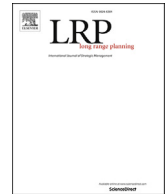


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Resource utilization as an internal driver of alliance portfolio evolution: The Qatar Airways case (1993–2010)

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ABSTRACT

This article aims to understand the role played by resource utilization levels as a driver of alliance portfolio evolution over time. Based on our theoretical framework and on a case study of Qatar Airways (1993–2010), we develop insights into the micro-dynamics of resource structuring in firms that possess an alliance portfolio. Our research shows that firms can create either their own or network resources with different deployment modes according to their resource utilization levels to remain profitable. We also emphasize that optimized resource utilization is a key driver of resource-structuring efforts in firms. Finally, we show that based on the focal firm's life cycle phase, the level of resource utilization changes and leads to various resource-structuring mechanisms that can be observed at the alliance portfolio level.

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Introduction

In today's business landscape, firms rarely rely on a single alliance to access network resources. Firms access a broad range of network resources through an alliance portfolio comprising multiple simultaneous strategic alliances with different partners (Wassmer, 2010). While a vast stream of research has investigated the different configurations of alliance portfolios and their respective impact on firm performance (Castro and Roldán, 2015; Gutiérrez et al., 2016; Lee et al., 2017), a significant set of contributions has adopted a dynamic approach and investigated the evolution of these alliance portfolios (Castro et al., 2014; Chiambaretto and Fernandez, 2016; Dittrich et al., 2007; Gutiérrez et al., 2016; Hoffmann, 2007; Lavie and Singh, 2012; Ozcan and Eisenhardt, 2009). Interestingly, most of these scholars have emphasized that firms can proactively change the composition of their alliance portfolios (Castro and Roldán, 2015; Greve et al., 2014; Hoffmann, 2007; Parise and Casher, 2003; Wassmer and Dussauge, 2011, 2012). Thus, firms can add, substitute or remove different types of partners and resources in their alliance portfolios to achieve strategic objectives (Greve et al., 2014; Holmberg and Cummings, 2009; Lin et al., 2007; Neyens and Faems, 2013).

A firm's management of its resources is as important as its possession of those resources (Hansen et al., 2004; Lippman and Rumelt, 2003). Along that line of thought, recent extensions of the resource-based view (RBV) have examined how firms manage and structure their resources (Sirmon et al., 2007, 2008, 2011). According to the resource management literature, to be successful, firms must accumulate and divest resources on an ongoing basis to ensure that they have the most efficient

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resource portfolio at any given time (Makadok, 2001; Sirmon et al., 2007, 2011). At the portfolio level, these resource-structuring actions can be explained by external and internal factors (Lavie and Singh, 2012). Most contributions addressing alliance portfolio evolution have focused their attention on external factors (Ahuja et al., 2012; Chiambaretto and Fernandez, 2016; Koka et al., 2006; Lavie and Singh, 2012; Madhavan et al., 1998), with much less emphasis on internal factors, although they are at least as important to investigate. Whereas external factors play a crucial role in alliance portfolio evolution, they are by definition unpredictable and can be perceived as external shocks that could have either occurred or not (Ahuja et al., 2012; Corbo et al., 2016). By contrast, some internal factors might be less unpredictable and observable in a larger number of firms in a more structured way (Castro et al., 2014). Furthermore, focusing only on external factors would mean that firms have a reactive alliance portfolio strategy. By contrast, several contributions have highlighted that firms can implement a pro-active alliance portfolio strategy to develop their competitive advantage or to shape their environment (Hoffmann, 2007; Ozcan and Eisenhardt, 2009; Lavie and Singh, 2012; Rindova et al., 2012; Greve et al., 2014). It is thus important to investigate both external and internal factors to understand alliance portfolio evolution.

Because significantly more attention has been paid to external factors, we focus our attention on the role of internal factors in alliance portfolio evolution. More precisely, we analyze in detail the role and the development of resource utilization as a driver of alliance portfolio evolution. Indeed, it has been noted in the literature that resource utilization is a critical explanatory factor for resource structuring and thus resource reconfiguration (Helfat and Eisenhardt, 2004; Levinthal and Wu, 2010; Penrose, 1959; Wu, 2013). By establishing a link between resource-structuring efforts and alliance portfolio evolution, we want to answer the following research question: How does the level of resource utilization impact the evolution of a focal firm's alliance portfolio over time?

Methodologically, we build on an in-depth longitudinal case study to discuss and illustrate our theoretical framework (Hoffmann, 2007; Chiambaretto and Fernandez, 2016). Longitudinal case studies are particularly suitable for studying the evolutionary processes of alliance portfolios (Koza and Lewin, 1999; Lavie and Singh, 2012; Mantere et al., 2012; Wassmer, 2010). The case study is based on *Qatar Airways* (henceforth, QR, the firm's IATA code) for the time period from 1993 to 2010.

Our study shows how firms can either create their own resources or utilize network resources with different deployment modes according to their resource utilization levels to remain profitable. We also emphasize that the optimization of a firm's resource utilization is a key driver of its resource-structuring efforts. Finally, we reveal that the logic of resource utilization optimization changes over time and that such changes lead to specific decisions regarding resource-structuring mechanisms and, consequently, alliance portfolio configurations. In summary, this research shows that based on the phase the focal firm inhabits in its life cycle, the level of resource utilization changes and leads to various resource-structuring mechanisms that can be observed at the alliance portfolio level.

Our research advances the alliance portfolio evolution literature by providing an understanding of how a firm's resource needs determine its choice of resource-structuring mechanisms and the configuration of its alliance portfolio (Hoffmann, 2007; Lavie and Singh, 2012; Rindova et al., 2012). More specifically, this research contributes to the stream of research focusing on the micro-dynamics of alliance portfolio evolution (Castro et al., 2014; Gilsing et al., 2016) by underlining the key role of resource utilization (Levinthal and Wu, 2010; Wu, 2013).

Theoretical background

Alliance portfolio evolution

The RBV of the firm posits that firms can achieve a sustainable competitive advantage through the accumulation and deployment of superior resources (Barney, 1991; Wernerfelt, 1984). As no firm can possess all the resources that are strategically necessary to ensure growth and success at every stage of the life cycle (Penrose, 1959; Rumelt, 1984), firms often reach beyond their boundaries to access, exchange, or internalize the required resources through strategic alliances (Ahuja, 2000; Das and Teng, 2000; Eisenhardt and Schoonhoven, 1996; Lavie, 2006). However, firms rarely rely on a single alliance to access network resources: many firms access a broad range of network resources through an alliance portfolio consisting of multiple simultaneous strategic alliances with different partners (Hoffmann, 2007; Lavie, 2006, 2007; Andrevski et al., 2016; Srivastava and Gnyawali, 2011; Wassmer, 2010).

Considering the simultaneous presence of different types of partners in a focal firm's alliance portfolio, a vast stream of research has investigated the different compositions of alliance portfolios and their respective impact on firm performance (Castro and Roldán, 2015; Gutiérrez et al., 2016; Wassmer, 2010). Alliance portfolio composition has been studied with respect to a variety of dimensions, including differences in terms of nationality (Goerzen and Beamish, 2005; Lavie and Miller, 2008), tie strength (Rowley et al., 2000), cohesive/sparse alliances (Padula, 2008), degree of competition (Chiambaretto and Fernandez, 2016) and exploration/exploitation goals (Dittrich et al., 2007; Lavie et al., 2011).

Most contributions focusing on alliance portfolio composition have adopted a dynamic approach and investigated the evolution of alliance portfolios (Wassmer, 2010). One stream of research has examined how alliances are created or terminated by focusing on the interplay between a focal firm's existing stock of resources and its position in a network of ties (Eisenhardt and Schoonhoven, 1996; Gulati and Gargiulo, 1999). A second stream of research highlights the links between a firm's strategy, its environment, and the evolution of firm alliances over time (Chiambaretto and Fernandez, 2016; Dittrich et al., 2007; Gutiérrez et al., 2016; Hoffmann, 2007; Lavie and Singh, 2012; Ozcan and Eisenhardt, 2009). From this perspective, a firm's alliance portfolio co-evolves with its strategy to reduce the effects of environmental uncertainty and

change. A third stream has linked alliance portfolio evolution to firm growth, highlighting how the firm's needs explain the evolution of its alliances during its life cycle (Hite and Hesterly, 2001; Maurer and Ebers, 2006; Rindova et al., 2012). Finally, a recent stream of research attempts to highlight the micro-dynamics of alliance portfolio evolution by emphasizing the portfolio-level aggregation of individual decisions regarding alliances (Castro et al., 2014; Gilsing et al., 2016).

Although external industry-level events can strongly influence a firm's alliance strategy (Ahuja et al., 2012; Koka et al., 2006; Lavie and Singh, 2012; Madhavan et al., 1998), they are by definition unpredictable and can be perceived as external shocks that could have equally occurred or not. By contrast, some internal factors might be less unpredictable and observable in a larger number of firms in a more structural way. Accordingly, several scholars have emphasized that firms can proactively change the composition of their alliance portfolios (Castro and Roldán, 2015; Greve et al., 2014; Heimeriks et al., 2009; Hoffmann, 2005, 2007; Wassmer and Dussauge, 2011, 2012). Thus, firms can voluntarily add, substitute or remove different types of partners and resources in their alliance portfolios to achieve strategic objectives and meet their evolving needs across their life cycle (Greve et al., 2014; Lin et al., 2007; Rindova et al., 2012; Neyens and Faems, 2013).

Linking resource management and alliance portfolio evolution

Various scholars have emphasized that a firm's management of its resources is as important as its possession of those resources (Hansen et al., 2004; Lippman and Rumelt, 2003). Along that line of thought, recent extensions of the RBV have examined how firms manage their resources (henceforth, resource management) in a process that involves structuring a resource portfolio, bundling resources to create capabilities, and leveraging these capabilities to create and maintain value for customers and owners (Sirmon et al., 2007, 2008). Through resource structuring, (i.e., the processes of resource acquisition, internal accumulation, and deletion), firms create resource portfolios that they use for bundling and leveraging purposes (Sirmon et al., 2007, 2011). Coherent resource management is thus crucial for creating value (Chadwick et al., 2015; Ndofof et al., 2011).

The idea of resource structuring as a set of processes involving resource additions and deletions builds on the resource stock and flow model (Dierickx and Cool, 1989; Winter 1988). To be successful, firms must therefore accumulate and divest resources on an ongoing basis to ensure that they have the most efficient resource portfolio at any given time (Makadok, 2001; Sirmon et al., 2007). Undoubtedly, the resource management literature has greatly advanced the RBV. However, it has provided only limited insight into the criteria and decision rules that are used to structure a resource stock (Sirmon et al., 2007, 2008).

From this perspective, we can view a firm's resource-structuring efforts through the evolution of its alliance portfolio (Dittrich et al., 2007; Lavie and Singh, 2012). In addition to internal or own resources possessed by the focal firm, we view partner resource stocks as firm resources accessed through its alliance portfolio (Lavie, 2007; Wassmer and Dussauge, 2012). Furthermore, we view alliance formations as the mechanism for creating partner resource inflows/additions (Ahuja, 2000; Gulati, 1999; Jensen, 2003; Stuart, 1998) and regard alliance terminations as mechanisms that create partner resource outflows/deletions (Lunnan and Haugland, 2008; Makino et al., 2007; Wassmer and Meschi, 2011).

Resource utilization as a driver of resource reconfiguration

Resource utilization is a critical explanatory factor for resource structuring and thus resource reconfiguration (Helfat and Eisenhardt, 2004; Levinthal and Wu, 2010; Wu, 2013). Since Penrose's (1959) seminal contribution, researchers have been concerned with how firm resources affect performance (Barney, 1991; Wernerfelt, 1984). One important factor explaining firm growth is excess resources, which exist because of (1) the indivisibility of resources, implying an imperfect match between the amount of resources and demand at a given point in time, and (2) a learning process that results in better use of existing resources (such that fewer resources are required for a given output) (Penrose, 1959). Consequently, excess resources generate sunk costs and must be redeployed and put to profitable use at a marginal cost close to zero (Pitelis, 2007). In other words, when a given resource is not used optimally or displays a low level of resource utilization, it needs to be redeployed so that it can be better used in another configuration.

In their contribution, Levinthal and Wu (2010) emphasize the importance of opportunity costs for resource reconfiguration. Those researchers emphasize that resources that are capacity constrained are subject to opportunity costs. Using a resource for a given activity excludes its simultaneous use for another activity (Wu, 2013), so that the opportunity costs of deploying a given resource are the revenues from an alternative deployment. As a consequence, resources can be reconfigured according to their relative attractiveness, and the minimization of opportunity costs becomes the driver of resource redeployment. Thus, from a resource perspective, a firm's strategy for addressing evolving constraints involves optimally (re)deploying its resources to minimize opportunity costs and consequently maximize the level of resource utilization (Wu, 2013).

Conceptually, two types of excess resource capacity exist. First, excess resource capacity can occur in a resource bundle with an excessive amount of unutilized individual resources. In this case, the low level of resource utilization is explained by the fact that some resources are fully used while others are not used at all. Second, excess resource capacity can occur on the level of a single resource (which is normally indivisible), referring to the unutilized capacity of the resource. For instance, in the shipping and airline industries, each ship or plane on a specific route has a fixed capacity that may or may not be fully utilized (Wu, 2012). For the purposes of this study, we focus on the second type of excess resource capacity, i.e., unused

capacity in a resource (Levinthal and Wu, 2010). This type of excess resource capacity is particularly relevant because it raises the question of the level of utilization of each resource and requires that alternative ways be found to minimize the opportunity cost associated with each resource.

Because one can view a firm's resource-structuring efforts through the evolution of its alliance portfolio (Dittrich et al., 2007; Lavie and Singh, 2012), we want to understand the role of resource utilization as a driver of alliance portfolio evolution. More precisely, we want to answer the following research question: How does the level of resource utilization impact the evolution of a focal firm's alliance portfolio over time?

Theoretical framework

Resource utilization and its impact on resource types

A focal firm's resources fall into two categories: (1) resources that are owned and controlled by the firm (henceforth, own resources) and (2) resources that are beyond the firm's boundaries but that the firm can access through its alliances (henceforth, network or partner resources) (Gulati, 2007; Wassmer and Dussauge, 2011). In parallel, a firm can deploy its own resources in two ways: (a) via private deployment, i.e., the firm deploys the resource alone and does not share it with a partner, or (b) via shared deployment, i.e., the firm jointly deploys the resource and shares it through an alliance with a partner. The deployment of network resources is shared by definition.

Going further, from a resource-based perspective, alliances can be divided at the resource level into product-market-extending alliances and efficiency-improving alliances (Wassmer et al., 2017). In product-market-extending alliances, for a given resource, the focal firm aims to enhance its revenue by entering new markets or developing new products. By contrast, in efficiency-improving alliances, for a given resource, a focal firm wants to enhance the productivity of its existing assets. A balanced portfolio that combines these two types of alliances should result in superior performance (Wassmer et al., 2017).

Combining these two approaches, we can elaborate the following typology of resources (Table 1)

Table 1
Resource ownership and deployment modes available to the focal firm.

		Ownership	
		Own	Partner
Deployment mode	Private	Own resource privately deployed.	
	Shared	Own resource jointly deployed in an efficiency-improving alliance	Network resource shared by a partner and accessed in a product-market-extending alliance.

Generally, the profit generated by a resource is the difference between the resource-related revenues and costs (Madhok and Tallman, 1998). The level of resource utilization is a critical factor in maximizing the profit generated by resources (Penrose, 1959; Wu, 2013). For own and partner resources, there are fixed and variable costs. Based on the resource utilization level, the revenues generated by a resource cover all, a part of, or none of the fixed costs.

For own resources, the main fixed cost is related to the ownership or acquisition cost. In this case, resource utilization does not increase the fixed cost of this resource but contributes to covering it by generating revenues. Conversely, resource-related variable costs (such as the raw material consumption associated with the use of this resource) change according to the level of resource utilization. If the revenues generated are sufficiently high to cover the fixed and variable costs, then the firm will own and privately deploy this particular resource. However, if revenues cover only a portion of the fixed costs, then the focal firm needs to increase the level of utilization (and thus revenues) for this resource. To do so, it will form an efficiency-improving alliance to increase its revenues and cover the costs. In other words, for resources that display a moderate level of resource utilization, choosing a shared deployment for an own resource might be necessary to cover the fixed costs.

By contrast, a focal firm decides to access a resource through a partner when the expected revenues are not sufficient to cover the fixed ownership costs either alone or in an efficiency-improving alliance. In other words, for partner resources, because the resource belongs to the partner, the focal firm does not have fixed ownership costs but only those generated by the creation of the alliance. This fixed alliance cost is much lower than the ownership or acquisition fixed cost.

In a nutshell, according to the resource utilization level, the focal firm can pick the most relevant ownership and deployment modes to maximize its revenue. If the level of resource utilization (u) is high enough (larger than \bar{u}) to generate significant revenues, the best option is to create an own resource that is privately deployed. If the level of resource utilization is moderate (between \underline{u} and \bar{u}) and generates a medium level of revenues, the focal firm has an incentive to develop an own resource but to deploy it jointly with a partner in an efficiency-improving alliance. Finally, if the level of resource utilization is very low (smaller than \underline{u}) and does not generate sufficient revenues to cover the costs, the focal firm renounces owning the resource and accesses it as a network resource through a product-market-extending alliance with a partner.

The evolution of resource utilization over the firm life cycle

As firms go through the different phases of their life cycle, they display evolving needs regarding their resources. As no one firm can possess all the critical resources needed to ensure growth and success at every life cycle stage (Katz and Gartner,

1988; McKelvie and Wiklund, 2010; Miller and Friesen, 1984; Quinn and Cameron, 1983), firms restructure their resource stock from time to time by adding new and removing existing resources (Capron et al., 1998; Helfat et al., 2007; Helfat and Peteraf, 2003; Karim and Mitchell, 2000; Sirmon et al., 2011; Teece et al., 1997). To restructure their resources, firms often reach beyond their boundaries and engage in strategic alliances (Das and Teng, 2000; Eisenhardt and Schoonhoven, 1996; Lavie, 2006).

As we explained in the previous section, the resource types selected (ownership and deployment modes) are significantly impacted by the level of resource utilization. To understand the internal drivers of the evolution of these resource-structuring mechanisms, we need to comprehend how firms' resource utilization evolves over time. Two opposite trends can be identified in the literature: on the one hand, one can observe a decreasing initial level of resource utilization for newly created resources; on the other hand, one can note an increasing level of resource utilization for existing resources.

• For newly created resources

For newly created resources, it is generally admitted that in the early phases of their life cycles, firms have a limited number of resources, and their allocation must be realized carefully (Baum et al., 2000; Rindova et al., 2012). When entering markets, these firms typically begin by entering the most profitable markets first (Samuelson and Nordhaus, 2009). These most profitable markets are highly attractive for the firm because they present the lowest opportunity costs (Penrose, 1959; Van Wegberg and Van Witteloostvijn, 1992). As soon as the first markets present decreasing returns, the firm allocates its additional resources to the second most profitable markets and so forth (Montgomery and Wernerfelt, 1988). This reasoning is as old as Ricardo (1817) and his law of diminishing returns. According to this approach, firms first focus on resources with the highest profit-generating potential before they focus on resources with lower rent-generating potential. From a resource utilization perspective, this means that firms first tend to create resources with a high level of utilization before they focus on resources with a lower level of utilization. Because resources with the highest level of utilization tend to be privately deployed own resources, firms are thus more likely to add privately deployed own resources before they add resources with a lower level of utilization—first through efficiency-improving alliances and then through product-market-extending alliances.

Following the conclusions of this Ricardian approach, we are in the presence of decreasing returns for resources developed over time, and our reasoning allows us to identify three distinct periods, which are represented in Fig. 1. The boundaries between the different periods are consistent with the moments in which the initial utilization level u_{i,t_0} crosses the thresholds \bar{u} and \underline{u} .

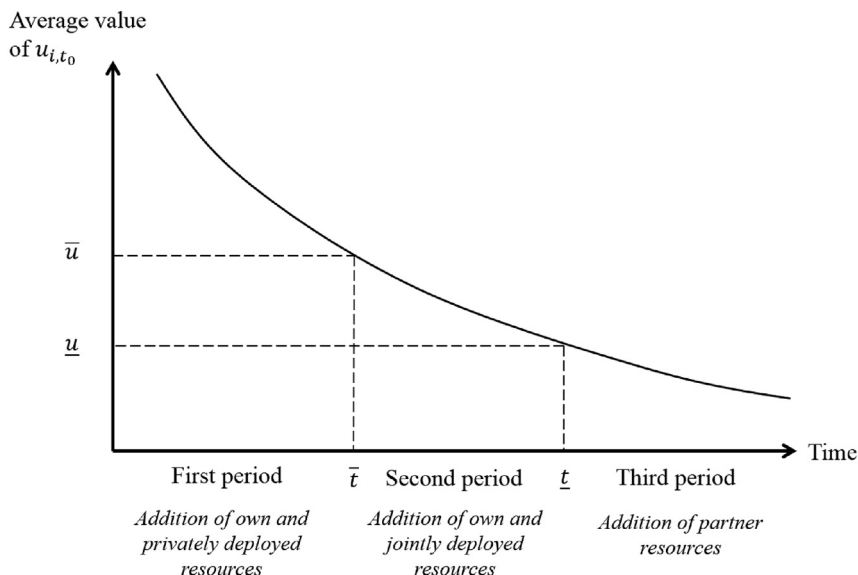


Fig. 1. Evolution of the initial level of utilization for the newly created resources.

During the first period of the firm life cycle (from 0 to \bar{t}), most resources that are developed have an initial utilization level that is higher than \bar{u} , and consequently, these resources are created as privately deployed own resources. Thus, during the first period, the largest fraction of resource additions should be privately deployed resources owned by the firm. During the second period of the firm life cycle (from \bar{t} to \underline{t}), most resources that are developed have an initial utilization level that is between \underline{u} and \bar{u} . During this phase, most of the added resources are likely to be own resources that are jointly deployed through efficiency-improving alliances. Finally, during the last period (after \underline{t}), most new resources that are accessed have an initial

utilization level that is lower than \underline{u} so that the firm is more likely to create resources by accessing partner resources through product-market-extending alliances.

• For existing resources

For existing resources, the evolution of the utilization level is significantly different. As a firm evolves, its ability to deploy its own resources at an optimal level of utilization increases. This improved ability can be explained by two factors. First, as a firm evolves, it becomes more likely to have an enhanced reputation among customers (Aaker, 2009). Increased brand awareness increases a firm's ability to fully use its resources and to avoid opportunity costs. Second, this improved ability can also be explained through learning (Arrow, 1962; Penrose, 1959). Additional experience enhances a firm's ability to better meet the expectations of its customers and to understand its competitors. This learning effect is also present when a firm cooperates with a partner to access partner resources or to learn from a partner how to use a particular resource (Khanna et al., 1998; Inkpen, 2000; Phene and Tallman, 2014; Fernandez and Chiambaretto, 2016). As a consequence, as a firm becomes more experienced, it develops a greater ability to deploy its resources at optimal capacity.

Knowing the initial values of the resources created during the different time periods and combining them with a logic linking resource utilization to the resource type selected, we can infer what type of resource-structuring effort is likely to occur at different moments (Fig. 2).

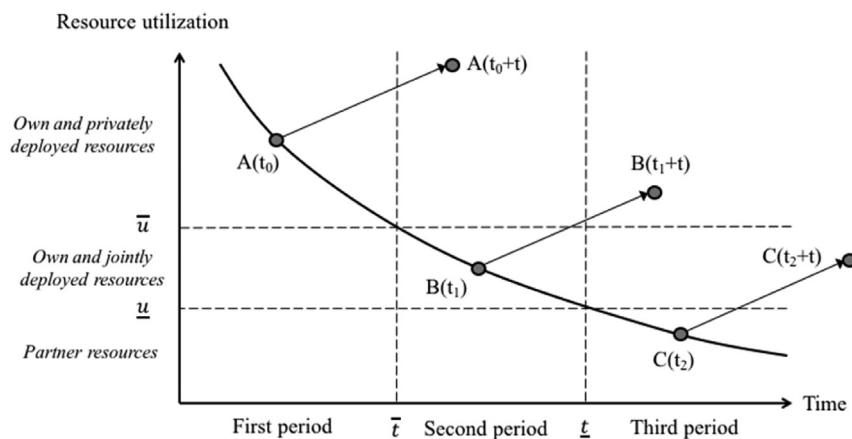


Fig. 2. Evolution of the resource utilization level and resource-restructuring efforts.

Regarding the resources created during a firm's early period (such as resource A in Fig. 2), their initial value is almost always larger than \bar{u} , and such resources are thus developed as privately deployed own resources. Consequently, as the utilization level increases, little room for improvement remains. In other words, privately deployed own resources are generally not restructured, as they already offer the optimal configuration to manage high utilization levels.

The situation differs for resources whose utilization level changes over time (and exceeds the thresholds \underline{u} or \bar{u}). As we showed before, during the second phase of the life cycle, the resources created tend to have an initial level of utilization that is between \underline{u} and \bar{u} . These resources (such as resource B in Fig. 2) are thus created as own resources that are jointly deployed through efficiency-improving alliances. As a firm evolves, the utilization level of these resources increases such that it may exceed \bar{u} during the later phases of the life cycle. As a consequence, the resource will remain an own resource, but its deployment will switch from shared to private.

The same reasoning works for partner resources that are accessed through product-market-extending alliances because their initial level of utilization is lower than \underline{u} (such as resource C in Fig. 2) and may increase over time, potentially becoming larger than \underline{u} or even \bar{u} . These partner resources may thus be restructured and, in the later phases, become either a jointly deployed own resource (if the new utilization level is between \underline{u} and \bar{u}) or a privately deployed own resource (if the new utilization level is larger than \bar{u}). Consequently, some resource structuring is likely to occur during the late phase in which jointly deployed own resources are restructured into privately deployed own resources and in which partner resources that are jointly deployed can be replaced by own resources that are either jointly or privately deployed.

In Fig. 3, we summarize our theoretical framework, in which we analyze how resource utilization variations act as a driver of resource-structuring mechanisms and have consequences for alliance portfolio evolution over the focal firm's life cycle.

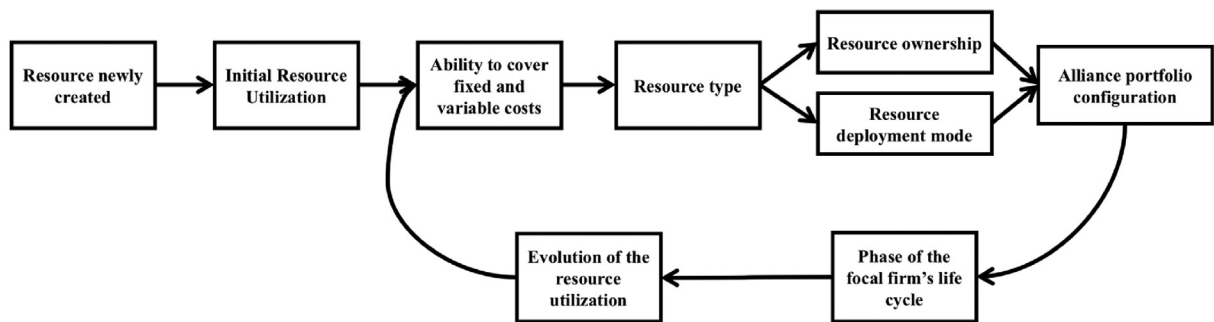


Fig. 3. Theoretical framework.

Methods

Research design

This research aims to explain how the level of resource utilization impacts the evolution of a focal firm's alliance portfolio over time. To do so, we build on a case-based method that is particularly appropriate for understanding poorly understood phenomena with multiple and complex elements that evolve over time (Eisenhardt, 1989; Langley, 1999). More specifically, we draw from Hoffmann (2007) and illustrate our theoretical framework through an in-depth and explanatory case study (Yin, 2014). This approach does not aim to test the external validity of our model but rather aims to illustrate its usefulness in providing insight into resource-structuring mechanisms and their role in alliance portfolio evolution. Several authors have noted the usefulness of case studies to illustrate and discuss theoretical insights (Bogenrieder and Noteboom, 2004; Chiambaretto, 2015; Chiambaretto and Fernandez, 2016; De Rond and Bouchikhi, 2004; Gnyawali and Park, 2011; Hoffmann, 2007; Huygens et al., 2001).

As explained by Hoffmann (2007), this research strategy has several advantages relative to other methods. First, compared with inductive approaches, the theory development is better grounded in the existing literature and less dependent on the specific case studied. Second, contrary to large empirical studies testing hypotheses with large samples, this research method allows the in-depth investigation of a phenomenon by considering the firm context. Finally, with a pre-existing theoretical framework, the case selection and data collection are more relevant to the research question than would be likely in a pure inductive study.

More precisely, our choice of a longitudinal approach with a single case study (Eisenhardt, 1989; Yin, 2014) is grounded in the fact that this approach is particularly suitable for studying the evolutionary processes of alliance portfolios (Chiambaretto and Fernandez, 2016; Koza and Lewin, 1999; Lavie and Singh, 2012; Mantere et al., 2012). Finally, according to Wassmer (2010), longitudinal research designs are best suited for examining alliance portfolio evolution by considering alliance formations, terminations, and reconfigurations.

Empirical setting and case selection

To answer our research question, we selected *Qatar Airways (QR)* as the case setting. The time period analyzed begins in 1993 and ends in 2010.

The airline industry is a suitable setting for a number of reasons. First, airlines' frequent alliance formations and terminations allow us to observe the evolution of resource structuring and alliance portfolio configurations over time. Second, critical resources, i.e., routes or markets¹ that airlines access through alliances with partners, can be clearly identified. Third, airlines engage in both efficiency-improving and product-market-extending alliances (Wassmer et al., 2017). Finally, several contributions have studied alliance portfolios in this industry (Casanueva et al., 2013, 2014; Chiambaretto and Fernandez, 2016; Lahiri and Narayanan, 2013; Wassmer and Dussauge, 2012; Wassmer et al., 2017).

We sought a case setting with an alliance portfolio evolution that could provide rich insight through sufficient alliance formations and terminations. *QR* provides an ideal case for several reasons. First, because the alliance phenomenon started to emerge in the airline industry in the late 1980s and the early 1990s (Gimeno, 2004; Iatrou and Oretti, 2007), we needed an airline that was founded at a time when alliances already existed in the industry. However, most national flag carriers (e.g., Air France, Lufthansa) were founded prior to the alliance era. Several airlines met our criteria, and we selected *QR* for a number of reasons. First, *QR* has been one of the fastest-growing airlines in the world (i.e., showing an annual growth rate of 35% in terms

¹ The most critical resource allowing an airline to achieve a competitive advantage is its route network, i.e., destinations (Doganis, 2001; Gimeno, 2004; Holloway, 2016; Wassmer and Dussauge, 2012). In the context of this study, we thus view a resource as a route/destination (the terms are used interchangeably).

of passengers), and, in a mere 15 years, it has become one of the leading firms in the industry. Second, QR has had very extensive alliance formation, termination and reconfiguration activity. Third, we were able to obtain rich internal data from QR to illustrate our theoretical insights.

Because QR was originally founded in 1993 and relaunched in 1997, we also include the period from 1993 to 1997 to explore how the firm's relaunch affected its alliance strategy. We selected 2010 as the end year for two reasons. First, we followed Gibbert et al.'s (2008) recommendation to reveal the name of the analyzed firm and thus were asked by QR managers to end our analysis in 2010. Second, QR was not at that time allied with one of the multi-partner alliance constellations that are present in the industry,² which enabled us to eliminate confounding effects resulting from constellation membership (Lazzarini, 2007).

To investigate alliance portfolio evolution, we build on prior empirical alliance research in the aviation context (Chiambaretto and Dumez, 2016; Park, 2004; Vaara et al., 2004; Wassmer and Dussauge, 2012) and focus on the dominant strategic alliance type between airlines: code sharing on one or more routes.³ Because creating a global route network is almost impossible for a single airline (Park, 1997), code-sharing alliances among airlines emerged in the 1990s (Iatrou and Oretti, 2007). Because code sharing allows airlines to offer service to destinations for which they do not have the resource capacity or traffic rights, code-sharing alliances allow airlines to bypass regulatory restrictions and to enter new markets (Brueckner, 2001; Gimeno, 2004). Building on the alliance typology developed by Wassmer et al. (2017), we distinguish two types of codeshare agreements: efficiency-improving agreements, which aim to reduce excess resource capacity by improving the capacity utilization (i.e., the load factor) of a particular flight without extending the airline's route network, and product-market-extending agreements, which link the partners' route networks by allowing the focal firm to place its code on partner's flights to destinations that it does not serve, thus extending the number of routes and markets offered.

Data collection and analysis

We collected primary and secondary data in order to use triangulation techniques (Eisenhardt, 1989; Gibbert et al., 2008; Lincoln and Guba, 1985). We collected primary data through 18 semi-structured interviews (interview length ranged from 40 to 135 min, with an average of 83 min) with key QR managers and industry experts. The QR managers have been working for the airline during more than 70% of the time span of our case study and were actively involved in the development of the alliances and the elaboration of the network of new routes. Regarding the industry experts (such as journalists, consultants or researchers), they have been working in the airline industry for more than 15 years and have thus followed the development of QR over the years. We clearly noted that these interviews would remain confidential and anonymous (Gioia et al., 2013), and at the request of the interviewees, most interviews were not tape-recorded (but notes were taken manually). To ensure the interviewee's confidentiality, we use a generic position ("QR manager") to identify him or her in the quotations.

To collect secondary data on QR's strategy, we performed a keyword search in *Factiva*, which yielded more than 10,000 articles. We then reviewed the titles and abstracts of those articles. After removing duplicates, i.e., when the same article appeared in different news outlets, we ultimately obtained 230 relevant articles. We paid particular attention to statements by the CEO and management team concerning QR's strategy. We cross-checked the elements of QR's strategy against its corporate website, press releases, internal documents, and other sources. We also used the *IATA World Air Transport Statistics (WATS)* and the annual *Airline Business*⁴ alliance survey to collect data on QR's traffic, employees, destinations, and alliances. Both data sources are frequently used in strategy research on the airline industry (Gimeno, 2004; Lazzarini, 2007; Wassmer and Dussauge, 2012). In Table 2, we provide a summary of the data collected and detail their respective use for the analysis as suggested by Ravasi and Phillips (2011).

We first classified our data in different categories and organized and coded all 230 articles into a multidimensional table across all years and various categories, including strategy, organization, resources, and alliances. We then introduced the other relevant data elements (e.g., interview extracts, internal documents, traffic, and fleet data). This process yielded an extensive multidimensional chronology that allowed us to identify transition points in the strategy (Dumez and Jeunemaître, 2006; Lehiany and Chiambaretto, 2014).

As we modeled different phases in the firm's evolution, we adopted the approach by Lavie and Singh (2012) to identify key transition points in the internationalization and alliance strategy to isolate time segments. We identified three distinct phases during the period from 1993 to 2010, each characterized by a major transition point in the firm's history: Phase 1 (November 1993 to 2002), Phase 2 (2003–2005), and Phase 3 (2006–2010). The first phase (1993–2002) corresponds with the birth (and rebirth) of QR. Because changing a CEO generally has a strong impact on the strategy implemented by the firm (Zajac, 1990; Shen and Cannella, 2002), we have decided to divide this long phase into two sub-phases, Phase 1a (the initial birth from 1993 to 1996) and Phase 1b (the relaunch from 1997 to 2002), for the description of the case and the analysis of its alliance activity. During Phase 1, the airline remained a minor actor in the industry and essentially tried to launch its activity and enter several markets for the first time. Its strategy was essentially emergent, and the largest part of QR's development was organic such

² In October 2013, QR joined the *Oneworld* constellation.

³ The *International Civil Aviation Organization (ICAO)* defines code sharing as a practice in which one carrier *i* permits another carrier *j* to use its airline designator code on a particular flight *i* or in which two carriers share the same designator code on a particular flight (ICAO Circular 296-AT/110, 1997).

⁴ *Airline Business* is the leading monthly industry magazine for airline strategy-related issues.

Table 2

Primary and secondary data collected for the analysis.

Type of data collected	Quantity	Use in the analysis
Primary data		
Interviews		
- QR managers	11	<ul style="list-style-type: none"> • Understand the decisions regarding alliances and destinations taken by QR • Obtain an external point of view on QR's strategy • Verify the truthfulness of QR managers regarding the airline's actions
- Industry experts	7	
Secondary data		
Press articles	230+	<ul style="list-style-type: none"> • Elaborate a multidimensional chronology of QR over the period • Understand the strategic drivers and the competitive environment in which QR evolved • Check the relevance of QR managers' explanations • Verify the number of alliances and their specificities (destinations, operating carrier, marketing carrier) over the period
Airline Business alliance surveys	16	
IATA World Air Transport Statistics	50+	<ul style="list-style-type: none"> • Collect statistical facts and key figures on QR (destinations, employees, fleet size, etc.) for the multidimensional chronology • Check the relevance of QR managers' interviews • Classify all the resources/destinations according to their ownership and deployment modes
Internal documents	15+	
Annual reports and press releases	40+	<ul style="list-style-type: none"> • Elaborate a multidimensional chronology of QR over the period • Understand the strategic drivers and the competitive environment in which QR evolved • Check the relevance of QR managers' explanations

that in terms of alliances, these two sub-phases can be considered as a single phase. During the second phase (2003–2005), which could be characterized as its rapid growth phase, the airline sped up its development by entering an increasing number of markets. This considerable expansion of QR's activity was due not only to its increased fleet but also to its more extensive use of alliances and partnerships across the globe. Finally, the last phase (2006–2010) corresponds with what some might call the “maturity growth phase”, in which the airline acquired the status of a “global airline” by offering its first flights to the US in 2006. Furthermore, the airline reached a cruising speed such that the number of new destinations continued increasing, but more slowly than it had previously. With a growing reputation and a high-end position, QR became increasingly able to be either selective in the markets and routes that it entered or more selective in the partners with whom it worked.

Because in each phase, QR's strategy, organization, resource stock, and alliance portfolio underwent certain changes, we coded all the resource-structuring mechanisms that occurred each year. This coding process allowed us to track the different structuring mechanisms over time to discuss our theoretical framework.

Case study analysis

In this section, we first provide a brief overview of QR's history and evolution before we illustrate our theoretical insights into resource structuring through observations from the case study. Table 3 provides a summary of this overview and illustrations.

Table 3a

Evolution of QR: strategy and organization.

Strategy and Organization	Phase 1		Phase 2	Phase 3
	Phase 1a: Birth	Phase 1b: The re-launch	Rapid growth	Mature growth
Geographical scope (including destinations accessed through alliances)	<ul style="list-style-type: none"> • 1993: no destinations • 1996: 28 destinations in Europe, the Middle East and India 	<ul style="list-style-type: none"> • 1997: 18 destinations in Europe and the Middle East • 2002: 41 destinations in Europe, the Middle East and Asia 	<ul style="list-style-type: none"> • 2003: 48 destinations in Europe, the Middle East, Africa and Asia • 2005: 80 destinations in Europe, the Middle East, Asia and Africa 	<ul style="list-style-type: none"> • 2006: 92 destinations in Europe, the Middle East, Asia, Africa and the US • 2010: 170 destinations in Europe, the Middle East, Asia, Africa, the Americas and Australia
Employees	<ul style="list-style-type: none"> • 1994: 75 employees • 1996: 630 employees 	<ul style="list-style-type: none"> • 1997: 735 employees • 2002: 2370 employees 	<ul style="list-style-type: none"> • 2003: 3037 employees • 2005: 5,435 employees 	<ul style="list-style-type: none"> • 2006: 7402 employees • 2010: 10,786 employees
Fleet size	<ul style="list-style-type: none"> • 1994: Wet-leased fleet • 1996: 1 aircraft 	<ul style="list-style-type: none"> • 1997: 2 aircraft • 2002: 16 aircraft 	<ul style="list-style-type: none"> • 2003: 17 aircraft • 2005: 38 aircraft 	<ul style="list-style-type: none"> • 2006: 38 aircraft • 2010: 86 aircraft
Positioning	<ul style="list-style-type: none"> • No-frills service 	<ul style="list-style-type: none"> • 1997: Evolution of the service • 2002: Standardized service 	<ul style="list-style-type: none"> • Focus on quality 	<ul style="list-style-type: none"> • Focus on quality
Number of passengers	<ul style="list-style-type: none"> • 1994: 124,000 passengers • 1996: 440,00 passengers 	<ul style="list-style-type: none"> • 1997: 646,000 passengers • 2002: 2.3 million passengers 	<ul style="list-style-type: none"> • 2003: 3.1 million passengers • 2005: 6 million passengers 	<ul style="list-style-type: none"> • 2006: 7.1 million passengers • 2010: 12 million passengers
Awards and certifications	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • IATA member since 1997 • Qatar's flag carrier since 2002 	<ul style="list-style-type: none"> • First airline to pass the IATA-IOSA in 2003 • 2004: 5-star excellence award given by Skytrax 	<ul style="list-style-type: none"> • 5-star excellence award given by Skytrax received every year

Table 3b
Evolution of QR: alliances.

Alliances	Phase 1		Phase 2	Phase 3
	Phase 1a: Birth	Phase 1b: The re-launch	Rapid growth	Mature growth
Number of partners	<ul style="list-style-type: none"> 1993: No partners 	<ul style="list-style-type: none"> 1993: No partners 2002: 3 partners 	<ul style="list-style-type: none"> 2003: 6 partners 2005: 14 partners 	<ul style="list-style-type: none"> 2006: 15 partners 2010: 10 partners
Types of alliances	<ul style="list-style-type: none"> No alliance activity 	<ul style="list-style-type: none"> Limited amount of efficiency-improving alliances 	<ul style="list-style-type: none"> Primarily efficiency-improving alliances 	<ul style="list-style-type: none"> Primarily product-market-extending alliances
Number and percentage of destinations accessed through alliances	<ul style="list-style-type: none"> 1993: 0 (0%) 1996: 0 (0%) 	<ul style="list-style-type: none"> 1997: 0 (0%) 2002: 3 (7.3%) 	<ul style="list-style-type: none"> 2003: 3 (6.2%) 2005: 11 (13.8%) 	<ul style="list-style-type: none"> 2006: 16 (17.4%) 2010: 70 (41.2%)
Number of alliance formations (in chronological order)	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> 3 efficiency-improving alliances Lufthansa, Bangladesh Airlines, Malaysia Airlines 	<ul style="list-style-type: none"> 14 efficiency-improving alliances o Alitalia, Garuda Indonesia, Philippine Airlines, Aeroflot, Air China, Middle East Airlines, Thai Airways, Yemenia, Myanmar Airways, Swiss, Ukraine Airlines, Saudi Arabian Airlines, Tunisair 2 product-market-extending alliances o <i>BMI</i>, <i>ANA</i> 	<ul style="list-style-type: none"> 1 efficiency-improving alliance o <i>Asiana Airlines</i> 2 product-market-extending alliances o <i>United Airlines</i>, <i>US Airways</i>
Number of alliance terminations	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> 3 efficiency-improving alliances Aeroflot, Bangladesh Airlines, Ukraine Airlines, 	<ul style="list-style-type: none"> 8 efficiency-improving alliances Thai Airways, Air China, Alitalia, Myanmar Airways, Saudi Arabian Airlines, Tunisair, Yemenia, Garuda Indonesia

Table 3c
Evolution of QR: resource-structuring mechanisms.

Resource-structuring mechanisms		Phase 1			Phase 2	Phase 3
		Phase 1a	Phase 1b	Total		
Resource additions	Privately deployed own resource <i>Example: 2009 addition of the Doha-Melbourne route privately deployed by QR</i>	28	21	49	17	11
	Own resource jointly deployed through an efficiency-improving alliance <i>Example: 2004 addition of the Doha-Tunis route operated by QR with an efficiency-improving codeshare with Tunisair</i>	0	2	2	19	11
	Partner resource accessed through a product-market-extending alliance <i>Example: 2005 addition of several Japanese secondary cities using flights operated by ANA in a product-market-extending codeshare</i>	0	3	3	8	65
Resource deletions	Privately deployed own resource <i>Example: 2009 deletion of the Doha-Nagpur route (privately deployed by QR)</i>	0	13	13	0	0
	Own resource jointly deployed through an efficiency-improving alliance <i>Example: 2005 deletion of the Doha-Kiev route (operated by QR in an efficiency-improving codeshare with Ukraine International Airlines)</i>	0	0	0	1	0
	Partner resource accessed through a product-market-extending alliance <i>Example: 2009 deletion of the Doha-Manchester-Edinburgh route operated by BMI in a product-market-extending codeshare</i>	0	0	0	0	2
Resource deployment-mode changes	Own resource: from private to shared deployment <i>Example: Doha-Shanghai route privately deployed by QR and then changed to an efficiency-improving codeshare with Air China</i>	0	1	1	0	3
	Own resource: from shared to private deployment <i>Example: Doha-Rome route deployed through an efficiency-improving codeshare with Alitalia since 2003 and then privately operated by QR after 2008</i>	0	0	0	3	12
Resource replacements	Replacement of privately deployed own resource with partner resource accessed through a product-market-extending alliance <i>Example: No example found in this case</i>	0	0	0	0	0
	Replacement of partner resource with privately deployed own resource <i>Example: Doha-Singapore route operated by Garuda (via Jakarta) in a product-market-extending codeshare before being privately deployed by QR</i>	0	0	0	0	5
	Replacement of own resource jointly deployed through an efficiency-improving alliance with partner resource accessed through a product-market-extending alliance <i>Example: No example found in this case</i>	0	0	0	0	0
	Replacement of partner resource accessed through a product-market-extending alliance with own resource deployed through an efficiency-improving alliance <i>Example: Doha-Washington route operated by Lufthansa (via Frankfurt) in a product-market-extending codeshare until replaced by an efficiency-improving alliance with United Airlines</i>	0	0	0	1	0

The rapid evolution of Qatar Airways' strategy

- **Phase 1 (1993–2002)**

Phase 1a. The initial birth (1993–1996). QR was founded in November 1993, and its operations went live in early 1994. Initially, QR did not have any staff or aircraft and instead wet-leased⁵ its first flights. During this phase, the number of destinations increased from seven in 1993 to 41 in 2002. All of these routes were operated by QR, which relied entirely on the development of its own resources deployed privately. As managers and industry experts noted, this route network strategy was similar to the strategy used by charter airlines. An industry expert detailed this point: “At this time, between 1994 and 1997, the strategy didn't really make sense. It was much more like a charter airline than anything else. The airline was a bunch of aircrafts, flying to many cities, but without any regular flights or frequencies. [...] In addition, the airline clearly lacked structure.” Consequently, the absence of any alliance activity and partner resources is unsurprising, as the lack of regular flights rendered a codeshare agreement nearly impossible. In October 1996, QR's shareholders asked the CEO to vacate his post.

Phase 1b. The relaunch (1997–2002). In 1997, QR launched a major reorganization (i.e., structure, fleet, and route network) and identity program (i.e., logo and cabin crew uniforms). This program transformed QR dramatically, and as explained by senior general manager Michael Hewitt, “Only the name remains the same” (*Middle East Economic Digest*, 1997). At the end of 2002, QR officially became Qatar's flag carrier, replacing Gulf Air. The new CEO, Akbar Al Baker, also decided to halt the expansion of the previous period. Concerning destinations, during the relaunch program, the viability of all QR's routes was scrutinized to focus on the airline's core business. Ultimately, 50 percent of the airline's routes were suspended, and the number of destinations served declined to 15 in three regions (Europe, the Arabian Peninsula, and the Indian sub-continent). In addition, the structure of the route network changed from a point-to-point system to a hub-and-spoke system.

QR's relaunch also initiated a new alliance strategy. The rationale for forming alliances was to offer seamless service throughout Europe while maintaining a sufficient load factor on these routes. The main goal of these alliances was thus to improve the load factor on existing routes and potentially to extend the destination network if it was possible. Akbar Al Baker explained as follows: “It is important for us to look at foreign partners for the simple reason that Qatar Airways does not plan to increase its fleet more than necessary” (*Gulf News*, 1999). The initial alliance strategy in this phase provided the foundation for a more sophisticated alliance strategy to help QR reach its growth objectives. QR decided to add new routes and to increase its frequency of flights, and in 2002, QR served more than 40 destinations and carried 2.3 million passengers.

- **Phase 2 (2003–2005).**

During this phase, QR's 22 percent annual growth rate required changes in the firm's organization and resource stock. Almost every year, QR developed new own resources by launching new routes and obtaining access to more distant markets. For instance, in 2003–2004, QR entered China with flights to Shanghai and Beijing. To sustain its international expansion while maintaining a profitable load factor, QR implemented a highly aggressive alliance strategy. Almost every time the airline entered a new country, it created an alliance with a local partner to handle over-capacity issues while benefiting from the partner's image in the target country. Interestingly, while most of these alliances aimed to improve the load factor, QR also formed some alliances to access complementary resources by linking itself to partners' networks and by offering new products and/or markets to its customers.

- **Phase 3 (2006–2010).**

In this phase, QR's main objective was to become a truly global airline, and its entry into the American market in 2006 through a codeshare alliance with *Lufthansa* gave a new international status to the airline. Through its worldwide expansion, QR had to address several challenges related to the configuration of its route network, such as increasing the frequency of flights on existing routes, serving secondary cities, and forming new and/or terminating existing alliances. In 2009, QR increased the frequency of its flights on several European routes by 40 percent while simultaneously opening new routes in the U.S., India, and Australia. QR continued to carefully expand its route network, and this continuous growth was supported by a shift in its alliance portfolio and in the configuration of its resource stock.

This phase was also characterized by a high number of alliance terminations (most of them being efficiency-improving alliances such as those with Air China or Alitalia). After this period, the number of QR's partners decreased from 15 in 2006 to 10 in 2010, and QR continued to shift between different types of alliances. As a consequence, at the end of the last period, product-market-extending alliances became more dominant than efficiency-improving alliances, which had previously been more prominent.

⁵ A wet lease is an arm's-length contractual leasing arrangement whereby one airline (lessor) provides an aircraft, complete crew, maintenance, and insurance (ACMI) to another airline (lessee), which pays according to the hours of operation. The lessee provides fuel and covers airport fees, duties, taxes, and so forth.

Resource-structuring mechanism rationales and dynamics

Resource and alliance creations over time

During the first period, from 1993 to 2002, QR focused its attention on key destinations with the highest utilization levels. At this time, its growth relied mainly on internal resource development and private resource deployment. Moreover, during this first phase (and especially during Phase 1a), the absence of an alliance partner suggests that the resource utilization level was sufficiently high on all routes, allowing QR to avoid sharing resources through efficiency-improving alliances. Because the destinations were served only once per week, QR's resource utilization (i.e., load factor) was sufficiently high to cover the fixed and variable costs. However, for some destinations, capacity utilization would decrease significantly when frequency increased (e.g., to 2 or 3 flights per week). In the period from 1997 to 2002 (Phase 1b), while continuing to operate resources alone, QR also initiated its alliance activity. At the beginning of this period, the airline went through a major reorganization process to scrutinize its existing destinations/resources before refocusing its attention on growing in new markets. As a QR manager explained, *"It was only once the airline had finished its reorganization and had become 'serious' that we began to think about alliances."* The first alliance with Lufthansa was motivated by Europe's market size and revenue potential. Managers explained to us that the alliance with Lufthansa provided QR with access to more destinations but mainly allowed it to improve its load factor on the routes between Doha and German cities. At that time, the limitations of QR's own resources constrained its growth, and by benefiting from Lufthansa's reputation, QR was clearly able to improve the capacity utilization (i.e., the load factor) of its own resources in the German market. QR realized that alliances could assist in accelerating growth while minimizing resource operation costs. To summarize, during the period of 1993–2002 (i.e., Phase 1), 54 routes (or resources) were created by QR. Of these 54 resources, 49 (91%) were QR's own privately deployed resources, whereas 2 resources (4%) were QR resources that were jointly deployed through an efficiency-improving alliance. Finally, 3 resources (5%) were accessed through product-market-extending alliances.

In the second phase, from 2003 to 2005, QR's international expansion strategy generated strong resource-structuring efforts. To expand geographically, QR relied on a combination of the previous strategy (i.e., creating its own resources and privately deploying them) and a new alliance strategy based on efficiency-improving alliances. A QR manager detailed how international expansion and the alliance strategy were intertwined during this phase: *"The alliance strategy at this time was the following one: the network grows, and, every time we reach a new country, we try to cooperate with the national airline even if, sometimes, they do not want to cooperate with us. The idea is not to increase our 'beyond' [the number of destinations], but much more to implement a codeshare agreement on the international route. At this time, Qatar Airways was a small airline, not very famous, and we had to try to take advantage of the reputation of the partners to fill our flights."* Most agreements were signed for international routes to and from the country to improve QR's load factor because the airline was not able to cover its fixed costs alone. In this phase, the alliance strategy aimed to increase the airline's resource utilization on international flights through efficiency-improving alliances. Such an alliance was created for the Doha-Tunis route, for instance. The addition of several own resources that were deployed through an efficiency-improving alliance illustrates this logic. Looking back at the 44 resources created during Phase 2, we observe that 17 resources were created as own resources that were privately deployed (39%), whereas own resources that were jointly deployed in efficiency-improving alliances became the largest means of developing resources, with 19 resources (43%) created in that manner. Finally, only 8 network resources accessed through product-market-extending alliances were created during this period, representing 18% of the resource additions.

Finally, during the period 2006–2010 (i.e., the third phase), it is striking that most resource additions were partner resources accessed through product-market-extending alliances. As QR attempted to reach more distant destinations, the expected levels of associated profit and resource utilization decreased. For these specific markets, operating the routes alone would not be profitable. For instance, although QR already served the U.S. market through its codeshare agreement with Lufthansa, QR obtained the traffic rights to fly to and from the U.S. without a partner in 2007. However, contrary to QR's strategy in other countries, QR decided that it had to increase its presence in the rest of the country by serving secondary cities with a local partner in a product-market-extending alliance. This strategy is partly explained by the peculiarities of the U.S. market. A QR manager explained, *"If there is a country in which codeshare agreements are important, it is the US. In this country, there are plenty of small flows coming from everywhere. Therefore, the hub is fed by many flights with only a few passengers at a time. [...] Because we do not have the traffic rights or enough volume of passengers to fill our flights to secondary cities in the US, we have to work with a local partner."* To summarize, during this last phase, 87 resources were added to QR's resource stock. Among these resources, 65 (74%) were accessed through product-market-extending alliances. In contrast, only 11 resources (12%) were created as own resources that were privately deployed, and 11 resources (14%) were added as own resources jointly deployed in an efficiency-improving alliance.

In a nutshell, the different phases of QR's life cycle involved a series of resource additions presenting very different characteristics (see Fig. 4). During the first phase of the life cycle, the Qatari airline relied extensively on the addition of own resources that were deployed alone. Then, in a second phase, to foster its international growth while maintaining a sufficient load factor, QR continued relying on own resources that were privately deployed, but mainly created own resources that were jointly deployed through efficiency-improving alliances. Finally, during the last phase, as it began reaching more distant destinations/resources with lower expected utilization levels and profits, the airline elaborated its network development through the addition of partner resources accessed through product-market-extending alliances.

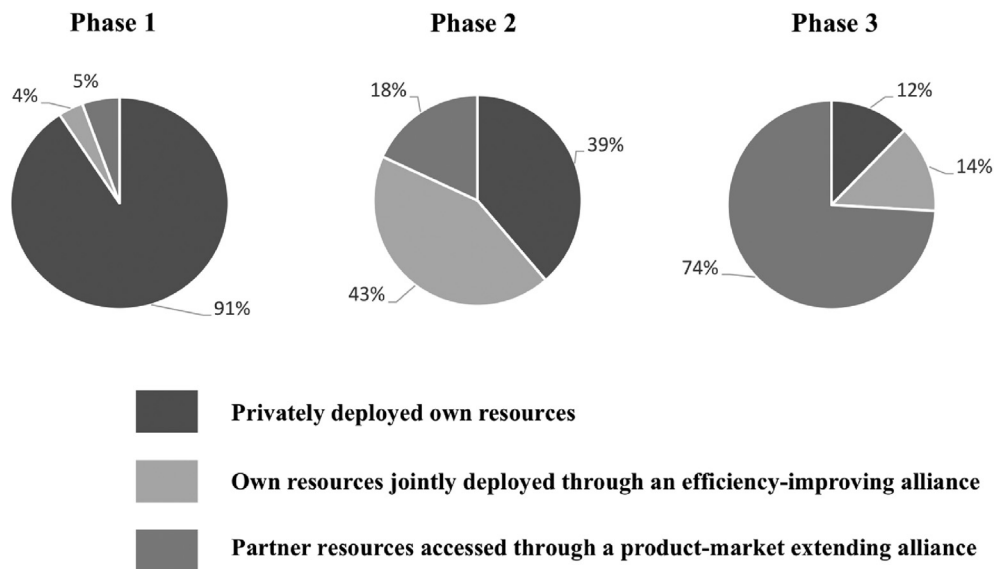


Fig. 4. Resource additions over the three phases.

Resource deployment mode and ownership changes over time

Extensive resource-structuring efforts occurred during the period of 2003–2005 (i.e., the second phase). For some international routes, QR had overestimated its ability to fill its planes, i.e., QR's actual resource utilization levels for some routes were lower than the expected levels. However, because this lower utilization level no longer covered the fixed costs associated with these resources, QR changed the resource's deployment mode from private to jointly deployed using efficiency-improving alliances. For instance, the Doha-Shanghai route was initially private and then was shared through an efficiency-improving alliance with Air China when QR realized that it could not meet its load factor target. According to one QR manager, "the largest part of these codeshare agreements is block space agreements in which QR sells a fixed quantity of seats to the partner who is in charge of selling the seats they have bought from us. It is not only a good way for us to reach a minimum capacity but also we reduce our commercial risk." We can clearly see that the alliance strategy at that time aimed to increase the airline's resource capacity utilization for international flights through efficiency-improving alliances. Furthermore, as highlighted by one of the industry experts, these efficiency-improving alliances also helped QR access some knowledge of the markets: "If you pick the example of the Chinese market, at first Qatar Airways didn't know much about China, and Chinese consumers didn't know them at all. They didn't even know where Qatar, as a country, is on a map! Once it signed this partnership with Air China, Qatar Airways used this alliance as an opportunity to absorb as much knowledge as possible on the Chinese market and local consumers' habits". We can thus note that during Phase 2, most alliances created by QR aimed at addressing over-capacity issues while absorbing as much knowledge about these new markets as possible.

However, the resource-structuring efforts changed considerably during the period of 2006–2010 (i.e., the third phase), which was characterized by a high number of alliance terminations (specifically, eight terminations in five years, with six terminations in 2008). More precisely, these alliance terminations represent resource-structuring efforts in which the resource deployment-mode changed from joint to private deployment. In other words, QR terminated several efficiency-improving alliances to operate these routes alone. Despite a very complex environment (with the beginning of the financial crisis in 2007), it appears that the resource utilization level variations were the key driver of these reconfigurations. A QR manager explained as follows: "One must understand the reasoning behind these alliances. At the beginning, we create an alliance and cooperate with the partner. However, if the traffic increases and covers our costs so that our revenues could be enhanced if we operated this route alone, then we decide to drop the partner and serve the market directly."

Understanding alliances as a temporary device for resolving capacity issues on a particular route is thus important. As soon as traffic was sufficiently high, QR decided to operate such routes privately. By examining QR's alliance terminations, one can observe that most of the terminated alliances were efficiency-improving alliances that were initially created to optimize resource capacity utilization (such as Tunisair, Air China or Alitalia). A QR manager detailed the mechanism behind these alliance terminations: "Initially, the goal of these alliances was to increase the load factor of these international routes. However, now, the situation has changed because we have a much better reputation. For instance, for a partnership with airline A on a flight to a city Y, when airline A sells a seat on our flight, it gets a commission. When we were not able to fill our planes, this was fine because these seats were actually additional revenues for us. But now that we have good reputation and that we can fill our planes on our own, the partner's commission represents a loss of earnings for us because we could sell the seat on our own and at a higher

price. Consequently, as soon as we have a good enough reputation in a country to fill our planes on our own, we do not need the partnership anymore.” As QR became a major industry player, its bargaining power over its partners increased, and it became less dependent upon some of these partners. In addition, some of these efficiency-improving alliances represented a significant opportunity cost for QR, which would have earned more if it deployed the resource privately. As a result, QR renegotiated previous agreements in its favor without assuming excessive risk. If the partner was unable to meet QR’s new expectations, the alliance was terminated. After this period, the number of QR’s partners decreased from 16 in 2006 to 10 in 2010, and QR continued to shift among different types of alliances (from efficiency-improving to product-market-extending alliances). The different resource reconfigurations identified here clearly show how the firm’s ability to generate sufficient revenues (depending on resource utilization) that partially or totally covered the various costs is crucial to understanding its resource-restructuring efforts.

From a more dynamic perspective, except in some minor cases, own resources that were privately deployed tended to remain unchanged mainly because their utilization level increased and already covered all the resource costs, thereby not requiring any resource-restructuring efforts. However, Table 4 highlights the increasing number of resource deployment-mode changes and resource replacements (i.e., changes in the ownership mode) that occurred in later phases. We indeed observe that no changes were implemented in Phase 1, whereas 4 changes occurred in Phase 2 and 17 in Phase 3.

Table 4

Resource deployment-mode changes and resource replacements over time.

	Phase 1	Phase 2	Phase 3
Resource deployment mode change (from shared to private)	0	3	12
Replacement of a partner resource with privately deployed own resource	0	0	5
Replacement of partner resource accessed through a product-market-extending alliance with own resource deployed through an efficiency-improving alliance	0	1	0
Total	0	4	17

More precisely, over time, own resources that were jointly deployed through efficiency-improving alliances tended to be replaced by own resources that were privately deployed, as their resource utilization (and thus their cost-covering capacity) increased because of the focal firm’s improved experience and reputation. The same phenomenon occurred for partner resources that were accessed through product-market-extending alliances, which tended to be replaced in the later phases of the firm’s life cycle by own resources that were either privately or jointly deployed because they achieved higher utilization levels.

Discussion

The key role of resource utilization levels for resource ownership and deployment modes

This article aimed to provide an understanding of the drivers of resource-structuring mechanisms and their implications for alliance portfolio evolution. More precisely, our in-depth analysis of QR revealed the key role played by the levels of resource utilization when deciding which ownership and deployment modes should be allocated for a new resource. Following the logic according to which firms optimize their resource type to maximize the profits they can generate from these resources (Levinthal and Wu, 2010; Makadok, 2001; Penrose, 1959; Wu, 2013), we have been able to observe how QR determined the most relevant ownership and deployment modes for each destination/resource created. The reasoning behind this resource optimization lies in the ability of the resource to cover the fixed and variable costs generated by the resource according to its level of utilization (Madhok and Tallman, 1998).

It is also interesting to note that the resource utilization level of a given resource can change over time, generating changes in the ownership and/or deployment modes applied to it (Helfat et al., 2007; Sirmon et al., 2007, 2011). These resource-structuring efforts were observed in our case study under two circumstances. On the one hand, for some resources/destinations, the airline had been too optimistic, so that the actual level of resource utilization was much lower than expected (the route between Doha and Tunis, for instance). For these resources, considering the initial ownership and deployment modes, the resource utilization level was not sufficiently high to cover the costs (Madhok and Tallman, 1998; Wu, 2012). A redeployment or replacement of this particular resource was thus necessary to find the optimal resource type given the actual (and not the expected) level of resource utilization (Sirmon et al., 2007). On the other hand, we observed some resource-structuring efforts associated with the “natural” evolution in the level of utilization of a given resource. In this case, the mismatch between the initial and current levels of utilization was not due to a mistake by the managers but simply through the natural evolution of resource utilization. Firms are indeed characterized by an improved ability to increase the utilization of their resources following improved reputation and brand awareness (Aaker, 2009) or learning opportunities (Arrow, 1962; Penrose, 1959), even for resources accessed through alliances (Inkpen, 2000; Khanna et al., 1998; Fernandez and Chiambaretto, 2016; Fernandez et al., 2018; Phene and Tallman, 2014). Under these circumstances, as the level of utilization increases, we observe that QR tends to adopt ownership and

deployment modes that provide more control to the focal firm, allowing it to maximize the profits generated by these resources more independently.

Understanding alliance portfolio evolution through resource-structuring mechanisms over the firm life cycle

As we established a strong connection between resource-structuring mechanisms and alliance portfolio evolution, we used our framework and our case study to understand the role of resource utilization as an internal driver of alliance portfolio evolution. This approach allowed us to highlight the necessity of connecting internal/own resources with partner resources in the alliance portfolio (Wassmer and Dussauge, 2011, 2012).

Having shown the connection between the variations in resource utilization and the different resource ownership structures and deployment-mode changes, we have been able to link these resource-structuring efforts to different phases of the focal firm's life cycle. Because firms need different types of resources to ensure growth and success throughout the different stages of their life cycle (Katz and Gartner, 1988; McKelvie and Wiklund, 2010; Miller and Friesen, 1984; Quinn and Cameron, 1983), they need to access or restructure their resources from time to time by adding new and removing existing resources (Helfat et al., 2007; Sirmon et al., 2011; Teece et al., 1997). These restructuring efforts can be explained by the average level of resource utilization associated with each phase in the focal firm's life cycle.

Concerning resource creation, our longitudinal in-depth analysis of QR over more than 15 years shows that during the first phase of its life cycle, a focal firm will be more likely to rely extensively on the addition of own resources that are deployed alone. Then, in a second phase, as it gains access to resources with lower utilization levels, it becomes increasingly necessary to add own resources that are jointly deployed through efficiency-improving alliances in order to cover the associated fixed and variable costs. Finally, during the last phase, as it reaches resources with even lower utilization levels and profits, the focal firm will be more likely to access resources through the addition of partner resources via product-market-extending alliances. In summary, considering the decreasing initial levels of resource utilization for the newly created resources, one can predict the main ownership and deployment modes for resources created during the different phases of a focal firm life cycle.

In parallel, as we explained earlier, the improved ability of the focal firm to increase the utilization level of resources also generates resource-structuring efforts (Levinthal and Wu, 2010; Makadok, 2001). Resources developed in the first phases of the life cycle, such as own resources that are privately deployed, will tend to remain unchanged mainly because their utilization level is already high enough to cover all the resource costs, thereby not requiring any resource-restructuring efforts. However, in the later phases, resources that have been created as own resources and jointly deployed through efficiency-improving alliances tend to be replaced by own resources that are privately deployed, as their resource utilization (and thus their cost-covering capacity) increases due to the focal firm's improved experience and reputation. The same phenomenon should occur for partner resources that are accessed through product-market-extending alliances; these should be replaced in the later phases of the firm's life cycle as they reach higher utilization levels by own resources that are either privately or jointly deployed.

Identifying the resource utilization level as a driver of resource-structuring mechanisms thus provides some very interesting insights into the internal drivers of alliance portfolio evolution over the focal firm's life cycle (Castro et al., 2014; Rindova et al., 2012).

Putting into perspective internal and external determinants of alliance portfolio evolution over the firm life cycle

It would be, however, too restrictive to consider that alliance portfolio evolution is entirely determined by resource utilization level variations. Especially when studying a firm over a long period, it is important to acknowledge the existence of external events that can impact the composition of the alliance portfolio (Madhavan et al., 1998; Lavie and Singh, 2012). Returning to the studied case, several events had a significant impact on the air transport industry between 1993 and 2010 (Chiambaretto and Fernandez, 2016; Corbo et al., 2016). Some had a positive impact, such as the EU-US Open Skies Air Transport Agreement in 2007, which opened the transatlantic market to more airlines. In contrast, other events threatened airlines at the industry level: economic events such as the Asian financial crisis in 1997, the "dotcom bubble" in the early 2000s and the economic downturn starting in 2007. Along the same vein, terrorist attacks such as 9/11 in the US or the Madrid (2004) and London (2005) attacks in Europe; the beginning of the second Gulf War (2003); and even the threat of a potential pandemic such as SARS in 2003 all contributed to redesign the flows of air transport passengers to avoid risky geographical zones. All these random events have had an impact on the level of uncertainty and on the relative abundance of resources in the industry; consequently, they have restructured the network of inter-organizational relationships between airlines (Ahuja et al., 2012; Koka et al., 2006; Hoffmann, 2007; Chiambaretto and Fernandez, 2016; Corbo et al., 2016).

At the same time, one must not think that external events completely explain the evolution of the alliance portfolio, as it is a combination of internal and external factors (Gulati et al., 2000; Hoffmann, 2007; Ahuja et al., 2012; Lavie and Singh, 2012; Castro et al., 2014; Fernández-Olmos and Ramírez-Alesón, 2017). Because the literature regarding alliance portfolio evolution mainly focused its attention on external drivers, we wanted to rebalance the situation by investigating the role of internal factors in greater detail. More precisely, in this contribution focusing on internal factors, we have shown how variations in resource utilization acted as a driver of resource-structuring mechanisms and had consequences for alliance portfolio evolution over the focal firm's life cycle.

Contributions to the existing literature

This study provides two main contributions to the alliance portfolio literature.

First, this study advances the alliance portfolio evolution literature by providing an understanding of how a firm's resource utilization impacts the configuration of its alliance portfolio (Hoffmann, 2007; Lavie and Singh, 2012; Rindova et al., 2012). More specifically, this research contributes to the stream of research focusing on the micro-dynamics of alliance portfolio evolution (Castro et al., 2014; Gilsing et al., 2016). Our study showed how resource creations and reconfigurations lead to alliance formations and deletions and thus affect relevant alliance portfolio parameters such as size, structure and composition (Wassmer, 2010). Our analysis of the drivers of these reconfigurations and the evolution of these drivers over time contributes to the literature that focuses on alliance portfolio evolution over time (Hoffmann, 2007; Lavie and Singh, 2012; Rindova et al., 2012; Castro et al., 2014). Thus, a firm's alliance portfolio evolution over time is closely related to its ability to manage its resources.

Our study also furthers the understanding of how firms structure their stocks of own and partner resources over time. By changing the deployment mode and resource type from own to partner resources, firms transfer resources either within or beyond firm boundaries and therefore change their alliance portfolio configuration. Thus, effective resource structuring in firms with alliance portfolios requires a combination of dynamic capabilities (Helfat et al., 2007; Teece et al., 1997) and alliance portfolio management capabilities (Heimeriks and Duysters, 2007; Heimeriks et al., 2009; Sarkar et al., 2009; Sirmon et al., 2011; Neyens and Faems, 2013; Castro and Roldán, 2015). In this vein, this study provides new insights into how resource utilization levels drive resource-structuring decisions in firms with alliance portfolios. Our analysis suggests that a firm selects the deployment and ownership modes for a resource according to its utilization level to maximize the profit it generates (Levinthal and Wu, 2010; Wu, 2013). Moreover, we found that a firm's ability to manage resource utilization levels changes over time and affects the firm's resource-structuring mechanism choices.

Managerial implications

This research offers several interesting insights for managers. First, this study underlines the set of actions available to firms that want to restructure their resources and alliances. We show that firms have options other than simply adding or removing alliances and that they can either modify their deployment mode or replace internal resources with partner resources.

The second key take-away from this research relates to the drivers of these resource reconfigurations. Managers must keep in mind the crucial role of resource utilization when optimizing the use of their resources. In other words, irrespective of the industry considered, firms must precisely monitor the utilization levels of their resources and compare them with their capacity in order to choose the best resource type and deployment mode. It is crucial for firms to use the relevant resource ownership and deployment modes according to their level of resource utilization if they want to maximize the profit generated by each resource.

Finally, we have shown that managers tend to use different types of resource-structuring mechanisms over the firm's life cycle. For newly created resources, managers are thus more likely to rely on own resources that are privately deployed in the early phases of the life cycle, then use more own resources that are shared through efficiency-improving alliances as the firm enters its growth phase, and ultimately access more partner resources through product-market expanding alliances as the firm matures and reaches cruising speed.

Limitations and directions for future research

Inevitably, this study has a number of limitations. First, we primarily focused on internal dynamics and resource utilization as a driver of resource structuring and alliance portfolio evolution. As mentioned in the discussion, external events may also influence a firm's resource portfolio and its evolution (Ahuja et al., 2012; Chiambaretto and Fernandez, 2016; Koka et al., 2006; Lavie and Singh, 2012; Madhavan et al., 1998). A more integrated approach combining internal and external factors could yield interesting insights.

Second, we decided to stop our analysis of *Qatar Airways* in 2010, just before it joined the global alliance *Oneworld*. Consequently, we did not investigate the role of external actors in the reconfiguration of these resources and alliances (Gulati and Gargiulo, 1999; Jiang et al., 2018). Nevertheless, the literature has increasingly highlighted the impact of membership in constellations or multilateral alliances on the stability of existing alliances (Chiambaretto and Dumez, 2016; Das and Teng, 2002; Lazzarini, 2007; Wassmer and Dussauge, 2012). Examining the role of membership issues may thus offer interesting research perspectives for future contributions regarding alliance portfolio evolution.

Third, our analysis of resource structuring relied on the assumption that resources evolve independently according to their utilization level. However, own and partner resources may interact and create synergies or conflicts (Gnyawali and Madhavan, 2001; Parise and Casher, 2003; Wassmer and Dussauge, 2011, 2012; Park et al., 2015). Future research could use a large sample and a quantitative approach to develop insights into the co-evolution of resources and alliances over time by accounting for these interaction and portfolio effects.

Finally, from an empirical and methodological perspective, our decision to use a longitudinal, single case study to illustrate our theoretical insights may limit the generalizability of our findings. Furthermore, one could argue that *QR's* alliance

portfolio activity could also be impacted by its internationalization strategy (Vapola et al., 2010). We are confident, however, that our findings are relevant not only to network and service industries but also to other industries, such as manufacturing, which also tends to be concerned with managing excess resource capacity (e.g., plant utilization levels). In this respect, future research could implement a multiple case study design, as has been used in previous alliance portfolio research (Ozcan and Eisenhardt, 2009; Rindova et al., 2012). Nevertheless, such research would require a sample of firms with similar attributes to ensure a rigorous comparison.

Conclusion

This article aimed to explore the drivers of resource-structuring mechanisms and their roles as micro-foundations for alliance portfolio evolution. By offering a more detailed view of resource-structuring mechanisms, we showed how firms can either create or modify their own resources with different deployment modes or utilize network resources to remain profitable. We also emphasized that the optimization of a firm's resource utilization is a key driver of resource-structuring efforts. Finally, we revealed that the logic of resource utilization optimization changes over time and that such changes lead to specific decisions regarding resource-structuring mechanisms and, consequently, alliance portfolio configurations. In a nutshell, this research showed that according to the phases of the focal firm life cycle, the level of resource utilization changes and leads to various resource-structuring mechanisms that can be observed at the alliance portfolio level.

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