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Winning the competition for supplier resources

The role of preferential resource allocation from suppliers

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Abstract

Purpose – This paper examines the competition between buying firms for the supplier's competitive resources. The purpose of this paper is to examine how indirect capabilities – the ability to access external resources – can help in obtaining preferential resource allocation from suppliers.

Design/methodology/approach – Partial least squares structural equation modeling is used to analyze data of 163 buying firms that assess preferential resource allocation from suppliers.

Findings – Two indirect capabilities (a buying firm's selection capability and relational capability) positively influence the firm's competitive advantage. These relations are significantly mediated by preferential resource allocation of suppliers. The impact of preferential resource allocation appeared stronger for manufacturing firms than for service firms.

Research limitations/implications – This study's data set represents the buyer's assessment of suppliers' resource allocation. Future research should aim for dyadic data for further validation. In addition, due to sample size limitations, this study's data does not allow sector segmentation. A larger study that provides insights into segmentation is suggested for future research.

Practical implications – The results inform managers about the relevance of the competition for supplier resources with rival firms that share suppliers, and the influence of this competition on firm competitiveness. Managers should not only focus on the supplier itself, but also on the capabilities of the supply chain management (SCM) function to recognize and integrate the supplier resources.

Originality/value – This study adds to the extended resource-based view literature by integrating the notion of supplier resource competition. In addition, the study shows the importance of indirect capabilities for obtaining preferential resource allocation from suppliers. Finally, the authors show the importance of separating between service and manufacturing when examining SCM practices.

Keywords Indirect capabilities, Extended resource-based view, Supplier resource competition

Paper type Research paper

Introduction

The success of a firm increasingly depends on the resources of its suppliers (Dyer and Hatch, 2006; Hult *et al.*, 2007; Hunt and Davis, 2012). However, as an increasing number of firms seek external collaboration, competition for capable suppliers grows (Takeishi, 2001). Because suppliers have limits on the resources they can devote to buyers, it has been argued that it would be “extremely difficult” for buying firms to create competitive advantages through a supply base that is shared with competitors

(Dyer and Hatch, 2006, p. 703). Therefore, competitive advantage is not a self-evident result of collaborations because competitors might obtain better resources (e.g. the best ideas, newest technologies or preferential allocation of scarce materials) from a supply base that is inherently similar. The competitiveness of firms critically depends upon the supply chain management (SCM) capabilities needed to obtain supplier resources for which competitors compete as well.

Recently, concepts such as factor market rivalry (Ellram *et al.*, 2013), preferred customer status (Pulles *et al.*, 2016), supplier resource mobilization (Ellegaard and Koch, 2012) and resource-advantage theory (Hunt and Davis, 2008) have addressed the competition for supplier resources in greater depth. These recent perspectives have changed the emphasis of the traditional resource-based theories (e.g. Wernerfelt, 1984; Barney, 1991), which view competitive advantage as a function of internal resources, to a perspective that considers the impact of external resources on the competitiveness of firms. This perspective has been termed the extended resource-based view (ERBV) (Mathews, 2003; Squire *et al.*, 2009; Lewis *et al.*, 2010).

In this study, we integrate the notion of supplier resource competition and examine the effects of preferential resource allocation from suppliers (i.e. the extent to which firms obtain better supplier resources than competitors) on the competitive advantage of buying firms. We link to a recent stream in the literature that has begun to consider “indirect capabilities,” which can be seen as a firms’ ability to access resources of external partners (Loasby, 1998; Araujo *et al.*, 2003; Bonomi Santos and Spring, 2013; Spring and Araujo, 2014) and examine the SCM capabilities needed to obtain preferential resource allocation. We discuss two capabilities (linking to the conceptual work of Teece, 2007) that refer to a firm’s capability to observe resource opportunities in its supply base (i.e. selection capability) and the ability to form an effective relation that facilitates resource exchange (i.e. relational capability). This paper builds upon the ERBV to theorize on the effect of a buying firm’s indirect capabilities on the competitive advantage of this firm and to examine the intermediate role of preferential resource allocation in the relationship between indirect capabilities and the buying firm’s competitive advantage. In addition, as firms in manufacturing industries are typically more reliant on supplier resources, we also examine how the effect of supplier resource allocation might differ for manufacturing and service firms. To test our hypotheses, we analyzed survey data of 163 buying firms, using partial least squares (PLS) structural equation modeling (SEM).

This paper makes several contributions to the literature. First, we integrate the notion of supplier resource competition with the ERBV thereby adding the perspective that acquiring preferential resource allocation from suppliers relative to competitors is an important determinant for the competitive advantage of buying firms. Second, even though the literature has begun to explore the capabilities that can improve the outcome of inter-firm collaborations (e.g. Kale and Singh, 2007; Kasch and Dowling, 2008; Paulraj *et al.*, 2008; Schilke and Goerzen, 2010), the literature lacks a clear examination on how indirect capabilities actually influence the resource allocation of suppliers and how they link to the competitiveness of buying firms. We examine the indirect capabilities that can help a buying firm in attaining competitive advantages and preferential resource allocation. Third, while little studies have examined the differences in impact of SCM practices between service and manufacturing firms, this study examines the different effects of preferential resource allocation from suppliers for these industries.

The ERBV and the competition for supplier resources

Many scholars have built on resource theories in exploring the strategic role of SCM. In its original form, the resource-based view (RBV) (Wernerfelt, 1984; Barney, 1991) explains the competitive advantage of a firm to be “a function of the combined value and rarity of all firm resources and resource interactions” (Lavie, 2006, p. 643). As such, the RBV has been used to explain the competitive advantage of firms in industries ranging from typical manufacturing industries such as the automobile industry (Dyer and Hatch, 2006) to service industries such as logistics services (Lai *et al.*, 2008). Over the last decades, resource-based theories have developed new perspectives. Whereas the RBV mainly looked within the firm for resources (Barney, 1991; Peteraf, 1993), newer perspectives focused on the resources that are acquired external to the firm to explain competitive advantage (Dyer and Singh, 1998; Das and Teng, 2000; Steinle and Schiele, 2008; Hunt and Davis, 2012). The theory that competitive advantage is derived from both internal and external resources has been labeled the ERBV (Mathews, 2003; Squire *et al.*, 2009; Lewis *et al.*, 2010).

A central premise of the RBV is that competitive advantage is a relative notion. Only those resources which are distinctive or superior relative to those of competitors, may form the basis for competitive advantage (Peteraf, 1993). Adopting this perspective to the ERBV would imply that the resources obtained from external sources will more likely result in a competitive advantage if the firm obtains better resources than its competitors (Capron and Chatain, 2008; Pulles *et al.*, 2014a). However, current ERBV studies have not yet integrated this perspective. Similar to internal resources, the extent to which external resources are distinctive or superior relative to the resources of competitors can be expected to be an important predictor for the competitive advantage obtained from these external resources. It has been argued that it would be “extremely difficult” for buying firms to create competitive advantages through their supply base if buying firms are in competition for the supplier’s best resources (Dyer and Hatch, 2006, p. 703). Nonetheless, suppliers treat competing customers differently. For example, Takeishi (2002, p. 328) showed how some buyers obtained better resource allocation than competitors “although they all outsourced to the same supplier.” Suppliers can have certain preferred customers to whom they allocate preferential resources (Baxter, 2012; Schiele *et al.*, 2012; Pulles *et al.*, 2014b). Once a buying firm achieves superior performance through superior resource allocation from its suppliers, competitors attempt to neutralize this advantage by engaging in similar relationships and by degrading the resource position of their rival (Capron and Chatain, 2008; Hunt and Davis, 2008). For example, supplier development programs can help to develop and access supplier resources but rival firms can still acquire the supplier resources developed in such programs (Mesquita *et al.*, 2008).

Throughout this paper, we label these dynamics as “supplier resource competition” based on the definition of competition by Hunt and Davis (2008, p. 15):

Supplier resource competition is the constant struggle among buying firms for supplier resources that will yield positions of competitive advantage.

Indirect capabilities

Organizing access to external supplier resources requires a firm’s own set of internal capabilities (Araujo *et al.*, 2003). Several researchers have built on Teece *et al.*’s (1997) dynamic capability ideas to conceptualize capabilities that enable firms to utilize inter-organizational relationships to integrate external resources. Although in its original conceptualization a dynamic capability mainly relates to the development of a firm’s internal resource base, these researchers have examined the effects of such

capabilities on the integration of external resources (e.g. Kale and Singh, 2007; Schilke and Goerzen, 2010; Allred *et al.*, 2011). Loasby (1998, p. 149) labeled these capabilities as indirect capabilities because, he argues: “We need not only to know how to do certain things for ourselves, but also how to get other things done for us.” Indirect capabilities can be regarded as a firm’s ability to organize access to the resources of other organizations (Mota and Castro, 2004; Spring and Araujo, 2014).

Spring and Araujo (2014) discuss several elements of indirect capabilities. They consider a firm’s contracting capability to be an important component of a firm’s indirect capabilities because contracting capabilities link to the performance of the exchange relationships (Poppo and Zenger, 2002; Roehrich and Lewis, 2014). In the context of procuring complex performance in the public sector, Hartmann *et al.* (2014) and Lewis and Roehrich (2009) elaborate on the importance of contractual and relational capabilities as buyers move toward a service-based, integrated stage of procurement. Recently, scholars have begun to consider collaboration capabilities that can improve the outcome of inter-firm collaborations. For example, Kale and Singh (2007) explain a positive link between a firm’s alliance management capabilities and alliance success rate, and Paulraj *et al.* (2008) show how relational competences of buying firms lead to better performance outcomes in buyer-supplier relationships. Others have studied firms’ (supply) network capabilities (Walter *et al.*, 2006; Singh Srai and Gregory, 2008), collaboration capabilities (Allred *et al.*, 2011), or alliance management capabilities (Schilke and Goerzen, 2010). The main focus of these studies was to examine the effects of the specific capabilities on the performance outcomes of inter-organizational collaboration. However, even though indirect capabilities have been argued to affect the extent to which firms appropriate external resources, the literature provides little insights into how indirect capabilities actually link to resource appropriation. The literature that explicitly addresses the effects of indirect capabilities on a firm’s external resource appropriation remains mainly conceptual (e.g. Loasby, 1998; Araujo *et al.*, 2003; Spring and Araujo, 2014).

In this paper, we examine two indirect capabilities. The first capability incorporates Teece’s (2007) concept of “sensing,” which reflects a firm’s ability to identify opportunities by scanning, searching and exploring technologies and markets. We name this capability a buying firm’s selection capability, which is defined as the firm’s capability to recognize valuable opportunities for collaboration within its supply base. The second capability refers to Teece’s (2007) concept of “seizing” opportunities. Once a resource opportunity is observed, a buying firm should aim to facilitate a resource exchange. We call this ability a buying firm’s relational capability, which is defined as the firm’s ability to build close relationships with suppliers to facilitate resource exchange.

Conceptual model and hypotheses

In the following we hypothesize on the effects of the defined indirect capabilities on the competitive advantages of a firm. We argue that, because indirect capabilities enable access to the resources of suppliers, buying firms that possess such capabilities will more likely attain competitive advantages from their supplier relationships. In addition, we theorize on the intermediate effect of preferential resource allocation from suppliers on the relationship between indirect capabilities and competitive advantage. Figure 1 shows the conceptual model.

The effect of preferential resource allocation on competitive advantage could greatly depend on the kind of industry a firm operates in. Therefore, we include hypotheses on how the effect of preferential resource allocation from suppliers might differ for manufacturing and service firms.

Selection capability, relational capability and competitive advantage

A firm is argued to have a specific “capability” if this firm (or its constituent parts) has the capacity to perform a certain activity in a reliable and at least minimally satisfactory manner (Helfat and Winter, 2011). Such a capability has a specific and intended purpose (Winter, 2003) and firm capabilities enable repeated and reliable performance of activities, in contrast to ad hoc activities that do not reflect practiced or patterned behavior (Helfat and Winter, 2011). Indirect capabilities would enable a firm to repeatedly acquire those external resources that can increase the competitiveness of a firm. Such capabilities typically lay within the SCM realm. Thus, while firms increasingly manage their supply base as an extension of their own resource base (Kannan and Tan, 2006), it can be expected that indirect SCM capabilities would influence firm’s competitiveness.

Firms that have more accurate expectations about the true value of external resources can use these expectations to acquire these resources ahead of their competitors (Barney, 1986). Thus, an important element of indirect capabilities is to understand the value of supplier resources (Spring and Araujo, 2014). Access to supplier resources is not instantaneous and indirect capabilities should offer a firm the knowledge of which supplier can provide what (Mota and Castro, 2004). Selecting the appropriate partner is therefore a difficult but also critical issue to the success for accessing external resources (Hitt *et al.*, 2000). Firms that possess organizational routines associated with identifying and selecting collaboration opportunities should therefore be able to attain higher levels of performance from their relationships with their supplier base. Indeed, Koufteros *et al.* (2012) discuss how strategic supplier selection can be seen as an important source of attaining competitive advantages through buyer-supplier relationships.

Relationships with suppliers provide the opportunity to leverage suppliers’ resources and mobilize them to enhance performance. Resources are embedded within the suppliers’ organization and much of the skills and knowledge needed to successfully integrate these resources are associated with complex relational interaction between the firms (Sarkar *et al.*, 2001). The capability of an organization to build close relationships with external partners may therefore facilitate resource exchange (Wasko and Faraj, 2005; Kale and Singh, 2007). Differences in the levels of trustworthiness and respect between partners may then relate to different levels of resource allocation from partner firms (Tsai and Ghoshal, 1998). Simply a greater number of “horse-trading” skills will not suffice to integrate the resources into the buyer’s organization (Teece, 2007). Without the relationship in place that facilitates this interaction between the buying firm and its suppliers, it would be difficult for a buying firm to integrate supplier resources. Similarly, Das and Teng (2000) argue that the extent to which firms can successfully integrate knowledge very much depends on the

Figure 1.
Conceptual model

relationship and alignment between firms. Therefore, a firm's relational capability can be viewed as the capacity to extend a firm's resource base (Kale and Singh, 2007) which the firm can utilize to increase competitiveness:

- H1.* The selection capability of a buying firm has a positive effect on the competitive advantage of a firm.
- H2.* The relational capability of a buying firm has a positive effect on the competitive advantage of a firm.

Preferential resource allocation

Because competition is a relative notion, the resources obtained from the supply base shared with competitors will more easily result in a competitive advantage when the buying firm obtains better resources than its competitors (Hult *et al.*, 2006; Capron and Chatain, 2008; Pulles *et al.*, 2014a). The recent literature describes a buying firm that is able to attain a preferential resource allocation position from a shared supplier network as a preferred customer (Bemelmans *et al.*, 2015; Pulles *et al.*, 2016). If a buying firm is a preferred customer, the supplier will, for example, allocate its best personnel to collaborative development or offer innovations that are not available to the buying firm's competitors (Hüttinger *et al.*, 2012). Then, following a resource-based logic, the buying firm that attains preferential resource allocation from a supplier can be expected to gain competitive advantages over its competitors that source from the same suppliers. Conversely, firms not capable of attaining a superior resource position in their supply base may lose the ability to differentiate themselves from competitors and thereby lower their competitive advantage (Gnyawali and Madhavan, 2001; Takeishi, 2001).

A supplier's willingness to collaborate with its buyers is not always apparent (Essig and Amann, 2009). The allocation of supplier resources to relationships with buying firms is a selective process in which competing customers may be treated unequally (Mitshuhashi and Greve, 2009). Once a firm observes a resource opportunity in its supply base, it needs to invest in the relationships with these suppliers to seize the opportunity. Yet, buying firms should not have the aim to develop relationships with every supplier. Instead, buying firms should aim to develop collaborations with suppliers that have those resources that can increase the competitiveness of the buying firm but also are likely to provide the buying privileged access to those resources. Firms should understand the potential role of partners and the role played by rival firms (Mathews, 2003). Or, as Barney (2012) argues, the SCM function should not only understand the impact of external resources on the competitiveness in product markets, but must also understand the competition for these external resources itself. Firms that understand this competition can be expected to identify and select those opportunities that competitors may not have access to. A firm's selection capability is therefore not only expected to affect the competitive advantage directly because it enables the firm to select those supplier resources that are valuable to the firm (i.e. *H1*), but also because it can help firms in identifying and selecting those suppliers that can provide them preferential access to these competitive resources. For example, firms that are able to recognize collaboration opportunities can start this collaborating before competitors do and may, in this way, enjoy first-mover advantages that cannot be regained. Thus, a buying firm's selection capability is expected to relate both directly as indirectly (via preferential resource allocation) to the competitive advantage of the firm.

Similarly, we expect a direct effect of a firm's relational capability on competitive advantage (i.e. *H2*) but also an indirect effect that is mediated by preferential resource

allocation of suppliers. Buying firms can influence the behavior of suppliers by investments in the relationship with suppliers (Ramsay *et al.*, 2013). For example, Lorenzoni and Lipparini (1999) found that the interactive process between actors facilitated by the relationship between the buyer and supplier created a greater exchange of information, both planned and spontaneous. Conversely, suppliers that become dissatisfied with a relationship might eventually search for other resource allocation channels (Ellegaard and Koch, 2012). Thus, if a buying firm is capable of building better relationships with its suppliers, then these suppliers should prefer collaborating with this buyer over the other (competing) buyers and allocate better resources to this relationship. In turn, preferential resource allocation relates to competitive advantage because the comparative advantage (relative to competitors) in supplier resource allocation positively affects the competitive advantages in its market position (Hunt and Davis, 2008). Because both relational capability and preferential resource allocation relate to competitive advantage, and because relational capability positively affects supplier resource allocation, we expect a mediating effect of preferential resource allocation:

- H3. The effect of selection capability on the competitive advantage of a firm is mediated by preferential resource allocation of suppliers.
- H4. The effect of relational capability on the competitive advantage of a firm is mediated by preferential resource allocation of suppliers.

The role of preferential resource allocation in different industries

As explained in the previous sections, the resource-based theories have been used to explain the competitive advantage of firms in industries ranging from typical manufacturing industries to more service-oriented industries. Similar to manufacturing firms, service firms are dependent on external resources which enable them to increase the quality of their services and, consequently, their competitive advantage (Helfat and Peteraf, 2003). For instance, the healthcare industry is increasingly outsourcing strategically important services (Foxy *et al.*, 2009). Of course, manufacturing (service) firms can, to a certain extent, rely on the services (products) of its suppliers (Araujo and Spring, 2006). Still, there are strong differences between manufacturing and service environments (Ellram *et al.*, 2004; Maull *et al.*, 2012). Suppliers therefore have a different role in these different industries, which implies that supplier resources would affect manufacturing firms and service firms differently.

Maull *et al.* (2012) argue that one of the main differences between the manufacturing and service logic of a supply chain, is that in the supply chain of a service provider the customer takes a central role. Taking such a customer perspective means that the firm works at finding opportunities and value together with the customer to create greater value for both the firm and the customer (Prahalad and Ramaswamy, 2004). Similarly, the service-dominant logic (Vargo and Lusch, 2004) implies that value is defined by and co-created with the consumer. Thus, whereas manufacturing firms rely on their supplier for, for example, the integration of new innovations (Pulles *et al.*, 2014b) and increasing operational performance (Liu *et al.*, 2013), service firms tend to rely more on the inputs of their customers. From this it can be argued that the necessity to acquire better supplier resources than competitors is higher for manufacturing firms than for service firms:

- H5. The effect of preferential resource allocation on competitive advantage will be stronger for firms in manufacturing industries than for firms in service industries.

Methodology

Sample and data collection

To test our hypotheses, we conducted a survey of key informants. Similar to other studies examining capabilities within the SCM realm (e.g. Paulraj *et al.*, 2008; Schilke and Goerzen, 2010), we surveyed key informants from the buyer's organization. To ensure that these respondents were well informed and properly qualified to assess their firms' capabilities and preferential resource allocation from suppliers, we asked them to choose random but important (i.e. key) suppliers of which they had a good understanding regarding the relationship between their firm and these suppliers.

The data were collected during a seminar in the Netherlands on future trends for procurement (May 2012). The seminar was organized by a section of the Dutch Association of Purchasing Managers, NEVI. Approximately 300 people attended this seminar. The keynote speakers of this seminar were several CPOs of multinational firms and one of the authors of this paper, who invited the participants to take part in a survey. This survey consisted of two parts: the first part questioned the participants on future SCM trends, and the second part was the measurement model of this study. The participants were motivated to complete the survey with a discussion of the results of the first part of the survey at the end of the seminar.

Collecting data via a seminar has several benefits. An important benefit is that participants of a seminar are generally willing to participate in a survey, which results in high response rates. In total, 209 participants completed the survey, which represents a response rate of approximately 70 percent. Another benefit is that the respondents can be given specific instructions. In this case, to reduce the risk of socially desirable answers, we explained to the respondents that there are no "good" or "bad" answers and asked them to choose the answers that best fit their firm's situation. A limitation of collecting data at a seminar is the risk that the participants are not the key informants most suitable to filling out the survey. Therefore, to assure high-quality responses, we restricted our sample and removed respondents serving in functions other than procurement and executive functions. In total, 29 respondents were removed (e.g. consultants, HR managers and business coaches). An additional 17 respondents were removed because they did not indicate their functions. A final limitation of collecting data at a seminar is that it is difficult to assess how a sample from seminar participants compares to a random sample from the entire population. However, as shown in the profile of the sample in Table I, the respondents come from a wide range of industries. In addition, the sample contains a considerable proportion of service firms, which is a valid representation of Dutch industries.

The total sample size of this study is 163. In this final sample, 48.5 percent respondents served as procurement managers, 33.1 percent served as procurement employees and 18.4 percent served in an executive function. On average, the respondents indicated to have worked for 5.8 years at their firms.

Measures

In the operationalization of the resource allocation variable, we asked the respondents to select key suppliers of their firm that they share with their main competitors. Then, we let the respondents assess the perceived resource allocation of those suppliers to their firm compared to the suppliers' resource allocation to the firm's main competitors. Key suppliers were chosen because the respondents were expected to have more accurate information on the resource allocation from key suppliers than the resource allocation from suppliers with less relative importance. Asking respondents to assess their key suppliers (similarly to, e.g. Carr and Pearson, 1999; Eggert and Ulaga, 2010),

Table I.
Profile of the sample

	Frequency (%)		Frequency (%)
<i>Industry sector</i>		<i>Services</i>	
Manufacturing		Trade	13.5
Construction	6.1	Public services	12.9
Food and drink	3.1	Healthcare	10.4
Mechanical engineering and machine building	2.5	Transportation	4.9
Mining and basic/raw materials	2.5	Media and news services	2.5
Electrical and electronic engineering	1.8	Other services	16.0
Chemical, rubber and plastics	1.2		
Printing	1.2		
Textile and footwear	1.2		
Vehicles	0.6		
Other manufacturing	14.1	Unknown	5.5
Annual turnover (€)		<i>Respondent function</i>	
0-50 million	24.1	Procurement manager	48.5
51-100 million	13.0	Procurement employee	33.1
101-500 million	36.2	Executive function	18.4
501-1,000 million	7.7		
> 1,000 million	19.0		

therefore, enables them to more reliably judge the relationships with their suppliers compared to an assessment of the entire supply base. All items were measured on a five-point Likert scale ranging from 1, “no, fully disagree,” to 5, “yes, fully agree.”

The operationalization of resources is based on the study of Newbert (2008). In his study he suggests to measure the availability of resources in an organization, in a similar way as the suggestions of Hunt and Davis (2008) and Villanueva *et al.* (2010). Similar to Pulles *et al.* (2016), we use Newbert’s classification of resources comprises financial resources (capital and cash), human resources (experience and the intelligence of individual employees), intellectual resources (patents and ideas), organizational resources (partners and suppliers), physical resources (materials and physical technologies) and capabilities (skills and expertise). The resource allocation variable is modeled as having formative indicators. Whereas reflective items are, in essence, interchangeable, formative items can be mutually exclusive. Formative indicators jointly determine the conceptual meaning of the construct (Jarvis *et al.*, 2003). For example, if suppliers allocate superior financial and physical resources to a buying firm, this does not necessarily mean that the buying firm will be allocated superior innovation resources as well (and vice versa). Still, the buying firm receives better resources than competitors do. Therefore, this construct is modeled as formative (Diamantopoulos and Winklhofer, 2001).

To measure competitive advantage, we asked the respondents to assess the relationships with their suppliers based on three items adopted from Newbert’s (2008) aggregate measure of competitive advantage (p. 766): the extent to which the relationship has enabled their firm to defend against competitive threats, has enabled their firm to reduce cost to a highly competitive level and has provided their firm with strategic advantages over competitors.

The measure of selection capability is based on the work of Zacharia *et al.* (2011), who measure a firm’s capability to select opportunities for more collaborative relationships, and Lichtenthaler (2009), who found measures for recognizing opportunities in external environments. The selection capability construct is operationalized by asking the

respondents to indicate their firm's capability to recognize opportunities for strategic collaborations, the capability to select suppliers with which their firm can successfully collaborate, the extent to which their firm has comprehensive information on state-of-the-art technologies within the supply base and the extent to which their firm can easily observe external sources of new technologies. Relational capability is operationalized by measuring the firm's capability to build personal relations, mutual trust and respect and to solve problems constructively (based on Kale *et al.*, 2000; Walter *et al.*, 2007).

In addition, we added turnover as a control variable because it could be argued that suppliers might be more willing to allocate better resources to large buyers. An overview of the measures is provided in the Appendix.

Data analysis

We use a PLS analysis to assess the conceptual model. PLS is a regression-based SEM technique that is ideally suited for testing models with latent variables. Compared to covariance-based SEM techniques, model complexity does not pose a severe restriction because PLS modeling only estimates a subset of parameters at any moment (Wetzels *et al.*, 2009). Because, PLS puts no restrictions on incorporating formative items in the measurement model, PLS is the appropriate technique to analyze this study's data. SmartPLS 2.0 (Ringle *et al.*, 2005) was used to obtain the PLS estimates.

Construct validity and reliability

We assessed the item reliability, convergent validity and discriminant validity (Hulland, 1999). Table II shows the cross-loadings of the items in the constructs.

To test the convergent validity of the reflective constructs we first examined the average variance extracted (AVE). As shown in Table III, all constructs exceeded the 0.50 cutoff (Fornell and Larcker, 1981). Composite reliability ranged between 0.86 and 0.90, exceeding Nunnally's (1978) threshold of 0.7. In addition, the square roots of the AVE values are greater than their correlation coefficients with the other constructs.

Item	Preferential resource allocation	Competitive advantage	Selection capability	Relational capability	Turnover
PRA 1	0.77	0.38	0.40	0.31	-0.11
PRA 2	0.91	0.44	0.44	0.44	-0.02
PRA 3	0.69	0.41	0.30	0.21	-0.18
PRA 4	0.72	0.38	0.32	0.30	-0.19
PRA 5	0.65	0.27	0.38	0.30	0.00
PRA 6	0.79	0.31	0.44	0.41	-0.12
CA 1	0.43	0.84	0.47	0.39	-0.18
CA 2	0.35	0.83	0.36	0.27	-0.11
CA 3	0.38	0.87	0.33	0.25	-0.18
SC 1	0.36	0.35	0.82	0.53	-0.10
SC 2	0.49	0.43	0.84	0.56	-0.15
SC 3	0.31	0.38	0.69	0.25	-0.12
SC 4	0.41	0.27	0.77	0.36	-0.11
RC 1	0.38	0.22	0.48	0.77	0.03
RC 2	0.41	0.42	0.46	0.86	0.04
RC 3	0.40	0.27	0.51	0.87	-0.04
RC 4	0.36	0.29	0.43	0.85	-0.13
TO	-0.10	-0.19	-0.15	-0.03	1.00

Table II.
Cross-loadings

Therefore, the constructs fulfill the requirement for discriminant validity (Fornell and Larcker, 1981; Rexhausen *et al.*, 2012). All of the variance inflation factors (VIF) are less than 3, implying the absence of multicollinearity (Hair *et al.*, 1995).

For formative constructs, the conventional procedures to assess the validity and reliability of scales are not appropriate (Diamantopoulos and Winklhofer, 2001). Hair *et al.* (2012) argue that researchers should consider the absolute contribution of the formative items, by analyzing both the outer weights and outer loadings. As shown in Table IV, the resource allocation construct's outer loadings all are above 0.50. This indicates that the items should be interpreted as important to the construct even when some of the outer weights are insignificant (Hair *et al.*, 2012). Based on the values of the outer loadings, all of the indicators are retained. Finally, each of the resource allocation items has a VIF lower than 3. Because this value is far below the cutoff threshold of 10, multicollinearity does not seem to be a serious concern for the preferential resource allocation construct.

Assessment of common method bias

Because the responses were collected from single key informants, common method bias could potentially threaten the validity of the results (Podsakoff and Organ, 1986). Therefore, we performed an unmeasured latent methods factor test for PLS developed by Liang *et al.* (2007) to examine the extent of common method variance in the reflective constructs. Following Liang *et al.* (2007) we introduced a common method factor in our PLS model whose indicators included all the principal construct's indicators. Then, we calculated each indicator's variances explained by the principle construct (i.e. substantive variance) and by the common method factor (similarly used by Rexhausen *et al.*, 2012; Perols *et al.*, 2013). As presented in Table V, the results show that the average substantive variance (CL^2 column) is 0.680, while the average method-based variance (MFL^2 column) is 0.013. Additionally, most of the method factor loadings are not significant. Given the results of the unmeasured latent methods factor test, common method bias is unlikely to pose a serious threat in this study.

Table III.
Means, standard
deviations,
correlations and
quality criteria of
constructs

	No. of items	<i>M</i>	<i>SD</i>	<i>AVE</i>	<i>CR</i>	1	2	3	4
1. Preferential resource allocation	6	3.23	0.72	–	–	–			
2. Competitive advantage	3	3.27	0.86	0.71	0.88	0.47	0.84		
3. Selection capability	4	3.38	0.73	0.61	0.86	0.49	0.46	0.78	
4. Relational capability	4	3.49	0.76	0.70	0.90	0.43	0.36	0.56	0.84

Notes: AVE, average variance extracted (communality); CR, composite reliability. Italic elements on the diagonal represent the square root of AVE. Off-diagonal elements are correlations between the constructs

Table IV.
Outer weights and
outer loadings of the
preferential resource
allocation construct

	Outer weights	<i>t</i> -values	Outer loadings	VIF
PRA 1	0.24	1.64	0.78	2.01
PRA 2	0.43	2.39	0.89	2.14
PRA 3	0.00	0.04	0.68	2.24
PRA 4	0.23	1.56	0.78	2.19
PRA 5	0.07	0.48	0.62	1.53
PRA 6	0.27	1.84	0.78	1.71

Construct	Indicator	Construct loading (CL)	CL ²	Method factor loading (MFL)	MFL ²	<p>Winning the competition for supplier resources</p> <p>1469</p> <p>Table V. Common method bias analysis</p>
Competitive advantage	CA 1	0.646	0.417	0.210	0.044	
	CA 2	0.917	0.841	−0.086	0.007	
	CA 3	0.961	0.924	−0.107	0.011	
Selection capability	SC 1	0.868	0.753	−0.051	0.003	
	SC 2	0.685	0.469	0.173	0.030	
	SC 3	0.730	0.533	−0.055	0.003	
	SC 4	0.849	0.721	−0.083	0.007	
Relational capability	RC 1	0.745	0.555	0.032	0.001	
	RC 2	0.747	0.558	0.130	0.017	
	RC 3	0.910	0.828	−0.046	0.002	
	RC 4	0.939	0.882	−0.111	0.012	
Average		0.818	0.680	0.001	0.013	

Results

To test the statistical significance of the hypothesized paths, a bootstrapping procedure using 500 resamples was used. To assess the stability of the estimates, similar bootstrap samples of 250 and 1,000 were employed. The results show consistent levels of significance across the bootstrap samples. We test two models. In Model 1, we test the effect of selection capability and relational capability on competitive advantage (i.e. *H1* and *H2*). In Model 2 we include the preferential resource allocation construct and test its mediating effect on the relationships between the capabilities and competitive advantage (i.e. *H3* and *H4*). The results of the two models are shown in Figure 2. To test whether the effect of preferential resource allocation on competitive advantage differs for firms in manufacturing industries and service industries (i.e. *H5*), we apply a PLS-based multigroup comparison approach suggested by Henseler (2012).

Test of Model 1 and Model 2

The results for Model 1 reveal a positive and significant relationship between selection capability and competitive advantage ($\beta = 0.36$; $p < 0.01$), which supports *H1*. Also *H2* is supported because the effect of relational capability on competitive advantage test significant ($\beta = 0.18$; $p < 0.05$). The control variable, the buying firm's turnover, does not significantly affect competitive advantage ($\beta = -0.13$). Model 1 accounts for 26 percent of the explained variance in competitive advantage (i.e. $R^2 = 0.26$).

Model 2 adds preferential resource allocation. Preferential resource allocation has a significant and positive effect on competitive advantage ($\beta = 0.28$; $p < 0.01$). The effects in Model 2 are indicative of a meditation effect of preferential resource allocation. That is, both selection capability ($\beta = 0.35$; $p < 0.01$) and relational capability ($\beta = 0.27$; $p < 0.01$) have a significant and positive effect on preferential resource allocation. The buying firm's turnover does not significantly affect preferential resource allocation and competitive advantage ($\beta = -0.039$ and -0.12 , respectively). Model 2 accounts for 31 percent of the explained variance in preferential resource allocation (i.e. $R^2 = 0.31$), which indicates the relevance of the preferential resource allocation construct. Compared to Model 1, the direct effect of selection capability on competitive advantage was substantially reduced, but remains significant ($\beta = 0.26$; $p < 0.05$). The direct effect of relational capability on competitive advantage was substantially reduced and became insignificant ($\beta = 0.09$).

To test the mediation effect of preferential resource allocation, we followed the suggestion by Rungtusanatham *et al.* (2014) and applied a procedure to explicitly test

Figure 2.
Empirical model

the significance of the mediation effect instead of an implicit procedure (e.g. Sobel test). They suggest to construct a percentile bootstrap confidence interval in which the sampling distribution is based on the estimated paths bootstrap samples. We followed this procedure and used 500 resamples to determine the product terms of the constituent mediation pathways (cf. Preacher and Hayes, 2008). This procedure showed that the indirect effect of selection capability on competitive advantage through preferential resource allocation is significant (95 percent confidence interval of 0.012 to 0.242), concluding that the mediation effect of preferential resource allocation exists in the relationship between selection capability and competitive advantage. Similarly the indirect effect of relational capability on competitive advantage through preferential resource allocation is significant (95 percent confidence interval of 0.007-0.165). Therefore, we accept *H3* and *H4*. Finally, we examined the impact of preferential resource allocation on the relationships between the capabilities and competitive advantage by assessing the variance accounted for factors (cf. Hair *et al.*, 2013). This analysis showed that 28 percent of the effect of selection capability on competitive advantage was mediated by preferential resource allocation and 46 percent of the effect of relational capability on competitive advantage was mediated by preferential resource allocation.

Test of *H5*

We applied a non-parametric procedure suggested by Henseler (2012) to analyze whether path coefficients of service firms significantly differ from the path coefficients of manufacturing firms. In this procedure, the structural model for service firms is

compared to the same model for manufacturing firms based on bootstrap estimates (with 500 resamples) of these groups. Each centered bootstrap estimate of the manufacturing group is compared with each centered bootstrap estimate of the service group. Then, differences between these bootstrapped populations indicate the probability of the groups being different (cf. Henseler, 2012).

We divided the sample into a sample of service firms (98 firms) and manufacturing firms (56 firms, nine are unknown). Although these samples can be considered relatively small, based on Monte Carlo simulations, Qureshi and Compeau (2009) explain that the effective sample size to accurately examine between-group differences is contingent on several conditions. Yet, potential lack of power does not affect cases in which a multigroup comparison observes significant differences. In such a case it can be concluded that between-group differences are, in fact, true (Qureshi and Compeau, 2009). First, we tested measurement variance. Although there are no accepted PLS-based approaches to test measurement invariance yet (Henseler, 2012), potential measurement invariance should be observed in differences between factor loadings. Therefore we used Henseler's approach to test the factor loading differences between the service and manufacturing groups. This test did not show significant differences between groups (at $p < 0.05$). Thus, differences in the measurement instrument does not appear to be a threat in our multigroup comparison.

Second, we used Henseler's approach to test between group differences in path loadings. Similar to the results presented in Figure 2, both models showed a positive link between preferential resource allocation and competitive advantage. However, the path in the service group was not significant ($\beta = 0.14$). The path coefficient of the manufacturing group was significant and substantially higher ($\beta = 0.58$; $p < 0.01$). Indeed, Henseler's approach indicated that the relationship between preferential resource allocation and competitive advantage is significantly stronger in the manufacturing group ($p < 0.01$). Thus, $H5$ is supported.

Conclusions and discussion

Building on the ERBV, this paper discussed the relevance of supplier resource for the competitiveness of buying firms. We examined the indirect capabilities that can help firms to acquire better resources than competitors. In doing so, this study provides answers to questions raised by several scholars. For instance, Takeishi (2001, p. 403) questions: "How could a company outperform competitors who also have cooperative relations with their partners?" Similarly, Dyer and Hatch (2006, p. 703) note "[...] when manufacturers purchase the same inputs from the same suppliers [...] it would be extremely difficult for a buyer to create competitive advantages through a shared supplier network." We introduced the term supplier resource competition to frame a setting in which buying firms compete for the resources of shared suppliers. Our results, as shown in Models 1 and 2, show that firms that possess organizational routines associated with identifying and selecting collaboration opportunities are able to attain higher levels of competitive advantage from their relationships with their supplier base. In addition, the capability of an organization to build close relationships with its suppliers positively relates to the competitive advantage that firm attains from its relationships. A significant and substantial proportion of the relationship between the capabilities and competitive advantage was found to be mediated by preferential resource allocation.

The multigroup comparison yielded interesting results. The effect of preferential resource allocation from suppliers was found to be significantly higher in the manufacturing sample than in the sample of service firms. In fact, preferential resource allocation did not significantly affect competitive advantage in the service sample.

Whereas in the current literature it has already been implied that SCM practices for service firms differ from those of manufacturing firms (Tate and Ellram, 2012), our findings indicate that the same is true for the importance of preferential resource allocation. These findings seem to confirm the belief that manufacturing firms are more likely to rely on supplier resource for increased competitiveness, while service firms rely on other sources such as customers (Maull *et al.*, 2012). Therefore, the notion of supplier resource competition is particularly relevant for firms in manufacturing industries. These findings provide new insights for both academics and practitioners.

Contributions to the literature

This paper makes several contributions to the literature. First, this paper contributes to the ERBV literature that addressed the importance of supplier resources for the competitiveness of buying firms. The ERBV views competitive advantage as a function of internal resources and external resources, and therefore recognizes supplier resources as an important source for competitive advantage (Squire *et al.*, 2009; Lewis *et al.*, 2010). However, competitors often seek for similar resources (Hunt and Davis, 2012; Ellram *et al.*, 2013; Pulles *et al.*, 2014a). Whereas the RBV stipulates that competitive advantage is a relative notion, current ERBV studies have not yet considered the perspective that external resources will more likely result in a competitive advantage if the firm obtains better resources relative to its competitors. Our study adds to the ERBV literature by integrating the notion of supplier resource competition in the link between supplier resources and the competitive advantage of buying firms. Our results imply that preferential resource allocation from suppliers that are shared with suppliers enables buying firms to more easily obtain competitive advantages.

Second, we contribute to the recent stream in the literature that discusses the importance of indirect capabilities to appropriate supplier resources (Loasby, 1998; Araujo *et al.*, 2003; Spring and Araujo, 2014). We linked to the conceptual work of Teece (2007) and discuss two capabilities that refer to a firm's ability to observe resource opportunities in its supply base (i.e. selection capability) and the ability to form an effective relation that facilitates resource exchange (i.e. relational capability). Our findings imply that these indirect capabilities within the SCM realm positively relate to the competitive advantage of buying firms. These findings contribute to the current stream in the literature debating whether the SCM functions can have capabilities that lead to firm-level competitive advantages (e.g. Mol, 2003; Barney, 2012; Hunt and Davis, 2012). In addition, we argued that, even though the literature has begun to explore the capabilities that can improve the outcome of inter-firm collaborations (e.g. Kale and Singh, 2007; Kasch and Dowling, 2008; Paulraj *et al.*, 2008; Schilke and Goerzen, 2010), a clear examination on how indirect capabilities actually link to supplier resource allocation is still missing. Our study shows that indirect capabilities are important means for obtaining preferential resource allocation from suppliers.

Third, our study shows the different effects of supplier resource allocation for manufacturing firms and service firms. The current SCM literature has been criticized for mainly seeking its empiricism in manufacturing firms and an increasing number of studies takes a service perspectives on SCM (e.g. Field and Meile, 2008; Drupsteen *et al.*, 2013; Ellram and Tate, 2015). Yet, little studies have actually examined the differences in impact of SCM practices between service and manufacturing firms. Our findings show how the impact of supplier resource allocation on competitive advantage differs for service firms as compared to manufacturing firms. This difference can be explained by the observation that manufacturing firms generally are more dependent on supplier resources than service firms. Whereas manufacturing firms rely on their suppliers for

increasing their performance (e.g. Liu *et al.*, 2013; Pulles *et al.*, 2014b), service firms might rely more on the inputs of their customers (Mauull *et al.*, 2012). Therefore, our findings contribute to the literature by showing the importance of separating between service and manufacturing when examining the effect of SCM practices.

Implications for practice

Our findings show that preferential resource allocation from suppliers positively affects a firm's competitive advantage. To effectively integrate this strategic perspective in a firm's supply management, managers should recognize that they are in competition for supplier resources with rival firms that share these suppliers and that this competition can influence the firm's competitiveness. This does not only require a potential change in the mindset of managers, but also information on the resource position of competitors. Firms may want to invest in acquiring competitive intelligence on the positions of competitors in a shared supply base. As our findings show that preferential resource allocation from suppliers is most relevant for manufacturing firms, especially managers in manufacturing industries may benefit from such efforts.

In addition, our study shows that firms with indirect capabilities are more likely to attain preferential resource allocation from their suppliers. Firms can increase the effectiveness of their selection capability by not only selecting suppliers based on their potential contributions in terms of their resources, but also by selecting those suppliers that can provide the buyer with preferential access to these resources. Similarly, relational capabilities that improve relationships with suppliers can help buying firms to gain access preferential access to supplier resources. The key here is that managers should not only focus on the supplier itself, but also on the capabilities within the organization to recognize and integrate the resources of the supplier. The way in which the SCM function is organized and the internal performance indicators are likely to play an important role in this. Thus, managers that look for preferential resource allocation from suppliers will have to invest in developing specific selection and relational capabilities.

Limitations and future research

Our findings are subject to several limitations that suggest the need for caution in drawing conclusions but also provide opportunities for future research. This study's data set represents buyers' assessments of key suppliers. Therefore, the validity of our results hinge upon the reliability of the perception of our respondents. Although all respondents serve in procurement functions and, on average, indicated to have 5.8 years of experience at their firms, future research should aim for dyadic data for further validation of the results presented here. In addition, our study examined the effects of SCM capabilities on preferential resource allocation from shared key suppliers. Future research could assess single suppliers to capture potential differences between different types of suppliers and, thereby, more specifically extract strategies that enable buying firms to fine-tune their resource appropriation efforts. Furthermore, even though the multigroup analysis showed significant differences between service firms and manufacturing firms, our sample size is rather small for performing multigroup analyses. Thus, the results of our study should be interpreted with a certain degree of caution considering the limitation of sample size. Also, our sample size did not allow a more detailed segmentation of industries. Therefore, more granular observations on supplier resource allocation are not possible within the scope of this research. Future research could focus on this opportunity.

Finally, whereas our study focused on supplier resources as source of competitive advantage, it should be noted that the compatibility with the firm's internal resources can impact the effectiveness of supplier resources. Some of the firm's internal resources are

better suited to generate synergies with only specific types of supplier resources. Or, as put by Freytag and Young (2014, p. 363): “competitive advantage through cooperation in networks is not only a matter of having the competencies to take advantage of the opportunities available, but is also a matter of the way competencies are combined.” In this light, a particular direction might be to explore the differences between manufacturing and service firms in terms of supplier resource requirements. Also within an industry type (i.e. manufacturing or services) resource requirements might differ. For example, Wynstra *et al.* (2006) describe different types of service applications (e.g. component service, semi-manufactured services) which differ in terms of required buyer-supplier interaction and resource requirements. This study’s data did not allow for a further segmentation into industries. Future research could aim for higher granularity in terms of industry differences. In addition, it would be interesting to examine the effectiveness of different types of supplier resources, for instance physical resources and innovation resources (see Pulles *et al.*, 2014a), in different manufacturing and service applications. Similarly, the effect of supplier resources allocation on the competitiveness of firms can depend on several contextual factors. An interesting direction for future research would therefore be to further examine the organizational or industrial factors in which supplier resources are most important.

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Appendix. Measures

All items were measured on a five-point Likert scale, ranging from 1 “no, fully disagree” to 5 “yes, fully agree.”

Introduction to survey

The following questions refer to important suppliers for your firm that you share with main competitors. For these “shared” suppliers we would like to know how you perceive the “commitment” of these suppliers. There are no “good” or “bad” answers, please fill in the questionnaire as it best describes your firm’s situation.

Preferential resource allocation from suppliers

Our key suppliers – which we share with our main competitors...

- PRA 1 ...allocate their best employees to the relationship with my firm
- PRA 2 ...share their best ideas with my firm
- PRA 3 ...allocate more financial resources to the relationship with my firm
- PRA 4 ...grant my firm better utilization of their physical resources
- PRA 5 ...grant my firm better access to their social network
- PRA 6 ...shares more of its knowledge and expertise

Selection capability

My organization...

- SC 1 ...has good ability to recognize opportunities for strategic collaborations
- SC 2 ...has good ability to select suppliers we can successfully collaborate with
- SC 3 ...has comprehensive information on state-of-the-art technologies in the supply base
- SC 4 ...easily observes external sources of new technologies

Relational capability

My organization has the ability to...

- RC 1 ...build good personal relationships with suppliers
- RC 2 ...almost always solve problems constructively with our suppliers
- RC 3 ...build mutual trust between us and our suppliers
- RC 4 ...build mutual respect between us and our suppliers

Competitive advantage

The relationship with our suppliers...

- CA 1 ...has provided my firm with strategic advantages over competitors
- CA 2 ...enabled my firm to reduce cost to a highly competitive level
- CA 3 ...enabled my firm to defend against competitive threats

Turnover

TO Please indicate your firm’s (in case of groups of firms: your business unit’s); annual turnover (in million €)

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