in self-identity formation (Caruana et al., 2014). In more, it has been evidenced that while tourists engage in sustainable and responsible behavior at home, on holiday they behave hedonistically with limited attention on sustainability issues (Juvan and Dolnicar, 2014). One of the reasons of the attitude-behavior gap in sustainable tourism in winter tourism is that tourists have limited knowledge on how winter tourism products are developed and at what cost. Stanford (2008) highlighted that tourists in some context might be receptive to take responsibility since they also expect tourism businesses to operate in a sustainable and responsible way. It has been observed that during spectator sport events tourists behave more responsibly in the place situated context which is central to the sport event (Higham and Hinch, 2018). This might explain why influential figures such as sport champions and instructors in different winters sport disciplines play a role in stimulating tourists to behave in a more responsible way. Winter sport events

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can be highly emotional and transformative for sport tourists and since the sport events are linked to the place, the event-hosting places turn to be meaningful for tourists (Higham and Hinch, 2018). Thus, many interesting opportunities can be found to foster the sustainability culture among tourists interested in winter sports.

Humanistic tourism education

The growing interest in sustainability education is associated with the awareness of the need to be proactive in sustainable development (Allen et al., 2017). Such proactivity lies at the base of value-driven humanistic tourism education. Humanistic education recognizes and valorizes people as core elements in building sustainable tourism (Della Lucia et al., 2021). Pirson (2017:237) argued that managerial education needs to be more human centered with issues related to 'values, character, trust, empathy and mindfulness'. Social and environmental responsibility are among the key concepts to lead humanistic tourism education. The paradigm of humanistic tourism management is based the following principles: respect for human dignity; ethical work, strategies and treatment of tourists; engagement with stakeholders on a real purpose (Owsianowska, 2020). Fennell (2017) urged practitioners to embrace ethics in tourism management and called for a more ethical tourism education with a focus on care and preserve rather than consume and compete. Guidici et al. (2011) explored the importance of social commitment in management focusing on the role universities should play in nurturing and diffusing such values by designing appropriate training sessions and courses. Putting emphasis on values of ethics (Wals and Blewitt, 2010), tourism management education provides graduate students with transformative learning experiences (Irimiás et al., 2021), responsibility in decision making and knowledge in social responsibility processes. Conclusively, recent research points out to different pathways to embed the sustainability values into education and considers the potential of humanistic education to innovate the current tourism management context (Della Lucia and Giudici, 2021).

Sustainable winter sport tourism

The experiential value of winter sport tourism is largely dependent upon the landscape where it is performed: a combination of scenery, climate and weather. From a geographical perspective, 'the environment is the totality of tourism activity, incorporating natural elements and society's modification of the landscape and resources' (Mitchell & Murphy, 1991:59). Thus, in consideration of such approach sustainable ski tourism is a contested concept. Winter sports such as skiing are intrinsically linked to certain types of landscape and natural environment and at the same time contemporary ski tourism heavily exploits nature and landscape. The experiential value of the mountain environment forms an important part of ski tourists' experiences. In fact, as Higham and Hinch (2018) highlighted outdoor sports are dependent on the integration of a physical activity with specific environmental attributes. However, skiing is built around specific features of the natural environment as sources of pleasure, challenge, competition. Indeed, human intervention in the tourism ski industry is massive and not always sustainable from an environmental point of view. The literature certainly points out to the vulnerability of winter sport destinations and attributes it to the changing weather patterns associated with climate change and the behavioral adaptation of sport tourists (Cocolas et al., 2016). However, sustainability can be analyzed from different perspectives. Little is known in our scholarly field about the potential that tourism and hospitality managers, leaders and stakeholders of winter tourism can have in educating tourists towards sustainable behaviors at ski tourism destinations.

Methodology. Alto Adige South Tyrol was selected a destination setting for the purpose of this research. The selection is justified by the fact that winter tourism is a relevant income source in the region and sustainable tourism is considered a priority by tourism planners, marketers and businesses working at the destination. In Alto Adige South Tyrol nature-based winter sport tourism is promoted by the destination marketing organization (DMO) on the website as 'environmentally friendly tourism' (www.visitsouthtyrol.com). For this exploratory research, a qualitative method was deemed useful to investigate the topic of humanistic tourism education in the context of ski tourism. Undergraduate students in two tourism courses were involved in the research data collection which consisted of two focus groups. A cross-cultural convenience sampling frame consists of students (n=10) enrolled at two universities: five students from the University of Trento and five students from the Corvinus University of Budapest were recruited. All students involved in the research had prior ski-tourism experiences in the studied area. Data collection was carried out between February and March 2021, in two videoconferences organized on Microsoft Teams. The reason to choose this online data gathering method was the mobility restriction imposed by the Covid-19 pandemic at the time of data collection. Qualitative data was gathered with two focus group discussions allowing to obtain rich data and insights. To organize the focus group sessions the traditional guideline by Morgan (1996) was followed, the English language was used during data collection. After an introductory phase, the researcher guided the discussion around the main topics of the research (a) the overall sustainability of ski tourism destinations; (b) tourists' responsibilities with respect to preserving ski-destinations and particularly younger generations "social responsibilities in the area of sustainability" at skiing destinations (c) the role of the different actors in charge of promoting responsible behavior at the destination and in the wider context of skiing; (d) possible role of influential figures (e.g.: ski champions, instructors) in stimulating ski-tourists to behave responsibly. In order to facilitate the discussion among participants three different situations related to sustainable winter tourism were also presented by the focus group moderator. All situations involved skiing, tourists, stakeholders and influential figures. Students were asked to reflect on the different situations and to discuss their ideas with other participants regarding responsibilities, values, and approaches to foster sustainability. A discussion of potential cross-cultural differences between the two groups was also facilitated, and the focus on the

potential of humanistic education in tourism was kept along the discussion with occasional interventions of the researcher.

Findings. *This research is explorative in nature. The first phase of the focus group session was designed to introduce students to the topic and discuss the characteristics of the destination with respect to ski tourism.*

The discussion rotated around the research themes in a smooth manner and students touched upon several relevant points. In discussing the topic of overall sustainability of ski tourism destinations, participants addressed several issues taking into account different stakeholders' point of views. Students reflected on the ethical issues regarding tourism management decision making processes. Discussing such issues in a cross-cultural context contributed to recognize and appreciate different understanding of social responsibility and allowed reflection on one's own habits and behavior, thus individual responsibility as well. Acknowledging that tourists are key stakeholders in winter tourism, participants discussed the need and possibility of a more active engagement of tourists in social and environmental sustainability issues. Such proactivity highlights young adults' responsibilities with respect to preserving ski-destinations, especially considering the role of younger generations in being in charge for and caring about skiing destinations. Participants of the focus groups identified different actors as influential figures in promoting responsible behavior at the destination. Students addressed the responsibilities of such actors with respect to informing and educating tourists about the cultural, social and ethical values of the winter tourism destination. In this cross-cultural focus group research, students of different cultural background found a mutual understanding on identifying influential personae linked to winter tourism destinations and sports. The exemplary behavior of winter sport athletes and their team-members was identified as a possible vehicle to stimulate ski-tourists to behave responsibly, to respect people and the environment. Skiing and snowboarding instructors, identified as knowledgeable stakeholders in winter tourism destinations, were also mentioned by participants as those in charge to behave in an exemplary way with respect to ethics, sustainability and protection of natural landscape. A discussion of cross-cultural differences between the two groups was also facilitated and the focus on the role of humanistic education in tourism was kept along the discussion with occasional interventions of the moderator

Sustainable tourism issues such as mobility, environmental protection, the use of renewable resources and visitor management were evidenced as core elements in sustainable future development. Findings reveal the vulnerability of ski fields and evidence the importance of individual assessment and tourists' responsibilities in ski tourism destinations' preservation. Results confirm prior research findings (Della Lucia and Franch, 2017) evidencing that participatory planning and stakeholder involvement are fundamental tenets in sustainable tourism management of ski-tourism destinations.

Conclusions. *Universities have the responsibility to empower graduate students with the competences to become responsible leaders with sustainability skills, but professors should also listen to students since they have also a great deal of values to share, and their contribution can be beneficial. Thus, empowering them with more tools and desire to drive change in the field of sustainability and other societal issues might be critical also for our scholarly field. During the pandemic, in the online learning process offered by higher education institutes there is less space to allow students to experience cross-cultural context and to stimulate critical reflections on responsibilities and humanistic values. In order to make online delivered courses more human and respectful for students' dignity, their voice must be heard. In this study a collaborative data gathering work carried out by the Italian and Hungarian undergraduates allowed students to share their vision on sustainable ski tourism. The different session of the focus group interviews allowed them to reflect on tourists and other stakeholders' role in sustainable winter tourism development. The students proceeded in a critical but collaborative way discussing relevant issues that can be useful to planner. In terms of the principles of humanistic tourism education, this approach has given participants the opportunity to challenge themselves in a cross-cultural context, to be open to different point of views and to try to be empathic in understanding the different cultural approaches and ways of thinking about sustainability. The concept of 'sustainable tourism', as emerged from the discussions, is perceived as wide and distant. In order to bring sustainable principles closer, individual responsibilities should be addressed. Thus, placing human dignity at the center of the discussion might enhance young adults' responsibility for sustainable winter tourism development. This approach can also make such principles tangible by identifying key actors as inspirational and exemplary of responsible behavior.*

Research limits. *The study has certain limitations. First, the study explores young adults' reflections on sustainability winter sport tourism during the Covid-19 pandemic which may limit the generalizability of findings. Second, the study applies qualitative methods that while giving an in-depth description of the issue, do not offer the possibility to generalize findings. Future studies should implement mix methods to explore the interconnections between humanistic values, ski tourism and sustainable tourism management. This study is exploratory in nature, but it is planned to be implemented with field research carried out in some winter sport tourism destinations once travel restrictions are lifted.*

Practical implications. *From a practical point of view this study offers managers, stakeholders and planners some initial suggestions on the view of the younger generations on the overall sustainability of ski tourism destinations. Tourism managers could implement on young adults' vision of tourists' social responsibilities with respect to preserving ski-destinations, and on the perceived role of the different actors in charge of promoting responsible behavior at the destination. Results offer some insights - from the research participants' perspective - on the possible role of influential figures (e.g.: ski champions, instructors) in stimulating ski-tourists to behave responsibly. Furthermore, scholars in tourism management can use these findings to reflect on issues in sustainable tourism*

education and how to incorporate sustainability skills into curricula by employing humanistic tourism management theory and practice.

Originality of the study. This exploratory study contributes to the debate on tourism education on sustainability by introducing humanistic tourism education. The study highlights that a value-driven humanistic tourism education can be a driver for change impacting on sustainable ski tourism. Involving students in cross-cultural transformative learning experience contributes to develop students' skills. The participatory experience provided students with hints and suggestions on the directions they could undertake in promoting sustainability issues once starting their professional life in the field of tourism, hospitality, and leisure.

Key words: humanistic education; sustainability; cross-cultural communication; ski tourism

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Humanistic Tourism: a new disciplinary perspective on tourism management[♦]

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Objectives. *This contribution positions humanistic tourism at the nexus between tourism management and humanistic management, aiming to establish a new disciplinary perspective on tourism that can interpret and manage the weaknesses of traditional approaches to tourism and cope with tourism challenges and new scenarios, including the current global pandemic crisis. An exploration of this nexus is not only consistent, but it is also important and urgent, from both a theoretical and managerial perspective. With this contribution we propose a novel and original approach that has been neglected so far.*

The premise is the predominant neoliberal structure of capitalism and the vital function of tourism in sustaining it. Humanistic tourism is an alternative development model which must be strongly aligned with the tenets of sustainability, and humanistic management, to create shared value, while dignifying people and communities (Della Lucia and Giudici, 2021a). This entails being less exploitative and greedy, more environmentally sustainable, more respectful to communities and their cultures and traditions, more mindful, fair, and compassionate (Higgins-Desbiolles, 2020a). Humanistic tourism envisions human flourishing as a deep shift in values (Cheer, 2020), towards revaluing and reconceiving the way we inhabit the planet and interrelate with humans and non-human.

Methodology. *Tourism has been identified to be vital for capitalism sustainability (Fletcher, 2011). Tourism's predominant neoliberal structure is evident in its marketization and corporatization. These two factors have served the interests and profit-making agendas of the tourism industry's powerful players. Increasing international flows, mass tourism, and overtourism evident in many places, manifest this approach as well as environmental impacts and concerns about livability of places and their loss of identity and culture (González Tirados, 2011). Capitalism and tourism have shown paradoxes as a result of recurring crises which urgently require rethinking (Melè, 2016).*

In the wake of global challenges, including climate change and pandemic crises, social responsibility and sustainability have become prominent concepts and practices in tourism. At their core, there is the need to multiply the nature (economic, environmental, and social) and sources of value generation. In turn, it recalls the ecosystem of value co-creation (and co-destruction) (Cabiddu, Lui and Piccoli, 2013), mobilizing resources and capabilities from many entities, sharing the costs of social transformation and the new economic opportunities arising from social progress. In the background there are synergies, enabling mechanisms and constraints that may derive by seemingly independent elements of these systems.

Shared Value (SV) (Porter and Kramer, 2011, 2012) is a notion that captures the multifaceted nature and value sources that allows to interconnect sustainability and social responsibility to address the paradoxes of capitalism and tourism as complex systems. It is also linked to humanistic management. "Creating economic value in a way that also creates value for society by addressing its needs and challenges" (Porter and Kramer, 2011, p. 64) may be assimilated to the gradual shift of business and social responsibility toward strategic-oriented approaches (Farmaki, 2019) due to global challenges. When CSR is integrated into firms and value chains, the company and society are mutually benefited by reconciling different interests (Goodwin et al., 2012). The ecosystem of SV shared value (Kramer and Pfitzer, 2016) links shared value to sustainability. The different stakeholders participating in firm ecosystems shape the collective-impact efforts that enhance value co-creation (economic) and reduce value co-destruction (environmental and social).

Simultaneously gaining profit and benefiting from the natural environment and society require business model innovation - the development of new visions and new architectures of organizational value proposition, creation, delivery, and capture. Business models for sustainability (Boons and Lüdeke-Freund, 2013) innovate business model as humanistic management approach may do (Pirson, 2019) by promoting unconditional human dignity as a core organizational goal (Spitzeck, 2011). In turn, this goal is also a necessary condition for societal well-being (Pirson et al., 2017) and thus sustainability (Dettori and Floris, 2019). In strict connection with justice, equality, and autonomy,

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recognizing and respecting individual value (i.e., dignity) involve different processes of value creation for organizational and social progress. These processes entail recognizing people's will, consent, and decision-making capacity. They require people's active participation in decision-making processes to obtain fair (and sustainable) outcomes. They make possible that people can benefit from basic resources and societal goods, participate in their integral and holistic growth and fulfillment, and interconnect with the environment and all living (Melè, 2016).

Recognizing and respecting individual value in uneven systems provide principles of morality (Waldron, 2013) and capacity building (Nussbaum, 2011). These factors allow people to overcome violations and "to do" and "to be". The unlatching protection and development of these capabilities are conceived as substantial freedoms "from" constraints/violations and "to" thrive, moral rights, and conditions for well-being and social justice. Developing capabilities requires government expenditure and economic and social right allocation to all citizens (Nussbaum, 2011).

Combined with sustainability, these principles can inspire uneven systems transformation at different levels (Jacobson, 2009), from the organizational to socioeconomic and political contexts. Moreover, they guide actions toward alternative models based on re-discovery of what means to be human and what matters most to humans.

Findings. The paradoxes of the growth model of tourism, and the need to rebuild tourism, like those prompted by the pandemic crisis, have drawn potential scenarios for the future of tourism (Brouder, 2020; Gössling et al., 2020; Hockings et al., 2020).

The worst-case scenario envisages a return to tourism as usual-the "old normal." which is a return to tourism as a function of capitalist expansion (Fletcher, 2011). Its "logic thrives on unjustifiable value capture in situations where the externalities are absorbed by the environment, the precarious labor force, host communities, and mom and pop businesses" (Ioannides and Gyimóthy, 2020, p. 6). However, the advisability of a simple return to the "old normal" is increasingly being questioned. The tourism sector worldwide is taking such a hit that many companies will disappear, consumers will change travel habits, and destinations and their governments will have to explore alternatives. However, rectifying an uneven global system is not easy, because of path-dependent processes driven by the logic of capitalism. A path that leads to transformation in tourism can be realized if sufficient institutional innovation occurs on both the demand and supply side of tourism (Brouder, 2020).

The cautious scenario envisages a return to tourism as un-usual-the "new normal." The growth-led, corporate-managed, resource-intensive models of tourism development will continue under circumstances of a deeper global economic depression, such as if the global pandemic lasts longer with ongoing contagion. In the new normal, "staycation" practices (Molz, 2009) encourage people to be tourists in their home region, supporting the local economy with alternative tourism practices (Richards, 2014) in which people (re)discover the natural environments and cultural attractions their region has to offer. The virtues of slow nature travel may be re-discovered as a means toward happiness and managing mental health (Buckley, 2020). Local businesses and communities must adapt to address these new market opportunities and expectations.

The more optimistic scenario envisages an unprecedented opportunity for a reboot of tourism (Niewiadomski, 2020)-we call this transition humanistic tourism (Della Lucia and Giudici, 2021a)-that is, tourism with a strong concern for human dignity, values, welfare, and nature, i.e. humanistic tourism. While we already know what is being "destroyed," there is still much wishful multidisciplinary thinking, which overlaps significantly, about what the new tourism configuration would be.

Humanistic tourism must be strongly aligned with the tenets of sustainability, and humanistic management, in order to create shared value, while dignifying people and communities (Della Lucia and Giudici, 2021a).

Humanistic tourism must be in line with the principles of regenerative economics (Ateljevic, 2020): Being in a right relationship with both the culture and the ecosphere in which the human economy is embedded; viewing wealth holistically in terms of well-being of the 'whole' instead of mere money; being creative, innovative, adaptive and responsive; empowering participation of individuals and groups; honoring and nurturing healthy and resilient communities and places; cultivating diversity as a source of creativity; shaping circulatory, and value-enhancing flows (of information, production, etc.); seeking balance between dichotomies.

Humanistic tourism responds to the climate crisis and endorses the shift to a carbon-neutral economy by "flattening the (growth) curve" (Prideaux, Thompson and Pabel, 2020). This approach embeds and supports the incipient circular economy model by adopting old and new strategies fostered by technology driven innovations. This entails reducing, reusing, and recycling, to achieve harmony with the fragility of resources required to sustain human life; renting rather than owning, moving from inbuilt obsolescence to repair and reuse for other purposes.

Humanistic tourism is a return to tourism as a social force (Higgins-Desbiolles, 2006, 2020b): Being a connector of people, bridging local communities and tourists, empowering, and building greater wellbeing of local communities, fulfilling wider social promises, including justice, equity, and autonomy. In this vein, humanistic tourism adopts a "Buen Vivir approach" (Everingham and Chassagne, 2020), requiring tourism to be small-scale, slow, local and benefiting host communities as well as tourists to increase the wellbeing for all.

The multidisciplinary thinking about a new tourism configuration converges around the fact that tourism paradoxes and the pandemic result in significant changes in how humanity perceives our planet, our relationship to nature and with each other, and with technologies. Accordingly, building humanistic tourism revolves around four cluster of interactions (Della Lucia and Giudici, 2021a, 2021b).

Human vs. Human: The human to human relationship is at the core of conviviality and, in turn, of tourism as a social force connecting people, facilitating sociability and associational life. In the end, it is people who travel and

people who host travelers. Health concerns, home isolation, quarantine, social distancing and other measures have prevented us from meeting, face-to-face - when, how, and where we want - forcing us to distance ourselves from the people we physically encounter and to meet more often online for business as well as for social and leisure purposes. These circumstances have forced us to consider what it means to be human and what is truly meaningful and valuable for us. Health and biosecurity, sociality, trust, confidence, and self-fulfillment/fulfillment of human potential, among others, all relate to possibilities inherent in sociability, that is, cultivating and celebrating convivial life. This sense of security, belonging, community and citizenship, should be embedded in humanistic tourism, starting from (re)creating trust and the confidence to travel. At the core, there is a new emphasis on meaningful experiences (Smith and Diekmann, 2017): Giving more value and more time (slow tourism) to self-help and self-development (wellbeing tourism), to human interactions within the traveling group (friends and family), and with the host community (indigenous/community-based tourism). From a business perspective, tourism operators should be more involved in facilitating social encounters and in benefiting the many people who are at the receiving end of tourism (both from the supply and demand side). Community support and wellbeing should become core values and objectives of the tourism sector.

Human vs. Nature: The human to nature relationship is another dimension that pandemic-related circumstances have forced us to give increasing value and importance to, raising awareness and responsibility at both the macro-meso level and the micro one. It is now well accepted that humans' impact on the planet is destructive, leading to pollution, natural resource depletion, loss of biodiversity, and climate change. We do expect that the generation of young people who led the 2019 climate change demonstrations in support of Greta Thunberg will implement the changes that are needed to consider our relationship with nature differently. Tourism has certainly played a major role in the significant and irremediable environmental damage that occurred in the past 30 years. The improvement of natural ecosystems and wildlife, due to the stark decline in international air travel, cruise travel, and overtourism caused by the pandemic, is a clear sign of the tourism vs. nature interaction. The tourism sector must work with governments and lead the charge in setting goals for decarbonization and depollution (i.e., environmental sustainability), but also by reshaping conservation programming. Convivial conservation (Fletcher and Büscher, 2020) does refer to an approach that allows humans and non-humans to live side by-side in meaningful coexistence and supports and subsidizes the livelihoods of people living intimately with wildlife. The move towards slow tourism, ecotourism, and staycation practices, mirrors this search for meaningful coexistence and engagement with nature. These tourism practices encourage greater environmental stewardship and sustainable and greener behavior, along with having extensive benefits for wellbeing.

Human vs. Technology: Due to communication and marketing technology-driven democratization, the changing relationships between humans fostered by the pandemic come with an acceleration of our relationship with technology. This interaction has both bright and dark sides. Containment measures, safety, anxiety and fear issues, as well as recovery strategies, have been balanced and mitigated by the technology mediation in personal relationships and the increase of technology adoption in business of any kind. During the lockdown, nearly everyone has spent more time - if not almost all the time - online, from work and learning to fitness, leisure and socializing. By contrast, in the next phase of deconfinement, the desire to spend time offline may intensify with the search for digital detox retreats. On the other hand, businesses have increased the digitalization of their processes and services, from robots to Artificial Intelligence (AI) and drones, all in an effort to limit human contacts and to increase efficiency. For example, in the tourism sector, robot technology has been adopted to clean hotel rooms, to disinfect public spaces in airports, or to check travelers' temperature before boarding planes. This shift affects human-to-human encounters at the base of tourism as a social force and triggers substitution mechanisms. Seyitoğlu and Ivanov (2020, p. 1) suggested that "robots create a technological shield between tourists and employees that increases the physical and emotional distance between them". While recognizing that COVID-19 has fostered a broader technology and robotics adoption, Zeng, Chen and Lew (2020) also argued that we increasingly rely, for business and pleasure, on video technologies that can be seen as a threat to the travel and tourism sector. Technologies overcome space distance, time and other access constraints providing (virtual) spaces and tools to experience conviviality and learning and sharing processes (Havitz et al., 2020). The progress made in Virtual Reality (VR) may help some of these technologies become marketing tools, but also substitutes, for certain markets, to actual travel (Griffin et al., 2017; Griffin and Muldoon, 2020). Technology is not an end in itself. It needs to be at the service of humans, be they consumers, service providers, or community stakeholders.

Human vs. the Economy: Humans make and contribute to the economy, it being based on capitalism or on other foundations. Tourism, as a function of capitalist expansion, has shown its vulnerability amid climate change, pandemics, and other challenges. The current economic/tourism model is unsustainable and needs to be rethought. The growing emergence of certified B Corporations (<https://bcorporation.net/about-b-corps>) demonstrates that a new generation of business leaders are paving the way towards new business practices that respect the environment and all stakeholders. A commitment to exercise economic practices that are beneficial to multiple stakeholders, including local communities and the natural environment, is essential. Strictly related, the basic tenet of economic growth must also be rethought if we want to accomplish the goals expressed in the Paris agreement to limit fossil fuel consumption. Tourism should take the lead in reinterpreting our understanding of the relationships between hosts and guests (Smith, 1989) and in managing constrained resources for the benefit of its stakeholders. These avenues for change may include cooperation, co-evolution, nested interactions, the ethics of sharing, altruism, and progress, among others.

Research limits. Exploratory research paper. An integrated research framework must be developed. Practical cases and examples, on an international scale that covers a wide variety of contexts, are needed to provide variations

and applications of disciplines, approaches, concepts, and ethical values contributing to the foundation of a new disciplinary perspective in tourism management.

Practical implications. Humanistic tourism presents an opportunity to set the ground for a transition towards alternative development models. The pandemic-driven unprecedented societal changes have shown that this transition is urgently required in tourism and economy. The processes of shared value creation at the interplay between sustainability and humanistic management around which humanistic tourism revolves represent avenues for change not only for tourism, but also for managing businesses and fostering a better economy.

Originality of the study. Humanistic Tourism offers a practical application to humanistic management, thus striving to establish a new disciplinary perspective in tourism management.

By explicitly marking a humanistic approach, humanistic tourism has both a critical and a positive approach to tourism management. On the one hand, it takes established perspectives in tourism management, mainly inherited from economics, human resource management, and efficiency-driven management, outlining their inadequacies. On the other hand, it discusses human dignity and values directly, thus explaining, analyzing, and interpreting the importance of topics that have been given limited attention so far. The contemporary relevance of human dignity may interpret and manage the weaknesses of traditional approaches to tourism and cope with challenges as well as new scenarios, including the current COVID-19 pandemic crisis.

Key words: humanistic tourism; capitalism paradoxes; crisis; alternative development model; shared value; sustainability

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Reshoring for sustainability: do Industry 4.0 technologies matters?

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Objectives. For several decades, production fragmentation and globalization pushed manufacturing to low-cost countries (Wiesmann et al., 2017). This process known as ‘offshoring’ is not new, but still blurred because it has been differently approached and defined, even though it generally deals with competitive strategic phenomena in both the domestic and international marketplaces (Ishizaka et al. 2018; Pereira et al., 2020). One of the most accepted and punctual definition of offshoring comes from Levine (2012), according to which it is “the process of sourcing and coordinating tasks and business functions across national borders” (p. 902).

Recently, the global economic downturn, the growing attention to sustainability, the increasing expectation of customers for flexibility, and the improved cost performance led several companies to re-thing their “shoring” decisions (Tate, 2014; Boffelli et al., 2020). It follows that many of them decided to reshoring manufacturing or to “bring back to the home country production activities earlier offshored” (Barbieri et al., 2018, p. 81) or, in other words, to reverse previous offshoring activities. In this sense, the dilemma of offshoring or reshoring generated a lively debate among scholars, practitioners and even policy makers (Ellram et al., 2013). It follows that the growing practice to (wholly or partially) bring manufacturing back home is one of the current imperatives for research (Fratocchi et al., 2016), which is still calling for better understanding the phenomenon per se as well as the related backshoring (or the relocation back to the home country of the firm) and nearshoring (or the relocation to a closer neighboring country) processes (Di Mauro et al., 2018; Piatanesi et al., 2019; Vona and Cosimato, 2021).

In the literature, one of the major questions to be answered is related to what kind of relationship links together reshoring and sustainability. Choosing “where” manufacturing activities have to be made plays a massive influence on sustainability both at firms and global level (Cosimato and Troisi, 2015; Orzes and Sarkis, 2019). Moreover, this question is not an easy one, even though it has been inspired by the growing and clear effect of manufacturing not only on environmental, but also on social sphere of sustainability (Fratocchi and Di Stefano, 2019). In this direction it is worth noting that sustainability goals and especially environmental ones represent one of the current competitive priorities, which is often related to the integration of advanced digital technologies for environmental protection into integrated manufacturing systems and technologies (de Sousa et al., 2018). It follows that the decision about the location of manufacturing has been also influenced by another key driver, that is Industry 4.0 conceptualized as the fourth industrial revolution, boosted by digital innovations (applied to industrial processes and engineering applications), the most recent communication technologies, a clear service-orientation (servitisation), a knowledge-based integrated and automated manufacturing systems, and an everchanging digitally offering, based both on products and services commercialized through new forms of markets and exchanges (Roblek et al., 2016, Yao et al., 2017). As stated, the recent and advanced technologies connected to the Industry 4.0 paradigm, such as Internet of think, real-time data collection, predictive analytics, big data analytics, block chain technologies, cloud manufacturing, robotics or Artificial Intelligence (AI) (Agostini and Filippini, 2019). This paradigm is characterized by “the adoption by industry of techniques and processes allowed by digitization, cloud computing, the internet of things and big data to gain competitive advantages in domestic and global markets” (Tiwari and Khan, 2020, p. 731). In this sense, the Industry 4.0 has been also led to emergence of the so-called “smart manufacturing”, based on the integration of manufacturing systems with the most advanced digital, automated and smart systems or applications (Roblek et al., 2016). These systems and technological application have deeply changed manufacturing and its processes, also influencing location selection and pushing to choose those geo-political areas in which these technologies are more accessible (Kinkel et al., 2021) and, therefore, able to improve local quality, productivity and flexibility (Di Paola and Vona, 2023; Ancarani et al., 2019; Dachs et al., 2019). This positive effect is often due to the potential of some countries (e.g., Germany and Italy) in exploiting the home-based resources (included technological ones) as well as local quality, productivity and flexibility (Ancarani et al., 2019; Dachs et al., 2019). Thus, this paper aims to provide an interpretative framework for recognizing the key drivers and the possible barriers to reshoring, highlighting the influence that sustainability issues and the Industry 4.0 technologies can have on the related decisions (Elteto, 2020).

Methodology. This work is based on a structured literature review (Synder, 2019; Paul and Criado, 2020), pointing to analyze various sources to better define the main motivations, implementation characteristics and impacts of

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reshoring decisions. To this end, this paper is intended to review several different sources, which deals with the adoption and impact of the Industry 4.0 digital technologies for reshoring purposes. A systematic literature review has been conducted to search, select, critically evaluate, and synthesize the existing literature on the topic (Cook et al., 1997), in order to outline the tendencies of current research conducted within a specified scientific field or domain. It follows that this method needs for a punctual definition of the boundaries of the analysis (Ashby et al., 2012; Seuring and Müller, 2008). Implementing this strategy, the work aims 1) to contribute to better understanding of the concept of reshoring and the reasons why (drivers) which inspire the related decisions, and 2) to improve the quality of the related information, selecting just the results coming from peer-reviewed sources (e.g., journals and books). In this sense, various scientific and academic sources have been reviewed to define drivers and barriers to reshoring. Two elements have been analyzed - sustainability and Industry 4.0 technologies - and their enhancing or constraining influence on reshoring decisions. The review of the literature has been based on the following databases CiteSeerX, ACM, AISel, EBSCOhost, Emerald Insight, Taylor Francis, Science Direct and on Google Scholar to cover other possible contributions in manufacturing, supply chain management, sustainability and digital technologies. Some keywords have been used to drive the analysis (reshoring, backshoring, nearshoring, manufacturing, production, sustainability, industry 4.0, Internet-of-think, blockchain, Artificial intelligence, robotics). Top 100 headings, abstracts and key words for each term were analyzed to make the review comprehensive and reliable. Then, the related contributions (published on journals or books indexed on the selected databases over the past 10 years) were selected and analyzed. After having retrieved the selected keywords, the analysis was conducted using the so-called “5Ws and 1H” (who-what-where-when-why and how) set of questions. A conceptual framework was developed to better identify and describe the retrieved key concepts and the possible additional concepts (keywords) retrieved during the analysis as well as to better understand the related theory and the relationships existing between the retrieved concepts.

Findings. The achieved results led to better define reshoring and the influence (positive or negative) that sustainability and Industry 4.0 technologies can have on it (Ahn et al., 2019; Butollo, 2020). In particular, this study discusses the influence that sustainability and its issues can have on reshoring decisions, focusing on if and how the most recent and advanced technologies (e.g., AI, Internet-of-think, robotization, etc.) can support them and their sustainable orientation (Ancarani and Di Mauro, 2018; Ashby, 2016). The review of the literature highlighted some different motivations (or drivers) at the core of reshoring decisions. One of these, emerged in few past years, is the growing automation and digitalization of manufacturing due to the application of the afore-mentioned Industry 4.0 technologies (Müller et al., 2017; Ancarani and Di Mauro, 2018; Elteto, 2020; Kinkel, 2020; Unterberger and Müller, 2021). The influence of these technologies on reshoring has been proven by some case studies, surveys and econometric experiments. In particular, Krenz et al. (2018) shed light upon the link existing between reshoring and automation (density of robots) within countries and within manufacturing, while Ancarani et al. (2019) maintained that companies have usually different competitive priorities, which call for different strategies and for a different adoption of Industry 4.0 technologies in reshoring production. Thus, these strategies can benefit from the great potential of the most advanced digital technologies, which can also change the nature of competition and the related strategies in several industries (Molka-Danielsen et al., 2018). In fact, according to Arcarani and Di Mauro (2018) in U.S. and in Western Europe “reshoring firms with quality-oriented business strategies, and for which cost containment is not the top priority, engage in capital investment in new technologies mainly when they are involved in new product development” (p. 89).

The review of the literature also highlighted that Industry 4.0 technologies can support the reshoring of manufacturing activities, improving, at the same time, their sustainability. The application of the aforementioned technologies in the countries of origin can support the overall sustainability of supply chains, because able to better develop localization, agility, and digitization (LAD) characteristics (Nandi et al, 2021). It is worth noting that reshoring has been also boosted by the still enduring COVID-19 pandemic (Barbieri et al., 2020). In fact, the subsequent national lockdowns have had a critical effect on offshore supplies (Strange, 2020), changing the rules of the current world trade battle, due to the raising of protectionist policies (Javorcik, 2020), the increasing pressures for the lack of self-sufficiency for needed products of several countries (Gurvich and Hussain 2020).

The achieved finding pointed out also other drivers of reshoring decisions, such as for example 1) the correction of managerial errors (e.g., insufficient planning, insufficient knowledge of the offshore location, miscalculation or underestimation of full costs, etc.) (Kinkel and Maloca, 2009); 2) the rising cost in offshoring destinations (e.g. Asia) or the lower costs of energy in the Western countries (Martínez-Mora and Merino, 2014; Simchi-Levi et al., 2012); 3) firms' inability in facing the emergent problem of offshored production (Manning, 2014); 4) the lack of higher soft and digital skills in offshoring countries (Davies, 2015); 5) consumers' growing pression due to their better perception of production quality (“made in” effect) (Yu and Kim, 2018); and 6) political programs aimed at stimulating reshoring (Iozia and Leiriao, 2014; Di Mauro et al., 2018). Finally, this analysis has also led to propose an interpretative framework for recognizing the key drivers and the possible barriers to reshoring.

Research limits. The theoretical nature of this work somewhat limits it, even though it provides meaningful insights on what currently enhances and/or constrains reshoring. In fact, it has been based on a review of the extant literature, conducted on secondary data, retrieved from scientific journals and books, which analysis and classification might be also limited by researchers' discretion and individualism. A further limitation might also be due to the newness of the topic under investigation; thus, for some of its main characteristics and issues few and just exploratory research are available. Even though the aforementioned limits, this work exhaustively describes the phenomenon under investigation, while further empirical research will support the achieved findings.

Practical implications. *The main practical implications of this study suggest that the most recent and advanced technologies can support entrepreneurs and managers in reshoring decisions and in making them as sustainable as possible. Thus, these technologies not only can boost reshoring strategies, but also monitor them especially in terms of environmental and social impact. Moreover, it offers to managers a different perspective on internationalization strategies and their effectiveness; thus, when treats and obstacles seem to be too difficult to be overcome, they can change their shoring decisions, bringing manufacturing back home to avoid risks or changes in strategic priorities (Barbieri et al., 2018). The results of the review of the literature also pointed out that managers tend to assume a “progressive” and/or a “selective” approach to reshoring, also inspired by sustainability issues (Boffelli et al., 2020). In terms of policy implications, this paper offers insights related to the importance of the development and the application of a sustainability-based legislation, which can drive and support reshoring decisions (Fratocchi and Di Stefano, 2019). However, this also implies that policymakers should better focus on reshoring influence on local market labor, regulating the related employment policies and contracts (Raj et al., 2020). Finally, in terms of implication for society, this analysis highlighted that reshoring strategies can contribute to Western countries re-industrialization policies, which can be supported by the high potential and the availability of Industry 4.0 technologies (Barbieri et al., 2018).*

Originality of the study. *This study is one of the first contributions which jointly approaches the influence that reshoring can have on sustainability at firm, local and global level also thanks to the implementation of Industry 4.0 technologies. The existing reviews of the literature have been usually focused just on the analysis of the reasons why reshoring decisions are taken, while this contribution tries to offer a broader analysis, pointing out some unaddressed issues and gaps (e.g., the driving force of sustainability in western countries or the enhancing role that Industry 4.0 technologies play in this sense) that future research should fill.*

Key words: Offshoring; Reshoring; Localization; Sustainability; Industry 4.0 technologies.

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How to turn circular economy into an asset? On the role of stakeholders' partnerships

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The research is a work-in-progress.

Objectives. *The Earth's capacity to sustain humankind is reaching a tipping point. Circular economy, described as a promising approach to achieve sustainability without losing competitiveness, enables value creation, delivery and capture, essential elements for a viable business strategy. Even if research on CE has grown in recent years, few scholars have approached it with a comprehensive perspective considering its economic, environmental and social sides. Although scholars have demonstrated that CE is not possible without collaboration of stakeholders, they have also noticed that there is still a lack of collaboration research. The focus of this research is to explore the role of stakeholders' partnerships for CE, with a focus on values creation, in all its forms. We investigate our research question through a qualitative exploratory case study. The chosen organization is KME Italy, a company which manufactures semi-finished products made of copper and copper alloys. KME has, in challenged itself to, not only implement circular economy practices, but also become a circular economy business model. With this study, providing further evidence of the strategic role of partnerships and of the social dimension of circular economy, we aim to both contribute to the current circular economy debate and to provide practical implications for managers.*

The research is based on the following framework.

Circular economy as a new paradigm

On the lips of practitioners, scholars, and politicians (Urbinati et al., 2017), "circular economy" (CE) defines "an economic system that is based on business models which replace the 'end-of-life' concept with reducing, alternatively reusing, recycling and recovering materials in production/distribution and consumption processes, thus operating at the micro level (products, companies, consumers), meso level (eco-industrial parks) and macro level (city, region, nation and beyond), with the aim to accomplish sustainable development, which implies creating environmental quality, economic prosperity and social equity, to the benefit of current and future generations." (Kirchherr et al., 2017, pp. 224 - 225). Circular economy has developed as a response to the traditional "linear" model - "take-make-dispose", where raw materials, once extracted, are processed into finished products and they finally become disposal -, due to the growing limitations of Earth's natural resources (Meadows et al., 2004). It consists of the adoption of a circular model based on the redesign of products and processes, to ensure a continuous reuse, or recycle, of resources (Veleva and Bodkin, 2018). This economy is, in fact, restorative and regenerative by design (EMF, 2015a). Based on a self-sustaining system inspired by natural processes, circular economy attempts to decouple economic growth from resources depletion (Ghisellini et al., 2016). Since resources are kept in a loop of production and usage instead of being disposed, a greater value is generated (Geng et al., 2009; McDonough and Braungart, 2002; 2012; Su et al., 2013; Xue et al., 2010). Given its increasing relevance for academia, companies and policy-makers, circular economy has become a paradigm (Bressanelli et al., 2019).

The transition towards a circular economy has become a topic of public debates, emerging as a key issue in the political and business fields (Testa et al. 2020). In the last year, a conspicuous number of policies has been released to spur more sustainable industrial paradigms and strategies (Geng et al., 2009; Gerrard and Kandlikar, 2007; McGlyn, 2017; Vermeulen, 2015; Xue et al., 2010). The European Union has a leading role in this transition: in 2020, the Commission has adopted a new Circular Economy Action Plan, replacing the previous Plan of 2015. The adoption of the plan is a part of its new industrial strategy and one of the main blocks of the European Green Deal, the Europe's new agenda for sustainable growth. The Plan consists of 39 actions, which includes initiatives along the entire life cycle of products, with the aim to keep resources in the EU economy for as long as possible. Promoting competitive sustainability in Europe, the Commission introduced legislative and non-legislative measures targeting areas where action at the EU level brings real added value.

Circular economy is thus recognized as a possible or, at least, a partial solution to achieve sustainable development

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(Geissdoerfer et al., 2017). On this trend, scholars have explored the role of circular economy in relation to sustainability and sustainable development (Ghisellini et al., 2016; Korhonen et al., 2018; Suarez-Eiroa et al., 2019). The sustainable development's definition is widely known: a "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development, 1987). Sustainability, on the other side, includes the economic, social and environmental dimensions. According to authors (Kristensen and Moostarg, 2020), while there is not doubts that circular economy and sustainability are related, the nature of this relationship is what makes the difference. Geissdoerfer et al. (2017), demonstrate that CE may be (i) a condition for sustainability, (ii) beneficial for sustainability, or (iii) a compensatory for sustainability. Moving on this, Suarez-Eiroa et al. (2019) stated that CE and sustainable development are closely related and that CE is at least beneficial to achieve sustainable development. The reasons why CE has become increasingly widespread among scholars, practitioners and politicians are, at this point, evident.

The three (?) dimensions of CE

According to Lacy and Rutqvist (2015), circular economy could generate \$4.5 trillion of additional economic output by 2030 and \$25 trillion by 2050. Environmental and social benefits are part of the game as well. Circular economy helps in preventing serious challenges such as unpredictable weather patterns, rising sea levels, and water shortage. Under a social point of view, instead, it offers ways to address, at least, mass unemployment and promote social wellbeing. CE is crucial for our future. However, although "circular economy strives for economic, social and environmental values creation in every part of the system" (Van Boerdonk et al., 2021, p.1), one of the main discussion about CE deals with the pertinence of the three dimensions of sustainability within the circular framework. According to Murray and colleagues (2017), social value delivery is a still missing area in the current CE research. Or, they continue, the CE "is virtually silent on the social dimension" (p. 376). Most of the time CE is described as an alternative system that enables economic and environmental benefits (Blomsma and Brennan, 2017; Geissdoerfer et al., 2017). Kirchherr and colleagues (2017), in their accurate analysis of 114 CE definitions aiming to create transparency regarding the current understanding of the concept, found evidence that the while almost half of the definitions (46%) have economic prosperity as the ultimate goal of CE, 37-38% consider the environmental quality as a fundamental aim, and only 18-20% of the studies emphasize the importance of social equity. Since only 13% of the definitions consider all the three dimensions, Geissdoerfer and colleagues (2017) call for studies with a holistic view on sustainability in CE. Thus, several scholars (e.g. Kristensen and Remmen, 2019; Murray et al., 2017) call for a deeper attention on the social dimension of CE, given its role when developing circular products and solutions (Bocken et al., 2016; Korhonen et al., 2018). In fact, for instance, the social value created from circular models is not limited to the potential new job opportunities, but it encompasses multiple stakeholders (Kristensen and Moostarg, 2020; Kristensen and Remmen, 2019; Pla-Julian and Guevara, 2019).

In a circular model, value creation and value capture are critical elements for establishing a viable business strategy (Bocken et al., 2014; Ghisellini et al., 2016; Rizzi et al., 2013; Veleva and Bodkin, 2018). As for the sustainability dimensions here above described of CE, value creation may refer to economic, environmental or social value. At the basis, the main idea is to extend resource value. Collecting or sourcing waste materials and resources, the goal is to turn these into new forms of value (Bocken et al. 2016). The Ellen MacArthur Foundation (2012) examined the potential of circular business models in creating value, pointing four sources of value creation: (i) the power of the inner circle (less cost in production); the power of circling longer (lengthening lifetime of products); the power of cascading use (waste-is-food); and the power of pure circles (where source material remains uncontaminated, thus improving redistribution efficiency and material productivity) (Murray et al., 2017, p. 374). However, this conceptualization appears biased focusing, above all, on the economic dimension of value capture and creation. Value is created when naturalistic ecosystem, ecological knowledge, human and social dimensions and economic results are all different facets of a unique circular business model. In order to achieve sustainable development through inclusive CE business models (Schröder et al., 2020) a sustainable future requires a "system-based thinking that involves in equal measure, society, environment and economics" (Murray et al. 2017, p.377).

Circular economy and partnerships

According to several scholars, value creation in CE results from collaboration between different actors. Collaboration, instead of competition, enables value creation (Veleva and Bodkin, 2018). These authors confirm the work by Lowitt (2008), emphasizing how symbiotic and mutually dependent collaboration, based on trust and close relationships, generate social benefits. Collaboration, partnership and creation of networks are key elements in the functioning of CE models. Recent studies stress collaboration as fundamental for CE implementation in business (Sarya et al., 2021). For instance, Stewart et al., (2018), in their exploration of the implementation of a circular economy strategy in the beverage sector, found evidence that concerns of stakeholders are mainly related to the fact that single companies cannot establish circular system on their own. Instead, they need to develop partnerships within - or beyond - their supply chain. If partnerships are mandatory to enable CE implementation, at the same time, incremental and radical changes at the system level are necessary to ensure long-term partnerships (Geissdoerfer et al., 2018). When considering small actors, such as single entrepreneurs or start-up, resources' access and scalability are commonplace elements. Veleva and Bodking (2018) have explored this context, showing how corporations and entrepreneurs get mutual advantage for delivering their value proposition, creating new markets and transforming industries (Hockerts and Wustenhagen, 2010), when establishing strategic partnerships. In addition, Homrich et al. (2018), in their

investigation of the trends and gaps on CE, reflect on the role of partnerships. They recognize that evidence of the creation of alliances mostly come from case studies papers, “contextualizing pilot practices (Zhang et al., 2010), process integration (Yu et al., 2014), evolution of symbiosis approaches (Yu et al., 2015b) and the effect of policy instruments (Yu et al., 2015a)” (p.536). To allow CE functioning, networks are needed. In fact, “CE model requires individual actors to participate in the same cause” (Sarya et al., 2021, p.8). Since in circularity, materials' flows happen both upstream and downstream in the value chain, partnerships and collaboration are necessary to allow remanufacturing and reverse logistic, which, in turn, enable CE on a larger scale. An additional confirmation of the pivotal role of partnerships comes from the work of Shi et al. (2010), who developed a qualitative case study of the Tianjin economic-technological development area in China. The authors focused on one of the two most cited business models when dealing with circular economy and partnership, industrial symbiosis. Defined as “a process-oriented solution, concerned with using residual outputs form one process as feedstock for another process, which benefits from geographical proximity of businesses” (Bocken et al., 2016, p.313), industrial symbiosis merges two or more different industries, where each of them tries to find optimal access to material components and elements, trying to reduce the overall operating cost and risks. To make this process to start, partnerships are key.

Although academia and practitioners agree on the role of partnership for CE implementation and value creation, its realization is not always an easy task. The current linear model is, at least in the medium term, still profitable. Thus, companies are not motivated to create networks to accommodate CE and do not allocate their efforts to this cause (Sarya et al., 2021). The study of Veleva and Bodkin (2018) provides some examples of challenges when implementing CE, such as a lack of regulation and incentives, a lack of awareness and market demand, the complex product or packaging design that prevents proper reuse/recycling, the cost of product/waste take-back, a lack of data indicators to measure and communicate the impacts. Other examples of difficulties in collaboration and partnerships are a disinterest for non-core business activities (Singh et al., 2016), resistance from key stakeholders with highest interests and misaligned consumer behavior (CIRAIG, 2015). According to Stewart et al. (2018), these elements “can threaten very good intention to create circular systems” (p.811).

Even if transition towards a circular value chain requires consistent and functioning networks and cooperation (Scheepens et al., 2016; Franco, 2017) and strategic partnerships are the greatest opportunities in the future (Veleva and Bodkin, 2018), several scholars notice that there is still a lack of collaboration research (Kirchherr et al., 2018; Adams et al., 2017). Further research efforts are needed. Partnership between internal and/or external stakeholders must be achieved to be properly able to create value - in all its forms. Given the great variety of stakeholders an organization face, such as governments, NGOs, academic institutions, large companies, consumers, entrepreneurs and suppliers, it is critical to develop a value network with those motivated and willing to achieve economic viability, environmental benefits and social concerns (Geissdoerfer et al., 2018). To become mainstream, CE need the acceptance of several stakeholders (Sarya et al., 2021), which, in turn, press on firm's circular initiatives (Jakhar et al., 2018). When companies deal with corporate sustainability multiple stakeholders partnerships are critical to make the system functioning (Breuer and Lüdeke-Freund, 2017; Kurucz et al., 2017; Rohrbeck et al., 2013). Webster (2015) states that is even impossible imagine a circular business models without elements of collaboration, whether involves recycling, reuse, reselling sharing, upcycling and/or downcycling. The inclusion of a broad range of stakeholders (e.g. state, market, civil society), is a must when implementing alternative business models (Bocken et al., 2013; Yang et al., 2017).

In fact, continue Gupta, Chen, Hazen, Kaur, Santibanez Gonzalez (2019), one of the main difficulties for implementing CE models lies in the lack of adequate information about key stakeholders involved in the business cycle. Based on the definition of stakeholders provided by Freeman (1984) - “any group or individual who can affect, or be affected by, the achievement of an organization's purpose” (p.54) - scholars argued that collaboration and partnerships with stakeholders are crucial as value creation, delivery and capture of an organization is always related to the collaborative ties with its stakeholders (Dreyer et al., 2017; Freeman, 2010). To effectively manage collaborative relationships with stakeholders, can help to integrate CE processes, to achieve improved efficiency and effectiveness (Shrivastava and Guimarães-Costa, 2017), and to benefit both business and society. In CE, cross-sector partnerships and collaboration between public, private and/or nonprofit actors, appear particularly effective, as they are a mean to address societal issues (McDonald and Young, 2012; Van Tulder et al., 2016).

Given the strategic role of partnerships to implement circular models and practices, and based on the lack of a comprehensive view of circular economy which focus not only on its economic side, but also on the environmental and social ones, this research aims at exploring the role of stakeholders' partnerships for CE implementation which has, as ultimate goal, the sustainable development.

With the lens of stakeholder theory (1994), we argue partnerships are fundamental in guiding an organization towards a comprehensive transition towards circular economy able to create, deliver and capture value. The way it happens is the object of this study. Further research on CE is needed, and partnership perspective remains a gap to be more intensively addressed, rather than tools, best practices to CE and its supply deployments (Homrich et al., 2018).

Methodology. Given the lack of a theoretical framework on the role of partnerships in the circular economy transition and the lack of empirical evidence of value creation, delivery and capture - in its three dimensions - in circular economy, we chose to address the research question through a qualitative exploratory case study. The chosen case is KME Italy. The KME Group is one of the world's largest copper producers. We believe the chosen methodology is suitable as cases are particularly useful for answering “how” questions (Gehman et al., 2018). Through a deep immersion in the setting to collect data, we expect to contribute to theory building (Eisenhardt, 1989; Eisenhardt and

Graebner, 2007). The case is approached without having a preconception of what relationships we are going to see. In other words, open-minded (Gehman et al., 2018). We expect, using multiple data sources, to find empirical instance of our phenomenon under investigation (Yin, 1994, 2009).

Case selection - KME at a glance

KME is one of the world's leading manufacturers of semi-finished products made of copper and copper alloys. Its 8 production plants are in Europe (Germany, France and Italy), in China and in the USA. The company is divided into two corporate divisions - the Copper Division (rolled products) and the Special Division (special products). While its central headquarter is in Osnabrück, the company is, since 2004, run by the IntekGroup Spa. KME purchases raw copper, scrap and alloying metals to re-melt the materials and create new copper alloys. Thus, KME operates in the downstream section of the copper value chain, purchasing raw materials and transforming them into semi-finished and finished products for use in other products and processes in a broad spectrum of end markets. Since KME does not produce raw copper, it has limited exposure to copper price. The success of its business model depends on, among others, securing raw materials, passing on cost increases to customers, securing customer contracts and having access to the latest and most efficient technology. KME strategy is based on three pillars: (i) ongoing efficiency and optimization, (ii) improving product margin, (iii) expanding customer base and innovation. It continues to strengthen industry position and grow business by focusing on offering innovative, competitive products to a broader, more diverse range of customers and continuing to improve operational efficiencies.

Why is copper so important? Being one of the most widely used working metals, it is needed now to manufacture essential medical equipment, to keep vehicles on the road, to keep electrical power flowing, or to ensure adequate food supply. Basically, normal life would come to a sudden stop without copper. Copper is essential to the economy, is used for generation and distribution of electricity to homes, shops and industry, is needed in the transport system, keeps people safe and its properties has been recognized by health industry as well, which relies upon copper for its medical fight against COVID-19. Copper has versatile and attractive properties. Last but not least, copper is an extremely recyclable material.

KME Italy

Within the KME Group, the research focuses on KME Italy S.p.A., based in Fornaci di Barga, a little village in Tuscany. Founded in 2007¹, KME Italy has, over the past years, significantly grown, with a marked flexibility in production which, combined with an ongoing innovation, has led the company to cover 482.000 square meters, with a production of 58.160 tons, and a production capacity of around 95.000 tons/year.

The reason why we chose KME Italy as our case lies in the fact that we believe it is and exemplar and, at least, particular convenient case with regards to circular economy. As said, copper is infinitely recyclable, essential for circular economy development. To cite some, the reasons why copper and recycle go hands in hands are:

- it can be recycled without losing its properties;
- recycle allows a reuse of materials, avoiding the use of additional natural resources;
- recycle means a lower energy consumption and CO2 emissions' reduction, responsible for global warming;
- in Europe, 50% of used copper comes from recycle;
- by 2035, copper recycle may reach 70-75%.

According to KME, copper will be the protagonist of the transition towards a circular economy (Rapporto di Sostenibilità, 2018). Even if the past of KME Italy has been very successful, being a leading manufacturer of copper and copper alloy products, its future appears brilliant as well. The company has, in fact, decided to turn the circular economy into an asset. Aware of how circular economy and technological disruption are transforming the global workplace, KME challenged itself to become a circular economy role model. Driven by a responsibility to communicate its concrete commitment to the environment, the embracement of circular economy aims to, first of all, demonstrate the company's responsibility and sustainable-oriented behavior, which can make a positive impact on its operational territory by redeveloping the disused premises in the industrial park of Fornaci di Barga and, secondly, to step into a leadership role among companies that have already opted for circular schemes. What KME has in mind is not only a traditional transition to circular economy, but a comprehensive circular project which consider economic, environmental and social elements. The company main goal is to become the first circular economy pole, where circularity is the common thread.

Its circular commitment is visible in several projects, whose core strategic implementation lies in partnerships and CE business models. First of all, the creation of the Circular Academy. It is a comprehensive management program for executives, developed in conjunction with Sant'Anna School of Advanced Studies, and first launched in 2018, which allowed the company to become a leading player on the subject of the circular economy. Secondly, an industrial symbiosis project, which implies the recycle of industrial scrap (paper) for launching an energy self-generation project.

¹ The story of KME Italy goes back to the end of the Nineteenth Century (1886), when the SMI, Società Metallurgica Italiana has been founded. In the first years of the Twentieth Century, the Tuscan history begins. While in 1902 SMI is acquired by Luigi Orlando, in 1915 the factory is settled in Fornaci di Barga. At the end of the century, in 1997, SMI, which becomes the financial holding company of the group, is renamed into Europa Metalli. However, is in 2007 that KME Group unify its subsidiaries under a common brand: Europa Metalli becomes KME Italy.

Partnerships with institutions and the companies of the Tuscan papermaking district are fundamental for its success. Some companies have already demonstrated their interest to collaborate, such as Ds Smith Paper Italia, Lucart, Industria Cartaria Pieretti, Cartiere Modesto Cardella, Smurfit Kappa Ania, Mondialcarta, Cartonificio Sandreschi, Bartoli. Another project on the list consists of the realization of an innovative plant for Ecopallet and Ecodadi production for the traditional pallet construction ("Ecoblock"), exclusively powered by woody waste. In order to collect the principal input (woody waste), partnerships' implementation with several actors who belong to different categories, such as waste disposal private companies, districts which produce woody waste, etc., is mandatory. They will be the actors of an extended and cross-sectorial supply chain.

An additional project consists of the implementation, in EM Moulds², of a new production process of the crystallizers for steel continuous casting based on remanufacturing and on the implementation of the Product-Service-System (PSS) business model in a crystallizers sales' segment. With the lens of the Reverse Logistic, the project aims to make end-of-life products' procurement sustainable. In other words, the project consists of a Take-back-System for the recovery and remanufacturing of crystallizers. The entire activity is based on the establishment of a new relationship with the client, both in contractual/commercial and technical/collaborative terms.

KME Italy has already developed a SWOT analysis for each project, to emphasize its strategic feasibility. [Additional technical data and SWOT analysis will be provided].

KME wants to improve its positioning, demonstrating the value and feasibility of its circular project. For this reason, it is also active in a redevelopment of an industrial park, to make it accessible to companies in the area who share working environments and services. The transition to circularity will have, according to KME, economic, environmental and social value. However, it won't be possible without the collaboration of key stakeholders. The company is aware that, in order to create a circular economy pole, partnerships are fundamentals. And the creation of the Academy, in collaboration with university, is only the first example.

Data collection and data analysis

Having a single exemplar case study, the data will be collected through a deep immersion in the case. According to best practice for conducting an in-depth qualitative research, we will collect multiple kinds of data. Among these, interviews, observation, archival surveys, feeds, online documentation, reports, and so on. We expect interviews will be the main source of data. Given the nature of the research, which focus on how stakeholders' partnerships drive value creation, delivery and capture in its all facets, according to the circular economy principles, we aim to interview as many stakeholders as possible.

Findings. *Once all the data will be collected, the findings will be analyzed.*

At this time, 3 interviews with the CEO of KME Italy, Claudio Pinassi, were collected. Based on the words of Mr. Pinassi, we believe we are moving in the right direction. We here report a couple of quotes:

"I think that, flexibility but, especially, the awareness that what save us is the value creation. All our activities, from the worker to the organization, from the entrepreneur to the investors, if they are finalized, in a healthy way, to the creation of value, they tend to improve the whole system. This value must then surely be distributed, shared, handled and so on. [...] Thus, I believe that not only in companies like our, but in general, activities should be oriented to the protection of people well-being. This is due."

"As managers, we realized that circular economy topics risked to be approached as the current moda and not as a fundamental element to harmonize the sustainable development with the development. [...] At a local level, we believe that the introduction of an academic activity, with the support of a such an important university (Sant'Anna) may have a powerful and positive repercussion on the whole ordinary economy of the territory."

In addition to these interviews, extra documentation, both available online and provided by the company, such as the sustainability report or a non-technical synthesis for industrial symbiosis implementation, has already been collected.

A couple of supplementary interviews have also been carried out, which represent the paths we wish to follow in order to select new stakeholders for collecting data. The first interview refers to a company located in Bergamo and specialized in cables production, interested in understanding if and to what extend cables could be recycled. A meeting with the two respective ADs has been organized and a partnership opportunity is born. Details will be further provided. Following this logic, we aim to interview new potential partners.

On the other side, the social perspective is fundamental in our analysis, where the key topics are impact and acceptability. The development of a CE pole implies a social impact - direct and indirect - on the territory (e.g. employment, supply chain), which, if not well-managed, may seriously spoil people acceptability. In this logic, key actors are represented by institutions and social actors, representative of the territory. With regards to institutions, Tuscany Region in primis, whose orientation has been explored. To acquire acceptability information instead, the opinion of labor unions has already collected. We also expect to carry out a social network analysis to get the

² EM Moulds S.p.A. is one the worldwide leader in copper crystallizers' technology for steel continuous casting. The company is based in Fornaci di Barga, Tuscany.

impressions and feelings of people (e.g. resistance). Finally, the social dimension of the project has also been analyzed under the Covi-19 pandemic point of view, with evidence of the numerous measures taken to guarantee health and safety of workers.

In relation to the pandemic, Mr. Pinassi also referred to agreements with research centers for studying antibacterial and virucidal properties of copper. Partnerships are key for innovation purposes.

- Data will be provided and the section refined

Research limits. The current study is not without limitations, which are typical of qualitative studies. However, these limitations also provide avenues for future research. First of all, the research is carried out with a single exploratory case study, which poses the question about generalizability to other contexts. For instance, we expect that considerations on CE, driven by the analysis of KME, which mainly deals with copper, may be applied to other industries, where the circularity of used materials may be improved.

- This section will be refined once the research is developed/findings analyzed

Practical implications and originality of the study. These sections will be developed once the research analysis is carried out.

However, with this study, the authors aim to contribute to circular economy current debate, proposing stakeholders' partnerships not only as an essential strategy for CE implementation, but also as an indispensable element for a more comprehensive understanding of circular economy - economic, environmental and social -, able to create, deliver and generate value. We thus also aim to provide additional evidence of the social dimension of circular economy, explaining how all the three dimensions of CE strategically come into play in an integrated manner.

In order to help the company in its accountability logic, we further expect the analysis enables us to appoint indicators which allow an integrated measurement of CE.

Theoretical contributions will be later outlined.

Stakeholders are considered as imperative sources of innovation that drives managers to explore how organizations can transform (Jakhar et al., 2018). They need to engage with different internal and external stakeholders to initiate innovative strategy to extract value (Waston et al., 2018). Aware of it, we hope the research is able to provide managers a different perspective of the role, and importance, of partnerships, showing how stakeholders' partnerships allow development and enable an efficient flow of material and resources (Ranta et al., 2018). In a changing world, managers are looking for legitimacy in society and they should be able to develop abilities to create value and pursue a multi-dimensional notion of performance, embracing a larger kind of impact. On these premises, additional practical implications for managers will be further developed.

- These sections will be refined

Key words: circular economy; partnerships; stakeholders; value creation.

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Sustainability practices in the footwear and clothing sector: an analysis on italian companies

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Objectives. Clothing and textile production is one of the most polluting industries in the world. Its sustainability challenge involves multiple, interrelated, and complex issues, therefore these sectors now play a key role in the global public

discourse on climate change, chemical society, water shortage, and human rights (Boström and Micheletti, 2016). Such attitude provides incentives for sustainability information-driven behavior and calls for a clear focus on circularity in the production process, throughout the entire organization (Thorisdottir and Johannsdottir, 2019).

The sustainability agenda has developed over the last four decades and emphasized collaboration between governments and organizations, to implement strategies with a focus on sustainability related-issues, and for the first time, through the Paris agreement, governments are responsible for such collaboration to mitigate climate change and pollution (Foley et al., 2017). For companies, dealing with these issues could lead to a growth opportunity, cost reduction and even develop a competitive advantage over competitors (Goworek et al., 2020)

The aim of this study is to develop an exploratory analysis (Malhotra and Grover, 1998), in order to analyze if and to what extent sustainability practices are adopted by Italian companies in the textile and footwear sector, what are the main reasons that prompted companies to adopt these practices and what are the main advantages deriving from their implementation and the main barriers encountered.

Methodology. An empirical research was carried out through a questionnaire proposed to 2446 Italian companies belonging to the clothing and footwear sector. Of these, 178 companies responded, that is 7.9% of the total. The survey started on February 24, 2020 and answers were accepted until April 21, 2020. The administration of the survey took place by e-mail, following a two-step administration. In fact, two weeks after the first submission of the questionnaire, the same was sent again with a reminder.

The questionnaire was divided in two sections. The first part was aimed at collecting information for profiling the company: geographical location, reference market, dimension, turnover and the type of products offered. The second part was aimed at identifying the approach of the company as regards the issue of corporate sustainability, asking questions about the practices adopted, the reasons that led the company to implement them, the benefits encountered and the obstacles faced in the transition to a more sustainable model. The second part also investigated the possession of business process and product certifications as a tool for implementing sustainability practices in the company. Finally, the survey focused on the way in which the company financed the development of sustainable practices, and if it needed an external support for implementing the change in its business practices in the best way possible.

Descriptive analysis was performed to define the sample profile of respondent companies. A five-point Likert scale was used to evaluate companies' main sustainable practices adopted, the motivations that pushed them to adopt these practices, and the main advantages and disadvantages encountered. To test the reliability of the items, Cronbach's alpha values were computed, taking into account only values greater than 0.60 as suggested by Nunnally and Bernstein (1994). Non-response bias was assessed by verifying that early and late respondents were not significantly different (Armstrong and Overton, 1977). A set of tests compared respondents who answered to the questionnaire during the first administration and those who answered when the survey was submitted for the second time. All possible t-test comparisons between the means of the two groups showed insignificant differences ($p < 0.1$ level).

Findings. The companies participating in the survey are mainly based in the North (55.1%) and Center of Italy (41.6%), while only 3.4% of them come from the South and the islands. This is in line with the presence in northern and central regions of industrial districts specialized in the textile and footwear industries, and with the levels of industrialization of the country (Daniele et al., 2018; Negri et al., 2020).

Considering the reference markets, the results show that most companies have Italy (41.6%) or international markets (40.4%) as main reference markets, while only 18.0% have Italy and Europe (18.0%) as main market in which they operate. As for companies' main business, 46.1% of them produce cloths, 28.1% footwear and 25.8% produce

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components for the clothing or footwear industry. As regards the size of the participating companies, these are mainly small enterprises (corresponding to 50.6% of the total) with staff between 10 and 49 employees, and micro enterprises (30.3%) with fewer than 9 employees. In a lower percentage are medium-sized enterprises (10.1%), between 50 and 250 employees, and large enterprises (9.0%), with more than 250 employees. Finally, considering their turnover as of 31 December 2019, most of the companies achieve an annual turnover of less than 2 million euros (49.4% of the total) and between 2 and 10 million euros (28.1%). In lower percentages, there are those that earn between 11 and 50 million euros (11.2%) and more than 50 (11.2%).

The study highlights different reasons that pushed companies to adopt sustainability practices. The principal actions carried out are aimed at reducing pollution (mean 3.70, st. dev. 1.25) or the waste of production processes (mean 3.82, st. dev. 1.09), considering the possibility of reusing defective products and production waste when recoverable (mean 3.35, st. dev. 1.46), and reuse materials used in the packaging phase, where surpluses occur (mean 3.33, st. dev. 1.33), that is a simple but useful practice considering that in this phase a considerable amount of plastic is used. Less relevant resulted those reasons for which it is necessary to make investments, such as the use of secondary raw materials or waste materials acquired from others (mean 2.56, st. dev. 1.36) and the use of renewable resources (mean 2.93, st. dev. 1.48).

Data show that companies have a great interest in adopting sustainability practices to make their own contribution to reducing environmental impacts (mean 4.25, st. dev. 0.99), demonstrating their willingness to minimize the externalities on the environment. This is a widely shared motivation, and it can be seen by the low standard deviation obtained from responses. In addition, other relevant motivations in developing a sustainable strategy concern the inclination of companies to develop a corporate social responsibility strategy (mean 3.87, st. dev. 1.09) and the growing interest of their customers in this area (mean 3.83, st. dev. 1.17).

The benefits that, on average, are most recognized by companies that switch to a more sustainable business model are the improvement of corporate reputation (mean 3.57, st. dev. 1.20) and the improvement of staff motivation (mean 3.35, st. dev. 1.22). On the other hand, the repositioning of the brand is less perceived as relevant (mean 2.92, st. dev. 1.24), although it is an element that can be linked to the improvement of corporate reputation.

Among the obstacles and difficulties encountered, the high implementation costs (mean 3.80, st. dev. 0.94) and the price of sustainable products / services (mean 3.79, st. dev. 0.99) emerge, indicating how the transaction to a circular model may require huge investments, which would make this change achievable above all for those companies that can count on a relevant turnover and adequate financial resources. These items also have low standard deviation values, demonstrating that these are obstacles perceived but by the majority of companies. On the other hand, the lack of internal technical skills is considered a less important problem (mean 2.76, st. dev. 1.24), since those who are inclined to change are willing to train and update their staff or to hire new ones, and they recognize it as a necessary sacrifice for achieving long-term improvements.

Deciding to operate in a sustainable way can allow a company to obtain awards that can be attributed to it by a certification body. As regards the certification of processes, 30.3% of the companies contacted stated that they obtained at least one recognition of this type. The most adopted certifications in this area are ISO 9001, for Quality Management Systems – in 17.98% of cases – and ISO 14001, for Environmental Management Systems, obtained by 11.24% of companies. Minor success has the certification REACH (Registration, Evaluation, Authorization, and Restriction of Chemical substances), which defines the prohibition of the use and marketing of substances that contain toxic compounds or that are considered risky for textile processing (Bergkamp and Herbatschek, 2014). This certification has been obtained by 7.87% of companies.

Although process certifications are important in order to guarantee to customers production processes that meet the required criteria, the adoption rate of these certifications is low. This is influenced by the size of companies. Indeed, only 11.1% of companies with less than 10 employees have obtained this type of certification (specifically ISO 9001). The opposite situation occurs with large companies, where 67.5% of them can show off at least one recognition, and this is in line with previous studies which pointed out the dimension as a critical factor in standard adoption (Bravi et al., 2020).

In the case of product certifications, 29.2% of the companies claimed to have obtained at least one of them. The most awarded certification is OEKO-TEX 100, present in 11.24% of cases. This certification regulates the presence of harmful chemicals in all stages of processing of textiles, from raw materials to finished products (Tartaglione et al., 2012). On the other hand, 7.87% of the companies adopted the Global Organic Textile Standards (GOTS), recognized as the best standard in the world for fabrics made with organic fibers. Another certification is the Global Recycle Standards (GRS) obtained by 6.74% of companies, a recognition focused on recycling for the development of a sustainable production and consumption model. Moreover, results show that the Ecolabel certification is hardly ever adopted by companies in the sector, since only in 1.12% of cases, despite its importance, it has been obtained. The importance of this certification is given by the fact that it promotes the circular economy by encouraging to minimize the production of CO₂ during the processing phase. It also encourages companies to make products that are long lasting and easy to recycle.

For product certifications described above, it is interesting to note how most of the companies that adopt these certifications are those with a high share of exports on their turnover. Considering the total number of participants in the questionnaire, in fact, only 16.2% of the companies that rely mainly on the Italian market have at least one product certification. Of the companies that have the European market as their reference market, 43.7% of them have obtained two certifications. A similar situation is recorded for those which rely mainly on international markets, even if the

percentage is slightly lower, at 38.9%. These data show how companies dealing with international market, decide to increase their competitiveness through the recognition of certifications that can induce potential buyers to choose them as suppliers. This can be interpreted as an element that counterbalances the distrust that frequently occur in market relationships at the international level.

For the company transition to a business model oriented towards the adoption of new sustainability practices, the skills of company's employees are not always sufficient to support such a conversion. The results of the survey show that in 46.1% of cases the companies trained their employees or hired new staff. In detail, of the respondents, 79.5% updated the technical skills of their employees, 47.7% updated the administrative and managerial skills of their employees, and one in five companies acquired new technical positions (20.5%) while 11.4% acquired new administrative and managerial staff. Regarding decisions of this type, the capital available to a company heavily influences the approach it has. In fact, considering all the companies with a turnover of less than 2 million euros that deemed it necessary for their employees to gain new skills, only one decided to acquire a new technical position. The remaining companies opted for the training and updating of already employees, probably for budget reasons. A similar situation occurs for companies with a turnover between 2 and 10 million euros, which only in 16% of cases decided to hire new staff, and in 48% of cases they opted for the updating of employee skills. The data of these companies is in contrast with that of companies with a turnover of more than 50 million euros. These, in 40% of cases, have decided to acquire new professional figures who could cope with the gaps to be filled following the change, probably with the aim of having new ready and experienced figures available, having the economic possibility to do so. This does not deprive them of the possibility of further training their employees, a situation which occurs in 30% of cases and which can be carried out in parallel with the recruitment of new staff.

Finally, the research shows how, considering only the companies that have implemented new sustainability practices, therefore having to incur costs to make this change, 86.7% of them have relied solely on the equity of the company, without counting on financing or loans. Among the companies that, on the other hand, did not have the possibility to sustain huge expenses with their own strength, 12% decided to resort to bank loans, while 4.8% to regional financing and 2.4% to European funding. On the other hand, nobody has used crowdfunding to make improvements in the green field.

Originality of the study. At the theoretical level, the originality of the research lies in the adoption of a wider perspective of analysis compared to previous studies, considering a wide sample of Italian companies in the footwear and clothing sector. What is more, while extant literature investigated in depth the main sustainability challenges (Boström and Micheletti, 2016; Książak 2016; Koszewska 2018; Goworek et al., 2020) and the integration of sustainability practices in business models (Thorisdottir and Johannsdottir, 2019; Hileman et al. 2020), this study besides investigating which are the main practices adopted in the sector, examines the main reasons for the adoption of these practices, also based on the different size and market orientation of the companies in the sample, considering the role of product and process certification in this context and investigating the main obstacles encountered in the adoption of the same. The results of the study can be useful to both scholars and practitioners to better understand the current attention that companies in the sector give to sustainability, and to allow the development of solutions that can optimize the balance between investment and returns in terms of internal human resources involved, reputation among stakeholders and market competitiveness (Boström and Micheletti, 2016)

Practical implications. Notwithstanding the growing attention emerged towards sustainability practices and related issues, the results of this study show that Italian companies in the footwear and clothing sector are implementing some basic sustainability practices, but there is still wide room for improvement. In the companies analyzed, sustainability strategies derive from both internal motivations, that is company's attention towards the environment, and external motivations, linked to the interest of consumers and stakeholders in these issues. In some cases the use of sustainability practices becomes a necessary competitive factor in order to survive in the market, particularly in foreign markets.

The study shows that companies that adopt a decisive change from the past have the possibility to obtain many advantages compared to those that decide not to innovate. Improving the reputation of the company by applying green business practices allows to reposition the brand in the minds of customers, thus giving the company the opportunity to breach those buyers who are particularly sensitive to environmental issues, and which prefer to pay more for products that are particularly attentive to the environment.

Of course, businesses encounter many barriers, such as high implementation costs, and often inadequate or not always clear legislations. In order to overcome these problems, the role of Governments and other public institutions is fundamental, with regard to both economic support to businesses, providing financial incentives and measures to support companies' efforts, and also as institutions that can clarify the right strategy to be followed and the benefits linked to it (Smedby and Quitzau, 2016).

As concerning the implementation of international standards and certifications, companies go beyond economic limitations linked to their adoption, trying to think of them as a medium-long term investment that will lead to organizational and environmental improvements, as well as to brand image and competitiveness improvements (Santos et al., 2016; Murmura et al., 2018; Bravi et al., 2020). In any case, a change in companies' culture and in top management involvement seems to be critical, along with training activities towards employees to ensure that these tools can be more widely (Bravi et al., 2019).

Research limits. *This study is subject to some limitations, which can provide suggestions for future research perspectives. The main limit concerns the adoption of a quantitative methodology, which although it is important to have a widespread overview of the sustainability strategies applied within the sector, it does not allow to analyze in depth the reasons behind the strategies undertaken by businesses. Therefore, for future research it would be relevant to broaden this study with the help of a qualitative multiple case-study analysis, considering companies of different size and also with different reference markets, to investigate in depth the sustainability strategies adopted and the reasons behind them. Furthermore, it would be relevant for future research to compare the Italian situation with that of the main European countries, trying to compare sustainability investments and performance of Italian companies with European ones and bringing out the best practices adopted.*

Key words: *sustainability practices; circular economy; clothing industry; corporate social responsibility, environmental impact.*

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The evolution of food recovery: a bibliometric analysis

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Objectives. *In recent decades, concepts which address the resolution or reduction of food poverty and insecurity, such as food recovery and food sharing, have received increasing attention from governments, non-profit organizations, and academics. Even greater interest has been prompted by the advent of the Covid-19 pandemic, which has exacerbated the problems of those people already living in poverty, and at the same time impoverished many more people who lost their jobs. Before the pandemic, more than 820 million people were classified as chronically food insecure, of whom 135 million were classified at crisis level or even worse (United Nations, 2020). As mentioned above, the unexpected arrival of a global pandemic has only made pre-existing food poverty problems worse. In fact, it has been estimated that in 2020 around 49 million people have become poor due to the Covid-19 pandemic (Pereira et al., 2020).*

Food banks are defined as organizations which operate to provide food to charities and other organizations which support food insecure people (Gentilini, 2013). The advent of digitalization has enabled the rise of digital platforms designed to manage food redistribution as a means of waste prevention. Examples are the food sharing digital platforms, like Olio and Too Good to Go, which were created to recover food surpluses in order to redistribute them to those people who need it most (Michelini et al., 2018).

The digital platforms developed to tackle food poverty have been defined as “circularity brokers” because these organizations operate as market intermediaries, exploiting digitalization to offer new approaches to waste recovery models (Ciulli et al. 2019).

The concept of food banks has been implemented in various countries for several years, beginning with the United States in the late 1960s, and it has become increasingly important in Europe in recent decades (Downing et al., 2014).

The world’s first food bank, “St. Mary’s Food Bank”, was founded in 1967 by John van Hengel in Arizona, USA. 9 years later, in 1976, van Hengel established “Feeding America”, a non-profit organization, consisting of a network of more than 200 food banks throughout the United States.

The first food banks arrived in Europe almost 20 years after the foundation of the St. Mary’s Food Bank. The first European food bank was founded in 1984 in France. Belgium soon followed this example and the first food bank in Brussels was established the same year. Two years later, in 1986, the “European Federation of Food Banks” (FEBA) was launched: between 1988 and 1992 FEBA supported the development of food banks in Spain, Italy and Ireland, followed by Portugal, Poland, Greece and Luxembourg from 1994 to 2001. The massive spread of food banks all over the world led to the need for a world organization: in 2006 the Global FoodBanking Network was founded, an international non-profit organization which operates in more than 40 countries.

Another key reason for the growing importance of the food recovery phenomenon is related to environmental issues. In fact, more than 930 million tonnes of food sold in 2019 ended up in waste bins, according to new UN research carried out to support global efforts to halve food waste by 2030. (United Nations, 2021). The Food Waste Index Report 2021 reveals that between food wasted in homes, restaurants and shops, 17 per cent of all food is just thrown away. Some food is also wasted where it is produced and in supply chains, indicating that overall a third of food is never eaten. Food waste also has a serious impact on the environment: estimates suggest that 8-10% of global greenhouse gas emissions are associated with food that is not consumed (Unep, 2021). In the light of these data, it is undeniable that several changes must be made, in order to reduce this global waste. In fact, in the 2030 agenda of the United Nation we find sustainable development as goal number 12; “Ensure sustainable consumption and production patterns”. This objective is designed specifically to change our production and consumption models, adopting a waste prevention and waste management approach, with the aim of reducing the figures referred to above by the year 2030, and hopefully reaching zero at some point in the future (United Nations, 2015).

Food banks are frequently cited as a solution to food insecurity. The European Food Banks Federation (FEBA) measured the impact of the network in 2019 by reference to a few key indicators. The report states that food insecurity has been alleviated by distributing 768,000 tons of food products, the equivalent to 4.2 million meals each day, to 9.5 million of the most deprived people, through 45,283 charitable organizations. Although a clear majority of papers and research support the positive role of food banks, we can find in the literature papers evidencing some weak points and critical issues related to these organizations. One example is Van der Horst with his article “The dark side of food banks”. As the title suggests, he adopts a critical approach, highlighting several weaknesses in these institutions. Another example is the article “Efficiency Analysis of the European Food Banks: Some Managerial Results”, a 2017 study that gathered data on 96 food banks, which are part of the FEBA organization, from 13 different European countries. The efficiency of every food bank was assessed, with several negative results. In fact, many inefficiencies in this sector have come to light, yet at the same time a few of them perform much more efficiently than the average. The

research argues that this data should not discourage those who operate in this field, because it means that there is substantial room for improvement, and that these organizations can have an improved impact on society, perhaps taking their cue from the best practices and strategies of the most successful food banks (González-Torre et al., 2017).

As we have seen, the role of food banks has been widely discussed by academics, with several different points of view, which has resolved into one major area of debate: whether, despite the noble purpose of these organizations, they are unable to solve or even reduce the problem of poverty, as some scholars have argued. Another example is provided by De Schutter who, in 2019, sent a letter entitled “Food banks are no solution to poverty”, to *The Guardian* newspaper. The letter was also signed by 58 other academics.

The growing international debate has led some academics to conduct studies on these topics using a literature review approach (Bazerghi et al., 2016; Middleton et al., 2018). The research conducted by Bazerghi reviewed 35 publications of which 14 examined food security status, 13 analysed the nutritional quality of food provided by food banks, and 24 considered the needs of their clients when using food banks. The study found that food banks are undoubtedly able to provide help to food insecure people, but the authors highlighted a weak point: food banks are often unable to provide nutrient-dense food in sufficient amounts, especially in the case of fresh products like dairy, fruit and vegetables (Bazerghi et al., 2016). Middleton’s research, presented as an international scoping review, analysed twenty qualitative studies focused on the user perception of food banks. Yet again the results have highlighted some critical issues: in particular, limited food choice, poor quality, shame, stigma and embarrassment associated with food bank use. The paper concludes by stating that experience of food banks is still mostly negative for users, and that there is still almost no evidence that food banks are the best solution to food insecurity problems. (Middleton et al., 2018)

Another study which analysed critical issues related to food banks was conducted in 2014 (Van der Horst et al.). As with the research mentioned previously, the approach was consumer oriented; in-depth interviews were carried out with 17 beneficiaries of the service provided by a food bank in the Netherlands, in order to explore the issues and the emotional responses of food bank clients. There were several negative findings: almost every interviewee claimed that they had often received spoiled food, and a few even became ill after eating some products. Emotional response was another significant problem: the majority of recipients, even regular beneficiaries, felt ashamed to receive aid from food banks. Some claimed that the first visit was the most humiliating, a factor that should not be underestimated because it could discourage potential new users.

In light of the urgent need to tackle the growing problem of food poverty, this paper aims to explore measures that are intended to reduce food insecurity, reviewing the literature produced in recent decades on subjects such as food sharing, food banks and all the other models that may help food insecure people. The research is designed to contribute to the extant literature by answering the following research question “How has the concept of food recovery evolved over the years?”. The literature review is carried out with a bibliometric analysis approach, with the intention of identifying commonalities and trends in the extant literature related to food recovery models and all the other organizations created to solve or reduce food related problems, such as food banks and food sharing platforms.

Methodology. A bibliometric analysis is the most suitable method for pursuing the research aims; it is a quantitative tool widely used to understand the development of a specific field by analysing citations, co-citations, geographical distribution and keyword frequency, in order to draw useful conclusions (Liao et al. 2018). The Scopus database was used to collate the papers, since it is a reliable academic database and provides all the information to carry out a bibliometric analysis. The initial search query was based on the keywords “food banks”, “food sharing”, “food recovery”, “social supermarket” and “food rescue”, to include the main topics associated with food poverty. The keywords were selected based on both a review of the literature and brainstorming with academic experts in the field.

The bibliographic research was conducted according to the following criteria:

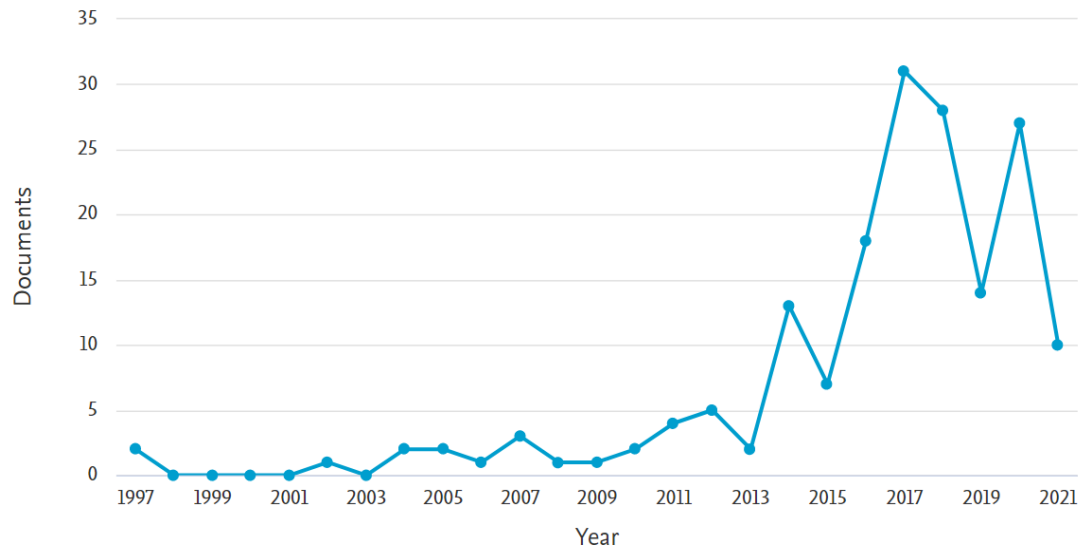
- only articles in the “Business, management and accounting” and “Economics, econometrics and finance” subject areas;
- only articles written in English, in order to be able to compare different works;
- only articles published since 1997;
- only papers and reviews published in academic journals

In conclusion, 176 articles were used as the final dataset. Scopus and VOSviewer were adopted to perform the analysis.

Findings. As a first step in the analysis, the Scopus charts were analysed to obtain an initial overview of the data set.

Fig. 1. Documents by year

Documents by year



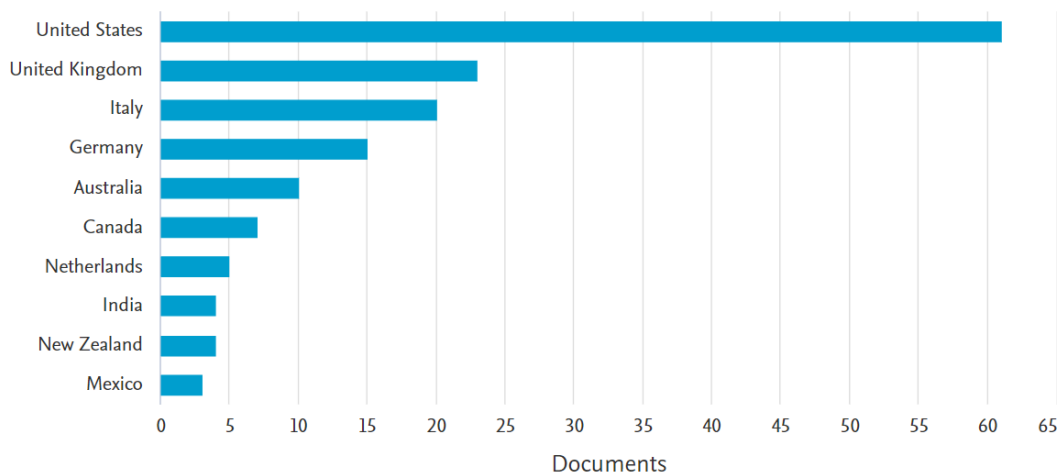
Source: Scopus - Analyze search results

As seen in figure 1, academic production related to food recovery topics has increased significantly since the year 2015. The 2021 drop is obviously attributable to the fact that the analysis is limited to the articles published in the first three months of the year.

Fig. 2. Documents by country or territory.

Documents by country or territory

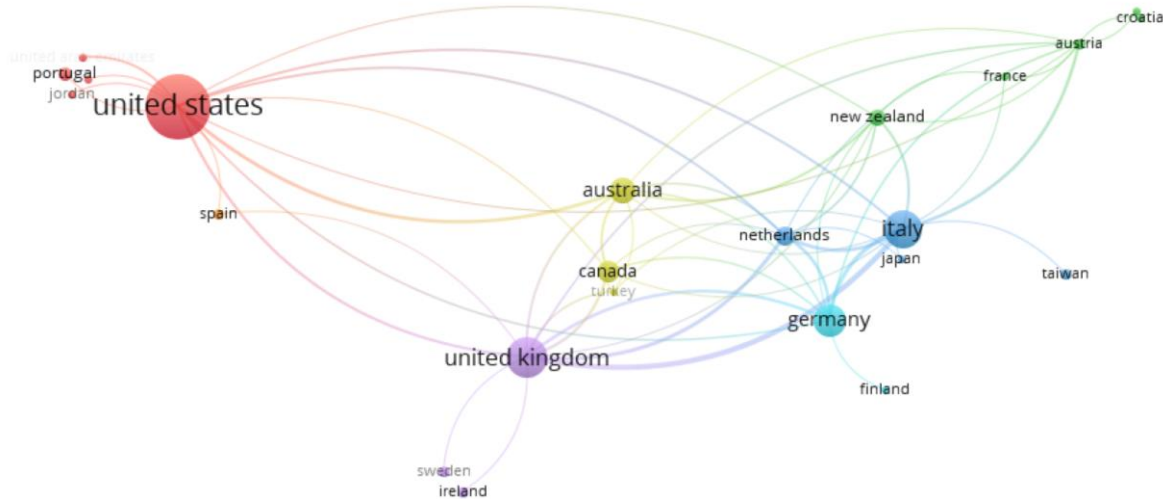
Compare the document counts for up to 15 countries/territories.



Source: Scopus - Analyze search results

Figure 2 shows us the most productive countries in terms of academic production related to food recovery topics: the United States, United Kingdom and Italy.

Fig. 3. Country cooperation



Source: Author's elaboration (VOSviewer)

Figure 3 provides a graphical representation of the citations from the different countries of origin involved in production. The size of the circles confirms that the most productive countries, the United States, United Kingdom, Italy and Germany have a good degree of cooperation.

Tab. 1: Most cited articles

Document	Authors	Year	Source	Cited by
The value of food waste: An exploratory study on retailing	Cicatiello C., Franco S., Pancino B., Blasi E.	2016	Journal of Retailing and Consumer Services 30, pp. 96-104	90
The “dark side” of food banks? Exploring emotional responses of food bank receivers in the Netherlands	van der Horst H., Pascucci S., Bol W.	2014	British Food Journal 116(9), pp. 1506-1520	87
Food banks, welfare, and food insecurity in Canada	Tarasuk V., Dachner N., Loopstra R.	2014	British Food Journal 116(9), pp. 1405-1417	68
Rising use of “food aid” in the United Kingdom	Lambie-Mumford H., Dowler E.	2014	British Food Journal 116(9), pp. 1418-1425	62
Review: Consumption-stage food waste reduction interventions - What works and how to design better interventions	Reynolds C., Goucher L., Quested T., (...), Svenfelt Å., Jackson P.	2019	Food Policy 83, pp. 7-27	59
Surplus food recovery and donation in Italy: The upstream process	Garrone P., Melacini M., Perego A.	2014	British Food Journal 116(9), pp. 1460-1477	59
Understanding Food Sharing Models to Tackle Sustainability Challenges	Michelini L., Principato L., Iasevoli G.	2018	Ecological Economics 145, pp. 205-217	58
Hungry for change: The food banking industry in Australia	Booth S., Whelan J.	2014	British Food Journal 116(9), pp. 1392-1404	55
UK print media coverage of the food bank phenomenon: From food welfare to food charity?	Wells R., Caraher M.	2014	British Food Journal 116(9), pp. 1426-1445	52
What explains hadza food sharing?	Marlowe F.W.	2004	Research in Economic Anthropology 23, pp. 69-88	51

Source: Author's elaboration

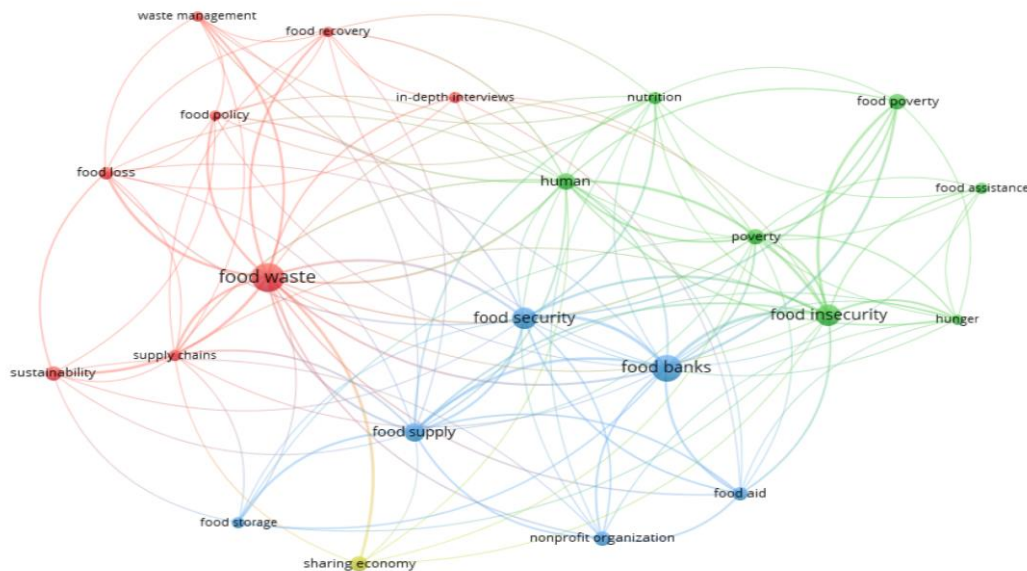
Table 1 displays the most cited articles from the dataset. The most frequently cited are the British Food Journal with 20 articles, followed by Food Policy, which occurs 10 times, and then Voluntas, 9 times. Several of the most cited articles come from the British Food Journal.

Moving to presentation and comment on the outputs of the bibliometric analysis, the dataset, extracted from Scopus, was analysed using VOSviewer, a software that converts the bibliographic information into charts. This enables a bibliometric analysis from various points of view.

Keyword co-occurrence analysis is an important tool for understanding, and at the same time representing graphically, the most common food recovery topics in academic research.

In figure 4 each circle stands for a keyword from the dataset. If terms tend to co-occur frequently, they are located close to each other in the chart; if they are further apart they are co-occurring less. The size of the circles depends on the number of papers that were found to contain that particular keyword. The co-occurrence analysis is based on 898 keywords, but the number was narrowed down by setting the minimum number of occurrences of a keyword at 5, meaning that the co-occurrence of keywords below 5 is excluded. After excluding certain terms that were considered irrelevant, the final output consisted of 22 main keywords.

Fig. 4: Keyword co-occurrence analysis.



Source: Author's elaboration (VOSviewer)

The keywords were divided into four main clusters, represented by the colours. As we see from the size of the circles, the main keywords are “food waste”, “food banks”, “food security” and “food insecurity”.

We see some presence of the keyword “in-depth interviews”, which is due to the fact that these kind of interviews have been often utilized in order to describe food recovery organizations, such as food banks and social supermarkets qualitatively, or to analyse the phenomenon from a consumer-oriented perspective, for example Van Der Horst’s research on the food banks in the Netherlands.

A significant number of keywords refer to the topics “food security” and “food insecurity”.

Food security was originally defined by Maxwell as “secure access at all times to sufficient food for a healthy life” (1992). A few years later, in 1996, in order to clarify the issue, the World Food Summit intervened stating that “food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life. Food insecurity exists when people do not have adequate physical, social or economic access to food as defined above. Food security therefore covers availability, access, utilization and stability issues, and - because of its focus on the attributes of individuals - also embraces their energy, protein and nutrient needs for life, activity, pregnancy, growth and long-term capabilities.” (Committee On World Food Security, 2012)

In the chart we see four main clusters:

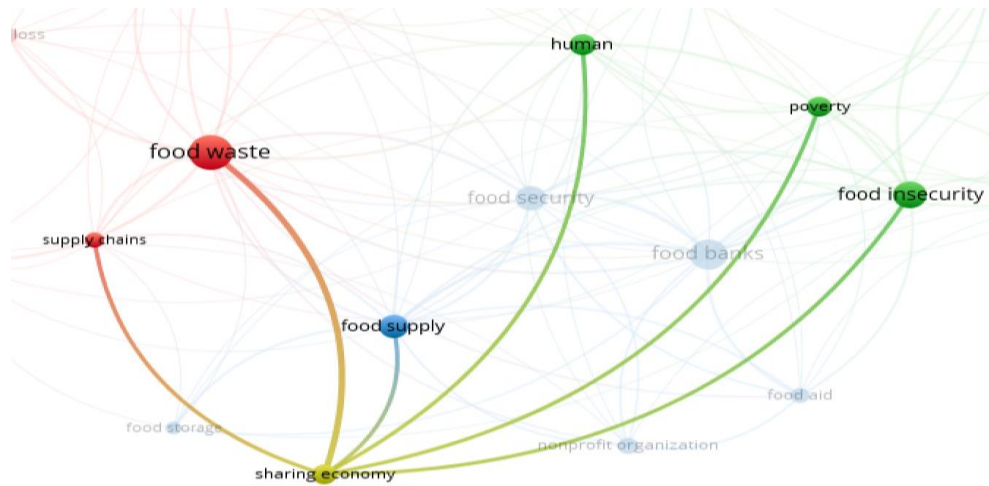
-The colour red represents the food waste cluster, strongly related to the topic of sustainability, which in fact is a keyword. We also find “waste management” as a main keyword; in fact, it is a sustainability strategy designed to tackle food waste problems;

-We then find the food banks cluster, marked in blue and strongly linked with the “food security”, “food supply” and “food aid” topics, which may be considered as a sub-cluster consisting of keywords related to the ultimate purpose of these organizations, that is providing food security and food aid by assuring food supply to those who need it most. We then find “nonprofit organizations”, a very significant keyword because it fully describes the kind of organizations that food banks are. Finally, the keyword “food storage”, although the most distant from the main keyword of this cluster, meaning that the term is the one with the least co-occurrence, is still very important because it is strongly related to the type of work performed by food banks;

-The third cluster, marked in green, reveals a social perspective, compared with the others. In fact, in this cluster, we find keywords such as “food insecurity”, “poverty” and “food assistance”;

-The yellow cluster which consists of the “sharing economy” stand-alone keyword. As we see from figure 5, this keyword is configured as a connection point between the other three clusters.

Fig. 5: Keyword co-occurrence analysis - Focus on “sharing economy”

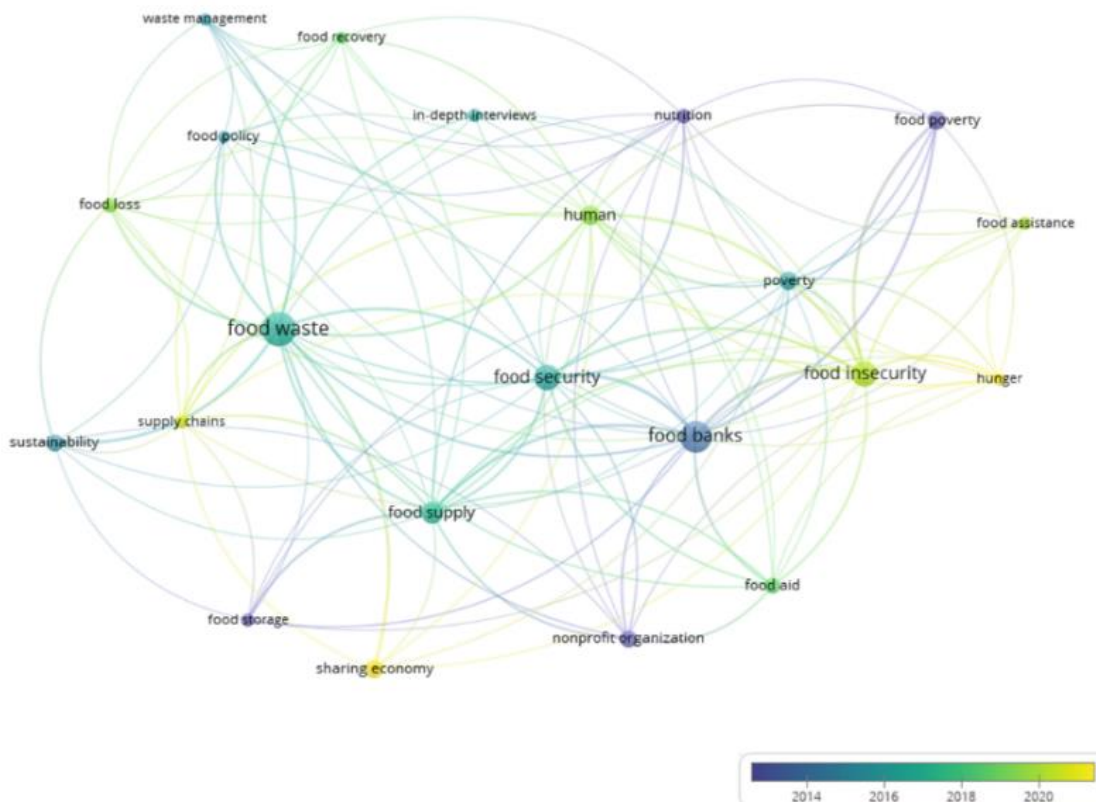


Source: Author's elaboration (VOSviewer)

The last chart in figure 6 represents the same keywords in figure 4, but on a chronological basis, which allows analysis of the evolution of the keyword co-occurrence throughout the years. The purple represents the older keywords, and the keyword displayed is more recent as it approaches yellow.

As we can see from its blue colour, “Food banks” is an older keyword, as it is a topic that has been debated for many years. As the years have passed, the focus has shifted to food waste, food security and overall to the topic of sustainability, as we see from the light blue colour. In the last few years, we observe a transition to the topic of the sharing economy.

Fig. 6: Keyword co-occurrence analysis on a time perspective.



Source: Author's elaboration (VOSviewer)

In conclusion, we see that the main topics in food sharing literature are food waste related, because clearly it is one of the main issues to be addressed to tackle food poverty. We then have the food security/insecurity theme, and food banks, which are the most common organizations operating to reduce world hunger.

We can observe that the food recovery theme has seen a certain evolution throughout the years. It has moved from older topics, such as food banks, which were discussed soon after the establishment of the first organizations of this kind, to new topics such as food security/insecurity and the sharing economy.

The introductory literature analysis shows that food banks and food poverty are central and strongly linked themes in the food recovery context. The results of this research confirm the highlighted trends in the literature. As we saw in the first section with the literature reviews of Bazerghi (2016) and Middleton (2018), and with the research conducted by Van der Horst, there are several critical issues and weaknesses regarding food banks, but it is still worthwhile to explore these models, particularly in the light of the advent of Covid-19, which has worsened all food security problems.

Research limits. The limitations mainly arise from the methodology adopted to conduct the research, which has purely descriptive purposes. Another limitation is due to the fact that Scopus has been used as the only database to carry out the analysis. Further, the keyword selection and exclusion was performed in a discretionary way.

Practical implications. Despite the descriptive approach and the literature review methodology, the present research may provide practitioners operating in food sharing or sustainability fields with useful data, and may offer factual information regarding the complexity of and the possible implications of the phenomenon, as well as operational aspects such as the impact on the supply chain.

Originality of the study. To date, there have been literature reviews on these topics, but this research is designed as the first to add a bibliometric approach methodology to complement the traditional literature review approach.

Key words: food sharing, food recovery, food banks, sharing economy, sustainability, waste management

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*The full dataset used to perform the research is available if requested to the author

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- <https://news.un.org/en/story/2021/03/1086402>
- <https://www.unep.org/resources/report/unep-food-waste-index-report-2021>
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Hang in there, biosimilars!

Leveraging awareness for a sustainable European market

MARIA CRISTINA CINICI* ALBA MARINO* DANIELA BAGLIERI*

Objectives. A growing number of biological medicines, including biosimilars, have been developed and approved over the past decade, improving patients' lives worldwide (Vulto et al., 2020). Although these have effectively treated numerous diseases, patients' adoption has been limited (IQVIA, 2020). Innovation scholars and industry experts have taken into account regulatory frameworks, economic incentives, clinical evidence, and patient preferences to question the biosimilars market's sustainability in the long-term (Niosi, 2017; Simoens & Cheung, 2020). They have revealed, for instance, that some biosimilar policies and purchasing mechanisms restrict the participation of competitor products in specific markets, apply increasing price pressure or push physicians to switch patient product use (de Mora, 2019). Yet, little is known about how stakeholders' awareness shapes biosimilar adoption.

Broadly speaking, how innovations get adopted has been a key concern of strategy scholars for decades (Erat & Kavadias, 2006; Hannan & McDowell, 1984; Majumdar & Venkataraman, 1998). There are numerous theories on the adoption and diffusion of technological innovations that are inherently deterministic and linear (e.g., Rogers, 1995). Scholars have recently begun to explore the role of socio-cognitive factors in the stakeholders' framing and understanding of innovative technologies (Grodal, Gotsopoulos, & Suarez, 2015; Kennedy & Fiss, 2013). This literature has highlighted an apparent paradox that every new technology needs to overcome. On the one hand, innovative technologies have to differentiate themselves from existing technological offerings; in other words, they must convey ideas of novelty, creativity, and originality. However, at the same time, innovations have to appear familiar enough to stakeholders and invoke existing understandings to minimize the natural reluctance to something new and unproven (Bingham & Kahl, 2013).

Particularly, scholars have begun to stress the socio-cognitive dimension of technology emergence and adoption, such as "category labels" (e.g.; Grodal et al., 2015), "field frames" (e.g.; Lounsbury, 2001); "schemas" (e.g.; Bingham & Kahl, 2013), and "technological frames" (e.g.; Kaplan & Tripsas, 2008). More specifically, category labels help make sense of new products by allowing stakeholders to develop semantic links to other categories and their associated labels, relating a label to other objects or concepts and borrowing from the label components' inherited properties. Scholars argue that through this process, the "deepening" of meaning occurs and some labels eventually become established categories (Bingham & Kahl, 2013). When stakeholders observe a category label, they construct the group of objects that they perceive as being associated with it (Yamauchi & Markman, 1998). Grodal et al (2015) demonstrate that the more familiar a category level, the higher the adoption, but only up to a point. Additionally, the more creative a category label is, the higher the adoption, but also up to a point. Similarly, the field frame concept has been proposed to analyze how industries are shaped by social structures of meanings and resources that underpin and stabilize practices and social organization. Lounsbury et al. (2003) infer that movements can help transform extant socio-economic rules and enable new kinds of industry development by engaging in efforts that lead to the de-institutionalization of field frames. Finally, while schemas serve to make the unfamiliar familiar but conceptually distinct (Bingham and Kahl, 2013), interactions of producers, users and institutions shape the development of collective frames around the meaning of new technologies (Kaplan and Tripsas, 2008). Technological frames shape how actors categorize a technology relative to other technologies and which performance criteria they use to evaluate the technology. Said differently, a technological frame guides the actor's interpretation of what a technology is and whether it does anything useful.

As far as healthcare is concerned, innovative medicines often remain expensive and inaccessible to many (Vidal et al, 2020). In this industry, disruptive innovations struggle to be adopted, and most technological enablers have failed to bring about lower costs, higher quality, and greater accessibility (Christensen et al., 2000). The emergence of a new market or technology catches off-guard incumbent firms and institutions that are locked into existing markets or technologies. These transitions are challenging to manage and require a thorough reconfiguration of capabilities and cognitive effort (Raffaelli, Glynn, & Tushman, 2019). In the healthcare sector, these challenges become more acute as

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the emergence of new technology or market often tests existing practices. In some cases, it requires drastic modifications of regulatory frameworks. In some instances, this can lead to industrial change, a shake-up of the health delivery systems and opportunities for new industry players to arise (Christensen, Bohmer, & Kenagy, 2000).

As a rapid acceleration in the biosimilars market may result in numerous challenges, we argue that, on the one side, the above described socio-cognitive factors can explain why innovations, such as biosimilars, struggle to be adopted. Specifically, transitions to biosimilars involve a complex interaction between a diverse set of stakeholders associated with innovation systems and healthcare systems (Niosi, 2017). On the other side, to support a thoughtful deployment of biosimilars, we propose that considering stakeholder understanding and acceptance of biosimilar medicines can improve their diffusion and acceptance. In so doing, we build on the premise that the biosimilar market must remain sustainable for all stakeholders to benefit from the opportunities.

Methodology. *Setting: The biosimilars market.* Biosimilars market represents a suitable context from which borrow the evidence for our theoretical framework. Biosimilars are defined as biological medicinal products similar to an already authorized original biological medicinal product (reference product) in terms of quality characteristics, biological activity, safety and efficacy. In general, they are less expensive therapeutic alternatives to their reference products since their cost is approximately 20-30 % less than the reference product are (Ingrasciotta et al., 2015; Karaca-Mandic et al., 2019). Several reasons may explain why we chose this setting. First, biosimilars represent a market space that emerged recently and therefore data can be retrieved on the entire set of digitalization processes created by the key stakeholders. The first biosimilar drug has been available on the European market since 2007, where reimbursement coverage, treatment rates, and regulatory pathways created a thriving market. By 2020, the European Medicines Agency (EMA) had approved about 60 biosimilars, and were successfully commercialized in Australia, Canada, Japan, and South Korea. In the United States, the biosimilars commercialization began since 2015, and currently more than 25 biosimilars have been approved to date. According to Chen, Lehmann, and da Silva (2019), the current biosimilars market could more than double to \$15 billion by the early 2020s, with an estimated \$5 billion to \$8 billion coming from emerging markets.

Second, many labels and definitions were introduced during a relatively short period of time, which highlights the socio-cognitive dynamics we are interested in. In particular, labeling has drawn a lot of interests because, for accurate pharmaco-vigilance, it is essential that physicians, pharmacists and patients are able to distinguish easily between biopharmaceutical products. According to EMA (European Medicines Agency), it is crucial requesting comprehensive labeling of biosimilars so that physicians and pharmacists can make informed decisions.

Third, due to the extensive and far-reaching technological possibilities offered by the rapid pace of recombinant technologies change, there has been much uncertainty, particularly in the early years. It has been not easy for clinicians and other stakeholders to make sense of the different categorical labels they were presented with. Four, biosimilars market shows huge opportunities in emerging markets both in terms of affordability and inclusiveness of health care systems. Consequently, multinational companies that seek growth are exploring opportunities in emerging markets, where biologic-treatment rates are still low.

Data. In order to address our research question, we analyze the relationship between the adoption of biosimilar drugs and the diffusion of awareness on biosimilars topic in the European biologic drugs market. At this stage of our analysis, we collected data on the biopharmaceutical market from multiple sources. First, we combined information on the biologic drugs approved by EMA between 1995 and 2020 and their specifics reported in the European public assessment reports (EPARs).¹ From this source, we created a variable to identify the number of new biosimilar medicines approved each year and whether a firm enters the biologic drugs market for the first time. Second, we gathered data on the competitive landscape of the biosimilar market in Europe through specialized reports leveraging information from MIDAS™ Database. In detail, we collected data on the biosimilar market share of eight groups of medicinal products computed as the number of biosimilar treatment days as a share of the total market volume and the price evolution measured as the price per Treatment Day (TD) versus the year before biosimilar entry (Troein et al., 2020).²

Furthermore, we constructed an empirical proxy for the diffusion of awareness about biosimilars leveraging two different sources for specialized audiences and the general public, respectively. On the one hand, we extrapolated extensive archival data such as international media articles, analyst reports, books and specialized magazines from the Nexis Uni® database to explore the European trends in awareness about biosimilars in public opinion. On the other side, we analyzed the research performance evolution in the biosimilars topic by measuring the impact of scientific publications in terms of views by SciVal. We compute these variables as the lagged log-transformations of the sum of the yearly observations.

At the end of the data collection process, we presented an unbalanced panel of 801 observations covering 23 European countries' markets and eight biological drug classes between 2014 and 2019 (see Table 1 for descriptive statistics and correlations). Thus, we explore the correlation between adoption and awareness by means of linear

¹ Among others, we retained and integrated information on reference products, biosimilars, international non-proprietary names, marketing authorization dates, therapeutic areas and authorization holders. Source: <http://www.ema.europa.eu>. Accessed on February 17, 2021.

² We identified the following clusters: human growth hormone (HGH), epoetin (EPO), granulocyte-colony stimulating factor (GCSF), anti-tumour necrosis factor (ANTI-TNF), follitropin alfa (Fertility), insulins (INS), monoclonal antibody antineoplastic agents (Oncology).

regression with clustered standard errors at the country level. Specifically, we estimate equations of the following form:

$$\text{MarketShare}_{dkt} = f(\text{Awareness}_{t-1}; \Delta\text{Price}_{dkt}; \text{ProductEntry}_{dt}; \text{NewCompetitor}_t)$$

where MarketShare_{dkt} represents the market share for drug class d , in country k , in year t , Awareness_{t-1} proxies the diffusion of knowledge on biosimilars in either the general public or scientific community; ΔPrice_{dkt} is the change in the price per Treatment Day (TD) in country k between t and year before biosimilar entry; ProductEntry_{dt} is the number of biosimilar products belonging to the drug class d and approved by EMA in year t , while NewCompetitor_t is a dummy variable equal to one if a company receives for the first time an EMA approval for medicine in one of the focal drugs classes, thus entering the biologic drug market in year t . In these specifications, we also control for a country-drug class effect λ_{dc} and $\eta_{t\text{time}}$ trend or year fixed effects.³

Tab. 1: Descriptive statistics and correlation matrix

		Obs.	Mean	Std. Dev.	Min.	Max.	1	2	3	4	5	
1	Market share	824	0.19	0.23	0.00	0.99	1					
2	Awareness (public)	886	8.30	0.51	7.43	8.93	0.160***	1				
3	Awareness (academic)	886	11.04	0.32	10.46	11.42	0.155***	0.998***	1			
4	Price evolution	801	1.18	34.29	-1.00	963.82	-0.0348	0.0504	0.0475	1		
5	Approved biosimilars	886	7.85	6.35	0.00	16.00	0.00806	0.477***	0.510***	-0.0195	1	
6	New competitors	886	0.85	0.36	0.00	1.00	0.0787**	0.518***	0.497***	0.0168	0.524***	1

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Findings. Table 2 reports preliminary results suggesting a significant positive association between adopting biosimilars in the European market and the diffusion of awareness on biosimilars among public opinion and the scientific community. Our results are robust to enlargement in the biosimilars market regarding new products and entrants and price dynamics connected to the evolving competitive landscape. We observe that the entry of more competitors and the increase in the potential market size for biosimilars correlates with higher biosimilar quotas in the total market. Furthermore, the increase in the average unit cost of biologic products since the first commercialization of a biosimilar medicine correlates with a shrinking in biosimilars market share. Also, our findings take into consideration country-level heterogeneity, thus accounting for fragmented national regulatory frameworks.

Tab. 2: Preliminary findings

	Biosimilars in general				Biologic drug classes			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Awareness (academic)	0.2229*** (0.0220)		0.2148*** (0.0220)		0.1172*** (0.0103)		0.0810*** (0.0071)	
Awareness (public)		0.1410*** (0.0139)		0.1359*** (0.0139)		0.2063*** (0.0215)		0.2014*** (0.0214)
Price evolution	-0.0002*** (0.0000)	-0.0002*** (0.0000)	-0.0002*** (0.0000)	-0.0002*** (0.0000)	-0.0001*** (0.0000)	-0.0001*** (0.0000)	-0.0001*** (0.0000)	-0.0001*** (0.0000)
Approved biosimilars	-0.0040*** (0.0007)	-0.0033*** (0.0007)	-0.0039*** (0.0007)	-0.0033*** (0.0007)	-0.0237*** (0.0041)	-0.0123*** (0.0046)	-0.0213*** (0.0040)	-0.0103*** (0.0045)
New competitors	0.0437*** (0.0073)	0.0337*** (0.0069)	0.0420*** (0.0068)	0.0324*** (0.0064)	0.0757*** (0.0159)	0.0942*** (0.0168)	0.0724*** (0.0195)	0.0705*** (0.0188)
Constant	-2.2793*** (0.2418)	-0.9842*** (0.1142)	-2.2087*** (0.2375)	-0.9616*** (0.1103)	-0.3797*** (0.0502)	-2.1049*** (0.2402)	-0.2236*** (0.0314)	-2.0635*** (0.2348)
Fixed effects	Yes	Yes			Yes	Yes		
Random effects			Yes	Yes			Yes	Yes
Within-R2	0.3281	0.3300	0.3280	0.3299	0.3846	0.2860	0.3817	0.2845
Between-R2	0.0598	0.0584	0.0588	0.0573	0.0047	0.0190	0.0056	0.0218
Overall R2	0.0316	0.0321	0.0318	0.0323	0.0079	0.0086	0.0077	0.0107
Observations	801	801	801	801	796	668	796	668
Clusters	23	23	23	23	23	23	23	23

Clustered standard errors at the country level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

The emergence of biosimilars shows that this market has the potential to alter generic industry leadership and create pathways to sustainable treatments for critical illness. However, our analysis reveals that healthcare stakeholders' acceptance of biosimilars might still represent an impending challenge. Our analysis thus pinpoints the

³ We first present preliminary findings with a linear fixed effect estimator, but results also appear robust to a random effect specification.

following three aspects. First, the emergence of biosimilars is highly significant from analyzing new developments in market segmentation for strategic management. Second, because healthcare systems are undergoing significant changes, and with the emergence of new market segments and entry of new players, there are grounds for thinking that we are going to experience signs of the beginning of a long game where changes in market, regulation, science and production technology are likely to impact on future patterns of partnership and production capabilities (Kale & Niosi, 2017). The picture is that of an industry in transition in which the stakeholders associated with innovation systems and health systems in advanced and emerging countries are likely to evolve further. These interactions between firms, social organizations and institutions may have critical role in the industry transformation and future sustainability of the healthcare system. Third, and relatedly, the spread of biosimilars raises fundamental questions about the ability of healthcare systems to support a sustainable medicines market. In this regard, greater effort in dissemination and communication strategies is required on the scientific concept of biosimilar medicines, the EMA approval process and therapeutic indications. Such knowledge should be communicated to all stakeholders in a context and language that provides complete understanding and support. The confidence and trust of physicians, healthcare providers, patients and other stakeholders should be reinforced by supporting and incentivizing appropriate early use. In this context, collecting and publishing Real World Evidence (RWE) and promoting access to unbiased information on biosimilar medicines is essential.

Research limits. The next steps in this research will involve collecting more granular data on the diffusion of information on biosimilar drugs targeting the general public at the country level and exploring the role of specific national regulatory frameworks. Also, we encourage further research to disentangle the behavioral/cognitive implications of such mechanisms and provide managers, stakeholders, and policymakers with novel insights on the evolution of the biosimilar market dynamics for a more informed rational decision making.

Practical implications. The emerging biosimilar market is at a tipping point. While a consistent number of biopharmaceutical patents is expected to expire in the next few years, the biosimilars market must remain sustainable for all stakeholders to benefit from such opportunities. Patients needing less expensive but increasingly complex drugs in these markets can obtain significant public health benefits if delivery systems are able to integrate biosimilar production and use safely. Domestic producers are poised to obtain significant economic benefits from meeting the demand for lower-cost production. Multinational pharmaceutical firms are also exploring strategies to enter the biosimilars market in rapidly developing emerging markets while also considering these forms for developed countries. However, technological and regulatory obstacles to biosimilars development are not the only challenges for market growth. We argue that the successful adoption of biosimilar medicines also depends on socio-cognitive dimensions. At the managerial level, decision criteria should look at cost in the context of additional factors provision and balance procurement decisions to reflect factors other than price. Also, without general support from the clinical community, any tender decision may be difficult or impossible to uphold. In general, promoting awareness in the public opinion and healthcare community should be a fundamental goal for policymakers for long-term economic and social sustainability. Finally, an increasing market share of biosimilars would secure reasonable returns on investment for firms deciding to enter the European biosimilar market, thus stimulating continued attractiveness of R&D investment in new medicines development.

Originality of the study. This study deepens our understanding of the socio-cognitive dimension of market emergence. Drawing from the literature on innovation adoption and diffusion, we present some preliminary findings on the potentials of socio-cognitive dynamics that take place as a market develops. Our study provides an early-stage contribution to the process through which categories are created, adopted and fall out of use. Biosimilars markets differ in regulatory pathways, patient perceptions, social acceptance, pricing, sustainability, and competitive landscapes - factors that biosimilar companies should consider when deciding which markets to enter. Social acceptance is also relevant for patient recruitment, which is one of the greatest challenges to the timely execution of clinical trials involving biosimilars.

Key words: biosimilars; awareness; technology adoption; European biosimilar market

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Five shades of plastic in food: which circular packaging are Italian consumers more sensitive to

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Abstract

Objectives. *Through a comparative study, we aim to explore what type of circular plastic packaging consumers are more prone to purchase, what are the antecedent drivers to that choice, what attributes count the most.*

Methodology. *This study consists of a between-subject experiment; three different bottles of orange juice made out of diverse types of plastics are tested in five settings (recyclable, recycled, recycled + certification, compostable, compostable + certification) on a representative Italian population sample (1236 individuals), collected through stratified random sampling. Data were processed through a Bayesian Generalized Linear Modeling.*

Findings. *All the different circular packaging options are valuable alternatives. Regardless of whether certifications are provided or not, consumers' purchasing intention is mainly affected by packaging attractiveness, perceived quality, and eco-friendliness, as well as further sustainable consumption drivers.*

Research limits. *Sustainability consumption drivers deserve are shown to do not work out for circular consumption, so a different set of drivers can be tested. Additionally, research is set in Italy, so replicating this experiment elsewhere can enhance validity of the results.*

Practical implications. *Circular plastic packaging (i.e., recyclable, recycled, and compostable) can enhance FMCG companies' competitive advantages by attracting circular economy consumers' complicity and increasing their loyalty. Yet increasing the appealing of circular packaging, as well as eco-labels' comprehensibility urgently need to be addresses.*

Originality of the study. *This sheds light on consumers' maturity, namely level of understanding, appreciation and rewarding about circular plastic packaging in the FMCG market.*

Keywords: *circular economy; recyclable plastics; recycled plastics; bioplastics; consumer attitude; bayesian inference.*

1. Introduction

Since its invention, plastic has enhanced our lives in several ways: safety, hygiene, comfort, wellbeing, and remarkably food preservation. Nonetheless, leakage of plastics into the environment (as a landfill or marine litter) is a serious problem, with severe consequences for the globe that urgently need to be addressed (MacArthur, 2017; Moazzem et al., 2021).

Dilkes-Hoffman et al. (2019b) conducted an extensive analysis about the general attitude towards regular plastics among Australians, and findings demonstrated that the general public views plastic as a serious problem for the environment; additionally, albeit they associated plastics with food packaging and convenience concepts, overall, they coupled its use to negative thoughts. Moreover, the same authors conducted an analogous investigation yet about the bioplastics: findings highlighted that Australians' knowledge about bioplastics is low, albeit its perception is positive (Dilkes-Hoffman et al., 2019a).

In this context, the global concern often has transformed into practical actions regarding food plastic packaging (Rhein and Schmid, 2020). However, although the topic's relevance, an extensive analysis of the literature has revealed that plastics in the food sector have shown several peculiarities such as to deserve an ad-hoc study (Tseng et al., 2018).

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At first, it is difficult to isolate and measure the impact of environmental features on willingness to buy food products, since strictly related considerations concerning the healthiness of the product itself can contrast with the ecological ones (Testa et al., 2019; Wandel and Bugge, 1997).

Second, concerning food items, a circular packaging is an environmental feature which does not relate to the sustainability of the content itself, and hence that can lead to misleading interpretations (Peters-Teixeira and Badrie, 2005; Williams and Wikström, 2011). Hence, further considerations concerning the packaging's quality and storage capacity must be tackled in addition to evaluations regarding its environmental sustainability (Han et al., 2018). Specifically, innovative food packaging systems, namely bioplastics, edible or biodegradable materials, can overcome that trade-off for consumers (Han et al., 2018; Mølgaard, 1995; Wang et al., 2019).

Third, concerning the different types of materials used for packaging, very few studies have compared traditional plastic with bioplastic (Stoica et al., 2020).

Forth, petroleum-based polymers and compostable polymers stand as, respectively, technical and biological nutrients from a circular economy standpoint (MacArthur, 2013; McDonough and Braungart, 2010; Moreno et al., 2016). Specifically, "the biological nutrients are non-toxic and can be simply composted. Technical nutrients-polymers, alloys, and other man-made materials are designed to be used again with minimal energy and the highest quality retention (MacArthur, 2013, p. 22). As a consequence, compostable plastics can eventually end up in the biosphere (biological cycle) without any problem for the ecosystem; by contrast, recyclable and recycled plastics are, respectively, the beginning and the end of a manufacturing loop (technical cycle), which need the consumers' support and cooperation to be "closed" and accomplished (McDonough and Braungart, 2010).

Lastly, the circular economy -like other sustainability aspects- is significantly growing within the fast-moving consumer goods (FMCG) industry (Reuters Sustainable Business, 2016; Testa et al., 2020a). Circular features of packaging (i.e., types of plastics) are intrinsic aspects that consumers cannot catch at first glance (Polonsky et al., 2012). To fill this information gap (Akerlof, 1970), companies are used to show off third-party certifications, i.e., eco-labels (Harring et al., 2019) in order to disclose their environmental commitment in a more pervasive way (Darnall et al., 2018; Taufique et al., 2017; Testa et al., 2020b). The same approach is also taking place for circular packaging (Testa et al., 2020a) although it is at an embryonic stage.

Considering the reason mentioned above, our study aims to investigate consumers' commitment to the circular economy from the FMCG industry standpoint. To reach that goal, a 1×5 between-subject experiment was proposed by using a representative sample of Italian consumers. Italy stands out as one of the highest-ranked nation in Europe about plastic concern (European Commission, 2017). Starting from a commercial panel of participants, people were grouped through stratified random sampling based on several socio-demographical parameters, which allowed us to obtain almost identical samples for each treatment.

Our research contributes to the current debate in several ways. Primary, it sheds light on the consumers' confusion over different types of plastics and their inability to discern diverse environmental consequences of different circular packaging. Then, this tests whether third-party certifications on circular packaging material influence consumers' purchasing decisions (recycled plastic and bioplastic are compared with their twins with a certification). Furthermore, this research highlights which are the most relevant circular packaging attributes in consumers' perception and, finally, what are the drivers through which people convey their concern over plastics and the environment into buying decisions.

2. Background and hypotheses development

The throwaway economic model we are accustomed to has created, over the years, several drawbacks that we are now facing. Among them, plastic pollution is one of its most dangerous one. An unprecedented detailed study published in 2019 estimated that, almost 6.2 million tons of macroplastics (mainly, municipal solid waste) and approximately 3.0 million tons of microplastics (e.g., scrape of tire rubbers and scratch of road markings) entered in the environment in 2015 only (Ryberg et al., 2019). Depending on the size of its shreds, plastic polymers can seep into the subsoil, poisoning the ground and the groundwater, can leakage into the sea, undermining marine life, and can even disperse in the air by toxic fumes (Dilkes-Hoffman et al., 2019b; Gall and Thompson, 2015; Zhao et al., 2015).

Academic and gray literature are unanimous: peoples' concern about plastic pollution has never been more serious than today (Dilkes-Hoffman et al., 2019b; Rhein and Schmid, 2020; Rivers et al., 2017; Zhao et al., 2015). Therefore, consumers are willing to contribute with their consumption and recycling habits for the sake of their health and the ecosystem (Hage & Söderholm, 2008). By the way, consumers are only the end of the traditional take-make-dispose economic paradigm (Khor and Udin, 2012). Such a serious question needs to be addressed jointly by all the economic system players, or by a completely new economic paradigm.

2.1. The plastics issue at the core of the circular economy

Albeit the general attitude towards bioplastics is very positive (perceived less harmful for the environment and easier to recycle), people's knowledge about it still little, so far (Dilkes-Hoffman et al., 2019a). Also, experiments conducted in UK demonstrated that people's willingness to switch from traditional plastic to their compostable alternatives is not taken for granted. Further research on circular strategies demonstrated, instead, that the vast

majority of respondents assert that recycled packaging is the preferred option (Grönman et al., 2013; Magnier et al., 2019). However, the gap between attitude and behavior is still present (Boesen et al., 2019).

Such contradictory results suggested us to propose that consumers, when exposed to different types of plastic packaging (i.e., recyclable, recycled, or bio-plastics packaging), are not yet mature to distinguish different circular economy. This is the first aspect that our experiment aims to address.

H₁: consumers are still not enough accustomed to the circular economy to express a different purchase intention depending on the type of plastic (recyclable, recycled, and compostable) that constitutes the circular packaging

Furthermore, while product developers are willing to switch to bioplastics, unfortunately, “they often refrain from bringing products to the mass market due to uncertainties of customer receptiveness and fears of greenwashing allegations” (Brockhaus et al., 2016, p. 84). This brings the influence of ecolabel and third-party certifications to the center of the debate (Darnall, Ji, & Vázquez-Brust, 2018; Monnot et al., 2015). To overcome these worries about greenwashing, often companies disclose environmental information through an independent third-party certifier: this helps companies make the information they provide more accurate, reliable, and trusted, and hence to bypass consumers’ skepticism on circular claims (Braga Junior et al., 2019; Brockhaus et al., 2016; Testa et al., 2020b).

Overall, academic literature agrees about the positive correlation between delivering a product’s environmental benefits information and the willingness to pay for it. In addition, this relation was proved for products made of recycled plastic (Magnier et al., 2019), as well as for bioplastic products (Confente et al., 2020). This kind of effect has been distinguished for diverse sorts of labels and certifications, ranging from Rainforest Alliance and Fair Trade (Van Loo et al., 2015; Vecchio and Annunziata, 2015) to EU Ecolabel (Testa et al., 2015; Thøgersen, 2000).

Given the progressive approach of FMCG companies to the circular economy (Reuters Sustainable Business, 2016), a comparative study (with vs. without third-party certification) on circular packaging to measure how much they effect purchase intention, is still missing in the academic literature. Hence, we formulated the second hypothesis:

H₂: consumers demonstrate a different purchase intention towards a plastic (circular) packaging with (vs. without) third-party certifications

2.2. Circular packaging attributes

Besides the circular features of packaging and the presence or absence of supportive information, there are several attribute that can play a crucial role in pushing consumer purchasing decision, such as: packaging attractiveness and its perceived quality and eco-friendliness

Packaging attractiveness. Through a long series of experiments conducted by many authors, it was shown that one of the most influential aspects of purchasing food products was its packaging (Clement, 2007; Simmonds and Spence, 2017; Stoll et al., 2008). As demonstrated by several laboratory experiments in neuromarketing, as human beings, we are attracted by appealing design; that leads us during purchasing decisions (Clement, 2007; Stoll et al., 2008).

Specifically, our brain processes positive visual stimuli differently from those negatives (Stoll et al., 2008). Stoll et al. (2018) investigated this process regarding marketing inputs (i.e., packaging design); through a functional magnetic resonance imaging study, they demonstrated that attractive packaging (compared with unattractive) triggers specific areas of the brain related to the processing of attention. These results “might explain why attractive packages gain more attention at the point-of-sale and this, in turn, positively influences turnovers of fast-moving consumer goods” [FMCG] (Stoll et al., 2008, p. 342). Moreover, Clement (2007) employed the eye-tracking technology to experiment on visual attention and buying behavior; the findings revealed that packaging influences the decision process in several steps, from search strategy to purchase decision.

By the way, while dealing with transparent packaging, further considerations have to be tackled. Indeed, other authors investigated the role and impact of transparent elements vs. images of food on packaging design; they found that food images can promote consumption and perceived quality only if the product is visually appealing (Simmonds and Spence, 2017). Therefore, in line with those academic indication, we formulated the following hypothesis:

H₃: when packaging is perceived attractive, consumers’ purchase intention increases

Perceived quality and eco-friendliness of packaging material. Moreover, packaging has further aspects that deserve to be taken into account (Shent et al., 1999). In this regard, Lindh et al. (2016b) conducted an extensive literature review, asserting that packaging covers a broad range of purposes; protection, handling and communication. More interestingly, they unearthed several adjacent effects, like lessening risk for human hazards, decreasing product leftover, improving managing and transport efficiency, and waste management, just to name a few (Lindh et al., 2016a; Subramanian, 2000). Among them, quality and eco-friendliness stood out (Lindh et al., 2016b; Nguyen et al., 2020). Other experimental approaches came to a similar conclusion, showing that altering packaging materials effects not only its eco-friendliness appearance, but also the perceived taste and quality of the product contained (Steenis et al., 2018; Steenis et al., 2017).

In the same vein, Magnier et al. (2016) conducted two experiments to test the effect of packaging sustainability on consumer’s perceived quality of food products (chocolate bars and coffee); interestingly, they demonstrated that a

sustainable packaging induces a higher perceived naturalness of the inside and eventually justify the superior quality perceived. Hence, we formulated the following hypotheses.

H₄: when packaging material is perceived of high quality, consumers' purchase intention increases.

H₅: when the perceived eco-friendliness of packaging is high, consumers' purchasing intention increases.

2.3. Various drivers of circular consumption

As we introduced, sustainable consumption in food sector involves many aspects, sometimes in conflict with each other (Han et al., 2018; Stoica et al., 2020; Williams & Wikström, 2011). In this section we introduce further parameters that are supposed to interplay in that sense.

Concern over plastic pollution. The global issue of plastic waste and litter is dramatically affecting people's pathway of consumption (Dilkes-Hoffman et al., 2019a, 2019b; European Commission, 2017). It is demonstrated that the growing awareness of the plastics utilization's drawback on the environment, as well as on health, is pushing people worldwide to adapt their consumption habits according to the needs of the planet; however, results in actual change are still controverse (Heidbreder et al., 2019). Herbes et al, (2018) conducted an extensive cross-cultural comparative research about the attitude on consumers about sustainable and eco-friendly packaging, demonstrating that final disposal of plastic items and the consequent plastic pollution is the main reason to switch to a biobased packaging. Thus, the following hypothesis:

H₆: consumers' concern over plastic pollution make them prone to select sustainable forms of packaging

Plastic-related behavior. It was proved that people with a keen environmentalist identity are more disposed to perform a broader range of actions in favor of the environment (Van der Werff, Steg, & Keizer, 2014). Specifically, Van der Werff and Keizers (2014) demonstrated that past behaviors, jointly with bio-spheric values, shape the environmental self-identity which, accordingly, predicts the final product choice. According to the rising sensitivity on plastic pollution (European Commission, 2017), and the spread of recycling behaviors (Cheung et al., 2018), we suggest that plastic-related actions are the status-quo, nowadays; hence, they are reliable predictors of sustainable packaging purchasing intention. Therefore:

H₇: consumers' plastic-related behavior, make them prone to select sustainable forms of packaging

Concern about global environmental issues. Several studies were conducted about the impact of environmental concern on sustainable consumption (Magnier et al., 2016; Matthes et al., 2014; Testa et al., 2020a). All of them are almost unanimous in demonstrating that the relationship is remarkable. More importantly, given the acclaimed importance of concern about environmental issues, we cannot exclude it from the list of drivers of sustainable consumption (Mainieri et al., 1997). Moreover, within this plethora of research evidences, a comparative experiment about recycled, recyclable and biobased packaging (with and without certifications) of edible product is still rare (Roy et al., 2009; van Dam, 1996). Therefore, here is the following hypothesis:

H₈: consumers' concern about global environmental issues, make them prone to select sustainable forms of packaging

Openness to change. Human values are playing a significant role under the lens of sustainable consumption (Schwartz, 2012). According to González-Rodríguez et al. (2019), customers' values, such as openness to change, exert an important influence on ecological consumption. Further evidences were provided by Caracciolo et al. (2016), that conducted an investigation about consumption of meat. Results showed that people's consumption preferences are particularly linked to personal values. Specifically, people with enhanced "openness to change" value were more in favor of ethical meat production approach. Those results suggested us to test the effect of individual value, i.e. openness to change, a set of sustainable plastic packaging for food.

H₉: consumers' openness to change, make them prone to select sustainable forms of packaging

Belief about greenwashing. The growing demand for eco-friendly products and the consequent support of regulatory agencies pushed companies to greening their business model more and more (WBCSD, 2018). For the reasons above, however, companies' green commitment risks to be perceived as artificial and interested and trigger consumers' skepticism. This consumer skepticism is known in literature as Greenwashing (Braga Junior et al., 2019). Usually, when consumers suspect a company is greenwashing, they tend to boycott that and avoid buying from that (Testa et al., 2015; Testa et al., 2020a). In this regard, we suggested that greenwashing belief could interplay also in purchasing food with environmental claims on the packaging. Therefore, the following hypothesis:

H₁₀: consumers' beliefs about greenwashing discourage purchasing of sustainable forms of packaging

Sensitivity to the quality-price ratio. Research on choices regarding sustainable packaging demonstrated that external factors, namely quality and price, can overcome the consumers' sensitivity towards the item (Martinho et al., 2015). Usually, eco-friendly products shows a fairly premium price compared with their traditional alternatives (Testa

et al., 2015), but that is justified from the need to display signals about the intrinsic characteristics of that item (i.e., eco-friendliness) (Polonsky *et al.*, 2012). Similarly, eco-friendly packaging often influence the perception of the product quality, too (Han *et al.*, 2018). Eventually, we suggested that when quality and price were jointly considered, consumers' sensitivity to quality-price ratio could dissuade the willingness to purchase products with sustainable packaging. Thus, the following hypothesis:

H₁₁: consumers' sensitivity to the quality-price ratio of the various goods, make them prone to avoid sustainable forms of packaging

3. Methods

3.1. Design, sample, and procedure

In order to test our hypotheses we designed a 1×5 between subject experiment (1 traditional plastic packaging: recyclable (control claim); 4 circular plastic packaging: recycled, recycled + certification, compostable, compostable + certification), where each group of subjects responds only and exclusively to a single stimulus (Charness *et al.*, 2012).

Among the highest-ranked nations worldwide by nominal GDP, Italy is the eighth one (World Bank, 2020), and the third-largest one in the European Union (World Bank, 2020). From a recent survey conducted at European level, Italy is the third-highest nation, across the member countries, whose population is worried about the impact on the health of everyday products made of plastic (86%) (European Commission, 2017). Given its economic resonance, remarkable concern for plastics, and serious commitment towards that (PlasticsEurope, 2018), we decreed Italy to be the ideal place to conduct our study.

Participants belonged to a commercial panel, representative for the whole Italian population ($n=1236$), from which they had been sampled through stratified random sampling. Strata included sex, age, the level of education, geographical area (North West, North East, Center and Southern Italy), the population size of their municipality of residence (<10.000, 10.000-30.000, 30.000-100.000, 100.000-250.000, 250.000-500.000, >500.000 residents) and marital status (single, cohabiting, married, divorced, widow). These characteristics were adopted as fixed blocks in assignment to treatment, so that the various experimental conditions had a nearly identical composition, in terms of participants' characteristics.

Participants were randomly assigned to 5 different experimental conditions (5 different types of plastic bottle for a juice). All the participants were told that we were evaluating some solutions for our "new line of juice products". Therefore, we would like to have their opinion about the following product. Participants from the control group were asked to give their opinion about "a juice with a bottle made out of 100% recyclable plastic, which can be recycled after its usage" (control group, $n = 249$ respondents); members of the first treatment group were asked to give their opinion about a bottle "realized in 100% recycled plastic" (treatment 1, $n = 247$ respondents), while those in the second treatment group to give their opinion about a bottle "realized in 100% recycled plastic, which had been certified by an independent third-party subject" (treatment 2, $n = 246$ respondents); participants who were assigned to the third treatment group gave their opinion about a bottle "realized in 100% compostable plastic (obtained from renewable sources and not from oil, and which can be disposed with the organic waste)" (treatment 3, $n = 246$ respondents) and participants assigned to the fourth treatment group evaluated a bottle "realized in 100% compostable plastic (obtained from renewable sources and not from oil, and which can be disposed with the organic waste), which had been certified by an independent third-party subject" (treatment 4, $n = 253$ respondents). By doing so, each respondent was shown only one type of packaging. This allowed us to study a single assessment based on the personal opinions of each consumer rather than obtaining a comparative analysis between the different options. Data were collected in September 2019.

3.2. Measures

For each one of the five packages, participants were asked to rate: i) the attractiveness of the packaging, ii) the perceived material quality of the package, iii) the level of eco-friendliness of the packaging ($H_3 - H_5$) and iv) their purchasing intention ($H_1 - H_2$). The purchasing intention of participants, for the package described in the experimental condition was assessed by measuring their agreement with various statements, on a 7-points bipolar scale ranging from "Totally disagree" to "Totally agree" (n items = 4). The attractiveness of the package described in the experimental condition was measured by means of 7-points semantic scale associated with the various attributes of the packaging. How participants perceived the quality of the packages described in the experimental condition was measured by means of items based on a 7-points bipolar scale ranging from "Totally disagree" to "Totally agree" (n items = 3). Same technique was employed to measure the eco-friendliness of the package (n items = 3).

Moreover, various antecedents of circular consumption were measured ($H_6 - H_{11}$), by asking participants to evaluate their agreement with some statements, on a 7-points bipolar scale ranging from "Totally disagree" to "Totally agree". These included consumers' concern about plastic pollution (n items = 6) (H_6), self-reported plastic-related behavior from the everyday life (n items = 3) (H_7), consumer attention towards the quality/price ratio (n items = 10)

(H_{11}), environmental concern (n. items = 8) (H_8), and beliefs about greenwashing (n. items = 3) (H_{10}). We also measured their openness to change (H_9), according to the Schwartz's value inventory (n. items = 7), by means of 7-points unipolar scales ranging from "Never" to "Always" (see Table 1 in Appendix).

Also, some questions aimed at checking the actual understanding by respondents of the different characteristics of the packaging described (manipulation checks) were introduced. Respondents who failed these control questions were excluded from the sample analyzed to process the results. Finally, socio-demographic questions (control variables) complemented the survey.

3.3. Data analysis

We aggregated multiple items through the median of single item scores, to account for their skewed distribution. Before their aggregation, we evaluated the reliability of the whole construct through Cronbach's alpha (Table 1).

Data analysis was carried out through Bayesian Generalized Linear Modeling. Bayesian inference differs from methods based on null-hypothesis testing, or maximum likelihood, as it estimates the posterior probability distribution of a parameter by combining some more-or-less detailed information about its prior distribution, with information from the data embedded into a likelihood function. Compared to frequentist methods, Bayesian ones have a higher flexibility in modeling a wide range of distributions and also provide more reliable results, enabling researchers to assess the most plausible value of the unobserved parameter. In the case of generalized linear model, parameters would include either intercept and regression slopes (GLM, Gelman et al., 2013). We adopted a Bayesian approach to GLM, as it provided us with a high degree of flexibility to model our response variable, which had a skewed distribution.

In our model consumer's behavior over the purchasing intention was explained in function of the effect of the various experimental conditions, consumers' package evaluation and consumer's antecedents of sustainable consumption. We also included consumer's age, sex and level of education, to control for confounding between the response and covariates and we also included an interaction term between each consumer's antecedent of sustainable consumption ($H_6 - H_{11}$) and the experimental condition.

Before model fitting, we assessed the linearity of the association between predictors and the response variable through scatterplots, and we explored the distribution of the response variable, adopting a distribution of the error term based on a Skewed Gaussian distribution. To improve model regularization, we standardized the response and the predictors and we adopted weakly uninformative prior distributions for model parameters (Lemoine, 2019; Schielzeth, 2010). We run our model based on 5000 Markov Chain Monte Carlo (MCMC) iterations, discarding the first 1000 replicates as a burn-in.

We adopted a backwise approach to variable selection, starting from a model including all the relevant predictors and then comparing nested models based on the widely Applicable Information Criterion and leave-one-out cross validation (Vehtari et al., 2017). We also tested our final model in terms of convergence of the posterior distribution of its parameters and the shape of MCMC. Effects were deemed to be significant based on their effect size and the comparison of nested models (Cumming, 2014; Kruschke and Liddell, 2018). We retained a predictor when the posterior estimate of its associated slope did not include the zero and when a nested model without it worsened its predictive performances compared to the original model. Bayesian GLM were fit with the statistical software STAN (Carpenter et al., 2017), through the package 'brms' (Bürkner, 2017) of the software R (R Core Team, 2019).

4. Results

Our best candidate model included treatment assignment, the perceived attractiveness of packaging, the perceived quality of packaging and the perceived eco-friendliness of packaging, concerns about plastic pollution, self-reported plastic-related behavior and openness to change, as predictors. Overall, the final model explained 66% of variability in the purchasing intention of participants. The inspection of draws from the posterior distribution revealed convergence of model parameters and a good fit with the proposed distribution of the error term.

Those variables who referred to the evaluation of plastic bottles in the experimental condition had the highest marginal effect, notably the perceived eco-friendliness of packaging (95% C.I = 0.33 - 0.42), the perceived quality of packaging (95% C.I = 0.23 - 0.32) and the perceived attractiveness of packaging (95% C.I = - 0.19 - 0.12). Therefore, our data analysis provided support for H_3 and H_4 . The assignment to the various experimental groups had an almost null effect, with 95% CI which encompassed the zero, but its inclusion in the model improved model performances and we retained it as a predictor in our final model. This finding indicates that most of the effect of treatment assignment could be attributed to the evaluation of packaging attributes depicted in the various conditions and H_5 was therefore supported.

Moreover, comparing the stimuli, treatment 1: recycled (95% C.I = -0.12 - 0.08), treatment 3: bioplastic (95% C.I = -0.14 - 0.06), and the control claim: recyclable (i.e., intercept) (95% C.I = -0.06 - 0.08), H_1 was supported, since any significant difference in purchase intention emerged between a traditional plastic packaging and circular alternatives. Also, consumers did not reveal a different purchasing intention between circular packaging with a third-party certification, i.e., treatment 2: recycled + certified (95% C.I = -0.14 - 0.06) and treatment 4: bioplastic + certified (95% C.I = -0.07 - 0.13), vs those without a certification, i.e., treatment 1: recycled (95% C.I = -0.12 - 0.08) and treatment 3: bioplastic (95% C.I = -0.14 - 0.06). Therefore, H_2 was not supported. The purchasing intention of

respondents was also influenced, albeit to a lesser extent, with concern about plastic pollution (95% C.I. = 0.06 - 0.14), self-reported plastic related behavior (95% C.I. = 0.07 - 0.15) and openness to change (95% C.I. = 0.01 - 0.07). Therefore, we found support for H_6 , H_7 and H_9 . However, as our final model did not include any interaction between these predictors and the various experimental conditions, we found no support for H_8 , H_{10} and H_{11} (see Table 2, in Appendix).

Specifically, we found no effect of many individual antecedents of consumer adoption of sustainable packaging, nor about their interactions with the evaluation of packages in the various experimental conditions. Hypotheses H_8 , H_{10} and H_{11} were therefore rejected. Also we did not find a significant effect of respondents' age, sex or level of education over the response variable. Table 3 provides an overview of the hypotheses tested and if each one was supported or rejected.

Tab. 3: Summary of the hypotheses and results

Hypotheses	Results
H1: consumers are still not enough accustomed to the circular economy to express a different purchase intention depending on the type of plastic (recyclable, recycled, and compostable) that constitutes the circular packaging	Supported
H2: consumers demonstrate a different purchase intention towards a plastic (circular) packaging with (vs. without) third-party certifications	Rejected
H3: when packaging is perceived attractive, consumers' purchase intention increases	Supported
H4: when packaging material is perceived of high quality, consumers' purchase intention increases.	Supported
H5: when the perceived eco-friendliness of packaging is high, consumers' purchasing intention increases.	Supported
H6: consumers' concern over plastic pollution make them prone to select sustainable forms of packaging	Supported
H7: consumers' plastic-related behavior, make them prone to select sustainable forms of packaging	Supported
H8: consumers' concern about global environmental issues, make them prone to select sustainable forms of packaging	Rejected
H9: consumers' openness to change, make them prone to select sustainable forms of packaging	Supported
H10: consumers' beliefs about greenwashing discourage purchasing of sustainable forms of packaging	Rejected
H11: consumers' sensitivity to the quality-price ratio of the various goods, make them prone to avoid sustainable forms of packaging	Rejected

Personal elaboration

5. Discussion

In Bayesian statistics, there are no p-values; by contrast, it is necessary to consider significant all the variables in which the confidence interval (which in Bayesian is called credibility interval, C.I.) does not include zero (from 95% lower to 95% upper) (Kruschke & Liddell, 2018). As shown in Table 2, the model did not reject the 4 experimental conditions (treatment 1 to 4): even if there was not a clear difference for the control condition, eliminating even only one of them would worsen the performance of the model, with an increasing estimated error in cross-validation (Kruschke & Liddell, 2018). It means that consumers' purchase intention is almost equivalent across the 5 different plastic bottles, namely one traditional plastic packaging and 4 circular alternatives. This allows us to assert that recycled plastic and bioplastic, whether certified by a third party or not (i.e., circular options), are considered by consumers to be valid alternatives to recyclable plastic (Boesen et al., 2019). In this regard, we are allowed to argue that the consumer does not seem to gaze the difference neither between traditional vs. circular packaging, nor among different circular options.

These experimental results provide further empirical evidence on previous studies concerning circular packaging (Boesen et al., 2019; Steenis et al., 2018; Testa et al., 2020a) and stress how much work still needs to be done for leading people to perceive the different environmental implications for different kinds of plastic packaging, and the different types of circular strategies that these packaging could imply (Blomsma et al., 2018; Ghisellini et al., 2016; WBCSD, 2018). By contrast, it is clear that what counts the most for consumers is whether a contribution to the environment is provided (or not), no matter how - that is, regardless of the realization of a technical cycle, through virgin or recycled plastic, or a biological one, through bioplastics packaging (McDonough and Braungart, 2010; MacArthur, 2013).

Since all the option of the experiment are perceived as almost equivalent, producers still do not have a clear indication on which circular strategy deserves to be implemented. However, none of the circular strategies should be discarded. Therefore, these results are in line with those from Herbes et al. (2018), where it came out that people evaluate packaging's information simply by relying on its end-of-life environmental impact, without attempting further distinctions between its recyclability, reusability, or biodegradability. As such, our findings demonstrated that consumers could not be asked for an overly sophisticated evaluation of the information displayed on the packaging (Moon et al. 2017). Any information shown by certifications must be clear and simple: the vast majority of studies on technical information have never produced satisfactory results on their effectiveness. Certifications that are too sophisticated for consumers to be processed could be not only ineffective, but also counterproductive and misleading (Moon et al., 2017) because they can activate mental shortcuts, namely heuristics and biases (Bhandari et al., 2019;

Gigerenzer and Gaissmaier, 2011; Gössling and Buckley, 2016; Singh and Giacosa, 2019; Tversky and Kahneman, 1974).

Unexpectedly, we can assert that the presence of certification does not exert a relevant impact on consumers' final purchase intention. This research complements previous papers that investigated the role of certifications (Darnall et al., 2018; Gössling and Buckley, 2016), providing a supplementing perspective. Indeed, our findings questions about the indiscriminate use of certifications on circular packaging, because for consumers, the relevance of a third-party endorsement might change according to the kind of feature it displays (i.e., circularity, country of origin, fair trade, etc.) (Asioli et al., 2020).

About the consumers' judgment on packaging attributes, all the three aspects, namely, attractiveness, perceived quality, and perceived eco-friendliness, are deemed. Remarkably, perceived eco-friendliness stands out as the major driving force to lead purchase intention. Further, perceived quality also plays a conspicuous role in driving consumers' choices. Surprisingly, attractiveness negatively influences the final evaluation of the product, albeit its influence is significant. That contrasts with evidence provided by neuroscience, whereby attractiveness has a positive role in purchasing intention (Clement, 2007; Stoll et al., 2008). Therefore, it opens a new avenue for further research that we will elucidate later on.

About the various circular consumption drivers, three out of six of them are rejected from the model. Respectively, belief about greenwashing, consumers' attention towards quality/price ratio, and ultimately environmental concern do not account for consumption decisions in our experiment. By contrast, a fairly significant influence is detected for concern about plastic pollution, self-reported plastic-related behavior, and openness to change. Overall, that allow us to confirm that general sensitivity towards plastics is a reliable predictor of consumers' food products choices with a plastic case (Dilkes-Hoffman et al., 2019a, 2019b; European Commission, 2018).

Finally, taking into account that the circular consumption decision-making process is a multidimensional phenomenon, in which multiple - and often conflicting - parameters are involved, our research has tried to simulate this complex process as closely as possible to reality. By doing so, we feel confident to state that consumers care too little about the circular characteristics of packaging when purchasing food products (i.e., fruit juices), ignoring the fact that these products, just as all the others plastic packaged FMCG, have a strong environmental impact, overall (Ryberg et al., 2019).

6. Conclusions

The circular economy has led to entirely rethinking the business models we were used to. As such, its innovative reach is as broad as still largely unexplored (WBCSD, 2018). Our experimental accroach focused on the great problem of plastic, which seriously threatens our ecosystem, and which is the main boost for the circular economy revolution (MacArthur, 2017). From this point of view, our results are comforting and in line with the general mood tested elsewhere (Dilkes-Hoffman et al., 2019b; European Commission, 2017; Subramanian, 2000; Zhao et al., 2015): respondents to our experiment showed interest (measured by purchase intention) towards all the circular alternatives to a traditional plastic packaging they were exposed to. This opens up interesting scenarios, because each type of plastic packaging, tested in the experiment, corresponds to a precise and different circular economy strategy (McDonough and Braungart, 2010; Moreno et al., 2016).

Furthermore, consumers involved in the experiment confirmed that the attractiveness of the packaging, its eco-friendliness, and its perception of quality is among the most relevant attributes regarding the purchase choice. Finally, we clarified the drivers that mostly influence circular consumption, showing that not all the supposed drivers of sustainable consumption detected in literature are equally relevant. In fact, only openness to change, concern about plastic pollution, and self-reported plastic-related behavior emerged as those that guided our experiment's respondents in their purchase choice the most. To sum up, this study contributes to the academic debate as well as provides useful insights for practitioners.

6.1. Theoretical implications

On the one hand, this study enriches the present body of academic literature.

First, this research contributes to the recent literature on the drivers of purchasing decision about plastic (Dilkes-Hoffman et al., 2019b; Heidbreder et al. 2020) by highlighting that emotional belief and not purchasing-behavior are important factors which increase the probability to select sustainable packaging. On the contrary, that beliefs are not able to make a consumer fully aware about the specific environmental implications of diverse packaging solution by stressing that green purchasing behavior are still mainly characterized by an emotional component (Matthes et al. 2014; Hartmann and Apaolaza-Ibáñez, 2009).

Second, this study also highlights the role of consumers in the new circular economy paradigm, a topic that deserves to be explored more in detail as introduced by several scholars (Ghisellini et al., 2016; Khor and Udin, 2012). Specifically, since leveraging on consumers' complicity in buying decisions is pivotal for the circular economy to be accomplished (Govindan and Soleimani, 2017), this experiment provides a clear picture of the people's actual intention towards circular products. Moreover, our outcomes demonstrate that, although general purchase intention towards circular products is positive (Testa et al., 2020a), consumers' are still not aware of different environmental

consequences for different circular packaging, considering recyclable, recycled, or compostable plastic packaging, alternative, and equivalent solutions. That supports the present literature for which people cannot truly estimate the environmental impact of different ecological solutions, neither when certifications are provided (Herbes et al., 2018).

Another novelty of this study consists in testing a wide range of different circular packaging in FMCG industry: the vastness of product variety in this industry, besides its huge repercussions on environmental pollution from plastic (Ryberg et al., 2019), make FMCG industry an area that is always worthy of new investigations (European Commission, 2017; PlasticsEurope, 2018; WBCSD, 2018).

The same applies to the role of certifications, whose consumers are not susceptible. Independent third-party certification, indeed, does seem to trigger consumers' interest, neither their final choices.

That contributes to the literature about third-party certifications, demonstrating that in the FMCG industry, people often overlook information when provided via technical certifications, due to several reasons, like size, framing, or content (Asioli et al., 2020; Bhandari et al., 2019; Darnall et al., 2018; Jiang et al., 2008; Singh and Giacosa, 2019). Certifications about "circularity" are not an exception.

Finally, this research has shown that the drivers of sustainable consumption, explored so far in academic literature, are not equally valid for circular consumption.

6.2. Managerial implications

On the other hand, practitioners can learn useful insights. We have seen that packaging is much more than just an envelope. Its practicality goes beyond the mere handlines and preservation of goods, since it also covers fundamental communication functions (Lindh et al., 2016b), and eventually strategic implications (Subramanian, 2000). As such, apparently similar plastics packaging (i.e., recyclable, recycled, and bioplastic packaging) lead to different circular economy strategies, since they trigger diverse cycles: technical and biological, respectively (McDonough and Braungart, 2010; MacArthur, 2013). Along with being a source of innovation itself, approaching circular economy leads to further competitive advantages: first, companies can leverage on consumers' complicity in returning plastic items (e.g., bottle banks) to promote customers' loyalty (Govindan and Soleimani, 2017; Khor and Udin, 2012); second, since packaging attractiveness plays a pivotal role in consumers' choices, increasing the appealing of circular packaging -compared with traditional options- seems a viable alternative to softly yet effectively nagging at consumers. Still from our findings, greenwashing belief doesn't seem to be a looming problem anymore. This should encourage companies to do something more towards circular economy.

Further reflection is reserved for the role of certifications. Seminal papers on eco-labels and third-party certifications proved their seminal role as a marketing tool (Atkinson and Rosenthal, 2014; Testa et al., 2015). For instance, our findings show that consumers' sensitivity to the quality-price ratio does not make them prone to avoid sustainable alternatives of packaging. This can allow companies to charge circular packaging with a little mark-up, to signal the better environmental footprint. Similarly, companies can leverage on certifications but, as our results showed, these communications are effective as long as they are transmitted simply and clearly.

Ultimately, companies can leverage people's openness to change to attract and satisfy new customers and expand their business (The Sustainability Consortium, 2020; WBCSD, 2018).

6.3. Further research

This study is not free from limitations, which allowed us to draw avenues for further research. At first, as suggested in the discussion, although attractiveness plays a relevant role in sustainable consumption, it impacts negatively. That contradicts the status-quo, where the attractiveness of the packaging captures consumers' attention and accelerates the turnover of FMCG (Clement, 2007; Stoll et al., 2008). A deeper understanding is needed.

Furthermore, as this research has shown that sustainable consumption drivers are not necessarily valid for circular consumption as well, exploring and testing new consumption drivers is a good area for future explorations.

Finally, these data refer to the Italian market; hence further analyses are recommended to be conducted in other countries, with different sensitivity to plastics topic and diverse level of wealth, since environmental sensitivity and purchasing capability are demonstrated as the two main obstacles on "green" purchasing behavior (Larson et al., 2015; PlasticsEurope, 2018).

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Appendix

Tab. 1: Variables measured at the individual level: items, response format, Cronbach's alpha of the whole construct to which they were aggregated and background literature explaining their inclusion as predictors in the model. All the scales were adapted.

Item	Median	1 st - 3 rd quartile	Construct	Reference
How would you evaluate the packaging of the juice that you saw before? (Answers on a 7-points semantic scale)				
Not catchy ↔ Catchy	3.0	2.0 - 4.0	Package attractiveness (α = 0.94)	(Magnier <i>et al.</i> , 2019, 2016)
Negatively ↔ Positively	2.0	1.0 - 4.0	Package attractiveness (α = 0.94)	
Not eco-friendly ↔ Eco-friendly	1.5	1.0 - 3.0	Package attractiveness (α = 0.94)	
Bad-looking ↔ Good-looking	3.0	2.0 - 4.0	Package attractiveness (α = 0.94)	
Not desirable ↔ Desirable	2.0	1.0 - 4.0	Package attractiveness (α = 0.94)	
Not recommendable ↔ Recommendable	2.0	1.0 - 4.0	Package attractiveness (α = 0.94)	
Unhealthy ↔ Healthy	2.0	1.0 - 4.0	Package attractiveness (α = 0.94)	
Dirty ↔ Hygienical	2.0	1.0 - 4.0	Package attractiveness (α = 0.94)	
Unpleasant ↔ Pleasant	3.0	1.0 - 4.0	Package attractiveness (α = 0.94)	
Please tell us how much you agree with the following statements ... (Answers on a 7-points bipolar scales, ranging from "Completely disagree" (-3) to "Completely agree" (+3))				
If I had to purchase a fruit juice, it would be likely that I would purchase a product with this type of packaging.	1.0	0 - 2.0	Purchasing intention (α = 0.96)	(Dodds, Monroe, & Grewal, 1991; Monnot <i>et al.</i> , 2015)
I want to buy a fruit juice with this type of packaging.	1.0	0 - 2.0	Purchasing intention (α = 0.96)	
If I had to purchase a fruit juice, I would really consider the idea of a product with this type of packaging.	1.0	0 - 3.0	Purchasing intention (α = 0.96)	
If I had to purchase a fruit juice, I would really like to buy a product with this type of packaging.	1.0	0 - 2.0	Purchasing intention (α = 0.96)	
The packaging of this fruit juice seems to have a low quality.	1.0	0 - 2.0	Perceived quality (α = 0.82)	(Monnot <i>et al.</i> , 2015; Chen & Chang, 2013)
I would completely trust the quality of this fruit juice packaging.	1.0	0 - 2.0	Perceived quality (α = 0.82)	
Purchasing a fruit juice with this type of packaging, to me, would mean to have a guarantee about its quality.	-1.0	-2.0 - 0	Perceived quality (α = 0.82)	
This packaging of this fruit juice is eco-friendly.	2.0	1.0 - 3.0	Eco-friendliness (α = 0.91)	(Monnot <i>et al.</i> , 2015)
The packaging of this fruit juice seems to be a nice solution to some environmental issues.	2.0	1.0 - 3.0	Eco-friendliness (α = 0.91)	
The packaging of this fruit juice confers a green look to the overall product.	2.0	1.0 - 3.0	Eco-friendliness (α = 0.91)	
Forecasts about the fact that in 2050 there will be more plastic than fish in the seas, makes me feel angry about them.	3.0	1.0 - 3.0	Concern about plastic pollution (α = 0.69)	(Magnier <i>et al.</i> , 2019; Chirico <i>et al.</i> , 2020)
The problem of plastic pollution in the oceans is tremendously overrated by media.	1.0	-1.0 - 3.0	Concern about plastic pollution (α = 0.69)	
Our oceans have more serious problems than plastic pollution.	0.0	-2.0 - 1.0	Concern about plastic pollution (α = 0.69)	
I am concerned about sea animals that die after having ingested too much plastic.	3.0	1.0 - 3.0	Concern about plastic pollution (α = 0.69)	
I do not think too often about plastic pollution in the oceans.	1.0	0.0 - 2.0	Concern about plastic pollution (α = 0.69)	
Plastic pollution is far more serious than most people imagine.	2.0	1.0 - 3.0	Concern about plastic pollution (α = 0.69)	
When I notice some plastic litter on a beach, I usually collect them, to dispose them at the recycling trashcan.	1.0	0.0 - 2.0	Plastic-related behavior (α = 0.66)	(Cavaliere <i>et al.</i> , 2020; Heidbreder <i>et al.</i> , 2020)
To me, it is hard to avoid using disposable plastic products.	0.0	-1.0 - 2.0	Plastic-related behavior (α = 0.66)	
I would approve the commitment of a supermarket aiming at becoming plastic-free.	2.0	1.0 - 3.0	Plastic-related behavior (α = 0.66)	
When I order a drink at the bar, I always refuse plastic straws.	1.0	0.0 - 2.0	Plastic-related behavior (α = 0.66)	
I always bring a reusable shopping bag with me, to avoid disposable plastic bags.	3.0	1.0 - 3.0	Plastic-related behavior (α = 0.66)	
Protecting natural environments is among the most important problems that the world is facing right now.	2.0	1.0 - 3.0	Environmental concern (α = 0.85)	(Matthes <i>et al.</i> , 2014)
Media excessively emphasize global environmental issues.	1.0	0.00 - 3.00	Environmental concern (α = 0.85)	
There is no real need of worrying about environmental protection, because nature is perfectly able to protect itself.	2.0	0.00 - 3.00	Environmental concern (α = 0.85)	
Environmental issues does not affect my personal life.	1.0	0.00 - 3.00	Environmental concern (α = 0.85)	
I can imagine many things that I could care about, rather than being concerned about the environment.	1.0	0.00 - 2.00	Environmental concern (α = 0.85)	
I am already too busy to donate my time to an NGO operating in the field of environmental protection.	0.0	-1.00 - 3.00	Environmental concern (α = 0.85)	
Natural resources should be preserved for the future generations.	2.0	1.0 - 3.0	Environmental concern (α = 0.85)	
The adoption of disposable products should be encouraged, as they are more practical for consumers.	1.0	0.00 - 3.00	Environmental concern (α = 0.85)	
Most companies provide consumers with vague or unverifiable information about their products.	1.0	0.00 - 2.00	Beliefs about greenwashing (α = 0.73)	(Braga Junior <i>et al.</i> , 2019; Leonidou and Skarmas, 2017)
Most companies exaggerate or overestimates the environmental performances of their products.	0.0	0.00 - 1.00	Beliefs about greenwashing (α = 0.73)	
Most companies omit to communicate or hide important information about the real environmental performances of their products.	1.0	0.00 - 2.00	Beliefs about greenwashing (α = 0.73)	
Preferably buy fair trade products (fair trade)	3.0	3.0 - 4.0	Consumer attention towards the quality/price ratio (0.704)	(Magnier <i>et al.</i> , 2019)
I prefer to buy local products	4.0	3.0 - 5.0	Consumer attention towards the quality/price ratio (0.704)	
I pay close attention to how much I spend	5.0	4.0 - 6.0	Consumer attention towards the quality/price ratio (0.704)	
I only buy what I really need	4.0	3.0 - 5.0	Consumer attention towards the quality/price ratio (0.704)	
I easily change the brand of the products I buy	4.0	3.0 - 4.0	Consumer attention towards the quality/price ratio (0.704)	
I follow the latest fashion	3.0	1.0 - 4.0	Consumer attention towards the quality/price ratio (0.704)	
I love shopping	4.0	3.0 - 5.0	Consumer attention towards the quality/price ratio (0.704)	
I shop on impulse	3.0	1.0 - 4.0	Consumer attention towards the quality/price ratio (0.704)	
I am looking for bargains and discounts	5.0	4.0 - 6.0	Consumer attention towards the quality/price ratio (0.704)	
I pay a lot of attention to the value for money	5.0	4.0 - 6.0	Consumer attention towards the quality/price ratio (0.704)	
Could you please tell us how often you engage in the following activities (7-points unipolar scale from "Never" to "Always")				

I always collect my garbage separately, to recycle it.	7.0	6.0 - 7.0	Proenvironmental behavior ($\alpha = 0.79$)	(Larson <i>et al.</i> , 2015; Taufique <i>et al.</i> , 2017)
I save energy at home.	6.0	5.0 - 7.0	Proenvironmental behavior ($\alpha = 0.79$)	
At home I keep water consumption low.	6.0	5.0 - 7.0	Proenvironmental behavior ($\alpha = 0.79$)	
I purchase eco-friendly products.	4.0	4.0 - 5.0	Proenvironmental behavior ($\alpha = 0.79$)	
I collect organic waste separately.	7.0	5.0 - 7.0	Proenvironmental behavior ($\alpha = 0.79$)	
I donate my time or money, to an NGO operating in the field of environmental protection.	3.0	2.0 - 4.0	Proenvironmental behavior ($\alpha = 0.79$)	
I re-use product packages.	5.0	4.0 - 6.0	Proenvironmental behavior ($\alpha = 0.79$)	
I try to purchase products made out of recycled materials.	5.0	4.0 - 5.0	Proenvironmental behavior ($\alpha = 0.79$)	
To what extent you agree with the following statements? (7-points unipolar scale from "Not at all" to "Very much").				
For me it is important to always develop new ideas and be creative	3.0	3.0 - 4.0	openness to change ($\alpha = 0.678$)	(González-Rodríguez <i>et al.</i> , 2019; Schwartz, 2012)
I find it difficult to take risks	2.0	1.0 - 3.0	openness to change ($\alpha = 0.678$)	
Enjoying the pleasures of life is important to me	3.0	3.0 - 4.0	openness to change ($\alpha = 0.678$)	
I think it's important not to ask for more than you have	3.0	2.0 - 4.0	openness to change ($\alpha = 0.678$)	
I think it is important to try many different experiences in life	3.0	3.0 - 4.0	openness to change ($\alpha = 0.678$)	
I think in general it is better to do things in a traditional way	3.0	2.0 - 3.0	openness to change ($\alpha = 0.678$)	
It is important for me to have a stimulating life	3.0	2.0 - 4.0	openness to change ($\alpha = 0.678$)	

Tab. 2. Coefficients from the best candidate model. Both the dependent and the independent variable were standardized and centered. 95% C.I refers to Bayesian 95% credibility intervals

Variable	Est.	Error	95% C.I. lower	95% C.I. upper	Eff.sample	Rhat
Intercept	0.01	0.04	-0.06	0.08	9011	1.00
Treatment: recycled	-0.02	0.05	-0.12	0.08	10741	1.00
Treatment: recycled + certified	-0.04	0.05	-0.14	0.06	11126	1.00
Treatment: bioplastic	-0.04	0.05	-0.14	0.06	10725	1.00
Treatment: bioplastic + certified	0.03	0.05	-0.07	0.13	11147	1.00
Attractiveness of packaging	-0.15	0.02	-0.19	-0.12	17313	1.00
Perceived quality of packaging	0.27	0.02	0.23	0.32	13542	1.00
Perceived eco-friendliness of packaging	0.38	0.02	0.33	0.42	14808	1.00
Concern about plastic pollution	0.10	0.02	0.06	0.14	15629	1.00
Self-reported plastic-related behavior	0.11	0.02	0.07	0.15	14125	1.00
Openness to change	0.04	0.02	0.01	0.07	19777	1.00

Tobin's Q and ESG Score in the banking industry: are there differences among banks?

SEBASTIAN PUSCEDDU* CORRADO GATTI•

Objectives. *In recent years, and especially after the global financial crisis, sustainability has attracted increasing attention from regulators, investors, firms, academics, and, in general, stakeholders. This interest has created opportunities and challenges for firms in their risk-return relationship with shareholders and, in general, stakeholders (Ng and Zabihollah, 2015), pushing them to pursue coherence between corporate financial performance and corporate social performance (Crespi and Magliavacca, 2020).*

Financial intermediaries are increasing their attention on socially responsible aspects in order to reinforce their credibility and reputation among stakeholders (Coulson, 2009), considering a three-dimensional financial logic (risk, return, and social impact) in order to enhance their long-term value by fulfilling their social responsibilities (Freeman, 1984; Amini and Bienstock, 2014; Ng and Zabihollah, 2015; Ziolo et al., 2019).

In this context, a critical characteristic of a successful sustainable business model is the explicit recognition of the importance of acknowledging multiple perspectives in defining and creating value, with a pluralistic and iterative process (Wheeler et al., 2003).

The growth of banks' sustainable practices is also strongly driven by legislation, with the adoption of regulatory provisions at both global (Global Reporting Initiative, United Nations Global Compact, Equator Principles) and European levels (Directive 78/669/EEC, Directive 83/349/EEC, EBA's Guideline, European Regulation 2019/2088).

Moreover, economical, legal and self-regulated aspects have influenced the financial firm behavior in acting in a more socially responsible way, in order to enhance its competitive advantage in high market competitiveness contexts and to attract socially responsible investors (Chih et al., 2010; Oliveira et al., 2019).

At the same time, these issues have become a new theme for academics in the field of management, and a number of contributions covering various issues and aspects have been published.

Two main strands of literature can be distinguished in this regard.

On the one hand, research sheds light on internal practices, by investigating how sustainability criteria are integrated in the decision-making process (Ziolo et al., 2019) and into policies, strategies, products and processes (Weber, 2005), with a specific attention on risk management frameworks (Weber, 2005; Weber et al., 2010; Attig et al., 2013; Birindelli et al., 2015; Devalle et al., 2017; Witold and McGlinch, 2019), lending practices (Goss & Roberts, 2011; Attig et al., 2013; Witold and McGlinch, 2019), capital requirements (Zeidan et al., 2015; Thomä & Gibhardt, 2019), funding structure (Gangi et al., 2019; Wu and Shen, 2013), and profitability (Soana, 2011; Cornett et al., 2016; Laguir et al., 2018; Miralles-Quirós et al., 2019; Brogi and Lagasio, 2019; Gangi et al., 2019).

On the other hand, research focuses on external practices, by analyzing the relevance of corporate social disclosure (Baldini et al., 2018), with specific attention to the role played by the board of directors in creating and developing a corporate culture and ethical values that consider sustainability aspects (Sethi, 2002; Baldini et al., 2018; Birindelli and Iannuzzi, 2019; Cremona and Passador, 2019). In this regard, several studies have investigated the effect of board disclosure on firms' reputation (Gray et al., 1995; Li et al., 2010; Vanhamme et al., 2012), trust (Carnevale and Mazzuca, 2014) and competitive advantage (Aguilera et al., 2006; Money and Schepers, 2007; Gill, 2008; Kolk and Pinkse, 2010; Garcia-Torea et al., 2016; Baldini et al., 2018). Board disclosure aspects have also been investigated in terms of number and presence of independent directors (Cheng and Courtenay, 2006; Patelli and Prencipe, 2007; Cucari et al., 2018; Garcia-Meca and Pucheta-Martínez, 2018), age and gender of directors (Slater and Dixon-Fowler, 2009; Cucari et al., 2018; Galbreath, 2018; Birindelli and Iannuzzi, 2019), and environmental committee existence (Kent and Monem, 2008; Peters and Romi, 2014; Liao et al., 2015; Cucari et al., 2018).

This study examines the relationship between the adoption of ESG criteria and shareholder value creation by banks, also taking into account differences in banks' business models (traditional, hybrid, and non-traditional) and size (large, medium, and small).

Specifically, this paper investigates the effects of the implementation of sustainability conducts on shareholder value creation (measured by the Tobin's Q) in a sample of 290 banks from 48 countries over the period 2011-2019.

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Our research aims to fill a gap in directly comparing and contrast banks in the relationship between ESG performance and shareholder value creation, with a specific focus on business models (traditional, hybrid, and non-traditional) and size (large, medium, and small).

Methodology.

Hypotheses development. As mentioned above, in recent years sustainability has attracted increasing attention from stakeholders, pushing firms to increase their focus on socially responsible aspects in order to reinforce their credibility and reputation (Coulson, 2009). Prior research (Coulson, 2009; Birindelli et al., 2015) reveals that the adoption of corporate social actions and disclosure are positively valued by shareholders.

Moreover, while there is not a unanimous consensus on the effects of each ESG pillar score (i.e. environmental, social, and governance) on corporate financial performance and on shareholder value creation, the adoption of principles that guarantee a deep disclosure on accountability, compliance, transparency and corporate governance practices, with a reduction of agency costs with firms' stakeholders, is undoubtedly reflected positively in shareholders' expectations (Miralles-Quirós et al., 2019; Crespi and Magliavacca, 2020).

However, the enhancement of socially responsible practices and of related organizational structures has not yet been accompanied by a disclosure equally reinforced (Birindelli et al., 2015), where the aim is to make a qualitative leap, contextualizing and connecting the various data and placing them both in the strategic orientation and in the economic context in which the company operates. In other words, allowing stakeholders to transform information into knowledge (Rutigliano, 2016).

In the light of the above, we develop the following hypothesis to test:

H1: There is a significant relationship between ESG score and shareholder value creation.

Considering business models, banks may be classified in traditional, hybrid, and non-traditional based on the share of revenues referred to commission and trading income vs. net interest and other income in most periods (Stiroh, 2004; European Central Bank, 2010). Taking into account the spread of the values of the share of net interest and other income on the amount of the intermediation margin, banks may be classified as (i) traditional, if the share is located above the 66th percentile, (ii) non-traditional, if the share is located below the 33rd percentile, and (iii) hybrid, if the share is located between the 66th percentile and the 33rd percentile.

Traditional banks may be expected to integrate the evaluation of future cash flows of borrowers, carried out through a traditional analysis of financial statements and business plans, as well as the probability of default (PD) of borrowers, by elements that go beyond pure tangible aspects (i.e. operational and economic-financial aspects), considering also intangible aspects (i.e. corporate social actions and disclosure).

In this context, banks with a traditional business model, that integrates ESG criteria in the valuation of borrowers' creditworthiness, have the opportunity to more accurately assess the ability of borrowers to generate value and respond to social and environmental risks that may negatively impact their operations and ability of repayment (Tami, 2013; Devalle et al., 2017; Hanson et al., 2017).

In the light of the above, we develop the following hypothesis to test:

H2: In banks adopting a traditional business model there is a significant relationship between ESG score and shareholder value creation.

Considering the average amount of total assets in the period, banks may be classified in terms of size, as large (total assets above or equal to USD 10 billions), medium (total assets between USD 10 million and USD 10 billions), and small (total assets lower than USD 10 million) (Berger and Mester, 1997).

Large banks may be expected to be more willing to use quantitative and hard information (i.e. transactions-based) in their lending practices, while smaller banks tend to lend to small-medium retail and private borrowers, using also qualitative and soft information (i.e., relationship-based) that are not directly formalized in ESG criteria (Berger et al., 2005).

Furthermore, there is no consistent approach to ESG-related (or sustainable) product classification across banks given the lack of baseline principles and standards. Banks' chosen approaches are often driven by factors such as the bank's size, its internal ESG-related capacity, and the sophistication of their overall ESG product offering. Smaller banks may have loan exposures to green projects or other sustainable purposes, but these are not necessarily publicly promoted or externally labelled as "green finance", while larger banks tend to establish an internal framework (e.g., using external or regulatory guidance), to classify ESG products (European Commission, 2020).

However, smaller institutions are not immune to ESG risks and could be even more susceptible to them (e.g., if they are particularly concentrated in a vulnerable sector, geography or if they lack the resources and expertise needed to manage ESG risks). This is why it is important that all institutions effectively identify and monitor the ESG risks to which they might be exposed in the short, medium and long-run, and that they implement adequate measures to address them (European Banking Authority, 2020).

In the light of the above, we develop the following hypothesis to test:

H3: In large banks there is a significant relationship between ESG score and shareholder value creation.

Sample selection and research methodology. To test our set of hypotheses, we used multiple regression analysis, run on 2.320 observations. Specifically, we used a modified version of the model proposed by Yu & Zhao and Miralles-Quirós et al. (Yu and Zhao, 2015; Miralles-Quirós et al., 2019), including variables at bank level where the dependent variable is shareholder value creation (measured by Tobin's Q), i.e. a prospective performance measure that does not require risk-adjustment or normalization and reflects market expectations, and not (only) information provided by firms' financial statements (Lindeberg and Ross, 1981; Lang and Stulz, 1994).

$$Q_{it} = \alpha + \beta_1 \ln(\text{Capital}_{it}) + \beta_2 \text{ESG score}_{it} + \beta_3 \text{Lev}_{it} + \varepsilon_{it}$$

As independent variables, we consider (i) net assets (*Capital*) expressed in the natural logarithm in order to control the heteroscedasticity, (ii) ESG score and (iii) leverage ratio (*Lev*), calculated from the quotient between total debt and total assets (Miralles-Quiròs et al., 2019).

In the table above (Table 1), we assign names based on the characteristics of the indicators that are related to the factors.

Tab. 1: Definition of variables

Q_{it}	Tobin's Q
$\ln(\text{Capital}_{it})$	Natural logarithm of the amount of capital
ESG_{it}	ESG sustainability performance as reported by the company
Lev_{it}	Leverage ratio

Our sample consists of 290 banks from 48 countries over the period 2011-2019, in order to gain an heterogenous and balanced panel data that allows us to look for robust results.

Thomson Reuters Eikon has been used as database, i.e. a database widely used internationally in management studies. This database proved to be among the most complete in terms of data collection (i.e., financial and social performance indicators) and provides a large combination of variables, useful to perform our analysis. Data analysis has been performed using IBM SPSS Statistics software.

The ESG score has been taken from Thomson Reuters Eikon for each company, as the weighted average of the scores achieved in different key sustainable performance indicators, and specifically applying the 14,4% of the weight to environmental score, the 49,6% of the weight to social score and 36,0% of the weight to governmental score.

The ESG performance may assume a score in a range between 0 (weak) and 100 (strong).

The table below (Table 2) illustrates the composition of our panel.

Tab. 2: Panel composition

	Banks	ESG Score		Environmental Score		Social Score		Governmental Score	
		2011	2019	2011	2019	2011	2019	2011	2019
Africa	8	45	51	31	46	35	68	39	56
Americas	155	47	42	13	24	21	46	24	53
Asia	66	41	59	28	45	36	62	43	58
Europe	54	58	69	38	58	46	67	51	61
Australia	7	75	74	6	20	14	45	23	50
Total	290	53	59	23	39	30	58	36	56
Mean		53	59	23	39	30	58	36	56
Median		47	59	28	45	35	62	39	56
Minimum		41	42	6	20	14	45	23	50
Maximum		75	74	38	58	46	68	51	61
Standard deviation		14	13	13	16	13	11	12	4

Table 2 provides a summary of mean, median, minimum, maximum and standard deviation values of the overall ESG scores and its three components over the sample period 2011-2019.

Overall, the average values of each pillar are higher in the 2019 than 2011, with the social and governmental scores that register the highest value. Considering that these scores range on a scale from 0 to 100, the corporate social performance of the financial firms in our sample is not particularly high.

Our analysis is implemented over the following three different panels:

- Panel A, which includes all the selected firms;
- Panel B, in which firms are differentiated in terms of adopted business model (i.e., traditional, hybrid, and non-traditional);
- Panel C, in which firms are differentiated in terms of size (i.e., large, medium, and small).

These compositions allow us to further investigate the relationship between ESG performance and shareholder value creation, also looking at differences in business models and size.

Findings. Table 3 illustrates the descriptive statistics of the Panel A (i.e., mean, minimum, maximum and standard deviation). It is observed that on average the firms in Panel A have a score of 45,76 points out of 100, with a standard deviation of 18,66, which indicates that the banks have good social responsibility practices and disclosure, but not excellent. As reported in the Table 2 the highest scores are registered in Australia and Europe, while the lowest are in America and Asia.

Tab. 3: Descriptive statistics

	Minimum	Maximum	Mean	Standard deviation
Q_{it}	0,01	17,52	0,20	1,02
$\ln(\text{Capital}_{it})$	19,60	27,40	22,91	1,86
ESG_{it}	7,70	88,50	45,76	18,66
Lev_{it}	-	47,40	0,29	2,78

We present below the results of the estimations described previously. Initially, we show the results of the whole sample (Table 4). After, we analyze the results of the estimations considering the type of business model (Table 5), and size (Table 6).

As shown in Table 4, there is a positive and significant relationship between ESG score and shareholder value creation (Tobin's Q), thereby supporting our hypothesis H1.

Moreover, with reference to the other financial variables, there is a positive and significant relationship between shareholder value creation and leverage, while there is a negative and significant relationship with capital.

Our results are partially in line with the findings of Miralles-Quirós et al. (2019) and Crespi & Magliavacca (2020), suggesting that shareholders positively value long-term investment in corporate social actions.

Tab. 4: Panel A results

α	0,74*** (0,00)
$\ln(\text{Capital}_{it})$	-0,03*** (0,00)
ESG_{it}	0,14*** (0,00)
Lev_{it}	0,37*** (0,00)
Adjusted R^2	0,99
F statistic	12.355 (0,00)
Total panel observations	2.320

Note: The table shows the results of analyzing the effect of ESG performance on shareholder value creation in a sample of 290 banks of 48 countries over the 2011-2019 period. The last rows include adjusted R^2 and F test statistics. In brackets are the p-value, indicative of the significance of each coefficient (i.e., *** represents the 1% significance level and ** represents the 5% significance level). In the last row, the table shows the number of observations.

Table 5 illustrates the results of analyzing the effect of ESG performance on shareholder value creation distinguishing among traditional, hybrid, and non-traditional business models.

Tab. 5: Panel B results

	Traditional	Hybrid	Non-traditional
$\ln(\text{Capital}_{it})$	0,01*** (0,00)	0,01*** (0,00)	0,01** (0,02)
ESG_{it}	0,00** (0,01)	0,00** (0,01)	0,00 (0,08)
Lev_{it}	0,37*** (0,00)	-0,03 (0,79)	0,08 (0,66)
Adjusted R^2	0,99	0,59	0,61
F statistic	11.394 (0,00)	57,21 (0,00)	8,69 (0,00)
Total panel observations	1.272	928	120

Note: The table shows the results of analyzing the effect of ESG performance on shareholder value creation in a sample of 290 banks of 48 countries over the 2011-2019 period, distinguishing by the business model. The last rows include adjusted R^2 and F test statistics. In brackets are the p-value, indicative of the significance of each coefficient (i.e., *** represents the 1% significance level and ** represents the 5% significance level). In the last row, the table shows the number of observations.

As shown in Table 5, there is a positive and significant relationship between ESG score and shareholder value creation (Tobin's Q) in both traditional and hybrid business models, thereby supporting our hypothesis H2.

Moreover, with reference to the other financial variables, there is a positive and significant relationship between shareholder value creation and leverage and capital.

Table 6 illustrates the results of analyzing the effect of ESG performance on shareholder value creation distinguishing among large, medium and small firms. Due to the size score assigned on the basis of the amount of total assets, Panel C contains only large and medium banks.

Tab. 6: Panel C results

	Large	Medium	Small
ln(Capital _{it})	0,01*** (0,00)	0,01*** (0,00)	- -
ESG _{it}	0,00*** (0,00)	0,00 (0,13)	- -
Lev _{it}	0,37*** (0,00)	0,02 (0,74)	- -
Adjusted R ²	0,99	0,90	-
F statistic	8.768 (0,00)	235 (0,00)	- -
Total panel observations	1.720	600	-

Note: The table shows the results of analyzing the effect of ESG performance on shareholder value creation in a sample of 290 banks of 48 countries over the 2011-2019 period, distinguishing by the size. The last rows include adjusted R² and F test statistics. In brackets are the p-value, indicative of the significance of each coefficient (i.e. *** represents the 1% significance level and ** represents the 5% significance level). In the last row, the table shows the number of observations.

As we shown in Table 6, large banks show a positive and significant relationship between ESG score and shareholder value creation (Tobin's Q), thereby supporting our hypothesis H3.

Moreover, with reference to the other financial variables, there is a positive and significant relationship between shareholder value creation and leverage and capital.

Notwithstanding the results of our analysis, however, it is necessary to conclude that the relationship between corporate social performance, corporate financial performance and shareholder value creation is complex and needs more research.

Research limits. From a methodological point of view, more variables may be further included in the econometric model, considering, for example, each pillar of the ESG score individually. Furthermore, the endogeneity issue is only partially addressed by lagging the dependent variable of our estimation.

From a theoretical perspective, since the sample is composed by observations referred to the period 2011-2019, we are not able to understand possible differences resulting from the inclusion of Sars-Cov2 effects.

Future research directions should then address further improvements of the identified framework by extending the observed period, including the effects of the Covid-19 pandemic and including also other variables in the econometric model.

Practical implications. Results have important practical implications for policy makers, banks and stakeholders, contributing to enrich the literature on the influence of ESG variables on banks' strategies and business models, highlighting the dynamical aspects of this issue in the present and in the near future.

Originality of the study. Our paper provides several contributions to the ESG field from a theoretical point of view, using a structured and replicable methodology and suggesting that this field requires a dedicated strategy to be formulated within the industry.

Key words: Banking Industry; Sustainability; ESG; Shareholders value creation; Tobin's Q

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Boards of directors in family firms: a review of the literature

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Objectives. *The Board of Directors (BoD) is considered as a potentially key element affecting family firm competitiveness in terms of performance (Anderson and Reeb, 2004), and entrepreneurial behaviors (e.g., Corbetta and Salvato, 2004; Zahra, 1996). Among the positive aspects of having and using a BoD in family firms, the literature identifies the fact that the BoD can help family firms increasing their management experience and improving their ability to access critical external resources (Hillman and Dalziel, 2003; Forbes and Milliken, 1999; Voordeckers et al., 2007). Since 1988, when Family Business Review dedicated an entire issue to the topic, the literature on family business boards has flourished. BoD in family firms have been the subject of extensive debate (e.g., Anderson and Reeb, 2004; Bammens et al., 2011; Corbetta and Salvato, 2004; Arzubiaga et al., 2018; Uhlaner et al. 2020) with large publicly listed firms having captured more attention compared to small and medium sized firms (Bammens et al., 2011).*

Scholars are starting to acknowledge that family business BoD have distinctive features (both in terms of composition and processes) compared to non-family firms (e.g., Uhlaner et al., 2007; Bettinelli, 2011). In addition, there is now agreement on the fact that the functions and activities of the BoD can differ significantly, “ranging from having a mere symbolic function to being actively involved in value-creating activities, such as strategic decision-making and access to valuable resources (Huse, 2007; Westphal and Zajac, 1998)” (Arzubiaga et al., 2018, pg 456). Consequently, often boards of directors in family firms do not fully exploit their potential (Chrisman et al., 2010; p. 20) and many are the calls for family firms to make full use of their board both from the academic scholarship (e.g., Wright et al., 2016) and from the business consultants (PwC, 2016: p.22). This opens the opportunity to dig deeper into the extant knowledge to clarify what we know and what we need to know on the topic through a literature review.

Methodology. *To explore the content of the literature on boards of directors in family firms, to represent its evolution and to identify the main patterns on this aspect, the research design is framed as follows: (i) journals identification (ii) studies selection; (iii) bibliometric analysis and (iv) qualitative analysis.*

- i) *Journals identification: to identify the journal, we focused on international journals with peer-reviewed articles. This is standard practice in bibliometric studies, since these sources are considered ‘certified knowledge’ and enhance the results’ reliability (Fernandez-Alles and Ramos-Rodríguez 2009; Rashman et al. 2009; Sarto et al. 2014; Torchia et al. 2013). In particular, because our task is to gain an understanding of the most relevant research trends, and not to offer an exhaustive review of the entire extant literature, we have followed Vaara and Whittington (2012) and Foss, Husted and Michailova (2010) and decided to select studies published in top-tier journals. In this case, we have chosen among the list Academic Journal Guide 2018 published by Chartered Association of Business Schools (ABS) all journals rated 4* and 4. Considering the specific research topic, we also added Corporate Governance: An International Review (CGIR), Family Business Review (FBR) and Journal of Family Business Strategy (JFBS).*
- ii) *Studies selection: with reference to publications selection, first of all, we extracted a collection of articles and papers published in English on the identified journals from Web of Science core collection (WOS). The reason we chose WOS as a source for our research is that it is one of the largest, most commonly used and generally accepted database for bibliometric studies (Furrer et al. 2008; Marsilio et al. 2011; Ramos-Rodríguez and Rodríguez-Navarro 2004; Rashman et al. 2009; Sarto et al. 2014; Torchia et al. 2013; Unger et al. 2011). To extract our collection, we carried out Boolean search using truncated combinations of two groups of search strings (Furrer et al. 2008; Sarto et al. 2014; Torchia et al. 2013). The first consists of keywords concerning the family business (“family firm*” or “business famil*” or “family business*” or “family enterprise*” or “family influence*” or “family owne*”). The second includes keywords related whit corporate governance field (“board* of director*” or “director*”). In order to gather all relevant publications on the topic, we applied our search protocol without imposing any time restrictions. In this way, 111 publications that include at least a keyword belonging to one of the selected sets were identified. Afterwards we identified only those publications which were explicitly on the role of*

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boards in family firms' topic by examining the content of each title and abstract and, when necessary, the full text of each publication. Finally, a total of 74 articles and papers were identified and selected.

- iii) *Bibliometric analysis*: with the aim of providing a description of the collection and mapping its conceptual structure, we proceed with bibliometric analysis using bibliometrix R-package (<http://www.bibliometrix.org>) developed by Aria-Cuccurullo (Aria-Cuccurullo 2017). Before proceeding with the bibliometric analysis, it was necessary to carry out an intermediate step in which the different versions of keywords with very similar, if not identical, meanings were homogenized. This allows to simplify the analysis and avoid unnecessary duplications. Tab. 1 shows the main aggregate keywords used in our bibliometric analysis.

Tab. 1: Aggregate keywords for bibliometric analysis

Aggregate keywords	Keywords
family firms	family firms, family firm, family business, family-controlled firms, family business group, private family firms, public family business, manufacturing family businesses
board of directors	board of directors, boards of directors, board members, board, board studies
ownership	ownership, ownership structure, family ownership, family control, family owners, ceo ownership, corporate ownership, controlling shareholders, share ownership, privately-owned firms
corporate governance	corporate governance, governance
firm performance	firm performance, financial performance, family firm performance, performance, corporate performance
agency theory	agency theory, agency problem, intrafamily agency conflicts
emerging markets	emerging markets, emerging mnes, Turkey, Thailand, India, Taiwan

Source: authors elaboration

- iv) *Qualitative analysis*: to get a deeper understanding of the research tendencies in the field in the last step of our methodology, as the literature suggests that authors who published most in one time period affect later studies and argues that the development of an academic field is driven by papers with the strongest impact (Bergh et al. 2006; Furrer et al. 2008), we provided a review of most influential articles with regards to the type of article, type of journal, main topic, theoretical framework, research setting and major results.

Findings. (Work in progress) This ongoing literature review provides some preliminary results. Tab. 2 shows main information regarding the collection. As you can see the collection is composed by 71 articles and 3 literature reviews, with the first study in WOS published in 2001. Only 5 publications (just 7%) are authored by a single scholar and on average there are 2.82 co-authors per document. If we consider the number of documents produced by each author, we find a value of 0.4. Thus, as shown in Tab. 3, we can conclude that there is not a strong concentration of authors but rather under this point of view the literature is rather fragmented. This evidence could be interpreted as a signal that the boards of directors in family firms topic may not be the unique focus of research for the authors in our sample. In other words, it is quite possible that this topic, lying at the intersection of the family business and corporate governance fields, is studied by scholars from both streams but does not constitute the main focus of any of them.

Tab. 2: Main information regarding the collection

Description	Results
Documents	74
Period	2001:2020
Sources (Journals, Books, etc)	18
Average citations per documents	72,51
article	71
review	3
Authors	189
Authors of multi-authored documents	184
Single-authored documents	5
Documents per Author	0,392
Co-Authors per Documents	2,82

Source: authors elaboration

Tab. 3: Authors' Production

Documents written	N. of Authors	Proportion of Authors
1	172	0,91
2	14	0,074
3	3	0,016

Source: authors elaboration

Contrariwise, with reference to source of publications we can see a strong concentration. In fact, only 18 of 124 originally identified journals appear in the collection. Furthermore, Tab. 4 shows that 3 journals cover more than 55% of the articles published in the collection.

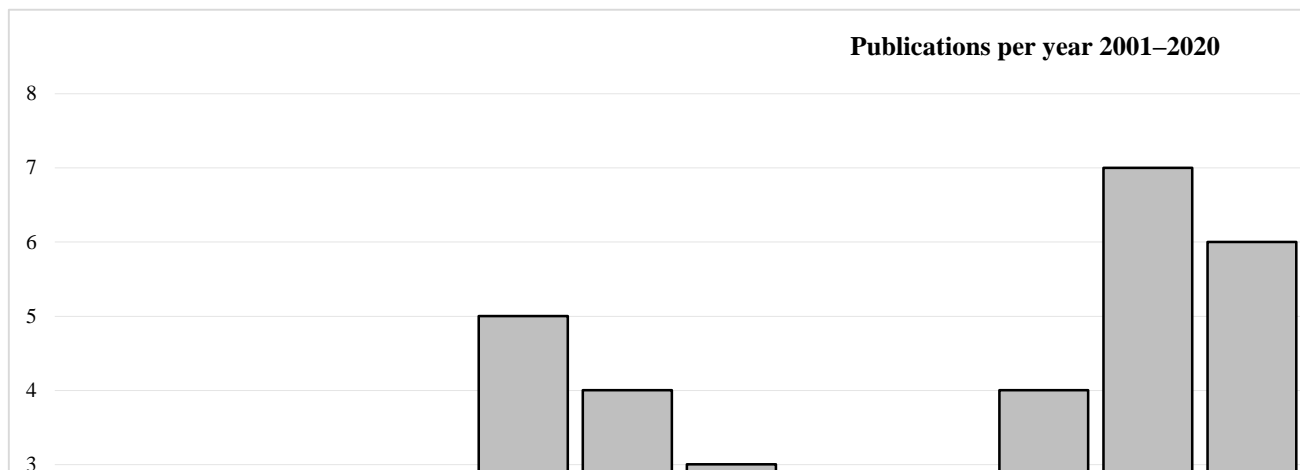
Tab. 4: Most frequent journals

Sources	Articles
<i>JOURNAL OF FAMILY BUSINESS STRATEGY</i>	23
<i>FAMILY BUSINESS REVIEW</i>	10
<i>CORPORATE GOVERNANCE-AN INTERNATIONAL REVIEW</i>	8
<i>ENTREPRENEURSHIP THEORY AND PRACTICE</i>	6
<i>JOURNAL OF CORPORATE FINANCE</i>	6
<i>ORGANIZATION SCIENCE</i>	3
<i>ACADEMY OF MANAGEMENT JOURNAL</i>	2
<i>BRITISH JOURNAL OF MANAGEMENT</i>	2
<i>HUMAN RELATIONS</i>	2
<i>JOURNAL OF BUSINESS VENTURING</i>	2
<i>JOURNAL OF WORLD BUSINESS</i>	2
<i>MANAGEMENT SCIENCE</i>	2
<i>ADMINISTRATIVE SCIENCE QUARTERLY</i>	1
<i>JOURNAL OF FINANCIAL AND QUANTITATIVE ANALYSIS</i>	1
<i>JOURNAL OF FINANCIAL ECONOMICS</i>	1
<i>JOURNAL OF MANAGEMENT</i>	1
<i>ORGANIZATION STUDIES</i>	1
<i>QUARTERLY JOURNAL OF ECONOMICS</i>	1

Source: authors elaboration

Fig. 1 analyzes the annual scientific production over the period 2001-2020 which is characterized by a roller coaster trend with peaks in some years followed by a progressive decrease in the following years up to a new peak. This means that scientific interest on the subject is quite fluctuating over time but still growing overall.

Fig. 1: Publications per year 2001-2020



Source: authors elaboration

With reference to conceptual structure of the collection Fig. 2 reports Author's Keyword co-occurrence network using the kamada-kawai layout (Kamada & Kawai, 1989). It is possible to observe that there is a strong connection between family firms and corporate governance, declined in ownership and board of directors. Moreover, the analysis of the author's keyword network and the top 10 author's keyword (Tab. 5) reveals that four main fields of investigation are explored: (i) board structure and independence; (ii) agency theory problems; (iii) the possible cause-effect relationship between corporate governance and firm performance; (iv) family firms in emerging markets.

Fig. 2: Author's Keyword co-occurrence network



Source: authors elaboration

Tab. 5: Top 10 author's keyword

Author's keywords	Occurrences
family firms	40
corporate governance	28
ownership	17
board of directors	16
agency theory	10
firm performance	8
emerging markets	8
board composition	5
family	5
board independence	4

Source: authors elaboration

To deepen the conceptual structure, it may be useful to trace the evolution of the literature on boards of directors in family firms over time. With this purpose in Tab. 6 we divided the time span of the collection (2001-2020) in four 5-years clusters.

From subperiods analysis, first of all it is possible to note that over years the keywords have increased both in number and in variety. This evidence suggests that scholars have expanded the field of their research on the subject over time, passing from a generic interest to more specific studies.

Going into the details, first period (2001-2005) was characterized by little interest in family firms' boards of directors, only 5 articles are included, and author's keywords were rather generic. This is compatible with a first exploration of the field with introductory systemic research that could serve both as basis for future studies on more specific stream and as an incentive for scholars to investigate the topic. Thus, it does not surprising that the top 3 papers for citation in our collection belong to this subperiod.

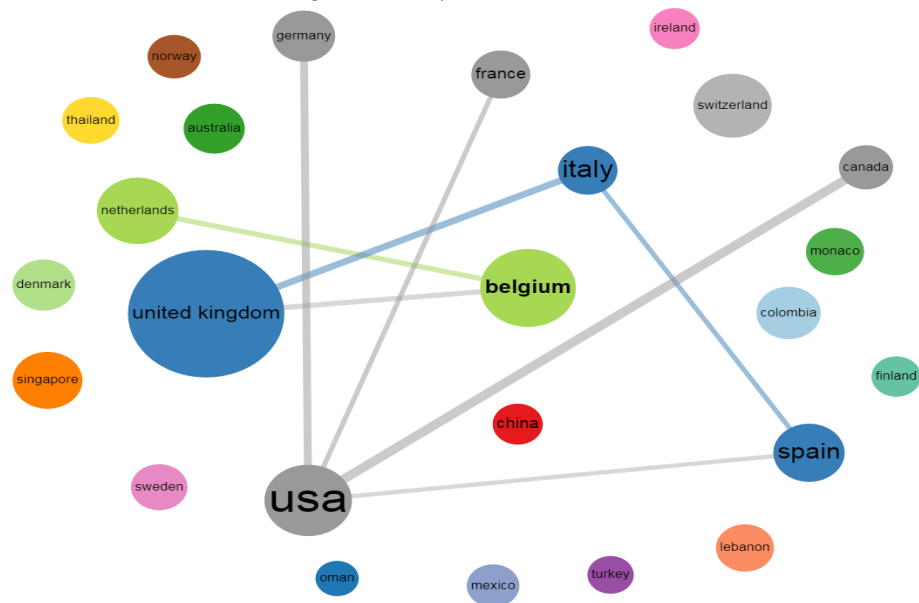
In second period (2006-2010) we can see a considerable increase in the number of articles (+ 300%) and a substantially equal exploration of board structure and independence, firm performance and emerging markets fields. It is surprising to note that the keyword 'family firms' registers only 3 occurrences (18,75%) even though it is the reference context of almost all the studies, even if only the abstract is read.

With reference to third period (2011-2015) the trend of growth of scholars' interest in family firms' boards of directors continues, even if less markedly, and agency theory field reappears into studies together with the introduction of an unprecedented and specific themes concerning the turnover of top figures and the inclusion of external managerial members into boards probably connected to the post-crisis period of 2008. In confirmation of what has just been said, we can also see a robust increase in interest (+ 100%) on family firms in emerging markets field which, as is known, were the only growing geographic areas in that period.

In the last period (2016-2020) we can see a substantial stability in the number of articles compared to the previous period, also considering that the 2020 data are partial as they were extracted at the end of August. Furthermore, it is possible to note that agency theory and board independence e composition fields are very relevant to the detriment of other issues in addition to new specific research insights concerning entrepreneurial orientation and family management.

Finally, Fig. 3 shows the country collaboration network from which is possible to deduce that family firms are a global phenomenon, in fact, studies from all continents, with exceptions of Africa, were included in the collection. It seems that only authors from a few countries, essentially G8 nations, collaborate with each other. This fact could mean that there are similarities between family firms in these countries. At the same time, these results stress the need (especially for top journals) to publish papers that further investigate the topic of family business boards by considering a wider variety of contexts and to stimulate production and collaborations from authors from different parts of the world. When this will happen, we will be able to depict a robust and sound representation of the body of knowledge on this topic and get a full picture.

Fig. 3: Country collaboration network



Source: authors elaboration

Tab. 6: Author's keyword subperiod analysis

Authors' Keywords	2001-2005		2006-2010		2011-2015		2016-2020		Overall	
	N	%	N	%	N	%	N	%	N	%
No. of articles	5		16		28		25		74	
family firms	3	60,00%	3	18,75%	21	75,00%	13	52,00%	40	54,05%
corporate governance	1	20,00%	6	37,50%	13	46,43%	8	32,00%	28	37,84%
ownership	1	20,00%	3	18,75%	6	21,43%	7	28,00%	17	22,97%
board of directors	1	20,00%	4	25,00%	7	25,00%	4	16,00%	16	21,62%
agency theory	1	20,00%	-	-	3	10,71%	6	24,00%	10	13,51%
firm performance	1	20,00%	2	12,50%	3	10,71%	2	8,00%	8	10,81%
emerging markets	-	-	2	12,50%	4	14,29%	2	8,00%	8	10,81%
board composition	-	-	-	-	1	3,57%	4	16,00%	5	6,76%
family	-	-	2	12,50%	1	3,57%	2	8,00%	5	6,76%
board independence	-	-	2	12,50%	1	3,57%	1	4,00%	4	5,41%
ceo turnover	-	-	-	-	4	14,29%	-	-	4	5,41%
socioemotional wealth	-	-	-	-	2	7,14%	2	8,00%	4	5,41%
outside directors	-	-	-	-	3	10,71%	-	-	3	4,05%
entrepreneurial orientation	-	-	-	-	-	-	3	12,00%	3	4,05%
family management	-	-	-	-	-	-	3	12,00%	3	4,05%
board structure	-	-	1	6,25%	1	3,57%	-	-	2	2,70%
embeddedness	-	-	-	-	2	7,14%	-	-	2	2,70%
strategy	-	-	-	-	2	7,14%	-	-	2	2,70%
resource dependence theory	-	-	-	-	1	3,57%	1	4,00%	2	2,70%
outside ceo	-	-	-	-	-	-	2	8,00%	2	2,70%

Source: authors elaboration

Research limits. *The main current limit is that the analysis is still ongoing, as previously stated. We are currently coding all papers included in our sample to provide a systematization of boards of directors in family firms literature domain. Moreover, by carrying out our selection protocol to collect articles it is possible that some important ones have been unintentionally left out.*

Practical implications. *The study of boards of directors in family firms has evolved in multiple streams and by adopting diverse perspectives from different disciplines. This literature review can generate almost three practical implications. First of all, we synthesize the fragmented literature on boards of directors in family firms helping to generate a useful overview for both scholars and practitioners of the topic. Moreover, by offering a representation of the development of this field of study we provide valuable insights into research gaps. Finally, we identify key research directions for future research that will hopefully inspire a fresh- and forward-looking debate.*

Originality of the study. *The literature on boards of directors has burgeoned rapidly during the last decades. The boards of directors in family firms have distinctive features compared to non-family firms and their functions and activities can differ significantly. By conducting a review of this literature, we systematize and provide directions to move this important research stream forward. We are proposing to examine the most relevant themes of boards of directors in family firms highlighting the existing differences between their non-family counterpart. Drawing on our review, we aim to summarize the large existing literature, identify some important research gaps and opportunities and develop promising directions for future research.*

Key words: *family firms; boards of directors; directors; bibliometric analysis; literature review*

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Family firms brand importance: the role of family identification with the firm

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Objectives. *Studying branding strategies of family firms is critical to understand how they communicate at the intersection of two idiosyncratic systems, the family and the business. When looking at family firm brands, research has mainly adopted an internal perspective, exploring how family firms strategically manage their brands (Botero et al., 2013; Micelotta and Raynard, 2011). These studies have shown that branding strategies that communicate the family nature of the firm positively relate to firm performance (Zellweger et al., 2012b) and that viewing the family “as a corporate brand” leads to higher rates of sales growth. A relatively less explored area of research considers the role of external audiences (e.g., media, consumers and other stakeholders) in determining the importance of family firm brands, and how this can ultimately impact company performance. Obtaining an external perspective on family firm brands and on the importance provided to them by external stakeholders - in our case, journalists - is particularly important because it allows us to further understand how they can affect consumers’ choices in turn favoring firms to gain competitive advantages. Although we know that the behavioral intentions of consumers ground their roots in their perception of the brands (Aaker et al., 2010), we believe that it is relevant to complement this knowledge with a more detailed consideration of the brand awareness, its embeddedness in a rich and distinctive discourses, and its connections with different discourse topics.*

In this paper, we thus rely on a recent conceptualization of brand importance (Fronzetti Colladon, 2018) - that is, the degree of importance provided to a brand by external stakeholders given by the prevalence, diversity and connectivity of the brand associations they make when talking about the brand - to assess and investigate the relevance that family firm brands have in online news. While scholar already considered media coverage as a factor affecting individuals choices and preferences (e.g., Liu and Lopez, 2016), there is evidence that just looking at how frequently a brand name is mentioned is not sufficient to fully capture the magnitude of its potential impact (Fronzetti Colladon, 2020). Indeed, media visibility can certainly increase brand awareness, i.e., its recognition and recall (Keller, 1993). However, we should also take into account the brand image that is in consumers’ mind and is affected by the brand associations conveyed by news articles. In particular, to evaluate brand importance, we complement the concept of coverage/visibility, with the two other constructs of brand diversity and connectivity. Diversity looks at the richness and uniqueness of brand association, following previous evidence of a positive impact on brand strength (Grohs et al., 2016). Indeed, a brand name could appear frequently, but in a very narrow discourse. Lastly, connectivity points to the brand name “brokerage power”, i.e. its ability to potentially connect different words and/or discourse topics (Fronzetti Colladon, 2018).

In our paper we aim to offer a new angle on the management of family firm brands by exploring whether brand importance relates to family firm performance, in terms of revenues. Moreover, whereas adopting an external perspective is important to advance marketing and branding research in family business, we cannot ignore the nature of the firms we are studying. Specifically, we contend that the relationship between brand importance and revenues might be contingent to a very peculiar characteristics that is distinctive of family firms - namely, the identification of the family with the firm (e.g., Chrisman et al., 2005; Zellweger et al., 2010). Therefore, we investigate whether the relation between brand importance and revenues changes depending on family firm identity.

Methodology. *To test our hypotheses, we took inspiration from previous studies (e.g., Micelotta & Raynard, 2011) and we considered a sample of family firms listed in the Forbes’ 2018 ranking of the Top 100 Italian entrepreneurial families and their businesses¹. Considering this type of firms is particularly relevant for our study, being entrepreneurial families (and their businesses) renowned for their entrepreneurial orientation (Sieger et al.,*

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¹ <https://forbes.it/classifica/100-famiglie-imprenditoriali-italiane-forbes/>

2011; Zellweger et al., 2012a), which strongly affects the firm strategic decision making process. From the starting list, we excluded 32 family firms because the name of their brand easily associates with famous individuals or products other than the firm, or because more than one firm exists with the same name. To gather data on firms' characteristics, we coded information from secondary sources (e.g., their websites) and retrieved firms' balance sheets from the AIDA database managed by Bureau van Dijk. To assess family firms' brand importance we used the Semantic Brand Score indicator (Fronzetti Colladon, 2018), which we applied to the textual data of Italian online news articles published in the year 2017. Telpress International B.V. provided the news data analyzed in this study, consisting in the articles of major online newspapers, press agencies and information websites in Italy. We considered all the articles that at least once mentioned the companies in our sample, for a total of 52,555 documents. We excluded other 5 firms, because of missing balance sheets, thus the final sample consisted of 63 firms.

Findings. Results show that brand importance positively and significantly associates to firm revenues. This suggests that a family firm whose brand importance is fostered by external stakeholders, meaning that the brand is frequently mentioned in media press (prevalence), is embedded in a rich and distinctive discourse (diversity), and connects different discourse topics (connectivity), obtains a competitive advantage, which likely translate into greater revenues. Nevertheless, our findings also reveal that this positive relation is contingent to a peculiar characteristic of and source of heterogeneity among family firms, that is family firm identity. Specifically, the positive association between brand importance and firm revenues is of greater magnitude when the family identifies with the firm. This could be explained by consumer emotional bonds, affectionate care, and orientation toward the brand that result from the firms choice of highlighting the familial component and promoting their family background, which add to the positive aspects of having high brand awareness. Moreover, identity plays a significant role only when brand importance is sufficiently high.

Research limits. As any other research, our study has limitations, which open up for future research directions. First, online news are not always easily and freely available, especially in the case of massive downloads. Telpress International supported our data collection process providing its full dataset of articles for 2017. This limits our study to be cross-sectional. Accordingly, in this research we do not claim for causality, but give evidence to the significant relationships among our variables of interest. While we are confident on the quality and reliability of our findings, we invite scholar to further advance our study, by replicating our methodology on a longer time period; a longitudinal study would indeed be useful to gain a deeper understanding on the investigated relationships. Second, our empirical investigation relies on data from Italy, which might limit the generalizability of our results. Indeed, the relationship between brand importance and revenues, as well as the moderating effect of family firm identity, might change depending on the cultural context in which the family firm operates. Future studies might consider different countries.

Practical implications. Despite limitations, our study provides some practical suggestions to the management of family firms. First, our results show the relevance of using brand importance as a measure that comprises prevalence, diversity and connectivity and demonstrate that the importance attached to family brand by external stakeholders positively relates to revenues. This suggests that family firms invest in their relationships with media and other external stakeholders. Being the positive relation between brand importance and revenues higher in case of family's identification with the firm, we suggest that family firms carefully choose whether it can be strategic to stress the link between the family and the firm, in their branding activities. In this vein, family firms might benefit from the use of the SBS to analyze the importance of their brands, to make more informed marketing and branding decisions. Second, our study shows that the sentiment generated by the news about the family firms' brand does not relate to revenues. We thus suggest family firms to be less concerned about the positive or negative feelings conveyed by news, and be more interested in raising the importance of their brand.

Originality of the study. Our study advances family business research on branding by introducing the new concept of brand importance and the consideration of its three constitutive pillars - prevalence, diversity and connectivity - to help delineate how family firm brands are perceived by external stakeholders. Moreover, by adopting an external perspective, we sought to advance literature on marketing in family firms, in a way that acknowledges the heterogeneity among these firms. On the one hand, our insights offer a deeper understanding on how brand importance might drive external audiences when they confront family firms brands. Assessing brand importance thus provides family firms with the opportunity to gain a richer perspective to evaluate their brands and understand how they relate to performance. Further contributing to the family business research, we show that family firm identity affects the relationship between family firm brand importance and performance. In this way, we extend prior studies that have acknowledged how the overlap between family's and firm's identities is an important determinant of family firm behavior (e.g., Deephouse and Jaskiewicz, 2013; Sundaramurthy and Kreiner, 2008) and may explain family firm heterogeneity (Chua et al., 2012). However, we depart by prior literature that shows a positive effect of family firm identity on consumers' purchases. Our results indicate that family firm identity does not relate to revenues per se, but it needs a minimum level of brand importance to play a role.

Moreover, by applying the SBS to study family firm brands, we move forward from the traditional use of surveys, case studies, interviews and/or focus groups (Aaker, 1996; Keller, 1993; Lassar et al., 1995) and we provide a new (big data) approach based on the discourse analysis of a considerable number of online news. Our method allows repeatable and automated measurements for a constant monitoring of brand importance. We believe that our research exploits the opportunities offered by the current availability of online rich text data and provide additional evidences that can inspire researchers in the family business field to adopt big data methods for their decision-making processes. In addition, we extend research on brand importance and the application of the SBS to the context of family business.

Finally, our findings partially contrast with studies attributing high importance to the positivity of messages for the prediction of consumers behaviors (e.g., Kim and Ko, 2012), as in our setting sentiment was mostly uninfluential. Therefore, whereas it is important to monitor the sentiment of external stakeholders towards a brand, our results suggest that family business scholars should pay more attention to the importance attached to the brand rather than the sentiment it generates.

Key words: family firm; brand importance; identity; SBS

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Risks in family firms: a review of the literature

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Objectives. *Research on risks in family firms has been burgeoning during the last decades. In the context of family firms, risks can be particularly relevant because the family dimension typically goes well beyond the mere economic and legal aspects. Previous reviews of the literature have focused on the entrepreneurial dimension, leaving out the organizational and financial dimensions. Goel and Jones (2016) pointed their attention on individual risk behaviors such as entrepreneurial exploration and exploitation in family business, while Hernández-Linares and López-Fernández (2018) mapped the literature on entrepreneurial orientation, where risk-taking is one its dimensions. However, the concept of risk and of risk management covers a way broader than often assumed (Hoskisson et al. 2017), including strategic choices with uncertain consequences at the individual (e.g., managerial satisfaction with firm performance), firm (e.g., corporate restructuring and diversification) and environmental level (e.g., market reaction), and this consideration applies also to the context of family firms. We argue that the literature on risks in family firms is still scattered and is broader than the mere analysis of individual risk behaviors. Scholars studied whether family firms are more risk averse than non-family firms, and considered the variables that characterize them and make them different from their non-family counterparts (Chrisman & Patel, 2012). Yet, other research focused on the risks that family firms can face, for example higher risks of expropriation of minority shareholders (Attig et al. 2008), and lower risks risk associated with firm bankruptcy (Gentry et al. 2014). For this reason, we propose a review of the literature that considers family firms' behaviors toward risks and all the risks associated with this type of firm.*

Some scholars tend to see family firms more inclined to risks, as they try to preserve their Socioemotional-Wealth (Berrone et al. 2012), while others believe that family firms are more risk averse (e.g., Bassetti et al. 2015) and therefore, less exposed to risks than non-family firms (e.g., Huybrechts et al. 2013). Starting from these contrasting assumptions we analyze the state of art of the literature on risks in family firms. Moreover, with this ongoing work we want to identifying research gaps and outlining directions to support future research either from a methodological and from a theoretical standpoint (Tranfield et al. 2003).

Methodology. *We are producing a systematic literature review that aims at mapping current knowledge on risks in the family firm context. First of all, our search protocol was based on Web of Science core collection (WOS). The reason we chose WOS as a source for our research is that it is one of the largest, most commonly used and generally accepted database for literature reviews and bibliometric studies (Furrer et al. 2008; Marsilio et al. 2011; Ramos-Rodríguez and Rodríguez-Navarro 2004; Rashman et al. 2009; Sarto et al. 2014; Torchia et al. 2013; Unger et al. 2011). Subsequently we have developed a Boolean research string consisting of a combination of truncated keywords (Furrer et al. 2008; Sarto et al. 2014; Torchia et al. 2013). The first group of keywords identified the topic of our study and the second was a group of keywords that allowed us to focus our research to the family business field. We searched the identified keywords related to risks in family firms for Title, Abstract, Author Keywords and Keywords Plus. We refined the results using the filters document types ("article" or "early access" or "review" or "editorial material"), languages ("English") and Web of science category ("business" or "history" or "social sciences" or "management" or "sociology" or "business finance" or "international relations" or "psychology social" or "ethics" or "multidisciplinary sciences" or "family studies" or "communication" or "economics" or "environmental studies" or "psychology applied" or "psychology" or "social sciences interdisciplinary" or "social work" or "behavioral sciences" or "environmental sciences" or "psychology multidisciplinary"). In order to combine the need to collect all the relevant publications and at the same time obtain more significant results in the bibliometric analysis, we initially did not set time restrictions but then we excluded the articles published in 2021. In so doing, we are able to include all articles published until 31th December 2020. At this initial step, a total of 1,202 articles were identified.*

According whit standard practice we decided to take into account only international journals with peer-reviewed articles, since these sources are considered 'certified knowledge' and enhance the results' reliability (Fernandez-Alles and Ramos-Rodríguez 2009; Rashman et al. 2009; Sarto et al. 2014; Torchia et al. 2013). In particular, following

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Vaara and Whittington (2012) and Foss, Husted and Michailova (2010) we select studies published in top-tier journals. For this reason, we have identified academic journals listed as 3, 4, 4* in the Chartered Association of Business Schools' Academic Journal Guide (2018) - ABS Academic Journal Guide. We also decided to include in the journals' selections "Journal of Family Business Strategy" to consider the specific contributions existing on the topic in the family firm's literature. As a result of this step 821 articles were eliminated from our dataset. In the following step, one of the authors divided the remaining articles into three categories (A - papers relevant to the research objective, B - papers whose relevance was unclear, C - non-relevant papers). Subsequently, the author passed the final sampled articles divided in the three different categories to the other two authors, which checked that the articles in the category "C - non-relevant papers" were placed in the correct category (193 articles at this point) and could be correctly eliminated from the final sample. Then, the authors discussed together the articles in the category "B - papers whose relevance was unclear" for inclusion of only relevant articles in line with the literature review scope, and they decided whether to move them to the category "A - papers relevant to the research objective" or to the category "C - non-relevant papers". Finally, the selection protocol adapted from Jones et al. (2011) led us to currently identify 146 pertinent articles.

We firstly proceed with a basic bibliometric analysis using bibliometrix R-package (<http://www.bibliometrix.org>) developed by Aria-Cuccurullo (Aria and Cuccurullo 2017) to provide some preliminary descriptive findings with reference to our articles collection.

Then, we are currently conducting a qualitative systematic analysis of each of the final sampled articles where we identify the key information that will allow us to create a thematic ontological framework. The information that we are gathering are:

- Type of study (i.e., empirical, conceptual, literature review)
- Nature of study (i.e., qualitative, quantitative, mix)
- Sample description
- Key findings (i.e., drivers, outcomes, moderators, mediators)
- Comparative study (i.e., focus on FFs only or comparison between FFs and non-FFs)
- Main theory(ies)/perspectives
- Level of analysis (i.e., family, FF, TMT/Boards)
- Research questions
- Hypotheses/propositions
- Name of risk
- Definition of risk
- Type of risk
- Measures of risk

Findings. (Work in progress) This ongoing literature review provides some preliminary results. Tab. 1 shows the main information regarding the sampled studies. The sample is composed by 146 articles, with the first study retrieved in WOS being published in 2001 with each publication having an average age of 6.89 years. Hence, we can argue that risk in family businesses is reaching a maturity stage. Moreover, only 16 publications are authored by a single scholar and on average there are 2.78 co-authors per article. If we consider the number of articles produced by each author, we find a value of 0.4. Thus, as shown in Tab. 2, we can conclude that there is not a strong concentration of authors but rather under this point of view the literature is rather fragmented. In fact, almost 87% of the authors that appear in our sample (291 authors out of 335) wrote only one paper. This evidence could be interpreted as a signal that risks are treated by many non-family firm scholars who include family firms in their investigations probably because they acknowledge their importance for a better understanding of many risk phenomena. In other words, it is quite possible that the topic of risk embraces different research fields and intersects different streams of literature.

Tab. 1: Articles details

Description	Results
Timespan	2001:2020
Journals	47
Articles	146
Average years from publication	6,89
Authors	335
Single-authored articles	16
Articles per Author	0,436
Co-Authors per Article	2,78

Source: authors elaboration

Tab. 2: Authors' Production

<i>Articles written</i>	<i>N. of Authors</i>	<i>Proportion of Authors</i>
8	1	0,30%
5	3	0,90%
4	3	0,90%
3	6	1,79%
2	31	9,25%
1	291	86,87%

Source: authors elaboration

With reference to the source of publication we can observe that the collection comes from 47 different journals and is distributed unevenly within them. In fact, Tab. 3 shows that in top-5 most relevant sources cover more than 40% of our sample. According to Bradford's law (Bradford 1985) these journals represent the core sources of the collection.

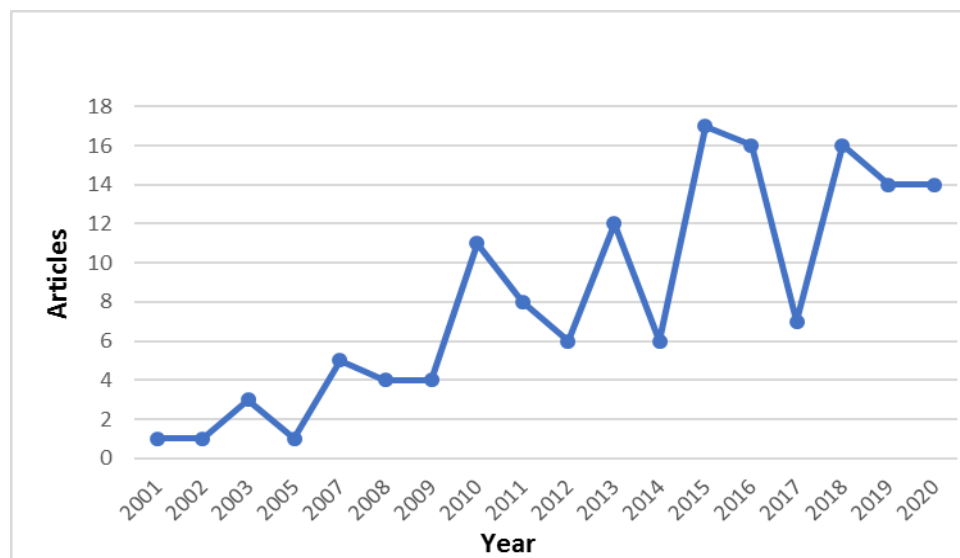
Tab. 3: Most prolific journals

<i>Sources</i>	<i>Articles</i>
<i>FAMILY BUSINESS REVIEW</i>	25
<i>ENTREPRENEURSHIP THEORY AND PRACTICE</i>	10
<i>JOURNAL OF BUSINESS RESEARCH</i>	8
<i>JOURNAL OF FAMILY BUSINESS STRATEGY</i>	8
<i>SMALL BUSINESS ECONOMICS</i>	8

Source: authors elaboration

Since the first article focused on risks in family firms published in 2001, Fig. 1 shows an irregular course in which is possible to identify peaks in some years followed by a progressive decrease in the following years up to a new peak. This means that scientific interest on the subject is quite fluctuating over time but still growing overall with an annual growth rate of 14.5%. From year 2009 on, research interest on the topic has increased. A reason could be due to 2007-2008 financial crisis, which may have triggered research on the subject. In the last 5 years, apart from 2017, we can note a stable interest at the higher levels of the curve as evidence of the fact that the topic still deserves to be explored.

Fig. 1: Annual scientific production over the period 2001-2020



Source: authors elaboration

Our literature review shows a strong predominance of quantitative articles (more than 83% of the studies) (Fig.2). Thus, regarding methodological issues, we argue that future research should focus more on various qualitative approaches, e.g., case studies and interviews could be used for in-depth analyze risk to see how it influences individual behaviors and how the organization responds to different types of risk.

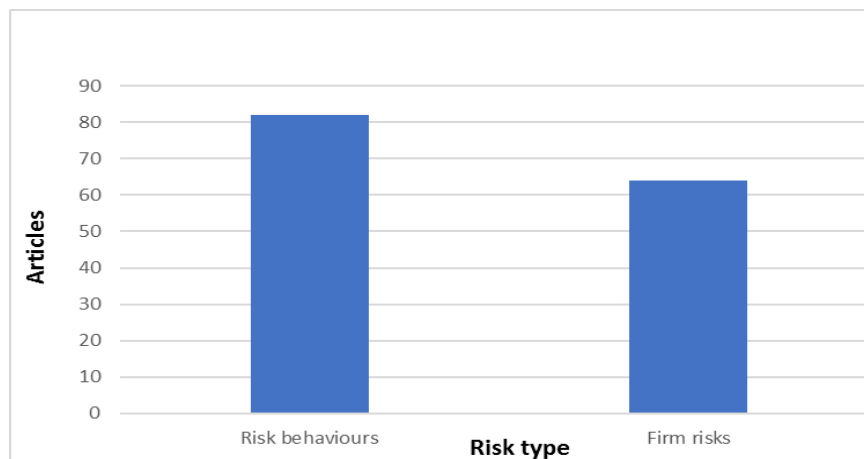
Fig. 2: Author's Keyword co-occurrence network



Source: authors elaboration

Moreover, we would encourage scholars to combine qualitative research and quantitative approaches in order to promote research designs that allow to offer a more complete view on risks occurring in family firms. In addition, our preliminary findings show that risks in family firms have been studied in different dimensions which, as illustrated in Fig. 3, can be distinguished into two macro-themes: Risk behaviors, and firm-related risk types. Articles focusing on concepts related to risk behaviors (57%) such as risk-taking, risk aversion, and/or risk management seem to point their attention at the individual and or group level. Indeed, in this stream of research the risk derives from individuals, such as entrepreneurs, founders, CEOs, managers and/or on family members. Instead, articles focusing on firm-related risks (43%) have mainly investigated risks connected with the business at the organizational level, rather than at the individual one. So far, we have identified two main subdimensions coded in the literature related to firm risks: Risks associated with financial aspects, e.g., audit risks, i.e., higher audit fees due to significant errors in the financial statement (Barroso et al. 2016); risks connected to the business itself, e.g., risks of bankruptcy (Gentry et al. 2014) and when the survival of the firm is at risk (Casillas et al. 2019).

Fig. 3: Articles based on risk-related typology



Source: authors elaboration

In our preliminary analysis, we also noted that there is a wide prevalence of articles focused on family and non-family firms compared to the works focused on family firms only. What are the effects of such choices? While comparing family versus non-family firms can allow to identify useful family firms' specificities, in the future it may be useful to build research that sheds also light on the heterogeneity among family firms (Memili & Dibrell, 2019), particularly in relation to how they deal with situation where the business is at risk and how family firms and their individual actors behave before, during, and after taking (or avoiding) risky strategic decisions. To summarize, every form of organization is affected by, and faces, risks. This is even more relevant for family firms where the family plays an important role in the occurring of these dynamics. We believe that a review of the literature on risks in family firms would contribute to the debate and properly guide future studies on this prominent topic.

Research limits. The main current limit is that the analysis is still ongoing, as previously stated. We are currently conducting the thematic ontological analysis on the final sampled articles, which will allow us to produce an

ontological framework that maps the current state of art of the literature on risks in family firms, identifying family firms their peculiarities, the different risks definitions, risks types, theories used, measurements of risks and the main methodological issues, in order to identify the main gaps and provide sound guidance and directions for future research. The main point on which we are working on, is the coding of the articles. The literature is broad, scattered and fragmented, it includes a multitude of risks types, risks definitions, risks concepts and risk measurements, at times focusing on the attitude and propensity toward risk, other times on risk behaviors and/or risk types. Indeed, the literature incorporates different streams of research from various fields (e.g., management, organizational behavior, finance, etc.). For these reasons, it is not simple to categorize the articles, code them and qualitatively analyze them in a systematic manner. However, to find a way to code the articles, identifying what drives various risks in family firms and what are the outcomes when certain risks occur, would contribute to the literature and bridge different streams of research. Another issue that we identified, is that, in some cases, risks such as “risk-taking” are not measured alone, but are considered as part of Entrepreneurial Orientation, usually measured on three main dimensions - innovativeness, risk taking, and proactiveness (e.g., Casillas et al. 2019; Arzubiaga et al. 2018). Going on with the analysis, we are working to find a way to code this construct and conceptualize it, considering “risk taking” as an important, distinct and independent dimension of Entrepreneurial Orientation in family businesses, even though it is positively associated with the other Entrepreneurial Orientation’s dimensions (Naldi et al. 2007).

Practical implications. This literature review could have some important practical implication and contribute to the development of research in the family firms’ risks field in different ways. First, we categorize different types of risk occurring in family firms and we associate them with different levels of analysis. This multi-level analysis can significantly impact the understanding of risk dynamics and their management within family businesses. Second, we identify which factors favor or reduce the various type of risks identified in the family firm literature, and what the outcomes are when risks are taken into account. Again, this result can help both family e non-family managers to deal whit risk. In addition, we bridge different streams of literature on family firms’ risks. Finally, such review has the potential to reveal important knowledge gaps and to develop a promising research agenda which will provide a guidance to extend the literature on risk in family firms and how further research should be conducted on the topic.

Originality of the study. The literature on risks in family firms has developed rapidly in recent decades. By conducting a systematic review of this literature, we take stock and provide directions to move this flourishing research area forward. We are examining the predominant themes of risks in family firms, pointing out family firms’ peculiarities on the topic and highlighting the differences between family and non-family firms. Drawing on our work in progress review, we aim to summarize this interdisciplinary literature, identify some important research opportunities and develop promising directions for future research.

Key words: family firms; risks; behaviors; attitude; bibliometric analysis; literature review

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Family ownership concentration and FDI location choice: a bifurcation bias approach

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Objectives. *Stemming from the bifurcation bias approach, this working paper investigates whether there is a relationship between family ownership concentration and cultural distance in foreign direct investments' (FDIs') portfolio and to what extent contingency factors, such as internal (below target performance) or external (global financial crisis) threats, can impact this relationship.*

Although the FDI location choice is considered as a function of a mix of economic and institutional factors (e.g., market attractiveness, low-cost resources, quality of human capital, transportation infrastructure, political stability and trade openness) (Flores and Aguilera, 2007; Kim and Aguilera, 2016), recent research suggests that characteristics of the firm's ownership structure could substantially shape this choice (Lien and Filatotchev, 2015). In particular, the presence of a controlling family in the ownership is attracting increasing scholarly attention in the international business (IB) debate, given its unparalleled features compared to other types of ownership structures (Xu et al., 2019). High identification and alignment with the firm, more agile decision-making, a long-term horizon which leads to resilient behaviors in times of hardship, and transgenerational orientation are only some of the distinguishing features. Indeed, when dealing with strategic choices, such as the location of their FDIs, family owners take into account a unique mix of business- and family-related preferences, which make international strategic decisions in family firms significantly different from those of non-family firms (Pukall and Calabrò, 2014).

Prior studies have extensively shown that the characteristics of the ownership structure influence the extent to which the family firm goes international, i.e., international intensity (e.g., Calabrò et al., 2013; Fernández and Nieto, 2006; Sciascia et al., 2012; Zahra, 2003), as well as how the family firm internationalizes, i.e., entry mode decisions (e.g., Boellis et al., 2016; Pongelli et al., 2016; Sestu and Majocchi, 2020; Xu et al., 2019). Yet, where family firms do internationalize, i.e., location choices, is still being debated, as only a few studies have explored this issue so far and with contrasting evidence (Lien and Filatotchev, 2015; Gómez-Mejía et al., 2010; Strange et al., 2009). This is surprising, considering that the location is one of the main aspects of firms' international behavior, as also recently highlighted in the mainstream IB discussion (Kim and Aguilera, 2016). Moreover, recent attempts have addressed the inherent heterogeneity issue within the group of family firms, showing, for instance, different entry mode decisions associated with different types of family ownership constellations (Xu et al., 2019) and that family decision makers become more risk-seeking in their strategic choices, especially when they face internal (Gómez-Mejía et al., 2018) and external threats (Minichilli et al., 2016), which could compromise their future survivability and existence. However, the debate is still in its infancy and more investigation is warranted. We aim at addressing the above-mentioned gaps by answering the following research questions: 1) How does family ownership concentration influence the cultural distance of the FDI portfolio? 2) What changes occur when the firm is exposed to internal and external threats?

We draw on recent insights from the bifurcation bias approach (Kano and Verbeke, 2018; Verbeke et al., 2019) in order to highlight how family firms with concentrated ownership are especially inclined to family-oriented or biased decisions, which drive them to avoid culturally distant FDI locations, on the basis that they fit less well with family-related priorities compared to alternative locations. Such bias consists of preferring and trying to preserve family-based assets (i.e., heritage assets) over non-family ones (i.e., commodity assets). This bifurcation bias is considered to be an affect-driven barrier to efficient decision-making in family firms, as it may lead to an excessive focus on socioemotional preferences that go against the rational evaluation of available international location alternatives

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(Kano and Verbeke, 2018; Verbeke and Kano, 2012). Nevertheless, there might be contingencies under which family decision makers can overcome the bifurcation bias. In this direction, we propose that performance below aspirations and the global financial crisis, respectively, a widely accepted form of internal and external threat (Gómez-Mejía et al., 2018; Minichilli et al., 2016), can mitigate the influence of the bifurcation bias over FDI location decisions in family firms. Specifically, in the face of a threat to the firm's survival, family owners with large shareholders can revise the emphasis placed on family-related priorities and fix the bias more easily and more rapidly than family owners with dispersed ownership, where consensus over the right direction to pursue is harder to reach.

Methodology. We test our hypotheses on a longitudinal database on medium- and large-sized Italian family firms, which covers the years from 2004 to 2014. Our sample is based on Italian family firms whose annual sales exceeded the threshold of 50 million euros in the fiscal year 2014. This threshold corresponds to the boundary that distinguishes small from medium- and large-sized family firms in the Italian context (Amore et al., 2011). This is an appropriate setting in which to investigate external growth choices through FDIs, as smaller firms are often characterized by domestic growth or export strategies (Naldi and Davidsson, 2014).

We define family firms as those non-listed firms in which one or two families control the absolute majority of shares (Miller et al., 2013). As most non-listed family firms are controlled by a small number of shareholders in Italy, a 50% stake is often needed to exert control (Amore et al., 2011). Consistent with other studies, we reduced this threshold to 25% for family firms listed on the stock market, as the fragmentation of minority shareholders and/or the use of control-enhancing mechanisms are able to maintain control of the firm (Miller et al., 2013).

The data set is assembled using detailed and updated information from three different sources. For each firm, we collected the financial data from Aida, which is the Italian accounting data service provider of Bureau van Dijk. Ownership data were hand-collected using CONSOB data for listed firms and official public filings obtained from the Italian Chamber of Commerce for unlisted firms. Data on FDIs were collected from Orbis, provided by Bureau van Dijk, which contains information on over 160 million firms worldwide. Excluding subsidiaries of foreign parent firms from our sample, for each firm, we collected relevant information on subsidiaries held abroad with a stake higher than 10% (excluding purely financial investments) at the end of 2014, including subsidiaries held indirectly. Then, we identified the year in which each FDI was realized, reconstructing the portfolio of FDIs for the period of 2004-2014. In particular, 1,304 family firms were found to be internationalized in the financial year 2014 (e.g., with at least one FDI), out of the initial sample of 2,651 family firms. In total, they account for 13,212 FDIs. Finally, we merged our data sources and dropped observations with missing values in the key explanatory variables, as well as observations with a negative or zero book value of assets.

The result is a panel data set which allows us to monitor the behavior of each entity over the complete period of 2004-2014. While our final data set is limited to medium and large firms, it has a number of important advantages. First, it covers listed firms as well as the vast majority of privately held companies (around 96%), which represent the most widespread organizational form in the Italian economy. Second, it has a longitudinal dimension, and a number of studies has highlighted how important this is, in the context of family firms (Gómez-Mejía et al., 2018), in understanding risk behavior (Hoskisson et al., 2017). Third, it contains a large set of firm characteristics that permits us to carefully control for factors potentially intervening in our analysis.

Findings. By focusing on foreign location choices in the context of family firms, where strategic decisions are driven by both economic and non-economic priorities, the aim of this article has been to investigate the theoretical contention that family firms with high family ownership concentration will locate their FDIs in less culturally distant countries, unless they are facing internal or external threats. Our results support this contention, suggesting that family ownership concentration negatively influences the cultural distance of the FDI portfolio and that this tendency changes when the firm has performance below aspirations or a global financial crisis is occurring. Indeed, the research is still in progress but empirical evidence confirms so far our contention that family firms with high levels of ownership concentration are less likely to locate FDIs in culturally distant countries. We also find that this tendency changes when the firm is experiencing performance below aspirations and when the global financial crisis is occurring, as family owners with concentrated ownership are more likely to select culturally distant FDI locations under these circumstances. Overall, this study shows that family firms cannot be treated as a homogenous group of firms and that considering that heterogeneity could lead to a better understanding of the variations in FDI location choices. We tackle this heterogeneity by considering differences in the family ownership structure with respect to internationalization, which is consistent with a large body of literature in the IB and family business research fields (e.g., Arregle et al., 2012, 2017; Pongelli et al., 2016; Sansant-Bueno and Usero, 2014; Xu et al., 2019; Zahra, 2003). We combine this notion with recent insights into the bifurcation bias approach (Verbeke and Kano, 2012; Kano and Verbeke, 2018) in order to demonstrate that decisions in family firms with concentrated ownership are especially biased, i.e., strongly driven by the prioritization of family heritage assets. Our contention is that the pervasive presence of such bias at higher levels of family ownership concentration generates an aversion towards locating FDIs in culturally distant countries. Indeed, when family firms realize FDIs in culturally distant countries, they face greater uncertainty and perceived risk compared to FDIs in less culturally distant countries, because of the issues arising in connection with operating in culturally distant countries, such as different languages, institutions and norms (Ojala, 2015). In addition, the emphasis on family-related priorities may differently nuance cultural distance. In fact, by increasing the need to adapt the business to differences in the host market and to rely heavily on local actors to overcome that lack of familiarity, cultural distance not only increases the risk perception, but might also clash with the pursuit of family-

related priorities that strongly drive international strategic decisions in family firms (Gomez-Mejia et al., 2010; Reuber, 2016).

Our findings further show that certain boundary contingencies affect the above-described mechanism. In particular, we show that, in the face of internal (performance below aspirations) or external (the global financial crisis) threats, the cultural distance of the FDI portfolio increases at higher levels of family ownership concentration. This is consistent with our idea that family owners may be triggered to revise their FDI location decisions when confronted by such threats, thereby placing lesser emphasis on family heritage assets in order to safeguard the long-term survival of the family business. More precisely, our explanation is that family owners with concentrated ownership may be more effective than family owners with dispersed ownership in rewriting their strategic agenda and reducing the influence of family-related priorities over international investment decisions, due to a higher authority in decision-making and fewer internal conflicts. This finding thus suggests and supports the view that, if only one family member (or a few) dominates, decision-making could be facilitated (Feltham et al., 2005) in times of hardship, whereas family firms with less discretion on the part of single owners are more prone to conflicts (Martin et al., 2017). A possible alternative explanation is that family firms with a dominant owner could leverage more easily the large amounts of survival capital, such as extra work without pay or interest-free loans from other family members, which can be utilized when the firms experience below target performance (Arregle et al., 2007; Sirmon and Hitt, 2003) or face an external crisis.

Research limits. Although we rely on the bifurcation bias approach, we neither directly measure the actual presence of differential treatment between family heritage assets and non-family assets, nor measure its direct impact on FDI location choices. However, this approach is still in its infancy and empirical evidence is still scarce. Moreover, previous studies have provided interesting insights into how certain triggers can alter the influence of bifurcation bias over strategic decisions in family firms by activating specific “economizing mechanisms”, which family owners can exploit in order to soften the distortions generated by the prioritization of the family heritage (Verbeke and Kano, 2012; Kano and Verbeke, 2018; Majocchi et al., 2018). While our study represents a first attempt to understand when bifurcation bias is mitigated in bifurcation-biased firms, we believe future studies could better address this issue and focus firms’ efforts to empirically isolate specific economizing mechanisms as well as other internal and external conditions that foster their activation. Second, we use the cultural distance of the FDI portfolio as a measure of strategic decision-making behavior. Even though the distance between the home and the host countries encompasses differences in values, norms and behaviors (Hofstede, 1980), as well as reflects country risk when evaluating alternative locations for firms’ investments, it does not include the strategic appeal and the financial opportunities in terms of GDP growth offered by the different countries, and in particular by the most culturally distant countries. Thus, other studies could use alternative dependent variables, which also consider the economic potential of the different countries in the FDI portfolio composition, especially during periods of global financial crisis.

Practical implications. Our study also has implications for family business owners and managers. Our findings indeed could foster reflections about which family ownership constellation should be designed in order to promote international growth through FDIs pursued in more culturally distant countries. While family ownership concentration may be a source of family-driven decision-making, it could also have a beneficial effect in times of internal and/or external financial difficulties. Under such circumstances, having a dominant family shareholder would give to the firm the speed and the flexibility needed in the decision-making process to contrast the effects of this negative scenario.

Originality of the study. Our work sides with recent studies showing that family decision makers move their preferences from risk-averse towards more risk-seeking international behaviors with respect to safeguarding family-related assets when severe risks to the future firm’s survival occur (Gómez-Mejia et al., 2018; Minichilli et al., 2016). When the business risk increases, family firms are more willing to give priority to financial results through an explorative attitude in order to preserve the future wealth of the family business (Patel and Chrisman, 2014). Specifically, we integrate this stream of studies with the bifurcation bias approach, indicating that, while family ownership concentration is associated with stronger bifurcation bias, this also implies a greater ability to fix such bias when the occurrence of threats forces family owners to revise their priorities. In doing so, we also extend the recently evolved bifurcation bias approach, as we provide theoretical and empirical evidence for internal and external threats that encourage large family shareholders to provide remedy for the bias. This is particularly interesting as, if left unresolved, bifurcation bias will lead to poor strategic decision-making in family firms that undertake internationalization (Kano and Verbeke, 2018); however, specific contingencies that help family decision-makers to fix such bias are still largely unexplored.

From a theoretical standpoint, our study also complements efforts concerning the effect of regional strategies for the internationalization of family firms (e.g., Banalieva and Eddleston, 2011; Pongelli et al., 2019). Indeed, by focusing on cultural rather than geographical distance, we provide a different perspective as to how the concept of distance is framed in family firms.

Key words: Family firms; Internationalization; FDI location choices; Cultural distance; Bifurcation bias

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Family firm branding: a bibliometric analysis and research agenda

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Objectives. *This paper aims to provide a systematization of the extant literature on family firm branding through a bibliometric analysis; moreover, it tries to offer a research agenda. In particular, through bibliometric analysis, we attempt to identify the most important research lines existing in family firm branding literature and the main theoretical frameworks underlying such stream of research.*

Indeed, in recent years we have witnessed massive interest from scholars toward family firm branding (Astrachan et al., 2018), as also demonstrated by the increasing number of documents published on this topic, especially in the last 10 years. The reasons underlying this growing interest are essentially three: a) the huge importance of family firms in the world economy (Lude and Prügl, 2018), enough to be described as its “backbone” (Beck, 2016: 225); b) the fundamental importance of the family firm’s brand as strategic resource turning the idiosyncratic nature of the firm into a competitive advantage, with an additional differentiation and leverage (Astrachan et al., 2018); c) the ambiguity behind the reasons why some firms decide to promote their family nature, while others prefer to act as “non-family firm”, despite of the great importance of family firm branding (Lude and Prügl, 2018).

Notwithstanding this growth in interest in family branding, significant gaps still exist, as identified by several scholars. In our opinion, the most significant gap that has mainly contributed to our decision to focus on this subject is the one identified by Astrachan and colleagues (2018): currently, it is not still clear what family branding is. In fact, the phenomenon of family branding has been studied from numerous angles, without ever producing a true systematization and, thus, creating an extremely fragmented field of research. Moreover, the last review on family branding is the one published by Sageder et colleagues (2015), which has three current weaknesses: first of all, it considers papers published only until 2015, so it is slightly outdated; then it only looks at two aspects of family branding: i.e. image and reputation; and finally, it is a qualitative study, which as such can suffer of a certain degree of subjectivity.

Therefore, drawing on the aforementioned elements, our research is meant to provide an answer to the following research questions: 1) What are the theoretical frameworks on which family brand literature is currently based? 2) What are the main topics attracting major interest within family brand literature?

According to our research questions, we propose a quantitative and updated review of the literature, building our study on bibliometric analysis, as it “introduces quantitative rigor into the subjective evaluation of the literature” (Zupic and Carter, 2015: 431). In particular, to reach our research goals, we performed a double bibliometric co-citation analysis: an external and an internal analysis, to answer to the first and the second question, respectively.

To perform the bibliometric analysis, we decided to consider the three dimensions of family brand, as previously identified by Astrachan and colleagues (2018): i.e. image, identity, and reputation. Then, we explored the Web of Science (WoS) of Clarivate Analytics® and collected 66 papers on family branding. We operated a double bibliometric co-citation analysis on this dataset; and specifically, with the employment of the internal analysis we have identified the main topics characterizing family branding literature, while with the employment of the external one we have identified the theoretical roots at the origin of this stream of research.

The contribution of our study is twofold. First, we tried to systematize the existing research on family branding in a quantitative way (i.e., through the bibliometric analysis), also trying to minimize the biases. Secondly, also by embracing the latest contributions on the topic, we considered the three main components of family firm brand: image, identity, and reputation. Additionally, we identified the theoretical roots of family firm branding, categorizing them in 3 clusters, while also grouped in 5 clusters the main topics of the literature. Finally, in view of the findings of our analysis, we provided a research agenda that could address scholars in future research.

Methodology. *Since this paper aims to provide a quantitative and systematic representation of the existing literature on family branding, the methodology used in this study is bibliometric analysis. We selected bibliometric analysis for many reasons. First, among the existing techniques, it is one of the most used by scholars to perform a literature review. Second, since it is a quantitative methodology, it can “introduce a systematic, transparent, and reproducible review process and thus improve the quality of a review” (Zupic and Cater, 2015: 430); indeed, because of its quantitative nature, it can reduce the subjective biases of the analysis (Zupic and Cater, 2015), contributing to a*

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more impartial and unbiased assessment (Nerur et al., 2008). Third, bibliometric analysis is highly suitable when the analyzed topic is fragmented between several different streams of literature (Casprini et al., 2020; Boyack and Klavans, 2010; Kajikawa et al., 2007; Dabić et al., 2019; Habib and Afzal, 2019; Rialp et al., 2019). The last reason underlying our methodological choice relies on the capability of bibliometric analysis to “provide a picture of the structure of a specific research field” (Galvagno and Pisano, 2021: 759).

Purposely, we used a double co-citation analysis: i.e. internal and external analysis. With the first one, we attempted to identify the theoretical framework underlying family branding literature; with the second one, we identified the most recurrent and important topics in literature. In general, co-citation analysis measures two papers' similarity looking at the number of the times they are simultaneously cited (Small, 1973). Therefore, a third paper that simultaneously cites two papers creates a link between them (Galvagno and Pisano, 2021). This fact implies that the more two papers are cited together, the higher is the probability that they are related and similar (Zupic and Cater, 2015). For example, they can rationally share a similar content, or similar topic, or theoretical lens, and so on (Galvagno and Pisano, 2021). Therefore, “the number of co-citations determines the proximity of any two publications in terms of contents” (Gmur, 2003: 27).

Internal analysis measures existing co-citations generated from the 66 papers included in our dataset. Hence, it is built on these 66 papers. External analysis measures co-citations on the citing papers of the dataset. Therefore, it is built on the papers that cite the 66 documents included in the dataset.

To conduct a proper bibliometric analysis, we followed the methodological path traced by Zupic and Cater (2015: 433): “1) Research design; 2) Compilation of bibliometric data; 3) Analysis; 4) Visualization; 5) Interpretation”.

We collected data using the following databases: Social Sciences Citation Index (SSCI) and the Emerging Sources Citation Index (ESCI). To access these databases, we used Web of Science of Clarivate Analytics®, because it is “the most widely used and authoritative database of research, publications and citations” (Birkle et al., 2020: 363). Moreover, “it covers more than 12,000 of the highest impact journals in a variety of disciplines from around the world” (Nguyen et al., 2018: 258).

Notably, because we have not been able to identify a seminal paper on family branding, we considered the timespan 1985-2021.

To collect papers, we intersected the results of two different searches: the first search concerned the “family firm” and the second one the “brand”. To identify the first group of papers concerning family firms, we used the following keyword with the Boolean operator “OR”: “family business*”, “family control*”, “family firm*”, “family led”, “family own*”, “family organization*”, “family enterprise*”, “family management”. Then, to identify the second group of papers concerning the brand, we firstly took in consideration the three elements that constitute a family brand: i.e. image, reputation, and identity (Astrachan et al., 2018). Then, we used the following keywords: “brand *” OR “image” OR “identity” OR “reputation”. We performed both searches for Title, Abstract, Author, Keywords and Keywords Plus, and after we refined the results for “language: English” and “type of article: article or early access or review”.

Then, we refined again the dataset selecting only papers published in journals ranked with 4*, 4, 3, 2 stars on Chartered ABS (2018) and fitting the fields: ENT-SBM, ETHICS-CSR-MAN, IB & AREA, INNOV, MKT, ORG STUD, STRAT. Moreover, we also selected the documents published on “Journal of Family Business Management”, since it is a specific journal on family firms, indexed on Web of Science, but not ranked on Chartered ABS.

Finally, for methodological completeness, we consulted the website of Family Business Review (FBR) - the most distinguished journal for family firm research - looking for papers on family branding published prior to 2005 (the year in which FBR was indexed on the Web of Science) to possibly include them in the sample. The search gave us negative results.

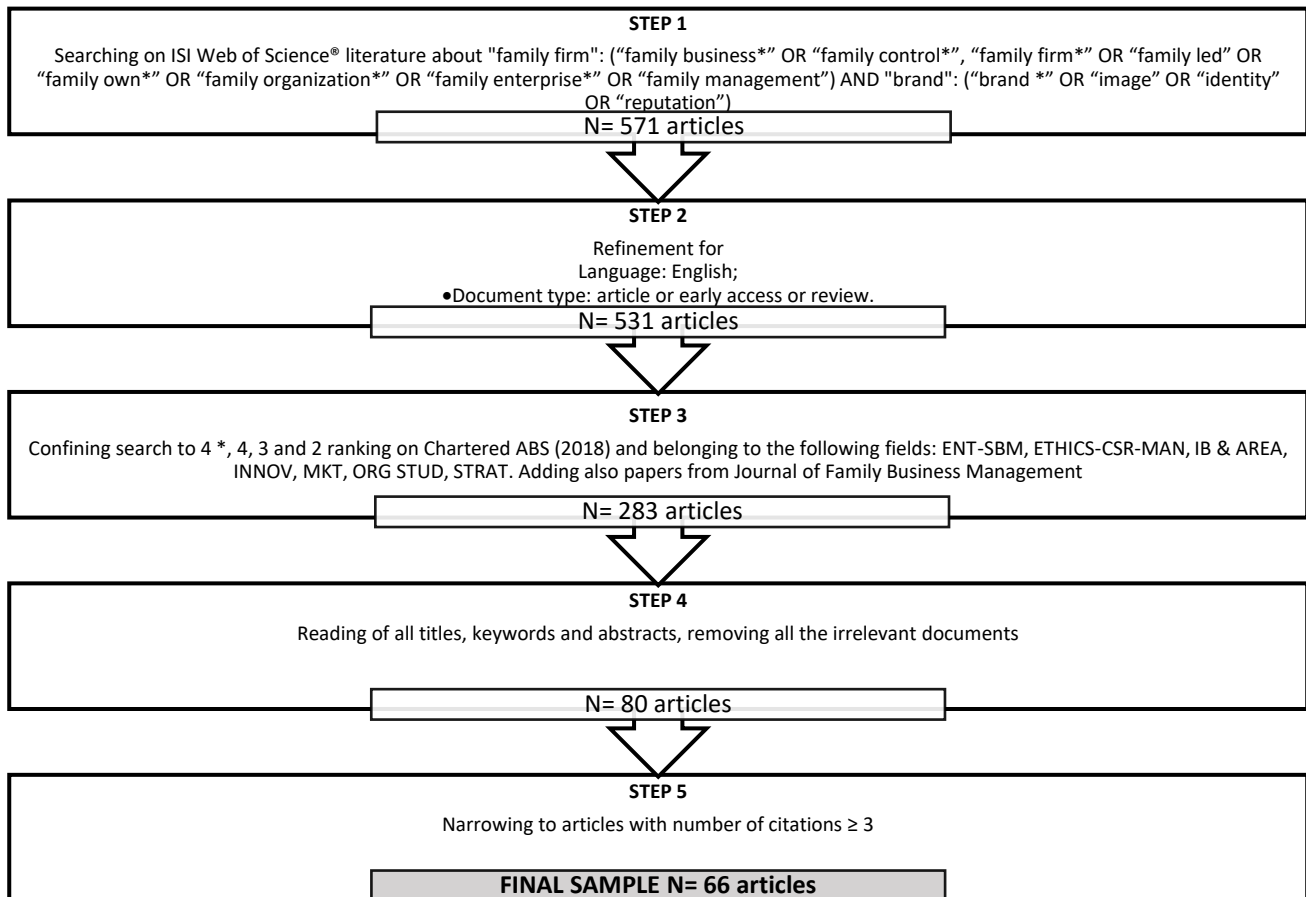
Through all these searches, we collected a total of 283 papers.

Therefore, we read all titles, keywords and abstracts to select only relevant and pertinent papers, finally reducing our dataset to 80 documents.

The last refinement we operated on the dataset concerns the number of citations; indeed, we considered only papers with a number of citations ≥ 3 . Finally, through the sample collection process described in Fig. 1, we collected 66 papers whose publication outlets are described in Table 1.

Finally, once the dataset had been collected, we performed the double co-citation bibliometric analysis on the VosViewer version 1.6.15 (Van Eck & Waltman, 2010).

Fig. 1: Sample collection process



Source: Our elaboration.

Tab. 1: Journals in the sample

Journal	Number of contributions
<i>Journal of Family Business Strategy</i>	14
<i>Family Business Review</i>	13
<i>Entrepreneurship Theory and Practice</i>	11
<i>Journal of Family Business Management</i>	8
<i>Journal of Management Studies</i>	3
<i>Business Horizons</i>	2
<i>Journal of Business Research</i>	2
<i>Journal of organizational change management</i>	2
<i>Review of Managerial Science</i>	2
<i>Academy of Management Perspectives</i>	1
<i>Asia Pacific Journal of Management</i>	1
<i>Australian Journal of Management</i>	1
<i>Journal of Business Ethics</i>	1
<i>Journal of Product Innovation Management</i>	1
<i>Journal of Small Business Management</i>	1
<i>Scandinavian Journal of Management</i>	1
<i>Strategic Entrepreneurship Journal</i>	1
<i>Strategic Management Journal</i>	1
Total contributions	66

Source: Our elaboration.

Findings. The findings of our study are twofold. The first category of results relies on internal co-citation analysis, through which we identified the theoretical frameworks underlying the literature on family firms branding. The second category concerns the results of external co-citation analysis, through which we identified the main topics in family firms branding literature.

Internal co-citation analysis returned us 151 papers grouped in 3 different clusters: therefore, we read all papers to find the theoretical lens on which they were built, if declared. Through this analysis we found the most relevant theoretical frameworks and the top cited papers for each cluster (please see Table 2):

Tab. 2: Internal co-citation cluster composition

Cluster	Color on the map	Number of contributions	Time Span	Main sources	Top cited papers	Main theoretical framework
1	Red	67	1968-2015	Entrepreneurship Theory and Practice (16), Family Business Review (9), Journal of Management Studies (6), Academy of Management Journal (5).	Dyer & Whetten (2006); Gomez-Mejia et al. (2011); and Berrone et al. (2010).	Agency Theory; Socioemotional Wealth
2	Green	48	1977-2018	Journal of Family Business Strategy (8), Family Business Review (6), Entrepreneurship Theory and Practice (3), Journal of Small Business Management (3)	Deephouse & Jaskiewicz, (2013); Zellweger et al. (2010) and Craig et al. (2008)	Organizational identity theory; Corporate identity theory
3	Blue	36	1985-2008	Entrepreneurship Theory and Practice (10), Family Business Review (9), Academy of Management Review (4), Journal of Business Venturing (4).	Sundaramurthy & Kreiner, (2008); Habbershon & Williams (1999); Chua et al. (1999)	Resource-Based View; Organizational Identity

Source: Our elaboration.

External co-citation analysis mapped all the 66 paper of our dataset, grouping them in 5 different clusters, composed as showed in Table 3. These clusters are not clearly separated, as it was the case in the external analysis; indeed their borders are blurred, and the clusters tend to overlap.

Once we identified the papers composing each cluster, we found the main topics characterizing each one of them and listed as it follows:

- Cluster 1: Family members and their effects on family firm brand;
- Cluster 2: Family brand communications strategies and stakeholders' brand perception;
- Cluster 3: The mediating role of brand identity and reputation for superior family firm's performance;
- Cluster 4: How to build a visible brand identity and its consequences;
- Cluster 5: Residual contributions.

Tab. 3: External co-citation cluster composition

Cluster	Num. of documents	Colour	Total Citations	Average year	Top cited papers
1	27	Red	714	2015	Miller D. et al., 2011; Block, J., 2010; Milton, L. P., 2008
2	18	Green	448	2016	Micelotta, E. R. & Raynard M.(2011); Astrachan B.C. et al. (2013); Sageder M. et al. (2018)
3	13	Blue	719	2014	Chirico F. et al., 2021 Combs, J. G., et al., 2020 Frank H., et al., 2017
4	5	Yellow	364	2009	Craig et al., 2008; Parmentier M.A., 2011 Zellweger, T. M. et al., 2012
5	3	Violet	453	2011	Dyer Jr., W., G., 2006
Total documents	66				

Source: Our elaboration.

Research limits. Some limitations affect this study. First, co-citation analysis is not able to embrace the most recent contributions (for example, the documents published in the last year); specifically, all documents that do not have enough citations to be mapped are excluded (e.g., one paper is too recent and, thus, it has not been cited yet despite of its potential contribution to the field).

Another limitation concerns the keywords used to collect the data: indeed, while on the one side they could seem too restrictive; on the other, there is a risk of introducing further biases when trying to increase them. To attempt to limit this issue, we drew on existing studies and reviews that clearly listed the employed keywords; however this practice did

not entirely ensure us that we completely avoided the risk of having biased our study.

The third limitation affecting this study refers to the nature of bibliometric analysis: notwithstanding its quantitative nature reducing methodological biases, it is quite reasonable that some discretion and subjectivity might have affected and biased the studied, on both selection and analysis of the papers.

The fourth limitation concerns the nature of co-citation analysis: in fact, such methodology is not able to distinguish the type of citations; that is, for example, if these citations were made to appreciate, criticize, or contradict a certain paper.

Last but not least, one final limitation concerns the high specificity of the topic: indeed, family firm branding is a very specific topic, although it concerns the most common type of firm globally.

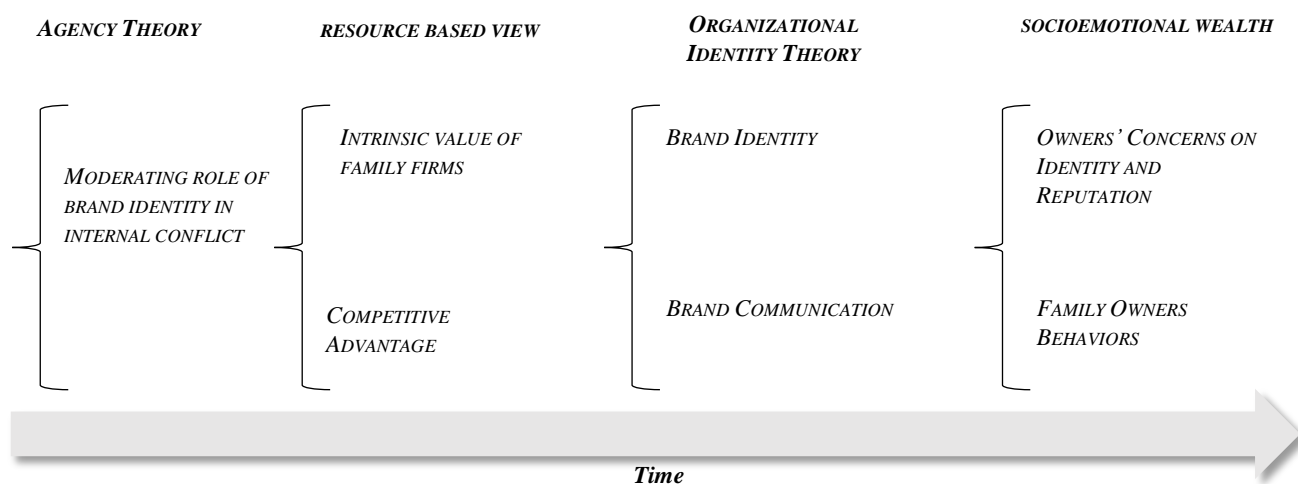
Practical implications. This study offers several practical implications. First, it attempted to provide an overview of the existing literature; such systematization, in our opinion, could be useful for future scholars as a guide to what is already acknowledged about family firm branding.

Secondly, it identified the theoretical frameworks on which the topic has been built, further proposing an integrated theoretical framework (please see Fig. 2) aimed to show the dynamic evolution of the theoretical lens adopted by scholars. More specifically, our integrated theoretical framework aimed to highlight the development of family business branding, up to becoming a recognized stream of literature with its own identity. This may be emphasized by an initial use of management theoretical lenses to the most recent employment of others, much more specific of family businesses. Further, this evolution of the employed theoretical lens has also been accompanied by an evolution in the topics addressed, gradually more and more complex.

Thirdly, drawing on the results of bibliometric analysis, we proposed a research agenda that might be useful for future research. We structured it on ten research questions, each one of them representing a different literature gap:

- 1) Is the family brand always a source of competitive advantage?
- 2) Why do some families decide to give their name to the family firm while others do not?
- 3) Does the type of narrative of the family identity influence the reputation and identity brand of the company?
- 4) Why do potential employees have conflicting ideas about the advantages or disadvantages of working in family business?
- 5) How to manage the link between the family business, its values, its history, and the brand narrative when changes in society make them anachronistic?
- 6) How far can the identification of the family identity with the firm go without it becoming harmful?
- 7) How is the family brand affected when a succession occurs with non-family members?
- 8) What happens when the family firm goes public? More specifically, how does the public listing of the firm influence brand, image, and reputation?
- 9) Is the family brand always perceived in the same way around the world or is it filtered by local culture?
- 10) What is the relationship between family events and brands? More specifically, how much can family events affect the brand? And how can the family manage them without damaging its brand?

Fig. 2: Integrated Theoretical Framework



Source: Our elaboration.

Originality of the study. To our knowledge, this study represents the first bibliometric analysis on family firm branding. Moreover, it is the first attempt to systematize the extant literature on family branding through a quantitative methodology, also considering the brand in its three well-known components of image, reputation, and identity. Further, its originality relies in the identification of the main existing topics within family firms branding literature, grouping them into 5 clusters, and finding their theoretical roots.

Another element of originality consists in the proposition of an integrated theoretical framework outlining that, depending on the topic under examination, scholars exhibited a preference for different theoretical lenses. Moreover, it

shows how through the years there has been a shift from more general management theoretical frameworks (e.g., Resource Based View) to others more specific of family business (e.g., Socio-Emotional Wealth), showing how the literature on family firms branding has undergone a development of its own identity.

Finally, the last element of originality relies on the research agenda built on the results of bibliometric analysis: indeed, to our opinion, because of the results of bibliometric analysis we were able to identify some research gaps which otherwise would have been difficult to detect.

Keywords: bibliometric analysis; family firm; family branding; family identity, family reputation; family image.

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