Value creation flies in the sky: the role of resource access and mobilization

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Giovanna Del Gaudio

Abstract

Purpose of the paper: *The aim of this paper is to explore the relationship between access to network resources, resource mobilization and value creation in the context of the airline industry. Hence, this work contributes toward the comprehension of the process of value creation by examining whether airline companies have access to network resources and to what extent they exploit these according to a new configuration that is at the base of resource mobilization.*

Methodology*: This study adopts a quantitative approach in order to reach a broader audience in an efficient way. The idea to proceed with a quantitative methodology originates from the aim to capture aspects that previous studies have not considered. To test the hypotheses, we adopt the partial least squares path modeling algorithm using the module R-package.*

Findings*: The findings underline two important aspects. First, there is a correlation between access to network resources, resource mobilization and value creation in terms of firm performance. Second, this paper reveals that, although airline companies tend to cooperate according to different forms, efforts towards value creation in terms of sustainability do not transpire since companies do not operate in that direction.*

Research limits: *The research limits can be ascribed to the number of companies the sample contains. Furthermore, future research on the topic may be enriched through the adoption of a qualitative methodology, such as interviews with managers, that can capture additional dynamics.*

Practical implications*: The results indicate future directions for managers in the airline industry. These should be in the field of value co-creation in relation to sustainability.*

Originality of the paper: *This paper captures the nature of value creation at the network level in terms of both firm performance and sustainability.*

Key words: value creation; airline industry; resource access; resource mobilization

1. Introduction

The issue of value creation has been studied according to different perspectives and levels of analysis (Lepack *et al.*, 2007) Network value creation arises from the metaphorical widening of a firm's borders because the exploitation/exploration mechanisms lead companies to search for resources outside their internal context. This process highlights both the lack of certain resources inside the firm and the systematic nature of value creation.

Despite the extensive body of literature (Gulati *et al.*, 2000; Lavie, 2007) on the subject, some points regarding value creation at the network level remain unexplored. Indeed, scholars agree that how firms mobilize their resources (Casanueva *et al.*, 2014), and knowledge, competences and expertise sharing is not always obvious (Della Corte, 2020). However, there is still confusion regarding this topic, as several works (Koka and Prescott, 2002; Dhanaraj and Parkhe, 2006; Min and Mitsuhashi, 2012) concentrate on the access to rather than the mobilization of network resources and, consequently, these studies use access to partner resources as proxy for mobilization without separating the two aspects. This has generated a general confusion in which the issue of resource mobilization is still a "puzzle" (Casanueva *et al.*, 2014). Hence, the relationship of the overall process that involves resource access and mobilization and leads to value creation is not yet well understood (Drencheva *et al.*, 2022).

Indeed, in today's dynamic and complex scenario, firms tend to have simultaneously different partners to maintain the possibility of wider access to resources (Wassmer and Dussauge, 2011), but the real issue remains the one regarding the capitalization of opportunities through the exploitation and use of the network's resources (Pironti, 2006; Bolívar *et al.*, 2022). Hence, the access to partners' resources is not sufficient per se and is not either synonymous or a proxy for mobilization, but rather as a single construct.

The first difference is semantic and involves specific content. Resource access includes the identification of resource holders (Muñoz *et al.*, 2018) and the way of accessing those resources (Casanueva *et al.*, 2015). Resource mobilization represents the effective capitalization of resources when there is the identification of their quality and utility (Muñoz *et al.*, 2018) and the transfer from resource holders to other actors of the network (Clough *et al.*, 2019) and/or to the network itself. The second difference is pragmatic, since the resources to which firms have access can also be partially mobilized (Casanueva *et al.*, 2014; Bolivar *et al.*, 2021). The effective new use of these resources corresponds to mobilization.

This is why this paper intends to separate the two different aspects. Indeed, the aim of this work is to explore the relationship between access to network resources, resource mobilization and value creation in the context of the airline industry, and answer the following research question: How can inter-firm collaboration among airline companies affect value creation through network resource mobilization?

This study analyzes the airline industry for several reasons. First, it is a global industry, at a mature stage, with a strong rivalry between airlines (Bolivar *et al.*, 2021). Second, it is characterized by high fixed costs that determine the management structure and strategic choices (Del Gaudio, 2015). Third, despite the strong competition between companies, they also forge inter-firm relationships (Oum et al, 1993; Chakrabarty and Kutlu, 2014). Fourth, literature on value creation in the airline industry is mainly based on case study analysis (Navarro-Meneses, 2022) and, hence, quantitative research is required. These features are well suited for analyzing the relational dynamics and issues underlying resource access and mobilization. In the airline sector, scholars have often highlighted the

importance of resource access and mobilization (Casanueva *et al.*, 2013, 2014; Bolívar *et al.*, 2022). These topics have been examined in both tourism (Casanueva *et al.*, 2014) and strategic management literature (Wassmer *et al.*, 2017). From a tourism point of view, they discuss the first variable in terms of access for the development/enhancement of a destination (Della Corte, 2020) that can reach a wide range of foreign markets (Wassmer and Dussauge, 2012). From a strategic management perspective, the airline industry offers a series of ideas to consider, such as the alliance portfolio mechanisms (Wassmer and Madhok, 2017; Kasanzu and Wanjira, 2021), operational strategies (Castiglioni *et al.*, 2018), and the role of resource complementarity within code-sharing agreements (Cobeña *et al.*, 2019).

Based on both perspectives, the focus of this study is on airline companies, specifically code-share agreements, which are considered the "most common type of alliance within the airline industry" (Domínguez-CC *et al.*, 2021), in order to examine how access to network resources can generate resource mobilization that influence value creation.

This paper is structured in three parts. The first section presents a literature review on the topic of value creation at the network level and resource mobilization. The second deals with the method and a discussion of the results from the quantitative analysis. The third part outlines the conclusions and future research directions.

2. Literature review

2.1 Value creation at the network level

Literature on value creation through "network resources" (Gulati *et al.*, 2000; Lavie, 2006; Wassmer and Dussauge, 2011; Vesalainen and Hakala, 2014) has gained increasing attention over the years in the strategic management community. The reason for this interest can be linked to the assumption that new sources of value are also generated through the exchange and combination of resources in novel different ways (Goshal and Moran, 1996) and the activation of different relations outside the firm's boundaries. Starting from this point of view, a network can be a new way of exchanging and combining resources to generate value (Dyer and Singh, 1998). In terms of the relational perspective, a network is a way to generate relational rents that are distributed amongst partners and whose benefits can occur at both a common and a single level (Dyer and Singh, 1998).

The locus of value creation, as some scholars (Gulati, 1998; Gulati *et al.*, 2000; Lavie, 2006) highlight, can reside in the network in different forms. The nested value in such networks can be exploited by the firms and/or actors involved and needs to be mobilized to assert its real capture.

A network is considered the unit of analysis for rent-seeking opportunities as some scholars conceive it as facilitator of knowledge transfer and exchange (Tsai, 2001; Mitton *et al.*, 2007). According to this view, networks must be able to deploy capabilities that allow the acquisition, generation and combination of knowledge and resources (Zheng *et al.*, 2011), since they are conceived as a core component in the creation and appropriation of value.

Value is, hence, created by the network where this network is the expression not only of the sum of the different resources provided by the single firms within the relational aggregate, but also of the new resources and opportunities generated by the network itself.

This reflection underpins the question of value capture since it is important to understand to what extent such created value is then spread between the firms and the network itself. The issue of value is also complex since in this case there is not a single source of value creation and, consequently, the understanding of "value slippage" (Lepak *et al.*, 2007), as described in the value appropriation literature, becomes more difficult to analyze.

The created value within the network expresses the collective soul (Lavie, 2007). Thus, the focus on value creation must take into account the resource mobilization of both firms and the network as a whole. As such, it is necessary to understand what such mobilization depends on.

First, firms' heterogeneity and complementarity, in terms of their strategic resource endowments, place them in different bargaining positions (Zaheer and Bell, 2005; Ferretti *et al.*, 2016). Second, bargaining power is linked to the ability of top managers in leveraging partners' endowments (Gulati *et al.*, 2009). Third, in inter-organizational networks, a focal partner may appropriate more value than others, capturing what Lavie (2007) calls the "lion's share of relational rents". In addition, a key component in both value creation and capture within networks is the governance actor and configuration, which can be meaningful to the whole set of relations.

Some firms develop a specific capability in managing the development of the network and, hence, deploy specific "networking capabilities". Along this line, Möller and Svahn (2004) introduce the concepts of "network visioning" and "network orchestration" as dynamic capabilities concerning the network that are necessary for both its formation (visioning) and development (orchestration). More precisely, the network-visioning capability refers to the analysis of the environment and the ability to evaluate opportunities and threats regarding the emerging value network, while the orchestration capability involves the dynamic understanding and coordination of strategic network resources (Ciampi *et al.*, 2021). Hence, the value is what companies create by working together through collaboration. These outcomes can be captured at different levels (i.e., the firm, network, society, customers, suppliers, etc.). This paper focuses on some outcomes at the firm (performance) and network levels (environmental and social sustainability).

Other important aspects in the value creation process are the resulting outcomes. Traditionally, the first ones that literature recognizes in the field of value creation are the economic gains, even if today the actual tendency is to recall the productivity measures rather than static measures (i.e., Economic Value Added, return ratios, profits, residual income, stock price, etc.), defining it as dynamic value creation (Lieberman *et al.*, 2018). The literature underlines the power of the network for the creation of ecological and social value creation (Aquilani *et al.*, 2016; Schaltegger *et al.*, 2016; Lüdeke-Freund and Dembek, 2017).

This typology of created value must simultaneously converge at both the firm and network levels, since environmental and social outcomes have to be integrated and/or in line with a single firm's purposes. Indeed, the created value in terms of sustainability does not differ for each company, but is the combination of different types of value, practices and/or ideas belonging to single firms of the network (Freudenreich *et al.*, 2020).

To summarize, this paper takes into account the outcomes of dynamic value creation with productivity measures and sustainable value creations with a brief look at co-shared initiatives for environmental and social responsibility.

2.2 Resource access and resource mobilization

Resource mobilization is derived from resource-based theory (RBT). According to this theory, a firm's competitive advantage can be traced through the VRIO framework (Barney, 2001), in which resources generate a strategic competitive advantage if they are valuable (V), rare (R), inimitable (I) and exploited by the organization (O) (Barney *et al.*, 2011). According to the resource mobilization view (McCarthy and Zald, 1977), existing resources acquire a new form through their redirection. The first step is access to partners' resources. What is particularly important is the specificity of resource mobilization, as "mobilization emphasizes access to needed resources, not on the allocation of resources among different parties. The resource mobilization metaphor hinges thus on working with external parties that control resources, not working for them" (Villanueva *et al.*, 2012, p.28).

Some scholars emphasize that it is not the attributes of resources that create value, but rather the linkages between them (Bingham and Eisenhardt, 2008). The unit of analysis of RBT was originally the firm, but in 1998, Dyer and Singh stressed the importance of extending RBT to inter-firm collaboration (Matarazzo and Resciniti, 2014).

The debate on resource mobilization needs to be analyzed in the light of the activities that take place within the network. The resource deployed depends on the goals that the network intends to achieve and on the capabilities for the creation of interactions among resources and on who combines and controls these resources (Baraldi and Strömsten, 2009). Although some studies view the access to resources as a proxy for mobilization (Koka and Prescott, 2002; Min and Mitsuhashi, 2012), we share the idea of some scholars (Casanueva *et al.*, 2014; Bolívar *et al.*, 2022) that they represent two different stages.

Indeed, actors of a certain network can have access to partners' resources, even if the level depends on the single partner capabilities to exploit them (Lin, 2001). These capabilities are expressions of resource mobilization and explain why some companies can mobilize resources better than others (Lin, 2001). With this view, we are in line with the definition of Bolívar *et al.* (2022), "network resources mobilization has been defined as the organizational ability and willingness to capitalize on the opportunities offered by the firm's set of partners in an alliance network setting, which in this case translates into the utilization of assets owned and controlled by partners in the net".

Before mobilizing resources, partners have to own the access to them. Our research model (Fig. 1) and hypotheses originate from this idea. We thus generate the following hypothesis:

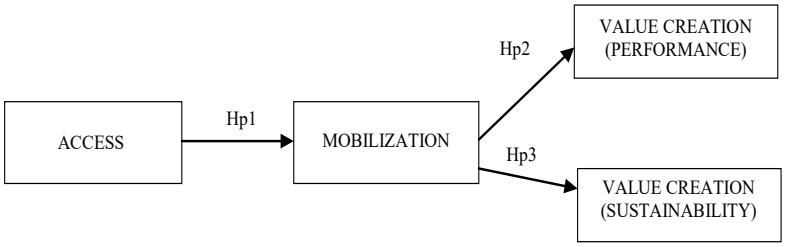
Hp1: Access to resources positively influences the mobilization of network resources.

2.3 Resource mobilization and performance

Resource mobilization consists of the exchange and sharing of diverse resources by mobilizing the bundle of resources as well as the competences of the actors involved into collective actions through the understanding of common goals (Ritvala and Salmi, 2011). Resource mobilization is a strategic choice connected with a firm's operational capabilities to exploit partners' resources. Although the idea of resource mobilization may be linear, it remains a buzz concept (Matinheikki *et al.*, 2017). As Bolivar *et al.* (2021) underline, there are some aspects that should be clarified, such as the level of the mobilization of these resources and whether and to what extent the access to these resources depends on the composition of the network and the related performance.

Given that it is not mobilization per se but rather the resource integration that creates value (Kleinaltenkamp *et al.*, 2012), some scholars have connected the topic of resource integration with the one of density for the creation of value, since "density expresses the degree to which resources are accessible for integration in a specific actor" (Storbacka, 2019). This is also linked to the topic of resource orchestration within the network (Sirmon *et al.*, 2011) and implies how the actors of the network organize, bundle, and leverage a firm's and network's resources.

Fig. 1: The proposed model



Source: Our elaboration

The issue of the actors involved is central in the resource mobilization process. Indeed, value creation depends on how the firms combine these resources. This interaction involves specific antecedents, such as the organizational model of each firm as well as of the network, the area of expertise (Storbacka, 2019), and the degree of willingness to collaborate. Firms mobilize their resources which affect performance, as suggested by the resource-based view (Barney, 1991; Wassmer and Dussauge, 2012).

The access and mobilization of external resources is strongly connected with the bundle of internal resources that together can have positive

impacts on performance (Casanueva *et al.*, 2015). Organizational ties play a key role in the process of value creation and capture since they enable gaining the competitive positions (Casanueva *et al.*, 2015) that lead to superior performance. The effective mobilization of firms' resources allows for fostering performance by absorbing knowledge and heterogeneous resources embedded in the network. Resource mobilization can lead to both firm performance and network performance (Bayne *et al.*, 2017), improving network effectiveness in achieving the desired goals. We therefore posit the following hypothesis:

Hp2: The mobilization of network resources positively influences value creation in terms of firm performance.

2.4 Resource mobilization and sustainability

Most of the literature concerns the link between resource mobilization and firm performance (Kleinaltenkamp *et al.*, 2012; Casanueva *et al.*, 2015) rather than the creation of value in terms of sustainability (Payán-Sánchez *et al.*, 2022), and this is because these studies have explored the conditions under which the competitive advantage occurs rather than focusing on sustainability issues. This paper aims to fill this gap by introducing and exploring the link between resource mobilization and sustainable results.

The issue of resource mobilization and its implications in the sustainability field has been studied in relation to the implementation of water systems in rural areas (Behnke *et al.*, 2017), sustainable tourism (Inogwabini *et al.*, 2020), and solutions for ecological problems (Scheidel *et al.*, 2018), etc.

Among the variety of theoretical lenses, this paper adopts the concept of resource mobilization for the creation of value for different beneficiaries (Singh and Singh, 2016), not only the firms, but also for the relevant ecosystem (i.e., the environment, the social community, etc.).

The topic of resource mobilization and its impact on sustainability has also been studied in the field of social entrepreneurship (Hota *et al.*, 2019) for the creation of social value. Hence, resource mobilization can lead to the enhancement of sustainability initiatives (Järnberg *et al.*, 2023). The idea of network resource mobilization generates social innovation and other useful sustainable practices for both the individual firm and the network (Spiegler and Halberstadt, 2018). There is sometimes a tendency to talk of "social mobilization" (Bui *et al.*, 2020) that emphasizes the purpose of the mobilization itself in fostering social goals (income, occupation, fairness income, etc.).

In the airline sector, the pillars of sustainability have grown in importance, given the current relevance of some topics, such as control over CO2 emissions (Hadi-Vencheh *et al.*, 2020), operational sustainability (Raynes and Tsui, 2019), and noise reduction (Jäger *et al.*, 2021), etc.

This is why this paper aims to verify the following hypothesis:

Hp3: The mobilization of network resources positively influences value creation in terms of sustainability.

3. Methodology

3.1 Data collection

Airline companies have been selected as the units of analysis. Hence, the airline industry has been chosen to test the three research hypotheses. The validity of this industry is confirmed by several studies (Casanueva *et al.*, 2014; Bolivar *et al.*, 2021; Bolívar *et al.*, 2022) that have used the airline industry as an exploratory context. This study ranges from the consideration of a single company to different kinds of collaborations in their various forms (i.e., frequent flyer programs, global alliances, marketing, codeshare, franchises, feeder and cargo, Casanueva *et al.*, 2014), for the years 2017–2020.

Following the work of Bolívar *et al.* (2022), we built a sample matching the top 100 airlines as indicated in the Airline Business Journal and adding other airlines belonging to one of the multi-global alliances (i.e., One World, Star Alliance, Sky Team). We excluded domestic airlines from the database, obtaining a final sample of 88 companies.

We obtained financial data from the single companies' balance sheets and other operational data from the International Civil Aviation Organization.

Tab. 1 contains the sample description.

Tab. 1: Sample description

Age range	N. of airlines
>=9	4
10–19	12
20–29	14
30–39	7
40–49	10
50–59	8
60–69	15
70–79	9
80–89	7
90–99	2
Affiliation	
SkyTeam	36
Star Alliance	22
One World	30
Region	
Asia and Oceania	42
Africa	1
Europe	31
The Americas	14

Source: Our elaboration

3.2 Method

This study adopted a quantitative approach in order to reach a broader audience in an efficient manner (Enright and Newton, 2004).

Previous works on the topic have exploited quantitative methodologies such as regression and structural equation models Casanueva *et al.*, 2014; Bolivar *et al.*, 2021; Bolívar *et al.*, 2022). Indeed, the idea to proceed with a quantitative methodology originates from the aim to capture aspects the previous studies have not caught. To test the hypotheses, we adopted the partial least squares path modeling (PLS-PM) algorithm using the module R-package.

The PLS estimation method was first formalized by Herman Wold (1973) for use in multivariate analyses. Its application in structural equation modeling (SEM) was also developed by Wold (1975) and the main references on the PLS algorithm include Wold (1975). The purpose of PLS-PM is to estimate the relationships among Q blocks of variables.

In SEM techniques there are two families: covariance-based techniques, as represented by linear structural relations (LISREL), and variance-based ones, of which PLS path modeling is the most prominent representative (Hair *et al.*, 2021). In the PLS approach, there are fewer probabilistic hypotheses, data are modeled by a succession of simple or multiple regression and there is no identification problem. This paper uses the PLS approach because it has less stringent assumptions about the distribution of variables and error terms and PLS can handle both reflective and formative measurement models (outer models). We selected the reflective mode for the seven latent variables (LVs) because we suppose that the causal relationships extend from the manifest variables (MVs) to the LVs.

PLS path modeling does not provide any global goodness-of-fit criterion. As a consequence, the evaluation model takes place in a two-step process: the assessment of the outer model and the assessment of the inner model. At the beginning, the model assessment focuses on the measurement models. A systematic evaluation of PLS estimates reveals the measurement reliability and validity according to certain criteria that are associated with formative and reflective outer models.

A PLS path model involves two parts: the measurement model (or outer model), which defines the relationships between the MVs and their respective LVs, and the structural model (or inner model), which defines the relationships between the LVs.

The PLS algorithm considers two double approximations for the LVs: a) external estimation, obtained as the product between the block of MVs and the outer weights, and b) internal estimation obtained as product between the external estimation and the so-called inner weights. The parameter estimation is then performed through the alternation of the external and the internal estimations, iterating until convergence.

The paths among LVs are obtained through the ordinary least squares (OLS).

3.3 Measurement model

The overall fit of the model has been evaluated by a combination of indexes recommended by Hair *et al.* Before testing the hypotheses, we have verified the unidimensionality of the MV blocks by means of Dillon-

Goldstein's (DG) rho, with values above the expected minimum level of 0.70 for all the observed MV blocks. In order to assess the validity, we consider both the convergent and discriminant validity. The convergent validity can be evaluated by the average variance extracted (AVE). The AVE measures the level of variance captured by a construct versus the level due to measurement error. Values above 0.7 are considered very good, whereas the level of 0.5 is acceptable. All the loadings are significant.

Tab. 2: Validity and reliability evidence

Items	Outer weights	DG rho	AVE
acc-x1 degree centrality	0.8882*	0.952	0.797
acc-x2 closeness centrality	0.9118*		
acc-x3 betweenness	0.8572*		
acc-x4 beta centrality	0.9069*		
acc-x5 eigenvector	0.8989*		
mob-X6 number of routes	0.8510*	0.931	0.773
mob-X7 number of other airlines the company mobilizes	0.8865*		
mob-x8 the relationships between number of shared routes and number of partners	0.8901*		
perf-x9 sales per employee	0.839*	0.881	0.778
perf-x10 revenue passenger kilometers	0.875*		
perf-x11 passenger load factor	0.929*		
sost-x12 environmental sustainability	0.92	0.894	0.815
sost-x13 social sustainability	0.907		

Source: Our elaboration

The discriminant validity (Tab. 3) is well established by comparing the square root of each AVE in the diagonal with the correlation coefficients (off-diagonal) for each construct in the relevant rows and columns (Fornell and Larcker, 1981).

Tab. 3: Fornell-Larcker criterion analysis for checking discriminant validity

	Access	Mobilization	Performance	Sustainability
Acc.	0.88			
Mob.	0.31	0.89		
Per.	0.66	0.50	0.81	
Sus.	0.54	0.34	0.71	0.65

Source: Our elaboration

3.4 Measures

The research model is shaped by two variables: access and mobilization. According to the proposed model, mobilization acts as a mediator and has a positive influence on value creation. The validity of each variable has been measured through a composite measurement model. In order to calculate the access variable, this paper uses companies which are part of code-sharing agreements. In this kind of network, each airline is a node that can have access to a certain type of resource owned or controlled by a partner. Hence, one of the indicators is the total destination of the partner.

According to some scholars (Everett and Borgatti, 2005; Bolívar *et al.*, 2022), companies belonging to a multilateral network can exploit partners' resources, considering the occupied position, the related role, and the structural dimension that underpins specific dimensions of the social network analysis such as beta centrality, degree centrality, closeness centrality, betweenness, and the eigenvector. Beta centrality measures the centrality of each partner, betweenness the number of airline companies needing an intermediary, the degree centrality the number of total ties, and closeness centrality the closeness with each actor of the network, while the eigenvector refers to the total closeness to all other members of the network.

In regard to the mobilization variable, the related indicators are the number of routes, including those operated using third-party resources, the number of other airlines the company mobilizes, and the relationships between the numbers of shared routes and partners.

Furthermore, in order to define the dependent variable of value creation, it is essential to point out that it is measured in terms of firm performance and sustainability (environmental and social). In regard to firm performance, this paper took inspiration from the study of Casanueva *et al.* (2014), taking into account sales per employee, revenue passenger kilometers and the passenger load factor (Rajasekar and Fouts, 2009). In terms of sustainability, the related indicators are the Atmosfair Airline Index (Araghi *et al.*, 2014) and the number of social initiatives. Tab. 4 summarizes the variables used and the relevant indicators.

Tab. 4: Variables and indicators

Variable	Indicators	Source
Access	Beta centrality Betweenness Closeness Degree centrality Total destinations of the partner	Casanueva *et al.*, 2014; Bolívar *et al.*, 2022
Mobilization	Mobilized partners Mobilized operations (routes) Operations mobilized (routes)/ Partner	Bolívar *et al.*, 2022
Firm performance	Sales per employee, Revenue Passenger Kilometers Passenger Load Factor	Casanueva *et al.*, 2014
Sustainability	Atmosfair Airline Index Total of social initiatives	Araghi *et al.*, 2014; Payán-Sánchez *et al.*, 2021

Source: Our elaboration

The period considered is 2017–2020, since scholars suggest a mean average of three years for the different measures (Casanueva *et al.*, 2014).

The model fit indices are reported in Tab. 5. As regards the loading coefficients, the summary in the table demonstrates their significance since t-statistics is >2. Thus, the t-statistics have been calculated to evaluate the overall significance.

Tab. 5: Model fit summary

	Original	Mean boot	Std. error	T-statistics
acc-x1	0.857	0.8064	0.125	6.856
acc-x2	0.861	0.8169	0.127	6.779527559
acc-x3	0.972	0.177	0.223	4.358744395
acc-x4	0.511	0.4528	0.203	2.517241379
acc-x5	0.566	0.4877	0.238	2.378151261
mob-X6	0.732	0.0651	0.123	5.951219512
mob-X7	0.982	0.8303	0.341	2.879765396
mob-x8	0.867	0.0589	0.124	6.991935484
perf-x9	0.894	0.7349	0.335	2.668656716
perf-x10	0.843	0.2533	0.325	2.593846154
perf-x11	0.623	0.6997	0.24	2.595833333
sost-x12	0.833	0.448	0.184	4.527173913
sost-x13	0.805	0.3058	0.135	5.962962963

Source: Our elaboration

3.5 Structural model

The second step consisted of testing the hypotheses. In accordance with the pre-eminent scientific literature, a bootstrap procedure with 5000 re-sampling was utilized (Hair *et al.*, 2019). The bootstrapping technique is used to validate the significance of path coefficients. This method allows for assessing the accuracy of statistical estimations (Efron and Tibshirani, 1998) and to generate the distribution of a statistic (Mooney *et al.*, 1993). Through bootstrapping, PLS creates a distribution for each path coefficient. Tab. 6 and Fig. 2 show the results of PLS-SEM. These demonstrate a direct and positive relationship between resource access and resource mobilization. Furthermore, there is a positive relationship between mobilization and value creation in terms of firm performance. Hence, both Hp1 and Hp2 are confirmed. However, Hp3 is not confirmed.

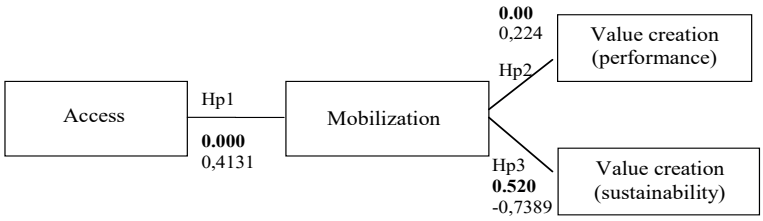
Tab. 6: Results of PLS-SEM

Hp	Direction	Original	Mean boot	Std error	T-statistics	P-value
1	Access-->mobilization	0.4131	0.462	0.18	2.295	0.000
2	Mobilization-->value creation (economic performance)	0.224	0.233	0.0889	2.519685039	0.00
3	Mobilization-->value creation (sustainability)	-0.7389	-0.464	0.508	-1.454527559	0.520

Source: Our elaboration

Access is significantly and positively associated with mobilization, thus providing support for Hp1 (path coefficient 0.4131; confidence interval (CI)=0.18). The path coefficient of resource mobilization on firm performance is significant (path coefficient 0.224; CI=0.0889), confirming Hp2. The path coefficient of resource mobilization on sustainability has a negative relationship (path coefficient CI=0.508), so Hp3 is not supported.

Fig. 2: Structural model results



Source: Our elaboration

4. Discussion and conclusions

The empirical findings indicate that resource access is positively related to resource mobilization, which has a positive effect on firm performance. Both access and mobilization affect firm performance and mobilization acts as a mediator. This result is in line with previous studies (Lai *et al.*, 1998; Batjargal, 2003) that also examine the airline industry (De Man *et al.*, 2010).

This means that the more an airline company is able to have access to and mobilize resources that can be exploited through its partners' alliances, the better its value creation in terms of firm performance will be. Thus, Hp1, "Access to resources positively influences the mobilization of network resources", is confirmed This nexus is not so obvious. For example, airline companies can have access to resources through global alliances (SkyTeam, One World, Star Alliance), but this does not mean that the individual airline companies choose to share their resources. Indeed, resource mobilization requires the willingness to make available some of the firm resources in order to create value, such as new services for their customer. For example, KLM and Air France have created a joint frequent flyer program called "Flying Blue" that creates a sense of attachment and fidelity from the customers of both airline companies. This requires the mobilization of resources rooted in the marketing activities of both airline companies' value chain.

This study has shown a positive relationship between access to and the mobilization of resources. This is in line with previous works (Casanueva *et al.*, 2014; Bolívar *et al.*, 2022) that show that a network's resource endowment does not correspond to the ability to mobilize rather than the simultaneity of resources owned/controlled by the network.

In regard to Hp2, "The mobilization of network resources positively influences value creation in terms of firm performance", the PLS-SEM

results confirm this hypothesis. This outcome highlights the ability of single airline companies to mobilize the bundle of network resources.

On the contrary, Hp3, "The mobilization of network resources positively influences value creation in terms of sustainability", is not confirmed since there is no significance in the relationship. This could be linked to the fact that airline companies tend to promote sustainable initiatives at the firm level rather than through co-shared activities between alliances partners. For example, an important co-joint initiative in the field of environmental sustainability was founded in 2021 when Virgin Atlantic, Air France-KLM and Delta Air Lines, in collaboration with Boston Consulting Group, created the Aviation Climate Task Force for the safeguarding of the environment, with particular attention to CO2 emissions.

This taskforce represents a major breakthrough in the airline world, as highlighted by the chief executive officers (CEOs) and managers of this alliance. Indeed, Shai Weiss, CEO at Virgin Atlantic, stated that it involves "working with industry partners to accelerate technological innovation and reduce carbon emissions over the next 30 years" (aviationclimatetaskforce.org). Amelia DeLuca, Managing Director of Sustainability, Delta Air Lines, highlighted "We're still too far from real, scalable solutions to clean air travel" (news.delta.com/delta-invests-net-zero-aviation-through-aviation-climate-taskforce). Finally, Benjamin Smith, CEO of the Air France-KLM Group, noted "We are signing this commitment because we are confident in our ability to make this transition collectively, together with our people, our customers and all our partners" (airfranceklm.com/en/air-france-klm-accelerates-its-environmental-transition-and-commits-science-based-targets-initiative).

These statements underline, on the one hand, the necessity of operating collectively in the direction of sustainable actions and, on the other, the absence of collaborative actions before this initiative. This is why this work has not captured the link between resource mobilization and value creation in terms of sustainability. Indeed, the cited operation started in 2021, while period considered in this paper was 2017–2020.

The value of this paper resides, first of all, in the distinction between access to and the mobilization of network resources. The analysis of code-sharing alliances has allowed us to gather a series of findings that relate to value creation through resource mobilization.

From a theoretical point of view, the foundation has been laid for the distinction of different facets of value creation. Indeed, future research should further explore the outcome of value creation in terms of sustainability. This study has, furthermore, confirmed the fact that access and mobilization have their own semantic and ontological identities. This work confirms that access per se does not involve the capabilities to orchestrate resources that mobilization does. Mobilization acts as a moderator between access to resources and value creation. This paper also underlines the dynamicity of mobilization since it underpins the dynamic capabilities.

From a managerial point of view, this paper has shed light on future challenges in the airline industry. Although the issue of sustainability has been widely discussed in both literature and the managerial world, little has

been done in terms of concrete actions at the network level. Even if a firm decides to not mobilize its bundle of resources, this can also be considered a strategic choice. These results open up new horizons to firms that do not desire to give access to and/or mobilize resources to preserve their internal bundle. In terms of the companies that are reluctant to cooperate, this paper shows the strategic path for value creation at the network level.

However, this paper has some limitations. The research limits can be ascribed to the number of companies the sample contains and to the lack of control variables. Furthermore, future research on the topic could be enriched through the adoption of a quantitative methodology, such as interviews with managers, that is able to capture additional dynamics. This work has not considered some antecedents of inter-firm collaboration (i.e., experience, trust, governance structure, etc.) that can accelerate or influence the overall path from access to network resources to their mobilization. Additional studies could enlarge the dataset, adding control variables and exploring the antecedents of collaboration, in order to better understand the whole process leading to both firm and green/social performance.

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Academic or professional positions and contacts

Giovanna Del Gaudio
Researcher of Management
University of Napoli Federico II - Italy
e-mail: giovanna.delgaudio@unina.it

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