The role of strategic purchasing in dynamic capability development and deployment

A contingency perspective

Alistair Brandon-Jones

School of Management, University of Bath, Bath, UK, and

Desiree Knoppen

EADA Business School, Barcelona, Spain

Abstract

Purpose – The purpose of this paper is to report on research into the impact of two sequential dimensions of strategic purchasing – purchasing recognition and purchasing involvement – on the development and deployment of dynamic capabilities. The authors also examine how such dynamic capabilities impact on both cost and innovation performance, and how their effects differ for service as opposed to manufacturing firms.

Design/methodology/approach – The authors test hypotheses using structural equation modeling of survey data from 309 manufacturing and service firms.

Findings – From a dynamic capability perspective, the analysis supports the positive relationships between purchasing recognition, purchasing involvement, and dynamic capability in the form of knowledge scanning. The authors also find support for the positive impact of knowledge scanning on both cost and innovation performance. From a contingency perspective, data supports hypothesized differences caused by industry, whereby service-based firms experience stronger positive linkages in our model than manufacturing-based firms. Finally, emerging from the data, the authors explore a re-enforcing effect from cost performance to purchasing involvement, something that is in line with the dynamic capabilities perspective but not typically addressed in operations management (OM) research.

Originality/value – The research offers a number of theoretical and managerial contributions, including being one of a relative few examples of empirical assessment of dynamic capability development and deployment; examining the enablers of dynamic capability in addition to the more commonly addressed performance effect; assessing the contingency effect of firm type for dynamic capabilities; and uncovering a return (re-enforcing) effect between performance and enablers of dynamic capabilities.

Keywords Survey, Dynamic capabilities, Contingency perspective, Knowledge scanning, Strategic purchasing

Paper type Research paper

1. Introduction

In a growing number of organizations, recognition by senior management of the criticality of purchasing has led to far greater involvement in a range of strategic activities, including new product/service development, process improvement, and high-level planning (Chen *et al.*, 2004). The boundary spanning and knowledge channeling nature of strategic purchasing (Hult *et al.*, 2000; Zhang *et al.*, 2011) may allow such involvement to be translated into dynamic capabilities and in turn improved performance (Grant, 1996; Teece *et al.*, 1997). Yet, the impact of the change in purchasing's role on dynamic capability development and deployment remains empirically underdeveloped.

In this paper, we consider two enablers of dynamic capabilities within a strategic purchasing context that have a sequential relationship: top management's attitude towards the purchasing function (purchasing recognition) followed by the purchasing function's involvement in company-wide processes (purchasing involvement). These dimensions are in line with previous research on strategic purchasing (Carr and Smeltzer, 1997; Cousins *et al.*, 2006) whilst the sequential relationship between attitude and behavior is in line with the traditions of psychology research (Ajzen and Fishbein, 1977; Glasman and Albarracín, 2006).

From a dynamic capabilities perspective, we argue that purchasing recognition and subsequent purchasing involvement act as enablers of dynamic capability development in the form of knowledge scanning. Given the boundary spanning function of purchasing towards the supply base of the firm, knowledge scanning is a key dynamic capability related to strategic purchasing (Hult *et al.*, 2000, 2006). We anticipate the positive effect of these two dynamic capability enablers in all organizational settings (i.e. manufacturing and service). In turn, knowledge scanning as a dynamic capability leads to improved cost and innovation performance, measured here specifically for purchasing. Again, we anticipate this positive effect will be applicable to all organizational settings. However, from a contingency perspective, we argue that the extent of these effects may differ based on context. We posit that the positive influence of both dynamic capability enablers and subsequent performance effects will be stronger for purchasing functions within service-based firms than for those within manufacturing-based firms.

Our study offers a number of key contributions to theory and practice. First, whilst the dynamic capabilities perspective has gained significant conceptual support within the literature, empirical studies examining their development and deployment remain relatively limited (Ambrosini and Bowman, 2009; Schilke, 2014). Second, of the extant research examining dynamic capabilities, the vast majority are concerned with defining the construct or examining the relationship between their existence and firm performance (Zollo and Winter, 2002). Our research extends the empirical base by examining not only the dynamic capabilities-performance link but also the enablers of dynamic capabilities in a strategic purchasing context. Third, from a contingent perspective, we answer calls within the field to explore whether the patterns of dynamic capability development and deployment vary depending on the type of organization – service-based as opposed to manufacturing-based (Ambrosini and Bowman, 2009; Schilke, 2014). Finally, emerging from our data, we examine a return (re-enforcing) effect between performance and dynamic capability enablers. Analysis of return effects is relatively common within the field of organizational learning (Dodgson, 1993; Levitt and March, 1988) but is much less prevalent within operations management (OM).

The remainder of this paper is structured as follows. First, we provide a synthesis of dynamic capabilities literature that acts as the basis for our conceptual framework. We then examine the logic of relationships between key constructs and present our hypotheses. Subsequently, we provide details of our research methodology, including construct measures, and the procedures for data collection, sampling, and analysis. We then present the results of our analyses. Finally, we discuss the implications of our findings for theory and management, highlight limitations, and suggest avenues for future research.

2. Conceptual framework and hypotheses

2.1 *Dynamic capabilities and competitive advantage*

The dynamic capabilities perspective extends the essentially static view of resource-based theory by examining how resources are created and refreshed over time in the face of changing business environments (Helfat and Peteraf, 2003; Teece *et al.*, 1997). It is not only concerned with the bundle of VRIN (valuable, rare, inimitable, and non-substitutable) resources, but importantly “the mechanisms by which firms learn and accumulate new

skills and capabilities” (Teece *et al.*, 1990, p. 11). As such, the dynamic capabilities perspective emphasizes that competitive advantage does not emerge solely from the possession of resources, but rather the way these resources are deployed and renewed over time in the face of external environmental change (Ambrosini and Bowman, 2009; Augier and Teece, 2007).

A dynamic capability is defined by Zollo and Winter as “a pattern of collective activity through which the organization systematically generates and modifies its operating routines in pursuit of improved effectiveness” (2002, p. 340). As such, dynamic capabilities are predicated on activities that are embedded within repetitious organizational processes. Such activities are also intentional as opposed to ad hoc, oriented on future as well as current needs, and exhibit high levels of path dependency (Ambrosini and Bowman, 2009; Pierce *et al.*, 2002). Furthermore, dynamic capabilities are developed and embedded within the firm, rather than being bought from the market (Eisenhardt and Martin, 2000; Makadok, 2001). Winter (2003) proposes that a firm’s basic functional activities (i.e. the physical and human assets) that permit its existence can be termed operational capabilities or zero-level capabilities. Dynamic capabilities or first-level capabilities are those that give the organization the capacity to understand environments, recognize the value of other resources, and respond through appropriate changes to its zero-level capabilities. In line with Collis’ (1994), notion of meta-capabilities, Winter suggests that, in turn, higher order capabilities act on dynamic capabilities as firms “learn-to-learn” more effectively over time.

A key reason for the growing interest in dynamic capabilities comes from their potential impact on competitive advantage. It is widely contended that, by providing firms with the capacity/mechanisms to learn and accumulate new skills and capabilities in the face of changing environmental conditions, dynamic capabilities provide a universally positive effect on performance (Griffith and Harvey, 2006; Lee *et al.*, 2002; Teece and Pisano, 1994; Teece *et al.*, 1997; Stoelhorst and Van Raaij, 2004). However, whilst the dynamic capabilities perspective has become a highly influential management theory in the past decade, its practical use remains limited due to ill-defined conceptual boundaries and a tendency for researchers to tautologically equate the existence of dynamic capabilities with organizational success and vice versa *post hoc* (Cepeda and Vera, 2007; Schilke, 2014).

To overcome these problems, it is necessary to identify discreet operational processes in which dynamic capabilities exist (Gruber *et al.*, 2010; Helfat and Winter, 2011). Extant literature points to a number of identifiable routines/processes that embody dynamic capabilities or act as the foundations of dynamic capabilities. These include research and development (Helfat, 1997), acquisition processes (Eisenhardt and Martin, 2000; Karim and Mitchell, 2000), search (Augier and Teece, 2007), new product and service development (Danneels, 2002; Schilke, 2014), and alliance management (Helfat *et al.*, 2007; Schilke, 2014). Following Teece (2007), we can assign these into three key sub-groupings that recognize the capacity to – sense and shape opportunities, seize opportunities, and manage threats and transform the business (see Table I).

Within OM more specifically, there is a small body of work that empirically examines the development and deployment of dynamic capabilities. Foundations of the “seizing” aspect of dynamic capabilities include supply chain agility (Blome *et al.*, 2013; Chiang *et al.*, 2012), logistics fulfilment capabilities (Vaidyanathan and Devaraj, 2008), and supply chain knowledge (Wowak *et al.*, 2013). Foundations of the “transforming” aspect of dynamic capabilities include supply management alignment (Handfield *et al.*, 2015), sustainable global supplier management (Reuter *et al.*, 2010) and supplier sustainability risk management (Foerstl *et al.*, 2010). Considering the “sensing” aspect of dynamic capabilities, Chen *et al.* (2004) argue that sensing capabilities are predicated on accessing critical upstream resources through open communication with selected suppliers. Revilla

Table I.
Dynamic capabilities
sub-grouping

	Sensing	Seizing	Managing threats/ transforming
Definition (Teece, 2007)	Analytical systems (and individual capacities) to learn and to sense, filter shape, and calibrate opportunities	Enterprise structures, procedures, designs and incentives for seizing opportunities	Continuous alignment and realignment of specific tangible and intangible assets
Past research in general: conceptualization of dynamic capability	Research and development (Helfat, 1997) Search (Augier and Teece, 2007) New product and service development (Danneels, 2002; Schilke, 2014)	Acquisition processes (Eisenhardt and Martin, 2000; Karim and Mitchell, 2000)	Alliance management (Helfat <i>et al.</i> , 2007; Schilke, 2014)
Past OM research: conceptualization of dynamic capability	Joint sense-making (Revilla and Knoppen, 2015) Knowledge scanning (Tu <i>et al.</i> , 2006)	Supply chain agility (Blome <i>et al.</i> , 2013; Chiang <i>et al.</i> , 2012) Logistics fulfilment capabilities (Vaidyanathan and Devaraj, 2008) Supply Chain knowledge (Wowak <i>et al.</i> , 2013) Open communication (Chen <i>et al.</i> , 2004) Joint decision-making (Revilla and Knoppen, 2015)	Supply management alignment (Handfield <i>et al.</i> , 2015) Sustainable global supplier management (Reuter <i>et al.</i> , 2010) Supplier sustainability risk management (Foerstl <i>et al.</i> , 2010)

and Knoppen (2015) propose two learning processes in a strategic purchasing context – joint sense-making (“sensing”) and joint decision-making (“seizing”) – that constitute a dynamic capability. Joint sense-making refers to the scanning of the environment, the noticing of relevant changes and the development of meaning for the observed changes. Joint problem solving on the other hand refers to the use and implementation of the newly assembled knowledge, in other words the conversion of information into action that eventually propels superior performance.

In this study, we are particularly interested in knowledge scanning, a routine that supports the identification and capture of knowledge and technology within a firm and from its supply base (Tu *et al.*, 2006, p. 695). When exercised strategically, the purchasing function acts as boundary spanner of the firm (Zhang *et al.*, 2011), channeling knowledge flows outside in and inside out (Hult *et al.*, 2000). Consequently, strategic purchasing can leverage its internal involvement in strategic activities and directly influence the resource mix of the firm (Barney, 2012; Chen *et al.*, 2004; Priem and Swink, 2012).

2.2 Enablers of dynamic capabilities

The growing appreciation of the value of dynamic capabilities has led a small number of academics to explore the “positions” that act as internal and external enablers or antecedents to dynamic capability development (Ambrosini and Bowman, 2009). Internal position concerns the firm’s stock of reputational, technological, financial, complementary, and structural assets, whilst external position concerns the institutional environment and market in which the firm operates (Teece *et al.*, 1997). We explore external positions when considering the contingent role of industry sector on dynamic capability development and performance (see section 2.3). In this section, therefore, we focus on the internal positions that may enable dynamic capability development.

Within the literature, there are a number of internal positions (enablers) that arguably impact the development of dynamic capabilities. Blyler and Coff (2003) propose that social capital is an important enabler in “facilitating the acquisition, integration, and release of resources” (p. 678). Social capital, in the form of social ties and internal reputation, enables managers to share information and innovation across functional boundaries (i.e. to be involved in strategic activities), and in doing so contribute more fully to dynamic capability development and deployment. Closely related to this is the argument that leadership from senior managers is critical to dynamic capability development, because it is typically the senior managers within a firm who formulate the organizational routines upon which dynamic capabilities are based (Eisenhardt and Martin, 2000; Helfat *et al.*, 2007; Rindova and Kotha, 2001; Teece, 2007; Tripsas and Gavetti, 2000; Zahra *et al.*, 2006).

The OM studies referenced in Table I also provide enablers to dynamic capabilities. First, the perception of stimuli or pressure from stakeholders enables companies to develop dynamic capabilities. For example, a non-government organization may exert pressure for firms to increase the sustainability of their supply chain. Consequently, firms may develop a dynamic capability relating to sustainable global supplier management (Reuter *et al.*, 2010). Second, alignment of internal stakeholders enables companies to develop the dynamic capability related to supply management alignment (Handfield *et al.*, 2015). Third, strategic purchasing is an enabler of the dynamic capability of supply chain agility (Chiang *et al.*, 2012). In the context of strategic purchasing, and building upon psychology literature which has a long tradition in exploring attitudes at work as they drive behavior (see e.g. Ajzen and Fishbein, 1977; Glasman and Albarracín, 2006; Lindenberg and Steg, 2007), we argue that the increased recognition of the purchasing function by senior management results in greater involvement in company-wide processes, and this expanded role of the purchasing function positively impacts on the dynamic capability creation process.

2.3 The contingent role of industry on dynamic capabilities

Until recently, most academics have assumed a universally positive relationship between dynamic capabilities and competitive advantage (Schilke, 2014). Likewise, the few studies exploring enablers of dynamic capabilities have typically treated antecedents as equally applicable under different contextual conditions. However, a number of researchers now advocate a contingency perspective, where performance outcomes not only rely on the existence of dynamic capabilities, but also on the environmental conditions in which such capabilities are deployed (Ambrosini and Bowman, 2009; Aragon-Correa and Sharma, 2003; Sirmon and Hitt, 2009; Schilke, 2014). In the same vein, we anticipate that these external “positions” are also likely to be applicable as contingency factors in the creation of dynamic capabilities.

Contingency theory holds that organizations must adapt their structures depending on contextual conditions (Donaldson, 2001) and as such the value of different physical and non-physical assets is partly determined by exogenous contextual (or contingency) variables, generally beyond the control of organizations or managers (Sousa and Voss, 2008). These include, but are not limited to, national context and culture, institutional conditions, such as the level of environmental dynamism and uncertainty (e.g. Koufteros *et al.*, 2005), and firm characteristics, such as industry, size, ownership, and structure (e.g. Koufteros *et al.*, 2007).

Within dynamic capabilities research, institutional conditions and, to a much lesser extent, firm characteristics have been explored as possible contingency variables influencing the development and value of dynamic capabilities. The majority of extant literature suggests that dynamic capabilities are most valuable when deployed in dynamic environmental contexts (i.e. high uncertainty, frequent change, high complexity) and are less valuable in environments characterized by low levels of dynamism. This logic is predicated on the fact that dynamic capabilities are expensive to develop and therefore only

worth investing in when environmental conditions necessitate their existence and regular use – in highly dynamic environments (Winter, 2003; Zollo and Winter, 2002).

Building on the idea of different environmental contexts is the potential contingent role of industry in influencing both the development of dynamic capabilities and its value to organizations (Aragon-Correa and Sharma, 2003; Winter, 2003), an area that has, to date, remained largely unexplored (Schilke, 2014). For example, from a conceptual standpoint, Winter (2003) argues that the decision to develop and deploy dynamic capabilities will be contingent on the pace of change within a particular industry. Aragon-Correa and Sharma (2003) argue that the business environment, including the type of industry and its characteristics, and the way that managers interpret such business environments, may play a contingent role in the development of various dynamic capabilities. Miller and Shamsie (1996) demonstrate that knowledge-based capabilities are most valuable in uncertain environments, whereas property-based capabilities are more valuable in stable environments. As such, the characteristics of the industry are likely to be crucial to the value of different kinds of capabilities. Exploring this issue further, Sirmon and Hitt (2009) propose that the lack of manufacturing in service-based firms elevates the importance of human dynamic capabilities (i.e. the skills, education, experience, and knowledge of employees and managers), especially in light of the high environmental dynamism faced by many such organizations. This view is supported by the work of Wowak *et al.* (2013), which finds significantly stronger relationships between supply chain knowledge and performance for service-based firms as opposed to those operating in manufacturing contexts in their meta-analysis of 35 supply chain management studies. Sampson and Spring (2012) elaborate the bidirectional processes between buyers and suppliers of services, and consequently an increased role for purchasing. More precisely, buyers can play different roles, ranging from providing input materials to competing with suppliers. Given this variety in roles, there are more opportunities for innovation, and consequently dynamic capabilities may gain importance.

2.4 Conceptual model and hypotheses

Figure 1 illustrates our conceptual model linking purchasing recognition, purchasing involvement, knowledge scanning, and two forms of performance – cost and innovation.

Our model is based on the premise that in order to generate improvements in cost and innovation performance, purchasing must effectively develop and deploy knowledge scanning, a dynamic capability that enables the identification and capture of internal and external knowledge and technology. Purchasing accomplishes this when it is recognized as a strategic function by senior management as well as those within other functions (purchasing recognition). This attitude elicits corresponding behavior (Ajzen and Fishbein, 1977; Glasman and Albarracín, 2006), in the form of the purchasing function's actual involvement in key strategic activities such as new product and service development, organization-wide process improvement, and strategic planning (purchasing involvement).

Figure 1.
Research model

Further, from a contingency perspective, we argue that the positive relationship between the elements of our model will be stronger for service-based as opposed to manufacturing-based firms. We now examine each element of our model in turn.

Purchasing is increasingly seen as a strategic function within organizations. Evidence of this strategic role can be seen in the increasing value placed on purchasing's views by senior management and recognition of purchasing's equality with other organizational functions (Carr and Smeltzer, 1997; Cousins *et al.*, 2006). Evidence also stems from the tendency to centralize the function in order to increase added value and minimize total cost of purchasing (Pagell, 2004). Centralization is possible for more generic activities, while context-dependent purchasing decisions necessarily have to remain at a local level. Inherent to centralization is top management's attitude to viewing purchasing as a strategic role in their company (Barney, 2012; Foerstl *et al.*, 2013). In other words, first there is an organizational restructuring reflecting a novel attitude on the status of the purchasing function, and after that, there is the actual change in daily behavior; i.e. how the purchasing function adds value in on-going processes. Finally, evidence can be found in companies devoted to the development of customized solutions, where project managers and engineers typically lead the contact with suppliers, and purchasing is involved in a later stage to execute prior agreements. These companies have seen a restructuring where purchasing has become the key boundary spanning function, responsible for inward and outward channeling of initiatives (Jia *et al.*, 2014).

Purchasing recognition can be viewed as a reputational asset (i.e. a form of social capital) that makes subsequent involvement in the strategic dialogue of the firm and in organization-wide processes related to new product and service design, process improvement, and strategic planning more likely. By introducing this sequential relationship between the two dimensions of strategic purchasing, we thus differentiate our research from other studies that treat both dimensions as reflective. Therefore, our first hypothesis is:

H1. Purchasing recognition positively affects purchasing involvement.

We suggest that behavior in the form of the purchasing function's involvement in intra-organizational and cross-functional activities acts as an internal factor or "position" (see Ambrosini and Bowman, 2009) to enable the development of dynamic capabilities. In the context of strategic purchasing, a key dynamic capability is the role of purchasing in acquiring and assimilating knowledge and technology resources from within the firm and across its supply network, and applying it to commercial ends (Barney, 2012; Chen *et al.*, 2004; Hult *et al.*, 2000; Priem and Swink, 2012). This can be termed knowledge scanning (Tu *et al.*, 2006) and refers to mechanisms such as market tracking, benchmarking, technology assessments, and the capacity to research the supply base (Giunipero *et al.*, 2006). Knowledge scanning builds upon actual purchasing behavior, rather than on the attitudinal dimension of strategic purchasing, in line with a behavioral view on learning (Levitt and March, 1988). Thus, we propose the following hypothesis:

H2. Purchasing involvement positively affects knowledge scanning.

In line with the general arguments set out in extant dynamic capabilities research, we argue that knowledge scanning permits the purchasing function to leverage its internal involvement in order to drive key performance outcomes of cost (Tu *et al.*, 2006) and innovation performance (Malhotra *et al.*, 2005; Stock *et al.*, 2002). We look to gain a more comprehensive evaluation of performance outcomes (Volberda *et al.*, 2010) by expanding on the predominant financial focus of previous dynamic capabilities studies. The combined focus on cost and innovation performance is increasingly common in studies on dynamic capabilities based on knowledge resources (e.g. Revilla and Villena, 2012; Sáenz *et al.*, 2014).

In other words, whilst dynamic capabilities may lead to operational improvements by reducing costs or using resources more efficiently (Tu *et al.*, 2006; Malhotra *et al.*, 2005), they may also impact on innovation performance in delivering greater levels of innovation and in bringing such products/services to market more quickly (Handfield *et al.*, 1999; Visser *et al.*, 2010). It is important to note that there are OM scholars who have an alternative perspective on the strategic contribution of purchasing. Ramsay (2001), for example, argues from a resource-based perspective that the purchasing function is inherently an operational rather than strategic function and is therefore unlikely to contribute to competitive advantage. However, the author does acknowledge that the identification and development of unknown suppliers (something akin to a dynamic capability) has the potential to generate competitive advantage. OM scholars have responded to these challenges with further evidence from the field of strategic management or resource-based view (RBV) more specifically to support the potential role of purchasing as a strategic function, alongside empirical examples demonstrating the contribution of purchasing to competitive advantage (For example, Mol, 2003; Nair *et al.*, 2015; Pressey *et al.*, 2009; Steinle and Schiele, 2008). A balance between these views is found in work exploring the future of purchasing and supply (Carter *et al.*, 2000) which predicts a shift towards smaller, more strategic purchasing functions, with much more tactical activities being outsourced.

Another important consideration is that it is often difficult to unambiguously demonstrate positive linkages between dynamic capabilities and firm-level performance (Helfat *et al.*, 2007). This is because first, internally, dynamic capabilities do not operate in isolation but combine to restore and refresh a firm's resource mix, and second, overall performance is influenced by external dynamics (e.g. competition, market growth, uncertainty, etc.) in addition to dynamic capabilities. Therefore, we narrow down performance to the purchase category level to enable us to more accurately assess the direct impact of knowledge scanning – as a purchasing capability - on purchasing performance. Thus, we envisage the following hypothesis:

H3. Knowledge scanning positively affects cost performance of the purchasing category.

H4. Knowledge scanning positively affects innovation performance of the purchasing category.

Figure 1 shows that we expect the disturbance terms of the two latent performance variables to correlate. This is because we acknowledge that performance may be affected by many variables, not only those included in our research model. The correlation is in line with studies that model a general “performance” construct through a broad range of reflective indicators. Based on our earlier exposition of the contingency perspective as it applies to dynamic capabilities, we expect to see service-based firms exhibiting stronger relationships between purchasing recognition and involvement; between purchasing involvement and dynamic capability development; and between dynamic capabilities and the two facets of performance investigated here. Thus, we propose the following hypothesis:

H5a. The positive relationship between purchasing recognition and purchasing involvement will be stronger for service-based firms.

H5b. The positive relationship between purchasing involvement and knowledge scanning will be stronger for service-based firms.

H5c. The positive relationship between knowledge scanning and cost performance scanning will be stronger for service-based firms.

H5d. The positive relationship between knowledge scanning and innovation performance scanning will be stronger for service-based firms.

3. Methodology

3.1 Survey instrument

The survey instrument was developed iteratively through a number of phases. First, extensive literature review was the basis for development of all constructs and their operationalization was based on previously validated survey instruments. The survey had two parts: one part focusing on the organization level and the second part focusing on the purchase category level. In the second part, respondents had to select a specific purchase category and describe this, before proceeding to answer questions related to the category level. Since the survey was to be administered in ten countries (see next section), we addressed construct equivalence across those countries by actively involving all members of the research team, representing their respective countries, in the development and final selection of constructs and their operationalization.

Second, we used the translation, review, adjudication, pretesting, and documentation (TRAPD) procedure as the basis for translation of the source English instrument to the local languages. The TRAPD procedure is increasingly seen as both theoretically and practically superior to the traditional translation/back-translation method (Douglas and Craig, 2006; Harkness *et al.*, 2003). Special attention was paid to consistent translation of key grammatical characteristics of the response scale (such as: not using a neutral middle category point in scales where possible; assuring symmetry of scales with a neutral middle category; providing brief labels for all scale categories and not just for the anchors; using balanced requests; and assuring congruence between the unipolar and bipolar nature of theoretical concepts and scales), as they impact significantly on the quality of the instrument and may be subject to inconsistent translation (Saris and Gallhofer, 2014).

Third, the translated survey instruments were locally tested with practitioners in each country in order to capture potential differences in local interpretations of the construct. Modifications were centrally coordinated in order to refine the same source document so as to allow clear translations in all local contexts.

3.2 Data collection

The data used to examine our hypotheses were collected in the first round of the International Purchasing Survey, a collaborative project involving researchers from European and North American institutions in ten countries (Canada, Finland, France, Germany, Italy, the Netherlands, Spain, Sweden, UK, and the USA of America). Sampling criteria were pre-agreed and unified among the participating researchers and as a result 681 purchasing directors or equivalent positions responded to the survey, which was administered online. An internet survey offers higher levels of accuracy and reduces missing values due to either the respondent or data entry mistakes (Boyer *et al.*, 2002). One academic partner was in charge of managing the online tool for data collection in all countries and the related data management.

In this study, we are concerned with dynamic capability development and its effect on performance, and the contingent effect of industry on these relationships. Such impact is likely to be less applicable for low-spend and indirect purchase categories. We, therefore, focus on companies that report on purchase categories that represent at least 20 percent of total purchasing spend and are classified as direct spend. Of the net sample of 681 companies and their respective selected purchase category, a total of 322 ($n = 108$ for service-based firms; $n = 201$ for manufacturing-based firms; $n = 8$ agriculture, $n = 4$ other, $n = 1$ missing) fit these criteria. From these, we use the 309 firms that are either manufacturing-based or service-based as the basis for our statistical analysis. Key characteristics of both sub-samples are provided in Table II.

3.3 Measures

All constructs used in our hypotheses were taken from literature, and their operationalization was based on validated survey instruments (see Table III). Purchasing recognition, purchasing

Table II.
Descriptives of
participating firms
in the study

Sub-sample	<i>n</i>	% of total purchasing spend that is direct spend		Ratio of total purchasing spend over total sales		Experience in purchasing (years)		Experience with selected category (years)	
		<i>μ</i>	<i>σ</i>	<i>μ</i>	<i>σ</i>	<i>μ</i>	<i>σ</i>	<i>μ</i>	<i>σ</i>
Manufacturing	201	71	18	0.51	0.17	12	16	9	7
Machinery and other equipment (16%)									
Chemicals (10%)									
Fabricated metal (9%)									
Motor vehicles (8%)									
Food (5%)									
Wood products (4%)									
Other or not specified what sub-sector of manufacturing (48%)									
Service	108	64	29	0.47	0.22	14	14	8	7
Wholesale and retail trade (23%)									
Professional and administrative services (18%)									
Construction (13%)									
Transportation, storage and communication (12%)									
Public administration and defense (9%)									
Other (25%)									

Measurement items/construct	Loadings	AVE/ composite reliability	Random error
<i>Constructs and items related to purchasing organization</i>			
Purchasing recognition			
Top management is supportive of efforts to improve the purchasing department	0.74	0.68/0.76	0.45
Purchasing's views are considered important by most top managers	0.90		0.20
Purchasing is recognized as an equal partner with other functions of the top management team	0.83		0.31
Purchasing involvement			
Purchasing recommends and initiates changes in products/services based on supply market analysis	0.74	0.51/0.86	0.45
Purchasing actively participates in new product/service design	0.76		0.43
Purchasing actively participates in organization-wide process improvement	0.65		0.58
Knowledge scanning			
To what extent do you seek to learn from tracking new market trends in your supply industry?	0.76	0.56/0.63	0.42
To what extent do you seek to learn from benchmarking best practices in purchasing?	0.79		0.37
To what extent do you seek to learn from trying out new technologies?	0.77		0.41
To what extent do you seek to learn from your suppliers?	0.67		0.57
<i>Constructs and items related to the selected purchase category</i>			
Cost performance			
The purchasing price	0.63	0.47/0.64	0.60
The cost of managing the purchasing process	0.74		0.47
Innovation performance			
The supplier time-to-market for new or improved product/services	0.84	0.55/0.71	0.35
The level of innovation in products/services from suppliers	0.67		0.55

Table III.
Constructs and
measurement items

involvement and knowledge scanning operate at the level of the purchasing organization. Both performance constructs operate at the level of the purchasing category. Such an embedded design reduces the risk of spurious effects due to omitted but relevant levels of analysis (Rothaermel and Hess, 2007). Purchasing recognition is defined as the recognition from senior management that the purchasing function is of strategic importance to the organization. Items tapping purchasing recognition, an attitude of top management, are reflective and include the extent to which top management is supportive of efforts to improve the purchasing department; purchasing's views are considered important by most top managers; and purchasing is recognized as an equal partner with other functions of the top management team (Carr and Smeltzer, 1997; Cousins *et al.*, 2006). Purchasing involvement is defined as the involvement of purchasing in key strategic activities. Items tapping purchasing involvement, actual behavior by the purchasing function, are reflective and include the extent to which purchasing: recommends and initiates changes in products/services based on supply market analysis; participates actively in new product/service design; and participates actively in organization-wide process improvement (Carr and Smeltzer, 1997; Cousins *et al.*, 2006). Response scales for both constructs are six-point Likert scales (totally disagree, considerably disagree, slightly disagree, slightly agree, considerably agree, and totally agree).

Knowledge scanning is defined as a mechanism that enables firms to identify and capture relevant external and internal knowledge and technology. Items tapping knowledge scanning are reflective and include the extent to which firms: seek to learn from tracking new market trends in the supply industry; seek to learn from benchmarking best practices in purchasing; seek to learn from trying out new technologies; and seek to learn from their suppliers. These items are drawn from the knowledge scanning dimension of the absorptive capacity construct as developed by Tu *et al.* (2006). The response scale for knowledge scanning is a six-point Likert scale (not at all, a very small extent, a small extent, a large extent, a very large extent, completely).

The variables used to measure performance were cost performance and innovation performance. For both variables, we used two items that converged well; a scale with few items performing well is preferable to a scale with more items that are non-convergent. In other words, it is common for later studies that build upon the relatively novel confirmatory factor analysis (CFA) to conclude that earlier developed scales, which were validated with other methods, must be narrowed down in order to converge and demonstrate predictive power (Saris *et al.*, 2013). Cost performance highlights one of the most distinct dimensions of operational capabilities (Boyer and Lewis, 2002), and items tapping costs include: purchasing price; and costs of the purchasing process. Innovation performance, on the other hand, focuses on novel strategies to compete in the market, and items tapping this construct included: the supplier time-to-market for new or improved product/services; and the level of innovation in products/services from suppliers. In this study, we did not have access to objective performance data and therefore relied on senior manager's perceptions of performance, in line with Chen *et al.* (2004) and numerous other OM studies. Response scales for both performance measures are seven-point Likert scales that request the respondent to compare a performance facet with management targets. Response categories are all labeled and range from "much worse than target," to "on target," to "much better than target."

3.4 Analytical procedures

We employed a two-step process of analysis to evaluate first the measurement model and then the structural model (Anderson and Gerbing, 1988). The measurement model test built upon CFA, while the structural model test built upon path analysis. We performed both tests with maximum likelihood estimation within Lisrel 8.72 for structural equation modeling (SEM). Common practice for both kinds of tests is to base the accept/reject

decision on a range of test statistics (e.g. AGFI, GFI, SRMR, NFI, CFI, RMSEA) (Hu and Bentler, 1998), all of which have the shortcoming of being highly dependent upon the power of the test (Saris *et al.*, 2009). In other words, the standard test and fit measures can only detect misspecifications for which the test is sensitive (high power). As a consequence, rejection of the model may be due to very small misspecifications for which the test is sensitive. Acceptance of the model, on the other hand, does not necessarily mean that the model is correct but may indicate a lack of power of the test. Therefore, we supplemented the standard test statistics with an alternative procedure to iterate between evaluation of misspecifications (i.e. relevant parameters that have been omitted from the model, or modeled parameters that are not present in the data) and subsequent partial modifications of the model in line with the procedure of Saris *et al.* (2009). The analysis of misspecifications is supported by modification indexes (MI) and expected parameter changes provided by Lisrel. Cut-off sizes to consider misspecification are 0.40 for factor loadings, 0.10 for causal effects, 0.10 for correlations, and 0.05 for mean structures (Van der Veld *et al.*, 2009).

Rules of thumb for cut-off values are arbitrary and context dependent (Lance *et al.*, 2006). We aimed to overcome this on the one hand by complementing the standard test and fit measures by the misspecification analysis, and, on the other hand, by testing alternative path models related to *H1*. In other words, we gathered multiples pieces of information to judge model fit (Lance *et al.*, 2006). In order to test the alternative path models, we had to introduce an instrumental variable (Hamilton and Nickerson, 2003), as elaborated in section 4.2.1.

Given that *H5a-H5d* aim to contrast findings for manufacturing vs services sub-samples, we performed equivalence tests while evaluating the measurement model and the structural model. Measurement equivalence implies that the relations between the observed variables and the latent variables are identical across sub-samples (Drasgow, 1984). Without the assessment of measurement equivalence, it is hard to know if findings reflect “true” similarities and differences between selected groups rather than the spurious effect of cognitive or socio-cultural differences in response to a survey (Mullen, 1995). Awareness and testing of equivalence, however, remains limited within the empirical OM literature working with latent variables (Knoppen *et al.*, 2015). Testing for measurement model invariance involves testing the equivalence of measurement models across sub-samples. We followed the bottom-to-top test strategy, which means that we started with the weakest constraints and proceeded to the most severe. With this strategy, configural equivalence may be established when the same measurement model fits the data in the different groups; in other words, when items load significantly on the same factors across groups and the correlations between the latent constructs are significantly less than one, guaranteeing discriminant validity. Metric equivalence may be subsequently established when the factor loadings (i.e. the slopes of the measurement model) across the different groups are the same. It implies that relationships between the evaluated construct and other constructs can be compared across groups (Steenkamp and Baumgartner, 1998).

For the structural model invariance test, the condition of metric measurement invariance should be fulfilled for all five constructs of our model. The structural invariance test involves constraining the model of the second sample to use the same estimated path coefficients as the first sample (or vice versa). When the model fit decreases, the structural paths are not equivalent, whereas when the fit remains the same, the structural paths are equivalent. For both measurement model and structural model equivalence tests, we used multi-group confirmatory factor analysis and the approach to SEM outlined above. In other words, we combined the comparison of test statistics of subsequent test steps with an analysis of misspecifications.

4. Results of analysis

We present the results in two steps, first for the measurement model, and then for the path model.

4.1 Results of the measurement model test

To answer *H1-H4*, we performed initial analyses on dimensionality for the pooled database. For identification purposes, the factor structures of the five constructs of our research model were jointly analyzed, as correlated first-order constructs. Fit statistics are satisfactory ($\chi^2 = 85.60$; $df = 67$; $\chi^2/df = 1.28$; $RMSEA = 0.027$; $NFI = 0.96$; $CFI = 0.99$). More importantly, the analysis of misspecifications does not point to misspecifications. Table III shows the standardized loadings and random errors. Additionally, convergent validity was assessed through the average variance extracted (AVE) (Anderson and Gerbing, 1988), which ranged from 47 to 68 percent (Table III). The complementary misspecifications analysis that we have performed did not point to alternative better fitting models.

We assessed discriminant validity by comparing χ^2 for a constrained CFA (where the interfactor correlation was set to 1, indicating they are the same construct) with χ^2 for an unconstrained model (where the interfactor correlation was free). All χ^2 differences are significant, providing support for discriminant validity (Anderson and Gerbing, 1988). After establishing validity, composite reliability (CR) was assessed in line with Fornell and Larcker (1981). Composite reliabilities range between 64 and 86 percent, as Table III shows. CFA results, which are satisfactory in our case, are an important complement to indicate acceptable reliability levels for the constructs (Bollen, 1989).

Given that we relied on a single-respondent design, we controlled for common method bias in two ways: *a priori* through the design of the study and *a posteriori* through statistical control (Podsakoff *et al.*, 2003). Regarding the survey design, the research project was labeled as a broad overview of purchasing management and purchasing practices adoption. Therefore, respondents' attention was not drawn to the relationships being targeted in this study. Questions including items and constructs related to each other in the general model were also separated in the questionnaire in order to prevent respondents from developing their own theories about possible cause-effect relationships. Furthermore, the questionnaire was carefully created and pretested and respondents were assured of strict confidentiality. Finally, we used different scales and formats for the independent and the dependent measures. As a matter of statistical control, we compared the baseline model with five correlated first-order factors, as reported before, with a model where all items were also allowed to load on a sixth latent common method variance factor. The latter loadings were all insignificant, while the loadings on the theoretical constructs remained significant. Moreover, we applied Harman's single factor procedure; i.e. all items from the five main constructs were included in an exploratory factor analysis to examine the un-rotated factors solution and determine the number of factors that are necessary to account for the variance in the variables. In this analysis, no single factor emerged and no general factor accounted for the majority of the co-variance among the measures. Given these findings, common method bias is less likely to be present our analysis. Finally, for the pooled database, the correlations between the first-order constructs are shown in Table IV.

Subsequently, we proceeded to contrast the measurement models of the two sub-samples defined by industry. The outcomes of the configural equivalence tests are satisfactory ($\chi^2 = 177.12$; $df = 134$; $\chi^2/df = 1.32$; $RMSEA = 0.040$; $NFI = 0.93$; $CFI = 0.98$). More importantly, the analysis does not point to misspecifications. The subsequent metric equivalence test also reports satisfactory outcomes ($\chi^2 = 187.94$; $DF = 143$; $\chi^2/DF = 1.31$; $RMSEA = 0.040$; $NFI = 0.93$; $CFI = 0.98$) and again no misspecifications are detected with the misspecifications test. Consequently, it is appropriate to pool the data for estimation of an overall structural model as well as to compare structural models of service companies vs manufacturing companies in the next section.

4.2 Results of the path model test

In this section we first develop a path model test for the pooled database, followed by a path model test with sub-groups defined by sector.

4.2.1 Path model test with the pooled database. The base model of 309 firms had acceptable fit indices of the path model: $\chi^2 = 99.43$; $df = 72$; $\chi^2/df = 1.38$; RMSEA = 0.032; NFI = 0.96; CFI = 0.99. There was a misspecification however, that pointed to a nonrecursive model (i.e. causality flows in more than one direction); a feedback loop from cost performance to purchasing involvement. According to the theory on learning and capability development, this return effect makes sense. Learning processes associated with knowledge scanning may be vicarious (learning from others by copying best practices) or experiential (learning from one's own actions and results of those actions) (Dodgson, 1993). Experiential learning more precisely refers to a sequence of events over time in which one course of action is sampled from a set of alternative courses of action (Levitt and March, 1988). The alternative which was most successful in the past is likely to be chosen again (Holland, 1998). In other words, companies that experience a positive impact of purchasing involvement on cost performance (mediated by knowledge scanning) will reinforce the involvement of purchasing in company-wide processes.

Nonrecursive models are almost absent in OM research, and where present lack explanation on model definition (Shah and Goldstein, 2006). A common misunderstanding about path analysis is that it is only appropriate when reciprocal or feedback loops are absent (Bollen, p. 38). On the contrary, path analysis using cross-sectional data can be employed for nonrecursive models provided one can argue that a variable measured at a single point in time is the aggregation of an array of influences from across time; and there is an on-going process of change and influence across the variables. In other words, in these cases the path model produces the same result as a unidirectional lagged model with longitudinal data (Maruyama, 1997). Wong and Law (1999) put it more strongly: in situations where the reciprocal effects happen simultaneously, which is the case in organizations that continuously learn and perform, nonrecursive models with cross-sectional data are more appropriate than recursive models with longitudinal data (p. 71).

Nonrecursive models can be handled routinely with the general SEM framework, but a key issue is identification (Shah and Goldstein, 2006). Nonrecursive models may not be uniquely solvable, even if they have sufficient DF, which depends upon their specific rank and order conditions (Bollen, 1989: pp. 98-102). In other words, identification is never a problem if exogenous variables exist in the model which affect only one or a few endogenous variables (Saris and Stronkhorst, 1984, pp. 139-140); i.e. when instrumental variables exist (Wong and Law, 1999). Purchasing recognition may be such an instrumental variable (at the end of this section we will test if purchasing recognition is a good instrumental variable). Therefore, we decided to include the return loop in the model and proceed to evaluate if identification issues emerge.

	Purchasing recognition	Purchasing involvement	Knowledge scanning	Cost performance	Innovation performance
Purchasing recognition	1.00				
Purchasing involvement	0.65	1.00			
Knowledge scanning	0.24	0.43	1.00		
Cost performance	0.07	0.28	0.33	1.00	
Innovation performance	-0.06	0.16	0.26	0.44	1.00

Table IV.
Correlations between
first-order constructs
(Pooled Database)

In line with Wong and Law (1999, p. 73), we allowed the disturbance terms of the two variables that hold the reciprocal relationship (cost performance and purchasing involvement) to covariate. This correlation proved to be insignificant and is therefore not included further. The updated model has acceptable fit indices: $\chi^2 = 89.65$ with $df = 71$; RMSEA = 0.027; NFI = 0.96; CFI = 0.99; i.e. with a decrease in one degree of freedom, the χ^2 value decreases by 9.78, which is significant at $p < 0.005$. Moreover, there are no further misspecifications. Lisrel did not report identification problems and the model leads to a robust solution. An explanation may be that “innovation performance” does not form part of the causal loop and may thus help to identify the variables of the loop.

To test if purchasing recognition is a good instrumental variable, we tested alternative models. First, we tested a model that treats purchasing recognition and purchasing involvement as if they were formative sub-dimensions of a broader construct “strategic purchasing” (i.e. each sub-dimension impacts knowledge scanning directly). The direct impact of purchasing recognition on knowledge scanning was non-significant however ($T = -1.06$). Therefore, we rejected the first alternative model.

Second, we tested a model that allows reciprocal causation between purchasing recognition and purchasing involvement (if reciprocal causation exists, purchasing recognition is not exogenous and this not a good instrumental variable and we could not trust the previous results on the feedback loop). Therefore, we had to include a variable that we expected to only impact in purchasing recognition, and not in purchasing involvement. The variable “environmental change” may play such a role (Fine, 1998), and we hypothesized that environmental change positively impacts in top management’s attitude towards the strategic importance of purchasing. We also hypothesized that it will impact positively in knowledge scanning (Hult *et al.*, 2006). It was measured in our survey by one item (Please describe: “the rate of change in technology in your industry” with a 6-point response scale ranging from extremely low to extremely high). We estimated its random measurement error using the Survey Quality Prediction program (SQP), which is available at www.upf.edu/survey/ and explained in Saris and Gallhofer (2014, Chapter 13). SQP provides a specific estimate for random measurement errors, based on a meta-analysis of MTMM-experiments, and has been awarded the 2014 Warren J. Mitofsky Innovators Award by the American Association for Public Opinion Research. According to SQP, the random error of the item was 0.33, which was entered into the CFA model. In other words, we modeled environmental change as a latent variable, reflected by one item with an error of 0.33.

The second alternative model has acceptable fit indices: $\chi^2 = 107.68$ with $df = 82$; RMSEA = 0.030; NFI = 0.96; CFI = 0.99). The impact from environmental change on purchasing recognition proved to be 0.14 and on knowledge scanning 0.29. The impact from purchasing involvement on purchasing recognition, however, proved to be insignificant ($T = -0.30$). Therefore, we returned to the original model of Figure 1, with causality only flowing from attitude to behavior (and not vice versa), but now including the environmental change variable. Fit indices do not decrease: $\chi^2 = 107.78$ with $df = 83$; RMSEA = 0.029; NFI = 0.96; CFI = 0.99). Moreover, no misspecifications were detected with the misspecifications test. Therefore, we rejected the causal effect from purchasing involvement on purchasing recognition and purchasing recognition is a good instrumental variable. Parameter estimates are identical with the ones of the model that did not include environmental change. Figure 2 shows the parameter estimates (we do not show the environmental change variable as its use was purely instrumental, as suggested by Hamilton and Nickerson, 2003).

The essence of SEM is to investigate if we can reject the hypothesized model (Figure 1). Examining the range of outputs, we have to conclude that we cannot reject the model.

In other words, we find support for the positive relationship between purchasing recognition and purchasing involvement (*H1*); between purchasing involvement and knowledge scanning (*H2*); between knowledge scanning and cost performance (*H3*); and between knowledge scanning and innovation performance (*H4*).

4.2.2 Path model tests with sub-groups defined by sector. In order to test the hypothesized contingent effect of industry on dynamic capability development and deployment (*H5a-H5d*) we proceeded to test the base path model (Figure 1) of the manufacturing and the service sub-sample separately. The service-based firm group has an acceptable fit: $\chi^2 = 98.32$; $df = 72$; $\chi^2/df = 1.37$; $RMSEA = 0.053$; $NFI = 0.92$; $CFI = 0.98$. Moreover, no misspecifications are detected for the service sub-sample.

The manufacturing firm group also shows an acceptable fit: $\chi^2 = 97.34$; $df = 72$; $\chi^2/df = 1.35$; $RMSEA = 0.038$; $NFI = 0.90$; $CFI = 0.97$. But here we detect the same misspecification as in the pooled database: the return effect from cost performance to purchasing involvement improves the fit: $\chi^2 = 91.03$; $df = 71$; $\chi^2/df = 1.28$; $RMSEA = 0.034$; $NFI = 0.91$; $CFI = 0.98$. In other words, with a decrease in one degree of freedom, the chi-square value decreases by 6.31, which is significant at $p < 0.02$. No further misspecifications are detected. Figures 3 and 4 show the parameter estimates of the accepted models.

We performed an equivalence test of both path models (as visualized in Figures 3 and 4). In the first step we have restricted all path estimators (betas and gammas) to be invariant across both sub-samples (except for the return effect which is only present in manufacturing

Figure 2.
Structural equation
model – pooled data
with return effect

Figure 3.
Structural model –
service-based firms

Figure 4.
Structural model –
manufacturing-based
firms

Note: $N=108$

Note: $N=201$

firms): $\chi^2 = 204.40$; $df = 147$; $\chi^2/df = 1.39$; RMSEA = 0.046; NFI = 0.92; CFI = 0.98. An analysis of misspecifications, however, points to multiple misspecifications at all stages in the path model (betas and gammas). When we free the path estimators, the fit improves to become: $\chi^2 = 189.34$; $df = 143$; $\chi^2/df = 1.32$; RMSEA = 0.042; NFI = 0.92; CFI = 0.98. More importantly, no misspecifications are indicated. In other words, path estimators are significantly different across sub-samples.

Comparing the outputs from the two sub-groups, we find strong evidence to support the argument that purchasing functions in service-based firms experience a stronger linkage between purchasing recognition and purchasing involvement (*H5a*). However, whilst the comparison of effects between purchasing recognition and purchasing involvement (0.72 vs 0.58) is easy to interpret, the existence of a return effect for one sub-sample and not the other necessitates examination of the standardized total effects when looking to compare the other parameters in our model (Tables V and VI). This analysis shows that, despite the return effect for the manufacturing sub-sample, the total effects in service-based firms are higher for all parameters. Therefore, we conclude that the contingency arguments made in *H5a-H5d* are supported by our data.

5. Discussion

The dynamic capabilities perspective has developed the resource-based view by arguing that the continuous transformation of resources, and more specifically knowledge resources (Grant, 1996), creates a unique capability that permits the generation of superior value (Sirmon and Hitt, 2009). In this study, we have focused on knowledge scanning as a dynamic capability, its enablers and performance outcomes. We have done so in the purchasing context, where strategic purchasing is shaped by two sequential dimensions – purchasing

Table V.
Standardized total effects for the sub-sample of service-based firms

Total effect from η on η^a	Cost performance	Innovation performance	Knowledge scanning	Purchasing involvement
Cost performance =			0.46 × knowledge scanning	0.26 × purchasing involvement
Innovation performance =			0.45 × knowledge scanning	0.25 × purchasing involvement
Knowledge scanning =				0.56 × purchasing involvement
Purchasing involvement =				
Note: ^a η refers to an endogenous latent variable in SEM				

Table VI.
Standardized total effects for the sub-sample of manufacturing-based firms

Total effect from η on η^a	Cost performance	Innovation performance	Knowledge scanning	Purchasing involvement
Cost performance =	0.01 × cost performance	-	0.19 × knowledge scanning	0.06 × purchasing involvement
Innovation performance =	0.01 × cost performance		0.11 × knowledge scanning	0.04 × purchasing involvement
Knowledge scanning =	0.07 × cost performance		0.01 × knowledge scanning	0.32 × purchasing involvement
Purchasing involvement =	0.23 × cost performance		0.04 × knowledge scanning	0.01 × purchasing involvement
Note: ^a η refers to an endogenous latent variable in SEM				

recognition and purchasing involvement. Purchasing, being a boundary spanning and knowledge channeling function, can prevent an organization from becoming ossified and mismatched with their environment, through its abilities to scan the environment and select, transmit, and interpret information originating in that environment.

Our empirical study of 309 firms provides support for the hypothesized links between strategic purchasing, dynamic capabilities development and deployment. Our performance measures go beyond the typical financial measures as related to dynamic capabilities, to include innovation as well as cost performance. We find that knowledge scanning helps companies to not only improve the costs associated to purchasing, but also to get the best out of suppliers in terms of innovative products/services supplied. Thus, our study reinforces the growing stream of research documenting the impact of dynamic capabilities on performance.

Only few OM researchers have documented the enablers of dynamic capabilities. We have done so by focusing on strategic purchasing, and more precisely, on purchasing recognition, which leads to purchasing involvement. Previous studies portrayed purchasing recognition and purchasing involvement as dimensions of a higher order strategic purchasing construct (Carr and Smeltzer, 1997; Cousins *et al.*, 2006). Our view is in line with psychology where attitudes (recognition) precede behavior (involvement) (Ajzen and Fishbein, 1977). It is also in line with the behavioral view on learning where learning builds upon behavior, rather than on attitudes (Levitt and March, 1988). We, thus, extend literature on the internal positions that drive capabilities formation.

Our study provides evidence of the contingent effect of industry (service-based vs manufacturing-based) on the relationships between purchasing recognition, involvement, knowledge scanning, and both cost and innovation performance. Perhaps what is more surprising is how relatively large these differences are within our study, particularly in relation to the value of knowledge scanning, as a dynamic capability, in delivering improved performance for the purchasing function. This highlights the particular value of strategic purchasing and dynamic capability development for service firms (Wowak *et al.*, 2013), because they rely so heavily on knowledge capabilities and often face particularly dynamic environments (Miller and Shamsie, 1996; Sirmon and Hitt, 2009). Dynamism stems heavily from the relatively higher growth rates of the service sector (vs the manufacturing sector), as more and more companies outsource business processes and professional services (Ellram *et al.*, 2008) and entirely new services are created taking advantage of new technology.

In addition, results suggest that, because strategic purchasing is generally less evident in service-based firms as opposed to manufacturing-based firms (Ellram *et al.*, 2004), when purchasing functions within such firms are recognized for their strategic importance, their involvement in strategic activities and resulting impact on dynamic capability development may be especially high. Furthermore, the value of knowledge scanning for purchasing functions in service-based firms is not simply the result of the knowledge emphasis and dynamic environments. Given the infancy of strategic purchasing in service-based firms, it is also likely that these valuable dynamic capabilities are rarer, more inimitable, and harder to substitute, than for purchasing functions in manufacturing-based firms, and hence deliver significant competitive advantage.

Additional insights on the observed differences can be derived from the marketing literature based on the service-dominant logic that highlights the shift away from a product-based mind-set focused on tangible resources, and embedded in value and transactions, to a service-based mind-set focused on value co-creation and relationships (Vargo and Lusch, 2004). Arguably, the traditional value chain perspective is supplier centric and stops when the customer has bought something (Gummesson, 2008). Consequently, this perspective anticipates little or no interaction between customers and suppliers beyond the exchange transaction. Service-based firms are often predicated on co-creation and

interaction with final customers, alongside a stronger sense of internal supplier-customer relations. Consequently, ties between activities in service-based firms may be stronger.

Broadly, the return effect that emerged from our data analysis may be explained from a path dependency or learning perspective, whereby the role of past experience acts to influence capability development and performance outcomes in the present and in the future (Teece *et al.*, 1997). Historical performance improvements resulting from the development of a dynamic capability are likely to result in improved effectiveness of subsequent development through learning effects, and increased emphasis on capability development by senior managers seeing evidence of improved competitive advantage (Ambrosini and Bowman, 2009). In the context of strategic purchasing, we see that the improved performance resulting from the deployment of dynamic capabilities has a return (or re-enforcing) effect on their internal enablers. This is because the strategic recognition of purchasing and its consequent involvement in strategic activities is likely to be re-enforced by perceived improvement in outcomes that have occurred as a result.

However, our analysis indicates that the return effect is only seen for cost performance. One possible explanation for this is that cost performance is arguably easier for senior managers to assess compared to innovation performance. Although measures were perceptual for both types of performance, hard cost data are easily available for purchasing professionals and therefore unambiguously steer the perception on cost performance. As such, improved cost performance resulting from improved knowledge scanning may be more clearly perceived by senior managers and thus encourage a return effect for greater purchasing involvement in strategic activities. Conversely, even when innovation performance has indeed been improved through better knowledge scanning capabilities, top managers and other functions may find it harder to make such a clear connection between these elements, and thus a return effect on purchasing involvement is less likely to occur. Additionally, the reliance on single respondents may have led to attenuated observed correlations and consequently to underestimated parameters (Ketokivi and Schroeder, 2004).

Finally, the question remains as to why this return effect is only present in manufacturing-based as opposed to service-based firms. One possible explanation is that given the infancy of strategic purchasing in service-based firms (Ellram *et al.*, 2004, 2008), top managers and other functions do not yet have sufficient understanding of the impact that purchasing involvement has on dynamic capability building nor of the performance value of such capabilities. As such, the return effect may be something that emerges over longer periods of time as purchasing takes on an increasingly strategic and active role in dynamic capability development and deployment. In addition, because dynamic capabilities are path dependent, their emergence and effective deployment are based partly on learning from previous outcomes and incremental adaptation (Schreyögg and Kliesch-Eberl, 2007). As such, dynamic capability development and deployment may in fact suffer in highly dynamic environments, such as those often faced by service-based firms (Sirmon and Hitt, 2009), because experience-based matching (i.e. matching processes with a particular environmental state) is increasingly challenging when faced with more “out-of-family” states, as opposed to “in-family” states (Weick and Sutcliffe, 2006).

In a recent empirical study examining the contingent role of environmental dynamism on the relationship between dynamic capabilities and performance, Schilke (2014) finds in fact that firms facing intermediate levels of environmental dynamism see the strongest positive effect between dynamic capabilities and performance. As such, we may be seeing two opposing forces at play between service-based and manufacturing-based firms in our study when examining relationships between purchasing status, recognition, knowledge scanning, and performance. On the one hand, the characteristics of service-based firms (knowledge intensive and within generally more dynamic environments) may act to strengthen the relationships between constructs in our model (i.e. provide support for the contingent effect of

industry). However, on the other hand, the strengthening of relationships caused by the return effect that we identified only in relation to manufacturing-based firms may arise because of lower levels of environmental dynamism and because of historic learning effects that are not yet evident in service-based firms. It is not uncommon to observe dual and even conflicting characteristics of organizational phenomena (Hargadon and Fanelli, 2002). New theoretical models may help to reconcile these apparent conflicting characteristics.

6. Conclusion, implications, and directions for future research

Whilst there is an increasing shift towards strategic purchasing in many organizations, there remains a paucity of empirical research examining how the increasing recognition of purchasing affects dynamic capability development and performance. In this paper, we have used SEM of data collected from 309 firms to demonstrate empirically that higher purchasing recognition leads to higher purchasing involvement in strategic cross-functional activities, and that this leads to increased dynamic capabilities, in the form of knowledge scanning. We have also confirmed that higher levels of knowledge scanning lead to improvements in cost and innovation performance for the purchasing function. From a contingency perspective, our study provides compelling empirical evidence that the positive influence of purchasing recognition on purchasing involvement, of involvement on knowledge scanning, and of knowledge scanning on both facets of performance is significantly stronger for service-based firms than for manufacturing-based firms. Finally, emerging from our analysis, we have evidenced a return or re-enforcing effect of performance on dynamic capability enablers, which can be explained from learning and path dependency perspectives. This return effect applies to the link between cost performance and purchasing involvement and only for the subset of manufacturing-based firms.

Our study offers a number of key contributions for academics in OM as well as those interested in dynamic capabilities more broadly. First, whilst the dynamic capabilities perspective has gained significant conceptual support over the last decade, empirical studies examining their development and deployment are still relatively limited (Ambrosini and Bowman, 2009; Pablo *et al.*, 2007). Further, the examination of dynamic capabilities as they relate to strategic purchasing is extremely limited, as is the examination of “sensing” aspects of dynamic capabilities, contrasted to “seizing” or “transforming” aspects. Second, of the extant research examining dynamic capabilities, the vast majority is concerned with either defining the construct or examining the relationship between their existence and firm performance (Zollo and Winter, 2002). Our research extends the empirical base by examining not only the link between dynamic capabilities and performance but also the enablers of dynamic capabilities. Third, from a contingency perspective, we answer calls to explore if and how the patterns of dynamic capability development and deployment vary depending on the industry in which a firm operates (Ambrosini and Bowman, 2009; Schilke, 2014). We find convincing evidence of differences between manufacturing and service-based companies in this regard. Fourth and finally, the examination of a return effect in this context, explained through a path dependency or learning perspective, is something seldom explored within extant OM research.

6.1 Managerial implications

Our study offers a number of important insights for practitioners. The purchasing function has matured over the past decade to become increasingly involved in transversal processes and the strategic direction of the firm. This paper has examined how companies may develop a purchasing function's knowledge capabilities related to supply market scanning in order to further leverage its strategic potential. We have empirically established the impact of purchasing recognition and subsequent involvement on transversal value chain processes, the development of knowledge capabilities, as well as the effect of such capabilities on performance. Such findings can be used by practitioners to argue the case for purchasing's

strategic value in broad terms, but more specifically to emphasize the value of dynamic capabilities, such as knowledge scanning, in the process of developing (and hiring into) strategic purchasing functions. However, it is also important to note that the link between dynamic capabilities and competitive advantage may not be deterministic (Helfat *et al.*, 2007). Whilst the resource base of a firm is altered as a result of dynamic capabilities, the resulting resource stock may lead to a number of different outcomes relative to competitors, including sustainable competitive advantage, temporary competitive advantage, competitive parity, or in some cases even failure (Helfat *et al.*, 2007; Rindova and Kotha, 2001).

Our empirical results highlight that everything starts with top management's recognition of the strategic role of purchasing. In other words, the right attitude has to precede purchasing's actual involvement in product/service design or other organization-wide improvement processes. It is also evident that this "attitude-into-action" allows purchasing to develop critical knowledge capabilities, which in turn improve performance. Critically, it is not only in traditional cost performance that results are seen, but also innovation performance, related to the time-to-market of new or improved products/services. For practitioners, our decision to include both cost and innovation performance as key outcome variables is useful because it allows a case for dynamic capability development and deployment to be made with multiple performance objectives in mind.

Our study points to a particular opportunity for strategic purchasing within service firms, where many functions remain relatively operational. When purchasing functions within service firms are recognized for their strategic importance, their involvement in strategic activities and resulting impact of dynamic capability development appears to be especially high. Finally, the identification of a reinforcing effect between cost performance and purchasing's actual involvement in company-wide processes within manufacturing-based companies only at present, suggests an opportunity for service-based companies to also improve learning effects. In the words of Vargo and Lusch (2004) "Outcomes are not something to be maximized but something to learn from" (p. 6). For practitioners, this finding reiterates the need to place greater emphasis on learning from past projects with suppliers in order to support further dynamic capability development and ultimately performance. Figure 5 provides a practitioner summary model identifying the differing impacts of purchasing-derived dynamic capabilities for both manufacturing and service organizations.

Figure 5.
Practitioner summary
of dynamic capability
enablers and effects
for manufacturing and
service organizations

6.2 Limitations and future research opportunities

Whilst making a number of valuable contributions to both academics and practitioners, the limitations of our study give rise to a number of potential research avenues. First, in line with the majority of OM survey-based work, our study adopted single-respondent approach to data collection. Whilst efforts were made in the design of the survey to minimize potential single-respondent bias, we acknowledge that future best practice in survey research will include broader perspectives on the key outcome variables. We would therefore welcome research that develops performance measures to more adequately capture the outcome of the knowledge scanning dynamic capability and thus increase the variance fit of our model. Psychometric properties of perceptual performance measures, such as the ones adapted from the literature for our study, may be improved by having multiple-informant studies (Ketokivi and Schroeder, 2004). Alternatively, secondary data on performance offer a valuable complementary perspective to the perceptual view in our survey data.

Second, we believe that further research is necessary to shed more light on the return effect that emerged from our data, and the potential role of environmental dynamism. Literature on learning and dynamic capabilities can help to shape research questions and hypotheses that involve reciprocal effects. In other words, we recommend a research design that includes the reflexive experience of managers, where performance outcomes are potentially back translated to purchasing involvement in company-wide processes. Such a reflexive process is not necessarily conscious, explicit, or purposive (Hargadon and Fanelli, 2000). Consequently, we would suggest in-depth longitudinal case studies or ethnographic studies may be the most appropriate methodologies. A focus on concrete organizational projects, and their post-mortems, may facilitate data gathering from multiple angles on one and the same phenomenon, in this case the potential feedback loop from performance to involvement. While not a tradition in empirical OM research, other fields have already embraced the related nonrecursive analytical models (e.g. Finkel, 1985, in political science and Neyer *et al.*, 2014, in personality research).

Finally, further research is also merited to expand our understanding of the difference between service-based and manufacturing-based organizations in how they reflect upon past experience. Do different degrees of dynamism impact on the speed or duration of reflection and therefore capabilities development, for example? Service firms still have a longer way to go in this regard, but their horizon looks bright.

References

- Ajzen, I. and Fishbein, M. (1977), "Attitude-behavior relations: a theoretical analysis and review of empirical research", *Psychological Bulletin*, Vol. 84 No. 5, pp. 888-918.
- Ambrosini, V. and Bowman, C. (2009), "What are dynamic capabilities and are they a useful construct in strategic management?", *International Journal of Management Reviews*, Vol. 11 No. 1, pp. 29-49.
- Anderson, J.C. and Gerbing, D.W. (1988), "Structural equation modeling in practice: a review and recommended two-step approach", *Psychological Bulletin*, Vol. 103 No. 3, pp. 411-423.
- Aragon-Correa, J.A. and Sharma, S. (2003), "A contingent resource-based view of proactive corporate environmental strategy", *Academy of Management Review*, Vol. 28 No. 1, pp. 71-88.
- Augier, M. and Teece, D.J. (2007), "Dynamic capabilities and multinational enterprise: Penrosean insights and omissions", *Management International Review*, Vol. 47, pp. 175-192.
- Barney, J.B. (2012), "Purchasing, supply chain management and sustained competitive advantage: the relevance of resource-based theory", *Journal of Supply Chain Management*, Vol. 48 No. 2, pp. 3-6.

- Blome, C., Schoenherr, T. and Rexhausen, D. (2013), "Antecedents and enablers of supply chain agility and its effect on performance: a dynamic capabilities perspective", *International Journal of Production Research*, Vol. 51 No. 4, pp. 1295-1318.
- Blyler, M. and Coff, R.W. (2003), "Dynamic capabilities, social capital, and rent appropriation: ties that split pies", *Strategic Management Journal*, Vol. 24 No. 7, pp. 677-686.
- Bollen (1989), "A new incremental fit index for general structural equation models", *Sociological Methods and Research*.
- Boyer, K.K. and Lewis, M. (2002), "Competitive priorities: investigating the need for tradeoffs in operations strategy", *Production and Operations Management*, Vol. 11 No. 1, pp. 9-20.
- Boyer, K.K., Olson, J.R., Calantone, R.J. and Jackson, E.C. (2002), "Print versus electronic surveys: a comparison of two data collection methodologies", *Journal of Operations Management*, Vol. 20 No. 4, pp. 357-373.
- Carr, A.S. and Smeltzer, L. (1997), "An empirically based operational definition of strategic purchasing", *European Journal of Purchasing & Supply Management*, Vol. 3 No. 4, pp. 199-207.
- Carter, P.L., Carter, J.R., Monczka, R.M., Slaughter, T.H. and Swan, A.J. (2000), "The future of purchasing and supply: a ten-year forecast1", *Journal of Supply Chain Management*, Vol. 36 No. 4, pp. 14-26.
- Cepeda, G. and Vera, D. (2007), "Dynamic capabilities and operational capabilities: a knowledge management perspective", *Journal of Business Research*, Vol. 60 No. 5, pp. 426-437.
- Chen, I.J., Paulraj, A. and Lado, A.A. (2004), "Strategic purchasing, supply management and firm performance", *Journal of Operations Management*, Vol. 22 No. 5, pp. 505-523.
- Chiang, C.-Y., Kocabasoglu-Hillmer, C. and Suresh, N. (2012), "An empirical investigation of the impact of strategic sourcing and flexibility on firm's supply chain agility", *International Journal of Operations & Production Management*, Vol. 32 Nos 1-2, pp. 49-78.
- Collis, D.J. (1994), "Research note: how valuable are organizational capabilities?", *Strategic Management Journal*, Vol. 1 No. 15, pp. 143-152.
- Cousins, P.D., Lawson, B. and Squire, B. (2006), "An empirical taxonomy of purchasing functions", *International Journal of Operations & Production Management*, Vol. 26 No. 7, pp. 775-794.
- Danneels, E. (2002), "The dynamics of product innovation and firm competences", *Strategic Management Journal*, Vol. 23 No. 12, pp. 1095-1121.
- Dodgson, M. (1993), "Learning, trust, and technological collaboration", *Human Relations*, Vol. 46 No. 1, pp. 77-96.
- Donaldson, L. (2001), *The Contingency Theory of Organizations*, Sage.
- Douglas, S.P. and Craig, C.S. (2006), "On improving the conceptual foundations of international marketing research", *Journal of International Marketing*, Vol. 14 No. 1, pp. 1-22.
- Drasgow, F. (1984), "Scrutinizing psychological tests: measurement equivalence and equivalent relations with external variables are the central issues", *Psychological Bulletin*, Vol. 95, pp. 134-135.
- Eisenhardt, K.M. and Martin, J.K. (2000), "Dynamic capabilities: what are they?", *Strategic Management Journal*, Vol. 21 No. 1, pp. 1105-1121.
- Ellram, L.M., Tate, W.L. and Billington, C. (2004), "Understanding and managing the services supply chain", *Journal of Supply Chain Management*, Vol. 40 No. 4, pp. 17-32.
- Ellram, L.M., Tate, W.L. and Billington, C. (2008), "Services supply management: the next frontier for improved organizational performance", *California Management Review*, Vol. 49 No. 4, pp. 44-66.
- Fine, C.H. (1998), *Clockspeed: Winning Industry Control in the Age of Temporary Advantage*, Basic Books, Cambridge, MA.
- Finkel, S.E. (1985), "Reciprocal effects of participation and political efficacy: a panel analysis", *American Journal of Political Science*, Vol. 29 No. 4, pp. 891-913.

-
- Foerstl, K., Hartmann, E., Wynstra, F. and Moser, R. (2013), "Cross-functional integration and functional coordination in purchasing and supply management: antecedents and effects on purchasing and firm performance", *International Journal of Operations & Production Management*, Vol. 33 No. 6, pp. 689-721.
- Foerstl, K., Reuter, C., Hartmann, E. and Blome, C. (2010), "Managing supplier sustainability risks in a dynamically changing environment-sustainable supplier management in the chemical industry", *Journal of Purchasing and Supply Management*, Vol. 16 No. 2, pp. 118-130.
- Fornell, C. and Larcker, D.F. (1981), "Evaluating structural equation models with unobservable variables and measurement error", *Journal of Marketing Research*, Vol. 18 No. 1, pp. 39-50.
- Giunipero, I., Handfield, R.B. and Eltantawy, R. (2006), "Supply management's evolution: key skill sets for the supply manager of the future", *International Journal of Operations & Production Management*, Vol. 26 No. 7, pp. 822-844.
- Glasman, L.R. and Albarracin, D. (2006), "Forming attitudes that predict future behavior: a meta-analysis of the attitude-behavior relation", *Psychological Bulletin*, Vol. 2006 No. 5, pp. 778-822.
- Grant, R.M. (1996), "Toward a knowledge-based theory of the firm", *Strategic Management Journal*, No. 17, pp. 109-122.
- Griffith, D.A. and Harvey, M.G. (2006), "A resource based perspective of global dynamic capabilities", *Journal of International Business Studies*, Vol. 32 No. 3, pp. 597-606.
- Gruber, M., Heinemann, F., Brettel, M. and Hungeling, S. (2010), "Configurations of resources and capabilities and their performance implications: an exploratory study on technology ventures", *Strategic Management Journal*, Vol. 31 No. 12, pp. 1337-1356.
- Gummesson, E. (2008), "Extending the service-dominant logic: from customer centricity to balanced centricity", *Journal of the Academy of Marketing Science*, Vol. 36 No. 1, pp. 15-17.
- Hamilton, B.H. and Nickerson, J.A. (2003), "Correcting for endogeneity in strategic management research", *Strategic Organization*, Vol. 1 No. 1, pp. 51-78.
- Handfield, R.B., Ragatz, G. and Monczka, R. (1999), "Involving suppliers in new product development?", *California Management Review*, Vol. 45 No. 1, pp. 59-82.
- Handfield, R.B., Cousins, P.D., Lawson, B. and Petersen, K.J. (2015), "How can supply management really improve performance? A knowledge-based model of alignment capabilities", *Journal of Supply Chain Management*, Vol. 51 No. 3, pp. 3-17.
- Hargadon, A. and Fanelli, A. (2002), "Action and possibility: reconciling dual perspectives of knowledge in organizations", *Organization Science*, Vol. 13 No. 3, pp. 290-302.
- Harkness, J.A., Van de Vijver, F.J.R. and Mohler, P.P. (2003), *Cross-Cultural Survey Methods*, Wiley, New York, NY.
- Helfat, C.E. (1997), "Know-how and asset complementarity and dynamic capability accumulation: the case of R&D", *Strategic Management Journal*, Vol. 18 No. 1, pp. 339-360.
- Helfat, C.E. and Peteraf, M.A. (2003), "The dynamic resource-based view: capability lifecycles", *Strategic Management Journal*, Vol. 24 No. 10, pp. 997-1010.
- Helfat, C.E. and Winter, S.G. (2011), "Untangling dynamic and operational capabilities: strategy for the (n)ever-changing world", *Strategic Management Journal*, Vol. 32 No. 11, pp. 1243-1250.
- Helfat, C.E., Finkelstein, S., Mitchell, W., Peteraf, M., Singh, H., Teece, D. and Winter, S. (2007), *Dynamic Capabilities: Understanding Strategic Change in Organizations*, Blackwell, London.
- Holland, J.H. (1998), *Emergence, from Chaos to Order*, Oxford University Press, New York.
- Hu, L.T. and Bentler, P.M. (1998), "Fit indices in covariance structure modelling: sensitivity to underparameterized model misspecification", *Psychological Methods*, Vol. 3 No. 4, pp. 424-453.
- Hult, G.T.M., Hurley, R.F., Giunipero, L.C. and Nichols, E.L. Jr (2000), "Organizational learning in global purchasing: a model and test of internal users and corporate buyers", *Decision Sciences*, Vol. 31 No. 2, pp. 293-325.

- Hult, G.T.M., Ketchen, D.J., Cavusgil, S.T. and Calantone, R. (2006), "Knowledge as a strategic resource in supply chains", *Journal of Operations Management*, Vol. 24 No. 5, pp. 458-475.
- Jia, F., Lamming, R., Sartor, M., Orzes, G. and Nassimbeni, G. (2014), "Global purchasing strategy and international purchasing offices: evidence from case studies", *International Journal of Production Economics*, Vol. 154, August, pp. 284-298.
- Karim, S. and Mitchell, W. (2000), "Path dependent and path-breaking change: reconfiguring business resources following acquisitions in the U.S. medical sector, 1978-1995", *Strategic Management Journal*, Vol. 21, October, pp. 1061-1081.
- Ketokivi, M.A. and Schroeder, R.G. (2004), "Perceptual measures of performance: fact or fiction?", *Journal of Operations Management*, Vol. 22 No. 3, pp. 247-264.
- Knoppen, D., Akın Ateş, M., Brandon-Jones, A., Luzzini, D., van Raaij, E. and Wynstra, F. (2015), "A comprehensive assessment of measurement equivalence in operations management", *International Journal of Production Research*, Vol. 53 No. 1, pp. 166-182.
- Koufteros, X., Cheng, T. and Lai, K.H. (2007), "Black-box' and 'gray-box' supplier integration in product development: antecedents, consequences and the moderating role of firm size", *Journal of Operations Management*, Vol. 25 No. 4, pp. 847-870.
- Koufteros, X., Vonderembse, M. and Jayaram, J. (2005), "Internal and external integration for product development: the contingency effects of uncertainty, equivocality, and platform strategy", *Decision Sciences*, Vol. 36 No. 1, pp. 97-133.
- Lance, C.E., Butts, M.M. and Michels, L.C. (2006), "The sources of four commonly reported cutoff criteria: what did they really say?", *Organizational Research Methods*, Vol. 9 No. 2, pp. 202-220.
- Lee, J., Lee, K. and Rho, S. (2002), "An evolutionary perspective on strategic group emergence: a genetic algorithm-based model", *Strategic Management Journal*, Vol. 23 No. 8, pp. 727-746.
- Levitt, B. and March, J.G. (1988), "Organizational learning", *Annual Review of Sociology*, Vol. 14 No. 1, pp. 319-340.
- Lindenbergh, S. and Steg, L. (2007), "Normative, gain and hedonic goal frames guiding environmental behavior", *Journal of Social Issues*, Vol. 63 No. 1, pp. 117-137.
- Makadok, R. (2001), "Toward a synthesis of the resource-based and dynamic-capability views of rent creation", *Strategic Management Journal*, Vol. 22 No. 5, pp. 387-401.
- Malhotra, A., Gosain, S. and El Sawy, O.A. (2005), "Absorptive capacity configurations in supply chains", *MIS Quarterly*, Vol. 29, March, pp. 145-187.
- Maruyama, G. (1997), *Basics of Structural Equation Modeling: Recursive and Longitudinal Models: Where Causality Goes in More Than One Direction and Where Data are Collected Over Time*, Sage, Thousand Oaks, London and New Delhi.
- Miller, D. and Shamsie, J. (1996), "The resource-based view of the firm in two environments: the Hollywood film studios from 1936 to 1965", *Academy of Management Journal*, Vol. 39 No. 3, pp. 519-543.
- Mol, M.J. (2003), "Purchasing's strategic relevance", *Journal of Purchasing and Supply Management*, Vol. 9 No. 1, pp. 43-50.
- Mullen, M.R. (1995), "Diagnosing measurement equivalence in cross-national research", *Journal of International Business Studies*, Vol. 26 No. 3, pp. 573-596.
- Nair, A., Jayaram, J. and Das, A. (2015), "Strategic purchasing participation, supplier selection, supplier evaluation and purchasing performance", *International Journal of Production Research*, Vol. 53 No. 20, pp. 6263-6278.
- Neyer, F.J., Mund, M., Zimmermann, J. and Wrzus, C. (2014), "Personality-relationship transactions revisited", *Journal of Personality*, Vol. 82 No. 6, pp. 539-550.
- Pablo, A., Reay, T., Dewald, J.R. and Casebeer, A.L. (2007), "Identifying, enabling and managing dynamic capabilities in the public sector", *Journal of Management Studies*, Vol. 44 No. 5, pp. 687-708.
- Pagell, M. (2004), "Understanding the factors that enable and inhibit the integration of operations, purchasing and logistics", *Journal of Operations Management*, Vol. 22 No. 5, pp. 459-487.

- Pierce, J.L., Boerner, C.S. and Teece, D.J. (2002), "Dynamic capabilities, competence, and the behavioral theory of the firm", in Augier, M. and March, J.G. (Eds), *The Economics of Change, Choice and Structure: Essays in the Memory of Richard M. Cyert*, Edward Elgar, Cheltenham, pp. 81-95.
- Podsakoff, P.M., MacKenzie, S.B., Lee, J.-Y. and Podsakoff, N.P. (2003), "Common method biases in behavioral research: a critical review of the literature and recommended remedies", *Journal of Applied Psychology*, Vol. 88 No. 5, pp. 879-903, available at: <http://dx.doi.org/10.1037/0021-9010.88.5.879>
- Pressey, A.D., Winklhofer, H.M. and Tzokas, N.X. (2009), "Purchasing practices in small-to medium-sized enterprises: an examination of strategic purchasing adoption, supplier evaluation and supplier capabilities", *Journal of Purchasing and Supply Management*, Vol. 15 No. 4, pp. 214-226.
- Priem, R.L. and Swink, M. (2012), "A demand-side perspective on supply chain management", *Journal of Supply Chain Management*, Vol. 48 No. 2, pp. 7-13.
- Ramsay, J. (2001), "Purchasing's strategic irrelevance", *European Journal of Purchasing & Supply Management*, Vol. 7 No. 4, pp. 257-263.
- Reuter, C., Foerstl, K., Hartmann, E. and Blome, C. (2010), "Sustainable global supplier management: the role of dynamic capabilities in achieving competitive advantage", *Journal of Supply Chain Management*, Vol. 46 No. 2, pp. 45-63.
- Revilla, E. and Knoppen, D. (2015), "Building knowledge integration in buyer-supplier relationships: the critical role of strategic supply management and trust", *International Journal of Operations and Production Management*, Vol. 35 No. 10, pp. 1408-1436.
- Revilla, E. and Villena, V. (2012), "Knowledge integration taxonomy in buyer-supplier relationships: trade-offs between efficiency and innovation", *International Journal of Production Economics*, Vol. 140 No. 2, pp. 854-864.
- Rindova, V.P. and Kotha, S. (2001), "Continuous 'morphing': competing through dynamic capabilities, form, and function", *Academy of Management Journal*, Vol. 44 No. 6, pp. 1263-1278.
- Rothaermel, F.T. and Hess, A.M. (2007), "Building dynamic capabilities: innovation driven by individual- firm- and network-level effects", *Organization Science*, Vol. 18 No. 6, pp. 898-921.
- Sáenz, M., Revilla, E. and Knoppen, D. (2014), "Absorptive capacity in buyer-supplier relationships: empirical evidence of its mediating role", *Journal of Supply Chain Management*, Vol. 50 No. 2, pp. 18-40.
- Sampson, S.E. and Spring, M. (2012), "Customer roles in service supply chains and opportunities for innovation", *Journal of Supply Chain Management*, Vol. 48 No. 4, pp. 30-50.
- Saris, W.E. and Gallhofer, I. (2014), *Design, Evaluation and Analysis of Questionnaires for Survey Research*, 2nd ed., Wiley Interscience, Hoboken, NJ.
- Saris, W.E. and Stronkhorst, H. (1984), *Causal Modeling in Nonexperimental Research: An Introduction to the Lisrel Approach*, Sociometric Research Foundation, Amsterdam.
- Saris, W.E., Knoppen, D. and Schwartz, S.H. (2013), "Operationalizing the theory of human values: balancing homogeneity of reflective items and theoretical coverage", *Survey Research Methods*, Vol. 7 No. 1, pp. 29-44.
- Saris, W.E., Satorra, A. and Van der Veld, W. (2009), "Testing structural equation models or detections of misspecifications?", *Structural Equation Modeling*, Vol. 16 No. 4, pp. 561-582.
- Schilke, O. (2014), "On the contingent value of dynamic capabilities for competitive advantage: the nonlinear moderating effect of environmental dynamism", *Academy of Management Journal*, Vol. 35 No. 2, pp. 179-203.
- Schreyögg, G. and Kliesch-Eberl, M. (2007), "How dynamic can organizational capabilities be? Towards a dual-process model of capability dynamization", *Strategic Management Journal*, Vol. 28 No. 9, pp. 913-933.
- Shah, R. and Goldstein, S.M. (2006), "Use of structural equation modelling in operations management research: looking back and forward", *Journal of Operations Management*, Vol. 24 No. 2, pp. 148-169.

- Simon, D.G. and Hitt, M.A. (2009), "Contingencies within dynamic managerial capabilities: interdependent effects of resource investment and deployment on firm performance", *Strategic Management Journal*, Vol. 30 No. 13, pp. 1375-1394.
- Sousa, R. and Voss, C.A. (2008), "Contingency research in operations management practices", *Journal of Operations Management*, Vol. 26 No. 6, pp. 697-713.
- Steenkamp, J. and Baumgartner, H. (1998), "Assessing measurement invariance in cross-national consumer research", *Journal of Consumer Research*, Vol. 25 No. 1, pp. 78-90.
- Steinle, C. and Schiele, H. (2008), "Limits to global sourcing?: Strategic consequences of dependency on international suppliers: cluster theory, resource-based view and case studies", *Journal of Purchasing and Supply Management*, Vol. 14 No. 1, pp. 3-14.
- Stock, G.N., Greis, N.P. and Fischer, W.A. (2002), "Firm size and dynamic technological innovation", *Technovation*, Vol. 22 No. 9, pp. 537-549.
- Stoelhorst, J.W. and Van Raaij, E.M. (2004), "On explaining performance differentials: marketing and the managerial theory of the firm", *Journal of Business Research*, Vol. 57 No. 5, pp. 462-477.
- Teece, D. (2007), "Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance", *Strategic Management Journal*, Vol. 28 No. 13, pp. 1319-1350.
- Teece, D. and Pisano, G. (1994), "The dynamic capabilities of firms: an introduction", *Industrial and Corporate Change*, Vol. 3 No. 3, pp. 537-556.
- Teece, D.J., Pisano, G. and Shuen, A. (1997), "Dynamic capabilities and strategic management", *Strategic Management Journal*, Vol. 18, August, pp. 509-533.
- Teece, D.J., Pisano, G. and Shuen, A. (1990), "Firm capabilities, resources and the concept of strategy", Working Paper No. EAP 38, Economic Analysis and Policy, University of California.
- Tripsas, M. and Gavetti, G. (2000), "Capabilities, cognition, and inertia: evidence from digital imaging", *Strategic Management Journal*, Vol. 21, October, pp. 1147-1161.
- Tu, Q., Vonderembse, M.A., Ragu-Nathan, T.S. and Sharkey, T.W. (2006), "Absorptive capacity: enhancing the assimilation of time-based manufacturing practices", *Journal of Operations Management*, Vol. 24 No. 5, pp. 692-710.
- Vaidyanathan, G. and Devaraj, S. (2008), "The role of quality in e-procurement performance: An empirical analysis", *Journal of Operations Management*, Vol. 26 No. 3, pp. 407-425.
- Van der Veld, W., Saris, W.E. and Satorra, A. (2009), "Rule 2.0, Judgement aid rule for structural equation models", User Manual, Unpublished document.
- Vargo, S.L. and Lusch, R.F. (2004), "Evolving to a new dominant logic for marketing", *Journal of Marketing*, Vol. 68 No. 1, pp. 1-17.
- Visser, M., Weerd-Nederhof, P., Faems, D., Song, M., van Looy, B. and Visschewr, K. (2010), "Structural ambidexterity in NPD processes: a firm-level assessment of the impact of differentiated structures on innovation performance", *Technovation*, Vol. 30 Nos 5-6, pp. 291-299.
- Volberda, H.W., Foss, N. and Lyles, M.A. (2010), "Absorbing the concept of absorbing capacity: how to realize its potential in the organization field", *Organization Science*, Vol. 21 No. 4, pp. 931-951.
- Weick, K.E. and Sutcliffe, K.M. (2006), "Mindfulness and the quality of organizational attention", *Organization Science*, Vol. 17 No. 4, pp. 514-524.
- Winter, S. (2003), "Understanding dynamic capabilities", *Strategic Management Journal*, Vol. 24 No. 10, pp. 991-995.
- Wong, C.-S. and Law, K.S. (1999), "Testing reciprocal relations by nonrecursive structural equation models using cross-sectional data", *Organizational Research Methods*, Vol. 2 No. 1, pp. 69-87.
- Wowak, K.D., Craighead, C.W., Ketchen, D.J. Jr and Hult, T.G. (2013), "Supply chain knowledge and performance: a meta-analysis", *Decision Sciences*, Vol. 44, pp. 843-875.
- Zahra, S., Sapienza, H. and Davidsson, P. (2006), "Entrepreneurship and dynamic capabilities: a review, model and research agenda", *Journal of Management Studies*, Vol. 43 No. 4, pp. 917-955.

-
- Zhang, C., Viswanathan, S. and Henke, J.W. Jr (2011), "The boundary spanning capabilities of purchasing agents in buyer-supplier trust development", *Journal of Operations Management*, Vol. 29 No. 4, pp. 318-328.
- Zollo, M. and Winter, S. (2002), "Deliberate learning and the evolution of dynamic capabilities", *Organization Science*, Vol. 13 No. 3, pp. 339-351.

Further reading

- Drnevich, P.L. and Kriauciunas, A.P. (2011), "Clarifying the conditions and limits of the contributions of ordinary and dynamic capabilities to relative firm performance", *Strategic Management Journal*, Vol. 32 No. 3, pp. 254-279.
- Ketchen, D.J. and Hult, G.T.M. (2007), "Bridging organization theory and supply chain management: the case of best value supply chains", *Journal of Operations Management*, Vol. 25 No. 2, pp. 573-580.
- Luzzini, D. and Ronchi, S. (2011), "Organizing the purchasing department for innovation", *Operations Management Research*, Vol. 4 Nos 1-2, pp. 14-27.

Corresponding author

Alistair Brandon-Jones can be contacted at: a.brandon-jones@bath.ac.uk