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Abstract

Purpose – The purpose of this paper is to analyze the impact of alliance portfolio internationalization (API) on firm performance in the context of exploitation alliances.

Design/methodology/approach – The hypothesis is tested by applying a panel regression using a sample of 64 airlines over a nine years period.

Findings – As a result, the study finds a U-shaped relationship between API and firm performance.

Research limitations/implications – The results are particularly relevant for firms using many exploitation (e.g. marketing) alliances.

Practical implications – In the context of exploitation alliances, managers should focus either on local partners or to take advantage of partners with a high degree of foreignness. Stuck in the middle seems to be not advantageous.

Originality/value – Previous work found an S-shaped relationship between portfolio internationalization and firm performance while concentrating on exploration alliances. In contrast, this study shows that exploitation alliance portfolios do not experience a decline of firm performance at high levels of portfolio internationalization.

Keywords Airline industry, Alliance portfolios, Exploitation alliances, Portfolio internationalization

Paper type Research paper

1. Introduction

It has repeatedly been stated that the outcomes of a firm's alliance portfolio are influenced by characteristics of the partners (Saxton, 1997; Dasí-Rodríguez and Pardo-del-Val, 2015; Jiang *et al.*, 2010). For alliance managers and top management teams, it is necessary to know how different portfolio configurations influence the organization's outcomes (Leeuw *et al.*, 2014). We study a rarely analyzed type of partner characteristics, portfolio internationalization, which has been shown to substantially impact firm performances (Zaheer and Hernandez, 2011; Lavie and Miller, 2008; Goerzen and Beamish, 2005). In our globalized world, alliances are increasingly international. Consequently, it is a key issue for firms to determine the optimal degree of alliance portfolio internationalization (API).

However, studies pursuing this question concentrated on innovation driven exploration alliances and found an S-shaped relationship between portfolio internationalization and firm performances (Lavie and Miller, 2008). Less attention has been devoted to the internationalization of exploitation alliance portfolios. Exploitation alliances refer to agreements where the focus is put on the usage of existing resources and information (March, 1991). In many industries like air transport (Casanueva *et al.*, 2014) or biotechnology (Rothaermel, 2001) they are used frequently and have a strong impact on firm performances. Compared to exploration alliance, they influence firm performances differently. Learning and innovation play only a minor role in exploitation alliances (Vassolo *et al.*, 2004; Rothaermel, 2001). They affect operations more directly compared to the lagged impact of product development through exploration alliances (Yamakawa *et al.*, 2011). Hence, exploitation alliances are less uncertain and more predictable (Levinthal and March, 1993; Nielsen and Gudergan, 2012). They offer a more "beaten track," because the inputs and outputs are often well-known (March, 1991). The necessary tasks in exploitation alliances are therefore more standardized.

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Consequently, it is reasonable to assume that the internationalization of exploitation portfolios also affects firm performances in a unique way. We predict a U-shaped impact of API on firm performance in the context of exploitation alliances. Hence, we do not expect a decline of performances at high levels of portfolio internationalization as overserved in the study of Lavie and Miller (2008), which we use as a role model for our study.

2. Hypothesis

The internationalization strategy of a firm has a substantial impact on its performance (Tallman and Li, 1996; Pangarkar, 2008) and strategic networks offer valuable opportunities for the internationalization process (Vasilchenko and Morrish, 2011). Thus, the level of API has important implications for the overall performance of organizations. Nevertheless, the association between API and firm performance has not received much academic attention. Goerzen and Beamish (2005) found a positive linear impact of portfolio geographic diversity on firm performance. Zaheer and Hernandez (2011) revealed that the geographic distance between a firm's subsidiaries and its alliance partners lowers the firm profitability, but the geographic distance between a firm's headquarter and its alliance partners raises the firm profitability. These two studies viewed internationalization predominantly as a factor of geography but neglected other dimensions of internationalization. Finally, Lavie and Miller (2008) found an S-shaped relationship between the API and firm performance. For them, the degree of the API increases the farther away the partner's home countries are in terms of geography, institutional governance, economic development and culture. We will use their approach as a role model, because it represents the most comprehensive view on portfolio internationalization.

Regarding the degree of API, there are benefits and drawbacks influencing performances (Wassmer, 2010; Zaheer and Hernandez, 2011). At very low levels of partner foreignness, it is relatively easy to manage exploitation alliances. Communication, personal meetings, transports and capital movements are uncomplicated due to small distances (Daamen *et al.*, 2007). Similarities in cultures, legal systems, languages and resources help to evaluate partner resources and the value of alliances (Lavie and Miller, 2008; Tang *et al.*, 2016). Consequently, firms can extract relatively high performances from their portfolio.

With an higher degree of portfolio internationalization, firms experience the "liabilities of foreignness" (Yildiz and Fey, 2012; Zaheer, 1995). There are knowledge handicaps regarding local conditions that impede the exchange of information (Johanson and Vahlne, 1977; Eriksson *et al.*, 1997). Firms face organizational problems that arise "from the unfamiliarity of the environment, from cultural, political, and economic differences and from the need for coordination across geographic distance" (Zaheer, 1995, p. 341). Increasing distances make it harder to interact personally in meetings or social events. Communication is also inhibited by boundaries like different time zones (Zaheer and Zaheer, 2001), dissimilar languages (van den Born and Peltokorpi, 2010), or national animosities (Arikan and Shenkar, 2013). Firms suffer from a lack of information about distant countries (Zaheer and Mosakowski, 1997). They have to invest in means to get information about political, economic and legislative conditions. Differences in the national, institutional and cultural backgrounds reduce performances (Das and Kumar, 2010; Chang *et al.*, 2012). Uneven market development levels lead to differing perceptions about the usefulness for sharing information (Hitt *et al.*, 2000). In order to deal with these liabilities of foreignness firms have to develop certain capabilities, which reduces performances compared to a low degree of internationalization (Autio *et al.*, 2011).

When partner foreignness further increases to high levels of internationalization, the firm has already learned to deal with unfamiliar cultures, institutions, languages and other factors that mitigate performances (Lavie and Miller, 2008). Once a firm is able to cope with these problems due to professionalized alliance management, it is more efficient in extracting benefits. Because of the standardized and predictable nature of exploitation alliances, the alliance management department can develop routines that apply to foreign countries no matter what the actual distances to the partners' home countries are (Zollo *et al.*, 2002). Of course, some factors will keep mitigating performances with greater distance, but at a lower growth rate (Hummels, 2007). Moreover, firms extract more valuable resources at high levels of internationalization. The international acquisition of critical resources helps firms to strengthen their business in their home market and abroad (Luo and Tung, 2007). The possibilities to get access to new markets or customer segments improve (Dacin *et al.*, 2007; Hagedoorn, 1993). The highly internationalized portfolio supports market entries in unfamiliar foreign markets (Lee *et al.*, 2012). A high level of API also allows to be more independent from the partners (Zaheer and Hernandez, 2011) and offers the possibility to share risks (Li *et al.*, 2013). Ties to international partners enhance the psychic distance perceived to other markets and therefore they ease the firm's internationalization process in general (Santos *et al.*, 2012). So, a highly internationalized portfolio reduces the demand and the competitive uncertainties (Burgers *et al.*, 1993). The high degree of portfolio internationalization is also accompanied by more diverse and non-redundant resources (Zaheer and Hernandez, 2011) and less redundancies (Baum *et al.*, 2000).

As a result, we expect a U-shaped relationship between the internationalization of the exploitation alliance portfolio and firm performance. Our expectation is only partly consistent with the results of Lavie and Miller (2008). They additionally found decreasing firm performances at very high levels of internationalization resulting in an S-shaped relationship between portfolio internationalization and firm performance. This is based on the circumstance that the utilization of knowledge in exploration alliances demands a certain absorptive capacity (Vasudeva and Anand, 2011). High levels of internationalization require a too large amount of absorptive capacity. This results in decreasing performances in the context of exploration alliances (Lavie and Miller, 2008).

However, contrary to Lavie and Miller (2008), we focus on exploitation alliances. Since knowledge is not the major outcome of exploitation alliances, we do not expect the effect of decreasing returns from high levels of internationalization in our study. Rather, we view portfolio internationalization from a learning perspective that postulates a U-shaped relationship between internationalization and performances (Ruigrok and Wagner, 2003). The possibility to standardize exploitation alliances enables firms to learn how to manage an international alliance portfolio, which reduces the coordination costs at high levels of internationalization:

H1. In the context of exploitation alliances, the internationalization of the alliance portfolio is associated with firm performances that first decrease and then increase forming a U-shaped relationship.

3. Methods

3.1 Sample

We used a data set from the airline industry to test our hypothesis, because this industry is characterized as highly international and dependent on strategic alliances (Ramón-Rodríguez *et al.*, 2011; Man *et al.*, 2010). Our data captured all airlines with full data coverage for the time from 2001 to 2009. We excluded all airlines with special business models (leisure, cargo, charter, low cost, or domestic) due to substantial differences between them (Gillen and Gados, 2008; Alderighi and Gaggero, 2014)[1]. In addition, we ensured with this focus that all firms operated globally. Otherwise, our results could be driven by the choice of business strategy (local vs international) and not by the choice of portfolio characteristics.

Our sample comprised 64 airlines from 47 countries. On average, each airline had 13 alliances per year. This covered alliances to 233 partner airlines from 126 countries. In the respective years, the 64 airlines of our sample represented between 69 and 80 percent of the passenger traffic generated by the top 200 airlines in the world. We selected to study the time from 2001 to 2009 because it covered important exogenous influences for the industry, especially 9/11 and the world financial crisis (Franke and John, 2011). It excluded the alliance activities in the 1990s observed as technology-driven in many industries (Schilling, 2015). We stopped in 2009 because industry associations (e.g. Star Alliance or SkyTeam) became very powerful and influenced the formation of alliances heavily in the last years (Gaggero and Bartolini, 2012; Alderighi and Gaggero, 2014). Subsequently, dyadic alliances became more and more a result of industry association membership. This could lead to results that are biased and do not properly reflect the influence of alliance portfolios.

Our main data source was the journal *Airline Business*, which has been frequently used by scholars (Lazzarini, 2007, 2008; Casanueva *et al.*, 2014; Morandi *et al.*, 2015). We selected an industry-specific data source because inter-industry databases like SDC suffer heavily from missing data and are often biased to publicly traded companies (Schilling, 2009). Country-specific data were extracted from the World Bank and the travel information browser Tripmondo. Airline data were also derived from corporate websites and from Gaggero and Bartolini (2012). We crosschecked our data, particularly with the Lexis Nexis database and national statistic bureaus.

3.2 Measures

Our dependent variable was firm performance, operationalized as the passenger load factor. The load factor provides information about the average rate of booked seats on flights. It is an established indicator for the performance in airline alliances (Casanueva *et al.*, 2014; Lazzarini, 2007; Rajasekar and Fouts, 2009). High values indicate an efficient use of internal resources, which subsequently results in enhanced financial performances. We selected this measure for several reasons. First, it is a standardized number and therefore comparable between organizations of different sizes. Second, a goal of codesharing (the way we defined a strategic alliance, explained below) is to allocate the passenger traffic more efficiently and to use the capacity in an optimal way. Consequently, the load factor measures the major objective of codeshare alliances (Chen and Ren, 2007), which is a key selection criterion for performance measures (Martynov and Shafti, 2016). Third, it is more suitable than financial indicators in the airline industry. The airline industry has undergone several liberalization efforts and multiple waves of consolidation (Czipura and Jolly, 2007; Button, 2009). Financial performances in the airline industry are also heavily influenced by many non-core business activities. Consequently, financial indicators are biased and not appropriate for the assessment of cooperation agreements in the airline industry.

We operationally defined an exploitation alliance as codeshare (Wassmer and Meschi, 2011; Goetz and Shapiro, 2012; Corbo *et al.*, 2016). Codeshares have a substantial impact on airline revenues (Hu *et al.*, 2013). In its most basic form, an airline puts its flight number on the flight of another airline in order to expand its route network (Steer Davies Gleave, 2007). In other words, airlines share resources using codeshares. Thus, we followed Koza and Lewin (1998) who characterized codeshare agreements as exploitation alliances.

Portfolio internationalization was measured based on Lavie and Miller (2008), because it is the most comprehensive operationalization of API. Their API variable included measures for cultural distance, geographic distance, institutional distance and economic distance. Each measure stated the average distance from a firm's country and all its partner countries. Lavie and Miller (2008) executed a factor analysis resulting in a single factor. In general, we agreed with the proceedings but we witnessed two difficulties that forced us to adapt their approach. First, we had to exclude the cultural block. There are many concerns regarding Hofstede's concept of cultural dimensions (Drogendijk and Slangen, 2006; Chudzikowski *et al.*, 2011) and cultural differences are less important within industries (Chatman and Jehn, 1994). In addition, there was the problem of the data availability. Data for 78 countries and regions was accessible at the time of writing from the Hofstede database (Hofstede *et al.*, 2010), but our data set contained 126 countries. Other data for cultural distances (e.g. GLOBE project or Schwartz's culture model) was not sufficient either.

Second, it has been suggested that institutional distances and economic distances of countries are linked (Weingast, 1995), but we highly doubt that they correlate with geographic distances. For example, Switzerland is in close geographic proximity to several countries with high institutional and economic differences (e.g. Algeria or Bulgaria)[2]. Therefore, we bisected the API measure. The first variable geographic portfolio internationalization (GPI) represented the average geographic distance in thousand kilometers between a firm's capital city and the partners' capital cities. Second, development portfolio internationalization (DPI) represented the average distance between a firm's country and its partner countries. It was the result of a factor analysis using the distances in the six governance indicators provided by the World Bank[3] and the GDP per Capita[4].

Additionally, we included several control variables. We used year dummies, since we carried out a time series analysis in a turbulent industry (Doganis, 2006). Moreover, we controlled for membership in global airline alliances (GAA), which are a type of industry association[5]. There are several differences between GAAs (Czipura and Jolly, 2007; Kuzminykh and Zufan, 2014). Consequently, we included dummies for the GAAs (Star Alliance, SkyTeam, Oneworld, Wings and Qualiflyer).

The age of an airline has implications for its strategy (Gaggero and Bartolini, 2012). Age was measured as the number of years since foundation using a logarithmic transformation. Firm size influences an organization's performance (Hansen and Wernerfelt, 1989). Hence, we used the RPK (revenue passenger kilometers) indicating the traffic volume of an airline. It was computed by multiplying the number of revenue paying passengers by the average distance traveled. Additionally, we used a logarithm transformation. The load factor often increases with the distance flown (Graham *et al.*, 1983). Subsequently, we computed average reach by dividing the revenue passenger kilometers by the total passenger number. The impact of codeshares on the load factor of airlines also erodes over time (Rajasekar and Fouts, 2009). That is why we created the variable age of portfolio by calculating the average age of the codeshare agreements using a logarithm transformation.

The institution-based view argues that the institutional environment of a firm influences its strategy and performances (Peng, 2002). Therefore, we used a development index to control for the development of the home country. We applied the approach from our dependent variable DPI, but took country specific values for the factor analysis instead of distances to partners[6]. Finally, we included the home country population using a logarithm transformation, because the size of the home market influences a firm's strategy and performance (Fan and Phan, 2007).

3.3 Analysis

We used a fixed effects panel regression with a fixed intercept to validate our hypothesis. This allowed us to test our model over the course of time and it explains the variation within organizations (Certo, 2006). It was more suitable than a random effects model, because our sample (the worldwide leading full service carriers) was one single group with similar characteristics (Wooldridge, 2002) and we were interested in variations within organizations (Haans *et al.*, 2016). Hausman's (1978) test supported our assumption ($\chi^2 = 66.641$; df $= 24$; $p < 0.001$). We fitted our covariance structure as a first-order autoregressive structure (Ar(1)), because we assumed that the correlation in our sample between points of time increased when the time gap between periods decreased. Since we used a fixed effects regression, we chose the maximum likelihood estimation over the restricted maximum likelihood. In our three models, we added the variables stepwise (controls, direct effects, quadratic effects). We mean-centered the variables before squaring to avoid multicollinearity.

4. Results

Table I presents descriptive statistics and intercorrelations for all variables. The average load factor within our sample airlines is 72.44 percent. In general, correlations are acceptable. The correlation between our two measures for API (DPI and GPI) is also relatively low supporting our argumentation about the constraint to separate these two measures.

Table II reports the results of the panel regression, starting with model 1. Compared to the basis in 2001, the year dummies show a more or less gradual increase of the load factor year by year. However, it is observable that the shock waves of 9/11 (2003) and of the World Financial Crisis (2008/2009) affected the load factors in the airline industry. The dummies for the GAA demonstrate no significant influence compared to non-membership indicating that there are eventually more indirect benefits or lagged effects of GAA. Two non-factorial variables possess a high significance suggesting a higher load factor for airlines that are bigger and are located in more developed countries.

Model 2 reveals that both portfolio internationalization measures have no significant direct impact on the load factor. Compared to model 1 there is also no significant change in −2 Log likelihood (i.e. no model improvement).

Model 3 additionally contains the quadratic effects for portfolio internationalization. The change in −2 Log likelihood suggests a substantial improvement of the model. Our hypothesis proposed a U-shaped relationship between portfolio internationalization and firm performance. For both measures, DPI and GPI, the quadratic term is positive and significant ($b = 0.235$, $p = 0.07$ for DPI^2 and $b = 0.067$, $p = 0.20$ for GPI^2), thereby supporting our hypothesis. Robustness tests confirm the results[7].

5. Discussion and conclusion

In line with our theoretical expectations, we found a U-shaped relationship between API and firm performance in the context of exploitation alliances. Compared to the study of Lavie and Miller (2008), we did not experience a drop of the performance at high levels of portfolio internationalization. We suggest this is due to the characteristic of exploitation alliances. Their focus on the utilization of existing knowledge and the possibility to standardize alliances opens the potential to profit from diverse resources without experiencing dramatically rising coordination costs. Furthermore, similar U-shaped impacts on performances were found for other forms of partner characteristics like network diversity (Goerzen and Beamish, 2005) or industry diversity (Jiang *et al.*, 2010). This reinforces our assumption that diverse alliance portfolios are difficult and costly to manage, but do have immense potential for receiving benefits if the coordination task is done properly (Cui and O'Connor, 2012). Firms have to develop certain capabilities and routines to manage alliances successfully. Gaining experience through international collaborations is helpful for that (Reuer *et al.*, 2002). Entering alliances with partners from diverse countries is one method to overcome the liabilities of foreignness over the course of time.

Our findings contribute to the strategic alliance literature in several ways. We demonstrated that exploitation alliances possess unique performance implications. Previous studies mainly concentrated on exploration portfolios and claimed that their results are valid for all types of alliances. However, the strategic positioning of a firm affects the performance implications of alliance portfolios (Martynov, 2017). Each alliance type has to be individually optimized in terms of partner attributes (O'Reilly and Tushman, 2013; Lee, 2007). Moreover, we adjusted the API measure of Lavie and Miller (2008) and proposed two

Table I. Statistics and intercorrelations ($n = 576$)

Variable	Mean	SD	1	2	3	4	5	6	7	8
1. Load factor	72.441	5.605								
2. GAA Star Alliance	0.262	0.440	0.069****							
3. GAA SkyTeam	0.139	0.346	0.093*	−0.239***						
4. GAA Oneworld	0.134	0.341	0.168***	−0.234***	−0.158***					
5. GAA Wings	0.010	0.102	0.079****	−0.061	−0.041	−0.04				
6. GAA Qualiflyer	0.007	0.083	−0.056	−0.050	−0.034	−0.033	−0.009			
7. Ln Age	3.924	0.548	0.119**	−0.003	0.176***	0.188***	0.077****	0.043		
8. Ln RPK	10.16	0.982	0.451***	0.102*	0.157***	0.220***	0.110**	−0.057	0.097*	
9. Average reach	2.298	1.121	0.314***	−0.132**	−0.100*	0.063	0.035	−0.036	−0.125**	0.245***
10. Ln Portfolio age	1.648	0.455	0.173***	−0.015	−0.001	0.177***	−0.013	−0.094*	0.263***	0.226***
11. Development index	0.000	1.000	0.495***	0.302***	0.021	0.298***	0.112**	0.013	0.232***	0.432***
12. Ln Population	17.69	1.680	−0.127**	−0.057	0.096*	−0.163***	0.021	−0.042	−0.077****	0.198***
13. Portfolio size	13.09	6.920	0.236***	0.404***	0.215***	0.061	0.023	0.002	0.279***	0.439***
14. DPI	0.000	1.000	−0.221***	−0.043	0.027	−0.139***	−0.042	0.025	−0.251***	−0.113**
15. GPI	5.379	2.240	0.157***	0.153***	−0.039	0.220***	−0.037	−0.096*	−0.062	0.420***
16. DPI^2	1.000	2.112	0.106*	−0.118***	−0.043	−0.084*	0.001	−0.008	−0.106*	−0.131**
17. GPI^2	5.009	8.140	0.179***	0.046	−0.117**	0.183***	−0.052	0.027	0.148***	−0.059

Variable	Mean	SD	9	10	11	12	13	14	15	16
1. Load factor	72.441	5.605								
2. GAA Star Alliance	0.262	0.440								
3. GAA SkyTeam	0.139	0.346								
4. GAA Oneworld	0.134	0.341								
5. GAA Wings	0.010	0.102								
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9. Average reach	2.298	1.121								
10. Ln Portfolio age	1.648	0.455	0.151***							
11. Development index	0.000	1.000	0.122***	0.131***						
12. Ln Population	17.69	1.680	−0.261***	−0.051	−0.357***					
13. Portfolio size	13.09	6.920	−0.025	0.169***	0.390***	−0.045				
14. DPI	0.000	1.000	0.020	−0.086*	−0.508***	0.102*	0.060			
15. GPI	5.379	2.240	0.295***	0.122**	0.238***	−0.024	0.114**	0.066		
16. DPI^2	1.000	2.112	−0.096*	−0.046	−0.131**	0.262***	−0.279***	0.159***	−0.140***	
17. GPI^2	5.009	8.140	0.044	0.133**	0.187***	−0.148***	−0.094*	−0.231***	0.387***	0.043

Notes: $^*p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$; $^{****}p < 0.1$

	Model 1		Model 2		Model 3	
	Estimate	SE	Estimate	SE	Estimate	SE
Intercept	59.052***	(5.735)	59.098***	(5.694)	59.838***	(5.388)
Year 2002	1.732***	(0.318)	1.716***	(0.318)	1.698***	(0.317)
Year 2003	0.772****	(0.425)	0.767****	(0.424)	0.653	(0.423)
Year 2004	2.637***	(0.507)	2.636***	(0.507)	2.534***	(0.502)
Year 2005	3.597***	(0.565)	3.648***	(0.566)	3.553***	(0.558)
Year 2006	4.663***	(0.614)	4.714***	(0.614)	4.762***	(0.602)
Year 2007	5.300***	(0.658)	5.346***	(0.658)	5.376***	(0.644)
Year 2008	4.449***	(0.694)	4.482***	(0.695)	4.568***	(0.678)
Year 2009	4.566***	(0.723)	4.672***	(0.726)	4.767***	(0.707)
GAA Star Alliance	0.282	(0.600)	0.321	(0.600)	0.170	(0.592)
GAA SkyTeam	0.373	(0.817)	0.338	(0.814)	0.458	(0.794)
GAA Oneworld	−0.496	(0.910)	−0.399	(0.911)	−0.485	(0.888)
GAA Wings	1.206	(1.781)	1.099	(1.778)	1.362	(1.751)
GAA Qualiflyer	0.506	(1.210)	0.141	(1.235)	−0.153	(1.231)
Ln age	−0.001	(0.782)	0.015	(0.779)	−0.183	(0.734)
Ln RPK	1.218***	(0.355)	1.254***	(0.355)	1.342***	(0.347)
Reach	0.415****	(0.246)	0.440****	(0.246)	0.460****	(0.240)
Ln portfolio age	0.175	(0.385)	0.126	(0.386)	−0.024	(0.384)
Development index	1.679***	(0.466)	1.907***	(0.492)	1.706***	(0.480)
Ln population	−0.169	(0.278)	−0.134	(0.277)	−0.210	(0.264)
Portfolio size	−0.030	(0.039)	−0.044	(0.040)	−0.022	(0.040)
DPI			0.231	(0.247)	−0.094	(0.288)
GPI			−0.174	(0.127)	−0.197	(0.127)
DPI^2					0.235**	(0.088)
GPI^2					0.067*	(0.029)
AR(1) diagonal	18.090***	(2.151)	17.828***	(2.121)	16.249***	(1.905)
AR(1) ρ	0.836***	(0.021)	0.834***	(0.021)	0.819***	(0.023)
df change			3		3	
−2 Log likelihood	2687.196		2685.069		2671.897	
Δ −2LL			2.127		13.172**	
Δ −2LL (model 1 to 3)					15.299*	

Notes: $n = 64$. Load factor as dependent variable; 9 periods; AR (1) covariance structure. *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$; ****$p < 0.1$

Table II. Results for fixed effects panel regression

variables for measuring the internationalization of alliance portfolios, GPI and DPI. Furthermore, we highlighted the role of alliance management capabilities and experiences in an international context. Without specialized competences, firms witness negative impacts when cooperating with foreign partners (Nielsen, 2003).

In addition, we provide several managerial implications. Our analyses demonstrated that portfolio size alone does not seem to influence firm performances. In supplementary analyses, we also did not find a quadratic or cubic effect of portfolio size on firm performances. Therefore, we conclude that a simple "collection" of alliance partners is not necessarily positive for a firm. Instead, management should analyze carefully the resources and characteristics of partners (Devlin and Bleackley, 1988). As we demonstrated, partner nationality must be an important selection criterion. Nevertheless, the decision about an alliance should not be done without taking the collectivity of all partnerships into account (Ozcan and Eisenhardt, 2009). More precisely, managers should pursue an alliance portfolio view, instead. When it comes to exploitation alliances, it seems advisable either to put the focus on a portfolio with local partners or to take advantage of partners with a high degree of foreignness. This is somehow in line with the generic strategies suggested by Porter (1980): "Stuck in the middle" might be unattractive if not dangerous.

This study has several limitations. For example, the variation of alliance network structures between industries is large (Rosenkopf and Schilling, 2007). The airline industry might be a special case because of its high degree of internationalization and a strong regulative framework (Hanlon, 2007). Moreover, codeshares are very standardized (Steer Davies Gleave, 2007). Other forms of exploitation alliances may be more complicated to manage. Future studies should ideally investigate additional industries. Finally, we operationalized our portfolio internationalization measures as the average distances between a firm and its partners. This fits the analyzed exploitation alliances in the airline industry well and enables us to compare our results with the results of Lavie and Miller (2008). However, a promising avenue for future research could be to develop measures that additionally capture the variances of portfolios.

Notes

1. Business models were identified through research in the journal *Airline Business*, corporate websites and publications provided by Lexis Nexis.
2. A statistical test supported our concerns. In line with Lavie and Miller (2008), we ran a factor analysis with all indicators. In contrast to all other indicators, geographic distance had only a very low factor loading (0.091). Lavie and Miller (2008) probably did not have this problem because their sample contained US-firms only.
3. See Kaufmann *et al.* (2009) for a description of the six governance indicators.
4. Factor loadings: control of corruption (0.947), government effectiveness (0.927), political stability and absence of violence (0.514), regulatory quality (0.889), rule of law (0.930), voice and accountability (0.706) and GDP per capita (0.585).
   Fit Indices: CMIN/DF (3.649), GFI (0.981), AGFI (0.952), CFI (0.992), NFI (0.989) and RMSEA (0.068).
5. The widespread term GAA (global airline alliance) is somehow confusing. Technically, it is possible to consider GAAs as a type of multilateral alliances (Lazzarini, 2008) but they are not the same as our measurement of alliances (codeshares). It is true that membership in the same GAA and codeshare agreements often overlap. However, especially in the early 2000s there are many cases where codeshares exited without a mutual GAA membership, and vice versa. Therefore, we brand GAAs as industry associations and treat them separately.
6. Factor loadings: control of corruption (0.979), government effectiveness (0.977), political stability and absence of violence (0.767), regulatory quality (0.967), rule of law (0.976), voice and accountability (0.804) and GDP per capita (0.819).
   Fit Indices: CMIN/DF (4.200), GFI (0.977), AGFI (0.942), CFI (0.994), NFI (0.993) and RMSEA (0.075).
7. We carried out several robustness checks. First, we included additional control variables and changed our GAA variables to a dummy variable. Second, we gradually changed specifications of our analysis (different covariance structures and REML estimation). Third, we tried a one-year lag. None of the modifications caused a significant improvement of our model. However, in all cases results for the independent variables remained similar.
   Finally, we built in cubic effects of our dependent variables to test for potential S-shaped effect as found by Lavie and Miller (2008). None of them was significant and we did not witness an improvement of the model.

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