

# Supply market orientation: a dynamic capability of the purchasing and supply management function

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## Abstract

**Purpose** – This paper aims to conceptualize supply market orientation (SMO) for the purchasing and supply chain management function and discusses how SMO capabilities are developed and how their application differs within and across firms. This research can thus be used as a blueprint for the development of a SMO capability that accommodates a firm's unique contextual antecedents' profile.

**Design/methodology/approach** – The qualitative research design comprises five in-depth case studies with 43 semi-structured interviews with large manufacturing and service firms.

**Findings** – SMO is defined as the capability to exploit market intelligence to assess, integrate and reconfigure the heterogeneously dispersed resources in purchasing and supply chain management in a way that best reflects the peculiarities of a firm's supply environment. The empirical analysis shows that although SMO capabilities are configured similarly, their application varies across and within firms depending on the characteristics of a firm's purchasing categories and tasks. Hence, reactive versus proactive SMO application is contingent upon firm-level and purchasing category-level characteristics.

**Originality/value** – The study uses the dynamic capabilities view as a theoretical background and provides empirical evidence and theoretical reasoning to elaborate and endorse SMO as a dynamic capability that firms need to have to compete in a complex and dynamic environment. The study provides guidance for supply chain managers on how to successfully develop and deploy a SMO capability.

**Keywords** Market intelligence, Dynamic capability, Supply-chain management, Integration, Market orientation, Purchasing

**Paper type** Research paper

## Introduction

Rising global competition, the demand for increased product variety with shorter product life cycles, rapid technological change and increasing digitalization are all expected to intensify in the future (Colicchia *et al.*, 2019; Pettit *et al.*, 2019). In this regard, firms that are better equipped to cope with market developments and to anticipate changing conditions are expected to reap superior profitability and at least a temporary competitive advantage (Day, 1994). Thus, the concept of market orientation has attracted broad attention among practitioners and scholars alike. Essentially, market orientation is reflected in the activities and behaviors associated with firm-wide generation, dissemination and responsiveness to market

intelligence pertaining to the current and future customer needs (Kohli and Jaworski, 1990). The strong customer focus underlying the market orientation concept has resulted in an emphasis on downstream markets. However, increased levels of outsourcing, raw materials scarcity, political and technological turbulence and intensified competition also require firms to approach their upstream markets strategically (Kraljic, 1983; Krause *et al.*, 2001; Liao *et al.*, 2010). As purchased goods and

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services typically range between 50 and 80% of the costs of goods sold for manufacturers (Johnson *et al.*, 2011), even incremental improvements to procurement processes impact firms' bottom-line (Azadegan *et al.*, 2013) as firms seek supplier capabilities in engineering, design, innovation, manufacturing and delivery (Narasimhan and Das, 2001; Calantone and Stanko, 2007). For instance, suppliers of semi-conductors have become an important source of innovation in passenger cars, but these suppliers cannot be considered direct suppliers to the larger automotive OEMs. Therefore, companies such as BMW have developed supplier technology scouting processes to potentially integrate these seemingly unimportant (in terms of spend volume) and distant suppliers into ongoing product innovation projects.

Only a few scholars have examined market orientation in the upstream supply context. Handfield (2010) was one of the first scholars to directly address supply markets in an exploration of supply market intelligence. Further steps toward an understanding of supply market orientation (SMO) have been taken by research on supply chain orientation (Fawcett *et al.*, 2007; Ellinger *et al.*, 2012). In spite of a range of concepts addressing the challenges of direct supplier portfolio management (Kraljic, 1983), our understanding of how buying firms create transparency and intelligence about the entire upstream supply chain, including distant suppliers, is limited. In particular, the active management of nexus suppliers and other key lower-tier suppliers must be enabled through supply market intelligence (Yan *et al.*, 2015). In fact, little is known about what this concept actually constitutes, how it is developed, and how it differs across buying firms and in its application across purchasing categories. Thus, we pose the following research questions:

- RQ1. How do buying firms configure and deploy a dynamic SMO capability?
- RQ2. How does the configuration and deployment differ within and across firms?

To answer the questions, we conducted multiple case studies with embedded multiple units of analysis (Corbin and Strauss, 1990; Yin, 2018). We were able to conceptualize and define SMO as the capability to exploit market intelligence to assess, integrate and reconfigure the heterogeneously dispersed resources in purchasing and supply chain management in a way that best reflects the peculiarities of a firm's supply environment. The concept addresses the beneficial exploitation of supply market intelligence in a firm's practices, processes, and organizational routines more directly and thus extends previous research in the area. Firms can pursue their strategies more effectively through SMO and can thus channel efforts and investments into the most relevant resources and practices. This provides valuable guidance for managers on how SMO may support them in coping with the challenges of an increasingly dynamic supply environment.

The paper is structured as follows: First, we establish the conceptual foundation by linking the supply chain information and knowledge management literature with the established concept of market orientation. As the theoretical backbone, we elaborate concepts of absorptive and desorptive capacity as well as dynamic capabilities. Next, we draw from the five case

studies to explicate the concept and definition of SMO. Reflecting on our findings against the literature, we elaborate on value capture potential of SMO in light of the various contextual antecedents that drive its application at the firm and the purchasing-category level. We conclude by stating the contributions we have made to business practice and theory and by discussing a number of promising avenues for future research.

## Theoretical background

### Market orientation, market intelligence and the supply market orientation capability

Essentially, market orientation refers to the implementation of the marketing concept. It is reflected in the diverse activities and behaviors associated with firm-wide generation, dissemination, and responsiveness to market intelligence (Kohli and Jaworski, 1990). Therefore, market intelligence embraces the current and future customer needs and preferences as well as the exogenous forces (e.g. competition, technology, culture) affecting them (Jaworski and Kohli, 1993; Matsuno *et al.*, 2000). Rooted in marketing research and practice, the market orientation concept fundamentally embraces the notion of customer focus (Kohli and Jaworski, 1990). For a comprehensive overview of the market orientation literature, we refer to Liao *et al.* (2011).

The market orientation concept has influenced the domains of demand chain management (Chen *et al.*, 2004; Jüttner *et al.*, 2010) and supply chain segmentation (Christopher and Towill, 2002). Few scholars have examined market orientation in the supply context. Fugate *et al.* (2008) emphasized the role of logistics in market orientation. Zhao and Cavusgil (2006) reported a link between suppliers' market orientation and manufacturers' trust, which in turn affects manufacturers' long-term orientation toward suppliers. Min *et al.* (2007) argued that market orientation drives a systems approach to consider the supply chain as a source of resources and skills, thus promoting collaborative initiatives. Moreover, a step toward understanding SMO has been taken by research on supply chain orientation, which emphasizes a supply chain philosophy in a firm (Mentzer *et al.*, 2001; Ellinger *et al.*, 2012) and the corresponding need to manage the capacity and capabilities of suppliers to improve productivity, quality, and innovation (Lee, 2004; Fawcett *et al.*, 2007). Shin *et al.* (2000) referred to supply management orientation as a firm's philosophy required to create an environment where the buyer and its suppliers interact in a coordinated fashion. Such a strategic supplier base captures value and enables the generation of a competitive advantage (Kähkönen *et al.*, 2015).

Another step toward an understanding of SMO was taken by Handfield (2010), who explored a concept of supply market intelligence. However, the concept essentially mirrors the existing concept of market orientation with regard to its basic information processing aspects of market intelligence generation and dissemination. The practical approach to gathering and analyzing basic information from supply markets is key to the concept of supply market research that refers to:

[...] the systematic gathering, classification and analysis of data considering all relevant factors that influence the procurement of goods and services for the purposes of meeting present and future company requirements (van Weele, 2014, 115).

Gathering and analyzing data through supply market research creates information and knowledge that is needed to create supply market intelligence. However, little is known about how firms exploit supply market intelligence and what this implies organizationally at the functional and the purchasing-category level. Extant concepts do not explicitly take supply market peculiarities into account. Also, assessing the purchase situation in terms of the importance of purchasing (e.g. cost of materials to total costs, value-added profile, profitability profile) and the complexity of the supply market (e.g. supply scarcity, competitive environment, pace of technological change), firms can determine the type of supply strategy required to minimize supply vulnerabilities and to exploit their potential buying power (Kraljic, 1983; Caniels and Gelderman, 2005). However, the purchasing portfolio approach and other related frameworks are rather static and neglect the need for the continuous updating of information to ensure fitting strategic choice over time as the supply environment evolves. Recently, for instance, Akhavan and Beckmann (2017) found that proactive, opportunity-oriented strategies, whereby suppliers and their capabilities are developed, are able to respond more effectively to the changing requirements than traditional reactive strategies. Neglecting such approaches could result in the misalignment of supply and demand, compromising operational performance and risk mitigation (Handfield, 2010). It has become clear that in the current dynamic business environment, one must consider the contextual antecedents in the configuration and application of a SMO capability to establish a connection to the established supply category management (Gelderman and van Weele, 2005; Gelderman and Semeijn, 2006) approaches.

### Absorptive capacity, dynamic capabilities and supply market orientation

Nowadays, knowledge is seen as one of the most important resources of a firm. Consequently, capabilities for generating, disseminating and using knowledge are critical, especially in the dynamic supply environment (Zacharia *et al.*, 2011; Blome *et al.*, 2014). However, the understanding about the process whereby the knowledge and information from supply markets are transferred into a value-creating practice and new intelligence is created is still limited. As firms need to develop market intelligence, for example about market and business cycle trends that can affect their sourcing practices, market information and intelligence are the fundamental elements to configure dynamic response processes (Handfield, 2010). The concept of supply market intelligence can be defined as “a process for creating competitive advantage and reducing risks through increased knowledge of supply market dynamics and supply base composition” (Handfield, 2010, pp. 43–44).

A firm’s ability to sense information must be considered the starting point (Kohli and Jaworski, 1990). Information must be turned into knowledge through reconfiguration of resources and capabilities. The ability to capture value from intelligence is often referred to in relation to the absorptive capacity (AC) concept. According to Cohen and Levinthal (1990, p. 128), absorptive capacity refers to “the ability of a firm to recognize the value of new external information, assimilate it and apply it to commercial end.” The basic premise is that prior related knowledge is needed to assimilate and to use new knowledge.

AC depends on the links between individual capabilities and can be strengthened if a firm develops a broad network of internal and external relationships (Cohen and Levinthal, 1990). Thus, AC fosters value capture from buyer-supplier relationships (Azadegan, 2011; Sáenz *et al.*, 2014), supply networks (Narasimhan and Narayanan, 2013), supplier innovation capabilities (Azadegan *et al.*, 2008; Azadegan, 2011) and supplier sustainability (Meinlschmidt *et al.*, 2016).

The value of AC lies in the notion that existing knowledge is needed to acquire new knowledge (Rojo *et al.*, 2018). However, not only to react to upcoming information but also to proactively assess and update information and knowledge and be ahead of the competition, firm-level capabilities in developing and exploiting supply market intelligence and knowledge are needed. As supply market intelligence refers to a process where increased knowledge of supply markets and supply base are used, to develop this process further and to build and reconfigure new knowledge and capabilities, SMO as a firm-level capability is required and must be applied to the various supply market transactions that a firm is engaged.

Similar to AC, the dynamic capabilities view (DCV) also emphasizes the configuration of a firm’s resources, which requires continuous updating in the context of changing environments to develop a competitive advantage (Teece *et al.*, 1997; Eisenhardt and Martin, 2000). The DCV provides valuable insight into the capability-development process (Eisenhardt and Martin, 2000). Essentially, dynamic capabilities (DCs) are defined as “the firm’s ability to integrate, build and reconfigure internal and external competences to address rapidly changing environments” (Teece *et al.*, 1997, p. 516). A firm’s basic functional activities that permit the existence of a firm can be defined as zero-level (or ordinary) capabilities, whereas dynamic (or first-level) capabilities give the firm the capacity to understand its environment, recognize the value of other resources, and respond by extending, modifying or creating ordinary capabilities (Winter, 2003; Brandon-Jones and Knoppen, 2018). Teece (2007) further categorizes DCs into sensing, seizing and reconfiguring capacities, with sensing referring to the capacity to scan, detect, identify and interpret new opportunities and threats, and seizing being about how the firm is able to seize these opportunities by forming decision-making structures and procedures. By reconfiguring, the firm is able to align and realign the specific assets to enable the renewal and to keep the resource base in line with the sensed opportunities and detected changes (Teece, 2007). Thus, DCs enable firms to continually monitor and renew their functional competencies as a response to a rapidly changing competitive context (Cao *et al.*, 2012). Therefore, DCs can be specific processes or routines that enable the combination, transformation or renewal of resources into new capabilities as markets evolve (Eisenhardt and Martin, 2000; Teece, 2007).

Based on the provided definitions of AC and DC, we synthesize the two conceptualizations for the purpose of this study as suggested by recent studies attempting to unify the two theoretical perspectives in their application to the supply chain context (Volberda *et al.*, 2010; Sáenz *et al.*, 2014; Rojo *et al.*, 2018). In the context of the synthesis, the description of knowledge to the supply base has recently received close attention (Roldán Bravo *et al.*, 2016) and was coined as a

descriptive capacity of the buyer (Meinlschmidt *et al.*, 2016) and was identified as a dynamic capability (Hu *et al.*, 2015).

The interplay of the absorptive and the descriptive capacity is at the core of a SMO capability. Successful firms redeploy internal and external resources and capabilities through internal coordination and integration in their pursuit to capture value creation opportunities (Hodgkinson *et al.*, 2012; Najafi-Tavani *et al.*, 2016) and to attain temporal congruence with the external environment (Teece *et al.*, 1997). As such, dynamic capabilities have the potential to affect organizational processes or organizational outcomes, suggesting an indirect link between dynamic capabilities and firm-level performance (Zott, 2003; Barreto, 2010). Thus, by conceptualizing SMO as such a dynamic capability, we assume an indirect link between SMO and a buying firm's operational and financial performance.

## Case study methodology

### Rationale and sampling

Even though existing research has provided a number of ideas on what SMO could entail, it is not yet clear what actually constitutes SMO, how it is developed, how it differs within and across firms, and which contextual factors can explain such differences. Following our research questions, we sought to explore this focal phenomenon in the context in which it occurs (Meredith, 1998) while embracing existing findings and theory for a substantiation of our results (Eisenhardt, 1989; Yin, 2018). In this regard, our research approach can best be described as theory elaboration (Vaughan, 1992). Following the suggestion from Fisher and Aguinis (2017), we pursue theory elaboration in order to specify a new construct, SMO by also making use of horizontal contrasting that helps to refine existing theoretical ideas, like market orientation, in a new context. In particular, we applied a qualitative, inductive research design composed of multiple case studies with embedded multiple units of analysis (Eisenhardt, 1989; Yin, 2018). This approach allowed us to identify and explore relevant constructs and interrelationships, adding description and understanding of the interactions, meanings and processes that constitute real-life settings (Gephart, 2004). In doing so, we extended the DCV to the realm of our study, providing a theoretical rationale for our empirically derived concept and research propositions.

In selecting cases, we followed a theoretical sampling logic that allowed us to replicate and extend findings and theory by exploring and understanding important categories, properties, and interrelationships (Meredith, 1998). Therefore, cases were chosen for their potential to illuminate and extend the relationships and logic among constructs—that is, for their potential contribution to theory development within the set of cases (Glaser and Strauss, 1967; Eisenhardt, 1989; Eisenhardt and Graebner, 2007). Thus, the cases allowed for relational inference (Meredith, 1998) rather than representational inference from a random population sample (Flyvbjerg, 2006).

We restricted our initial population to large firms (turnover > USD\$5 billion; employees > 15,000), thus constraining variation due to size differences and regional idiosyncrasies. We assumed that such large firms have an overall greater need and resource endowment towards a SMO. For reasons of external validity, we deliberately attempted to build a theoretical sample

comprising firms operating in different businesses, mainly manufacturing and service sectors as well as a hybrid of these two (Allred *et al.*, 2011). Moreover, we required variation regarding supposedly relevant contextual factors at the firm and the purchasing-category level. Thus, our main observational unit of analysis was the firm, whereas the major purchase categories of the firm served as explanatory sub-units of analysis (Wilhelm, 2011).

We first selected a manufacturing firm (ALPHA) and a service firm (ECHO), each with a supposedly heterogeneous supply environment in terms of different purchase categories. ALPHA's spend data was characterized by mostly direct material ranging from raw materials and simple commodity parts to complex modules with a large product variety. ECHO'S purchase portfolio was characterized by a relatively large proportion of professional service contracts and less emphasis on direct parts and components. Based on emergent findings from the first two cases, we selected incremental cases to facilitate the replication and extension of the findings and theory (Eisenhardt, 1989; Yin, 2018). Thus, our sampling strategy shifted from typical cases (ALPHA and ECHO) to diverse cases based on theoretical sampling (BRAVO, CHARLIE and DELTA) (Seawright and Gerring, 2008; Pratt, 2009) for a more sophisticated understanding of differences in the nature of SMO and related interdependencies. CHARLIE is a replication of ALPHA with a procurement focus on technical parts, specified components and technically complex modules; DELTA is a replication of ECHO with a focus on diverse service and technical equipment. Finally, BRAVO is a hybrid case because the firm equally engages in manufacturing of products and services around their products. To identify these case companies, we relied on publicly listed firms in Germany and called approximately 40 firms that met our sampling criteria. We interviewed the firms that agreed to participate using extensive case study interviews. Table 1 characterizes our final sample comprising the five firms.

### Data collection and selection of informants

To investigate the focal phenomena from different angles, tapping into a wide range of individual experiences and perspectives, we used numerous informants (Jick, 1979; Stuart *et al.*, 2002; Eisenhardt and Graebner, 2007). We first approached purchasing managers because the purchasing function is usually the major interface to firms' upstream supply chains. Also, the inclusion of purchasing managers allowed us to better gauge supplier relationships (Frohlich and Westbrook, 2001) and integration with other internal functions. We then approached additional informants in liaison, commercial, or technical non-purchasing positions. An illustration of our data collection and informant selection is provided in Table 1.

Data collection comprised in-depth interviews with informants to gain an understanding of the phenomena (Pratt, 2009), including the meanings ascribed by informants to actions and settings (Gephart, 2004). We developed semi-structured interview protocols with open-ended questions to enable managers to describe events and processes, to facilitate comparability of findings, and to retain the flexibility to probe deeper into emergent themes by eliciting examples, illustrations, and other insights (Fawcett *et al.*, 2012). The interviews lasted 45 to 90 minutes and were added until we

Table 1 Sample characteristics

Case firm	Industry	Turnover	# Employees	#Informants	#Interviews	Functional areas involved in the interview process (no exact job titles; possibly more than one informant from the same functional area)
ALPHA	Manufacturing	>\$50bn	>100,000	10	12	Purchasing (strategy, controlling, market intelligence, category management) Liaison functions (procurement engineering, commodity engineering) Other technical functions (quality, R&D)
BRAVO	Manufacturing and services	>\$50bn	>100,000	6	7	Purchasing (strategy, project purchasing) Liaison functions (cost engineering) Other commercial functions (customer projects) Other technical functions (engineering, R&D)
CHARLIE	Manufacturing	\$7bn	<50,000	8	8	Purchasing (strategy/processes, controlling, category management) Other commercial functions (marketing, sales) Other technical functions (engineering)
DELTA	Services	>\$50bn	>100,000	8	8	Purchasing (strategy, category management) Liaison functions (procurement engineering) Other commercial functions (marketing strategy, marketing operations) Other technical functions (engineering, product innovations)
ECHO	Services	\$10–50bn	50,000–100,000	8	8	Purchasing (CPO, subunit CPO, strategy, controlling, communications) Other commercial functions (sales)

reached theoretical saturation (Glaser and Strauss, 1967; Eisenhardt, 1989). Theoretical saturation was achieved once the research team could no longer identify new codes that would help to explain SMO further.

We conducted between seven and 12 interviews per firm. All interviews were transcribed as a basis for coding analysis according to Strauss and Corbin (1998), resulting in approximately 700 pages of interview transcripts in total. Out of the total 40 informants, 28 held purchasing positions, seven held marketing and sales positions, and five held quality, engineering, or R&D positions. The interviews conducted at each firm were supplemented with a questionnaire to complement and challenge interview responses. This survey was aimed to be an exploratory collection of contextual data and was not intended for statistical analysis and to provide the opportunity for the research team to familiarize itself with the interviewed company before the actual interviews. Given that each interviewee also filled in the questionnaire enabled us to triangulate between qualitative interview data, structured survey results and other firm internal data sources (e.g. guidelines, process documentation, performance reports) made available to the research team. Furthermore, we collected secondary data in the form of publicly available documents (e.g. annual reports).

### Data analysis

We first conducted a within-case analysis, generating single case representations in the form of detailed, descriptive write-ups (Ellram, 1996; Barratt et al., 2011). The within-case analysis results were then used as a basis for cross-case

synthesis, which involved identifying, comparing and contrasting patterns across cases in search of similarities and differences among cases and groups of cases (Eisenhardt, 1989; Yin, 2018). In doing so, we added order to the emergent conceptualization of SMO by explicitly delineating patterns (Whetten, 1989).

A manual coding process was used to reflect the diverse and nuanced answers as well as the linguistic and firm-related variety of informants' language (Fawcett et al., 2012). First, we derived first-order codes and provisional codes (Pratt, 2009) by following open coding procedures (Strauss and Corbin, 1998). Data and emergent results were then used together with the literature to derive second-order codes and to unfold theory (Pratt, 2009) by using axial and selective coding procedures. This allowed us to consolidated specific but related codes into broader, more theoretical categories (Strauss and Corbin, 1998). Two researchers coded the data set. First, these two researchers coded a subset of the empirical data set and compared their results to develop a joint understanding. Then, both researchers coded all cases based on a joint codebook. In the case of disagreement, both researchers met and discussed jointly the discrepancies. In case the researchers could not come to an agreement, further input from the company (e.g. in case of unclear information) and/or input from a third, experienced case study researcher was gathered.

### Results

In the following section, we develop a definition of SMO and discuss the concept and its elements. This way, we mainly build on our empirical case study observations while simultaneously

reflecting on the AC perspective and the DCV to underpin our results.

### An empirically derived definition of a supply market orientation capability

As a basis for the following discussion, Table 2 integrates detailed information about the practices observed at our cases in generating, disseminating and using supply market intelligence, thereby indicating differences and similarities within and across firms.

Our cases demonstrate that supply market intelligence comprises more than day-to-day information exchange between firms and their suppliers. Rather, supply market intelligence embraces multiple tiers of the upstream supply chain and the exogenous forces affecting them (e.g. regulation, technology, competition). Examples include analyses of suppliers' supply cost structures (ALPHA, BRAVO), supplier peer group analyses (DELTA), workshops with both complementary and competing part suppliers to create new technology ideas (ALPHA), and analyses of competitors' supply cost structures as a basis for benchmarking (ALPHA). Together with external financial analysts, DELTA conducts extensive financial supplier risk assessments. CHARLIE evaluates key commodity markets (e.g. crude oil) relevant to its directly sourced raw materials. BRAVO and DELTA do not directly source raw materials but analyze related markets along with internal and suppliers' cost structures to determine price trends for sourced parts and products. A purchasing executive at BRAVO stated the following:

Of course, in the sense of market intelligence, we know very well how [raw material] prices develop. [...] If there is a 30% rise in copper prices, we can tell quite well what that means for the final product. For this, we made assessments [...] to determine the copper content [...] in our [sourced and final] products.

Moreover, supply market intelligence embraces not only current suppliers and supply markets but also potential suppliers and supply markets. This pertains, for example, to technology and innovation screening (ALPHA, BRAVO, DELTA). ALPHA recently collaborated with a consultancy firm to evaluate supply market structures and potential suppliers for plastic parts in China. A global purchasing analysis team at BRAVO evaluates opportunities and risks in potential supply markets, including market structure and supplier analyses along with macro-economic analyses. CHARLIE evaluates opportunities and risks in raw material markets as part of its extensive supply risk management. DELTA and ECHO evaluate suppliers' technical capabilities together with product and service trends to improve their own product and service portfolios. Table 2 provides an overview of practices for each case across the three phases of SMO.

Our case observations show that the purchasing function plays a critical role in the generation and, in particular, the dissemination of supply market intelligence due to its strong interface with supply markets and its boundary-spanning role inside the buying firm. This is reflected in the statement by a senior purchasing executive at ECHO:

People identify us [purchasing] as an information pool in any situation. We are often the contact persons for all sorts of things. [...] Through permanent dialog, we are always some kind of catalyst: we pass on information, place it appropriately, establish contacts, communicate, facilitate[...] that's also part of our job.

However, supply market intelligence is not the sole responsibility of the purchasing function (Table 2). In fact, its highly interdisciplinary nature (e.g. macroeconomic, technical and financial analyses) requires integration with other functions, including liaison functions. Even though the case firms differ in their specific efforts, most of them use supply market intelligence in strategy formulation, risk management, supplier management and performance management. Therefore, firms develop abilities to create valuable knowledge emanating from the dispersed and specialist supply market intelligence and to beneficially embed this knowledge into practices, processes, and organizational routines. Here, we refer to knowledge as information and know-how (Kogut and Zander, 1992), which includes, for instance, market research know-how (ALPHA, BRAVO, CHARLIE), forecasting know-how (ALPHA, CHARLIE) and cost and process analysis know-how (BRAVO).

Our observations suggest that exploiting supply market intelligence allows firms to project whether certain resources (or combinations thereof) will be more or less beneficial. Resource complementarities can provide advantages in that multiplicative effects surpass the gains from deploying resources individually (Siggelkow, 2002; Das et al., 2006). At ALPHA and CHARLIE, exploiting supply market intelligence improves supply risk management and enables fast and flexible response to supply market changes. Exploiting supply market intelligence improves supplier management, strategy formulation, quality management and the development of new products at ALPHA, BRAVO and DELTA. At ALPHA, it also enables the timely development of alternative technologies and new suppliers. Thus, exploiting supply market intelligence enables firms to deploy their resources in purchasing and supply management more effectively.

By following the DCV framework by Teece (2007), SMO can be broken down into the capacity to assess and sense opportunities and threats through supply market intelligence and to integrate this intelligence to seize opportunities and to enhance and reconfigure available resources in purchasing and supply management. A similar notion has been put forward by Menguc and Auh (2006), who suggested that a customer market orientation is transformed into a dynamic capability when complemented by reconfigurational capabilities. Thus, the DCV provides an understanding of the process by which firms transform the dispersed resources available in purchasing and supply management into the distinctive capability of SMO. Based on our case firm observations provided in Table 2 and our theoretical arguments, we are now able to articulate the following definition of SMO: SMO refers to the capability of a firm to exploit supply market intelligence to assess, integrate and reconfigure the heterogeneously dispersed resources in purchasing and supply management in a way that best reflects the peculiarities of the firm's supply environment.

This definition recognizes the concept of supply market intelligence and thus reflects the basic information procedural aspects of the extant conceptualizations of market orientation. However, it explicitly addresses the beneficial exploitation of supply market intelligence. Second, the definition recognizes the diverse practices in purchasing and supply management that have been adopted individually by firms to tackle the challenges of their particular supply environments. However,

Table 2 Case analysis display: supply market intelligence generation, dissemination and use

Case firm	Supply market intelligence generation	Supply market intelligence dissemination	Supply market intelligence use
ALPHA	<p><b>Intra-functional (purchasing central):</b> Macroeconomics, firm-wide markets/suppliers (e.g. raw material markets), competitors (e.g. global sourcing/cost structures)</p> <p><b>Intra-functional (purchasing local):</b> Specific/ad hoc analyses (e.g. regional markets/suppliers), bundling potentials, cost benchmarking, technology screening</p> <p><b>Cross-functional (commodity/procurement engineering):</b> Technical market/supplier analyses (e.g. cost structures, processes, quality), technology/innovation scouting, joint analyses with suppliers (e.g. process optimization/innovation workshops)</p> <p><b>External (market researchers/consulting):</b> Macroeconomics, raw material/commodity markets (e.g. price indices), specific ad hoc analyses (e.g. plastics markets in China)</p>	<p><b>Intra-functional (purchasing central and local):</b> (De-)centralized regular and ad hoc collection/dissemination</p> <p><b>Cross-functional:</b> Meetings/discussions (e.g. strategy review, technology council) Teams (e.g. material strategy teams: purchasing, R&amp;D, quality) Processes (e.g. quality monitoring/management, contract design) Projects (e.g. product lifecycle management, cost optimization) Liaison functions (commodity/procurement engineering) Ad hoc to technical functions such as R&amp;D and quality (e.g. technology/innovation roadmaps, preferred suppliers/materials) Very little active ad hoc to sales (e.g. preferred suppliers)</p>	<p><b>Intra-functional (purchasing central and local):</b> Strategy formulation (e.g. supply base development, global sourcing, cost optimization, technology roadmaps), risk management (e.g. currency/commodity hedging, availability/quality assurance), negotiation, supplier management and development, target setting, performance evaluation, budgeting, reporting</p> <p><b>Cross-functional:</b> Strategy formulation (e.g. outsourcing initiatives, cost analyses in business strategy, technical supplier analyses in strategies of R&amp;D/quality), product lifecycle management, value engineering, product development, budgeting, planning (price, quality, capacity), reporting</p>
BRAVO	<p><b>Intra-functional (purchasing central):</b> Macroeconomics, supply base (e.g. competitive/cost structure, wages, skill levels), market potentials and risks, early indicators</p> <p><b>Intra-functional (purchasing local):</b> Specific/ad hoc analyses (e.g. regional markets/suppliers with respect to quality, technology, opportunities and risks)</p> <p><b>Cross-functional (cost engineering):</b> Technical market/supplier analyses (e.g. cost structures, processes), supplier benchmarks (incl. competitors), technical support of specific/ad hoc analyses (e.g. market opportunities/risks)</p> <p><b>External (market researchers):</b> Macroeconomics, raw material/commodity markets</p>	<p><b>Intra-functional (purchasing central and local):</b> (De-)centralized regular and ad hoc collection/dissemination</p> <p><b>Cross-functional:</b> Regular standard analyses (e.g. price, availability) Ad hoc analyses (e.g. new market evaluations/potentials/risks) In-house development/manufacturing context: Projects (active/on-demand)/little active ad hoc dissemination Liaison functions (cost engineering) Customer service/integrated solutions context: Projects (on-demand)/very little active ad hoc dissemination</p>	<p><b>Intra-functional (purchasing central and local):</b> Strategy formulation (e.g. supply base development, cost reduction roadmaps with key suppliers), risk management (existing and new markets), product cost structure analyses, price benchmarks, negotiation, supplier management and development, target setting, performance evaluation, budgeting, reporting</p> <p><b>Cross-functional:</b> Projects (e.g. supplier selection, evaluation, development), sourced innovation and utilization of suppliers' technical capabilities in the context of in-house product/service development, planning</p>
CHARLIE	<p><b>Intra-functional (purchasing central):</b> Macroeconomics, broad market/supply base analyses</p> <p><b>Intra-functional (purchasing local):</b> Specific/ad hoc analyses (e.g. regional markets/suppliers with respect to price, delivery, quality, technology), regular/ad hoc raw material market analyses (e.g. market overview/potentials/risks,</p>	<p><b>Intra-functional (purchasing central and local):</b> (De-)centralized regular and ad hoc collection/dissemination</p> <p><b>Cross-functional:</b> Regular IT-based dissemination of raw material analyses/reports Limited additional active dissemination to marketing and sales (e.g. ad hoc analyses in case of</p>	<p><b>Intra-functional (purchasing central and local):</b> Strategy formulation (e.g. raw material strategies), risk management, negotiation, supplier management and development (technical equipment and machinery), target setting, performance evaluation, reporting</p> <p><b>Cross-functional:</b> Strategy formulation (e.g. business unit strategies based on raw material/product structure analyses), negotiation support for sales (raw material</p>

(continued)

Table 2

Case firm	Supply market intelligence generation	Supply market intelligence dissemination	Supply market intelligence use
DELTA	<p>competitor benchmarks, price forecasts/variance analyses)</p> <p><b>External (market researchers):</b> Macroeconomics, raw material/commodity markets (e.g. crude oil, steel, plastics) to complement extensive internal efforts</p> <p><b>Intra-functional (purchasing central):</b> Macroeconomics, broad market supply base analyses, competitors (incl. peer groups), suppliers (e.g. market shares, financials), raw material/commodity labor markets, product trends</p> <p><b>Intra-functional (purchasing local):</b> Specific/ad hoc analyses (e.g. regional markets/suppliers, detailed analyses of price/product developments and trends)</p> <p><b>Cross-functional (procurement engineering):</b> Technical supplier analyses (e.g. cost structures/processes)</p> <p><b>External (market researchers/financial analysts):</b> Financials (Bloomberg), specialized market research platforms</p>	<p>unforeseen events/crises)</p> <p>Meetings (e.g. budgeting, strategy, pricing/engineering councils)</p> <p>Projects in technical equipment and machinery (largely commercial analyses by purchasing on-demand of other functions)</p> <p><b>Intra-functional (purchasing central and local):</b> (De-)centralized regular and ad hoc collection/dissemination</p> <p><b>Cross-functional:</b> Supply market reports (developments/trends in major categories)</p> <p>Supplier books (consolidated intelligence on strategic suppliers)</p> <p>Meetings (e.g. budgeting, planning, strategy)</p> <p>Liaison functions (procurement engineering)</p> <p>Projects (mostly on-demand, for example firm-wide cost optimization projects, mobile/fixed line network construction projects)</p>	<p>analyses), customer contract design (price escalation clauses)</p> <p><b>Intra-functional (purchasing central and local):</b> Strategy formulation (e.g. supply base development), cost/price benchmarking, risk management (operational/financial), negotiation, supplier management and development, budgeting, target setting, reporting</p> <p><b>Cross-functional:</b> Cost-benefit analyses, business case calculation (cost/price aspects), supplier evaluation and selection, technical cost optimization initiatives, product/service portfolio management, strategic firm-wide cost optimization projects, budgeting, planning</p>
ECHO	<p>Macroeconomics (very limited), few broad market analyses</p> <p><b>Intra-functional (purchasing local):</b> Specific/ad hoc analyses (e.g. regional markets/suppliers), product/service innovations/technology trends (limited scope)</p> <p><b>External (market researchers):</b> Macroeconomics, standard raw material/commodity markets (e.g. steel, copper, wood, plastics, crude oil, fuel)</p>	<p><b>Intra-functional (purchasing central and local):</b> Little centralized collection/dissemination (broad overviews)</p> <p>Ad hoc dissemination at subgroup level (diverse efforts)</p> <p><b>Cross-functional:</b> Meetings (e.g. status/market reports delivered by purchasing)</p> <p>Ad hoc management reports (e.g. board, subgroup management)</p> <p>Projects (largely restricted to standard issues: price, availability)</p>	<p><b>Intra-functional (purchasing central and local):</b> Strategy formulation (e.g. supply base development, spend/category management, insourcing), risk management, basic supplier management and development</p> <p><b>Cross-functional:</b> Business case calculation, quotation costing, tender preparation, supplier evaluation/selection, reciprocal business deals (suppliers' portfolio/earning power)</p>

dynamic and responsive markets require firms to manage their upstream supply chains more strategically (Liao *et al.*, 2010). Thus, our definition builds on the DCV to incorporate the notion that firms not only accumulate dispersed information and knowledge as resources but also assess integrate and reconfigure internal resources as a result of the generated intelligence in a way that best fits their supply environment.

#### Elements of supply market orientation

Our cases provide evidence for the existence of different elements of SMO, which is in line with research suggesting that dynamic capabilities exhibit common features but are

idiosyncratic in their details (Eisenhardt and Martin, 2000). First, the elements of SMO can differ with regard to their organizational level. While firm-level elements span different purchase categories, category-level elements are specific to a certain purchase category. Category-level elements include, for instance, efforts of individual category managers to conduct specific analyses of materials, parts and suppliers. Firm-level elements include, for example, a corporate supply market intelligence department at ALPHA, a global purchasing analysis team at BRAVO and a market research team in purchasing strategy at DELTA, as well as category-spanning market intelligence generation and dissemination processes. As

individual category managers' efforts are inevitably limited in scope and sophistication, such firm-level elements of SMO are of utmost importance to complement category-level efforts.

The elements of SMO can furthermore be divided into reactive and proactive elements. Reactive elements reflect a defensive stance and are often related to specific customer market-related demands by internal stakeholders. A category manager at CHARLIE noted the following:

When a business unit would like to advance a new product [...], then it's our task to evaluate: Which are the right raw material sources? Where are they? Which [raw material] specifications are necessary to arrive at the final product?

A customer service manager at BRAVO critically appraised the reactive element:

The information may be available, or may be obtainable, but it's not push information. [...] Purchasing does not provide quarterly overviews, for example of certain markets. [...] If we have a specific project, or a potential customer, or if we have entered the tendering stage, and we place specific requests, then purchasing is absolutely capable of delivering the information. But it's not delivered proactively.

This process is illustrated in the bottom part of Figure 1.

On the other hand, proactive elements reflect a preventive stance and an endeavor to delve into uncharted territory. As such, they often relate to risk and innovation, with the aim of proactively pushing supply market opportunities and risks into the firm. Hence, supply market intelligence (SMI) is generated in anticipation of its value, as opposed to the reactive case (top part of Figure 1). As a purchasing manager at CHARLIE remarked:

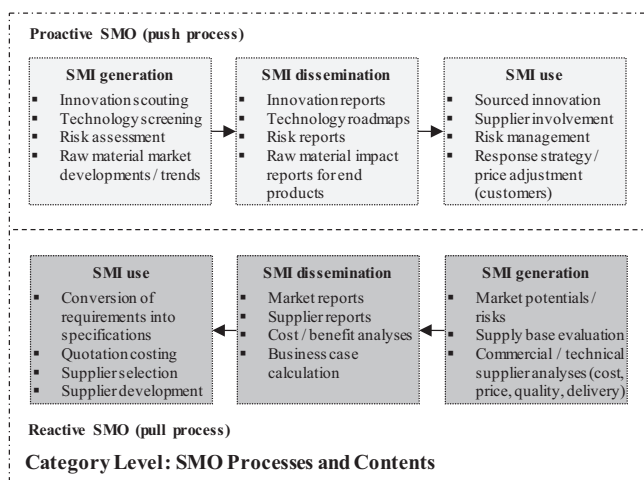
Through market intelligence, that is, an understanding of supply markets and their dynamics, we try to be faster than our competitors to understand in which direction markets are moving. [...] Anticipating market developments can be advantageous for the firm.

A purchasing executive at ECHO noted the following:

As we are close to the markets, to the industry, to manufacturers, to large retailers, we are quite close to new products, innovations and trends. [...] For this, we have to identify market novelties and innovations as fast as possible, evaluate their relevance for our business and, of course, position them accordingly [in the firm] and place them in our offers.

A senior purchasing executive at BRAVO stated that "Purchasing needs to be ahead in terms of knowledge. It should not happen that development approaches with a supplier or a

**Figure 1** Proactive and reactive elements of supply market orientation



technology that purchasing does not know about yet." Essentially, the proactive elements of SMO reflect the notion that performance benefits through dynamic capabilities lie not only in a firm's ability to transform extant resources but also in doing this in a rapid and timely manner, ahead of competitors (Eisenhardt and Martin, 2000; Teece, 2007). Figure 1 illustrates both elements of SMO.

### Contextual antecedents of supply market orientation

During our exploration, we identified four important contextual antecedents that help explain the emergence of SMO in our case firms: the degree of outsourcing, purchase complexity, supply base complexity and supply market dynamism. Table 3 provides insights into the crucial facets of our observations concerning the contextual antecedents, and Table 4 integrates selected cross-case patterns that support our research propositions concerning the contextual antecedents and the configuration of the SMO capability. The graphical summary of the findings is provided in Figure 2. Further contextual antecedents – like use of technology – were also part of the interviews but did not help to explain the observed variance across the cases and thus are not further discussed in the manuscript.

Our case findings provide evidence that the emergence of SMO in firms is influenced by the degree of outsourcing. Therefore, we define the degree of outsourcing as the degree to which a firm sources materials, parts and services from its suppliers rather than developing and manufacturing those materials, parts and services in-house. We measured the degree of outsourcing by dividing the overall sourcing volume of the firm by its annual sales (Table 3).

The cases show examples of how the degree of outsourcing impacts the emergence of certain elements of SMO, such as technical supplier analyses and innovation scouting associated with specific sourced parts, components, products and services at ALPHA, BRAVO and DELTA. In these cases, inputs (e.g. parts, components, services) and operations (e.g. manufacturing, product development) are less visible to firms, resulting in higher supply-related uncertainty – for example, with regard to cost, delivery, quality and technology. Thus, there is an increased need for firms to acquire and process information and knowledge (Koufteros *et al.*, 2007; Stonebraker and Liao, 2006; Wong *et al.*, 2011). A purchasing executive at BRAVO stated the following:

We are definitely on the way toward outsourcing more. [...] We are increasingly buying building blocks. That means that we lose knowledge, for example, in product development. [...] In terms of outsourcing, when you just buy complete servers, you no longer know what happens there. However, such knowledge should nevertheless still be available in purchasing.

Furthermore, our cases show that an increasing overall degree of outsourcing influences the emergence of firm-level elements of SMO, such as category-spanning market intelligence generation and dissemination processes (ALPHA, BRAVO, DELTA), the corporate supply market intelligence department at ALPHA, the global purchasing analysis team at BRAVO and the market research team in purchasing strategy at DELTA. Such firm-level elements can effectively complement category-level elements across different purchase categories, resulting in synergies that can be beneficially deployed by firms. As the cases of ALPHA, BRAVO and DELTA show, firms that exhibit a high degree of outsourcing generally

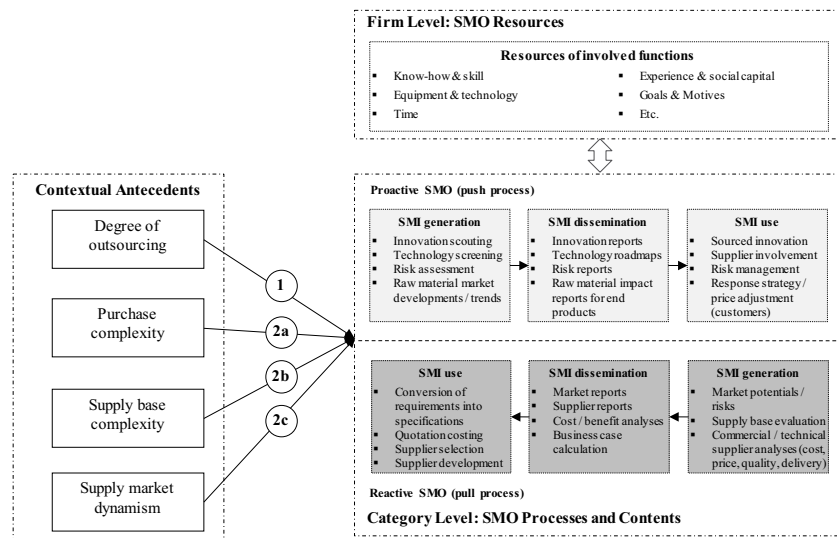
Table 3 Case analysis display: purchase complexity, supply base complexity and supply market dynamism

Case firm	Degree of outsourcing	Purchase complexity	Supply base complexity	Supply market dynamism
<b>ALPHA</b>	High degree of outsourcing (e.g. modules, integrated solutions, mobile devices)	Annual third-party spend: ~ \$45bn Heterogeneous material spend, predominantly technical parts/components/modules (mechanical, electronic, electromechanical), raw materials/commodities, few technical services Standardization/modularization tendencies, extensive bundling (50% of direct materials), recurring and project-specific spend	Number of suppliers: ~ 90,000 Largest spend portions in Germany and the USA, strategic global sourcing efforts reflecting global relocation of production sites Long-term commitments with key strategic suppliers, extensive supply base reduction/consolidation efforts, overall highly qualified supply base (especially suppliers of key materials) Number of suppliers: ~ 25,000 Largest spend portions in Asia (especially China), Eastern Europe (mostly equipment: metal parts, cables, power supplies), Mexico (mostly low-cost country sourcing for the US market)	Low short-term price volatility/average predictability of price estimates for materials in major categories, except for some critical raw material/commodity markets (e.g. rare earth, copper) Overall, relatively low technological turbulence (particularly raw materials and mechanical parts), higher turbulence for electronic parts/modules
<b>BRAVO</b>	High degree of outsourcing (e.g. modules, integrated solutions, mobile devices)	Annual third-party spend: ~ \$50bn Heterogeneous material spend, predominantly high-tech parts/components/modules (mostly electronic, few mechanical), technical services, very few raw materials/commodities Standardization/modularization tendencies, integrated solutions, steadily growing project-specific spend (reflects shift in core business from manufacturing to services/integrated solutions)	Long-term commitments with key strategic suppliers, growing spend concentration at global strategic suppliers (e.g. global contract manufacturers), overall highly qualified supply base Number of suppliers: ~ 25,000 Largest spend portions in Europe, growing portions in Asia and Latin America (reflecting global relocation of production sites) Long-term commitments with key suppliers of technical equipment/machinery (incl. initial consolidation efforts), short-term for raw materials (even spot market purchase)	Low short-term price volatility/high predictability of price estimates for materials in major categories (long-term commitments), except for some critical raw material markets (e.g. rare earth) Overall very high technological turbulence (particularly for high-tech electronic parts)
<b>CHARLIE</b>	High degree of outsourcing (e.g. modules, integrated solutions, mobile devices)	Annual third-party spend: ~ \$5bn Highly heterogeneous raw material spend (approx. 6,000), technical equipment/machinery (for in-house manufacturing) Mostly recurring spend, low standardization/bundling potentials, most strategic spend management efforts focus on raw materials	Number of suppliers: ~ 25,000 Largest spend portions in Europe, growing portions in Asia and Latin America (reflecting global relocation of production sites) Long-term commitments with key suppliers of technical equipment/machinery (incl. initial consolidation efforts), short-term for raw materials (even spot market purchase)	Very high short-term price volatility/low predictability of price estimates for most raw materials, but not for technical equipment/machinery Overall low technological turbulence (minor turbulence for technical equipment/machinery)
<b>DELTA</b>	High degree of outsourcing (e.g. modules, integrated solutions, mobile devices)	Annual third-party spend: ~ \$28bn Diverse technical goods (mobile devices, terminal equipment, hardware, IT systems, network construction machinery/equipment), diverse technical services (network construction, maintenance and facility, multimedia and communication) Mostly recurring spend, low standardization/bundling potentials	Number of suppliers: ~ 35,000 Largest spend portions in Germany/the USA (services, construction), Asia (e.g. hardware, terminal equipment, mobile devices) Consolidation tendencies and long-term commitments in network construction, global suppliers of mobile devices, terminal equipment and hardware with rather short-term commitments	Low short-term price volatility/high predictability of price estimates for materials/services in major categories (constant price development) Rather high technological turbulence for most high-tech goods (e.g. hardware, mobile devices) and network technology (e.g. optical fibers)
<b>ECHO</b>	Low degree of outsourcing (e.g. facility services, maintenance services)	Annual third-party spend: ~ \$5bn Heterogeneous service spend, construction (building, civil engineering), maintenance (industrial, power), facility (technical, infrastructural, integrated), real estate, construction machinery/equipment, few commodities (e.g. steel, wood, industrial gases) Predominantly project-specific spend, few bundling potentials regarding construction machinery/equipment or commodities	Number of suppliers: ~ 100,000 Predominant spend portions in Europe (local-for-local sourcing) 2/3 of the supply base specialized local subcontractors (long-term relationships), no firm-wide established comprehensive supplier management, little consolidation (local-for-local), still lack of transparency over the very heterogeneous supply base	Overall low short-term price volatility for materials/services in major categories, but low predictability of price estimates (project-specific spend) Overall rather low technological turbulence for materials/services in major categories

Table 4 Cross-case patterns supporting the impact of contextual antecedents on the emergence of supply market orientation

Antecedent	Case firm(s)	Antecedent condition	Supply market orientation
<b>Degree of outsourcing (Proposition 1)</b>	ECHO	Low degree of outsourcing (e.g. facility services, maintenance services)	Basic supply market orientation (e.g. day-to-day information exchange with subsidiaries, few technical/commercial market analyses)
	ALPHA, BRAVO, CHARLIE, DELTA	High degree of outsourcing (e.g. modules, integrated solutions, mobile devices)	Advanced supply market orientation (e.g. technical supplier and market analyses, analyses of raw material market impacts on sourced goods)
<b>Purchase complexity (Proposition 2a)</b>	ALPHA, BRAVO, CHARLIE	High heterogeneity (e.g. parts/components/modules, raw materials)	Advanced supply market orientation (e.g. firm-wide market and supplier analyses, analyses of bundling potentials/standardization potentials)
	ALPHA, BRAVO, DELTA	High technical complexity (e.g. electronic components, mobile devices)	Advanced supply market orientation (e.g. technical supplier and market analyses, cost structure analyses, joint analyses with suppliers)
	ALPHA, BRAVO, DELTA, ECHO	Low technical complexity (e.g. standard mechanical parts/construction services)	Basic supply market orientation (e.g. operational information exchange with first-tier suppliers regarding price and availability)
	ALPHA, BRAVO, DELTA	High innovativeness (e.g. electronic parts, mobile devices, hardware)	Advanced supply market orientation (e.g. technical supplier and market analyses, technology and innovation screening, competitor analyses)
	ALPHA, BRAVO, DELTA, ECHO	Low innovativeness (e.g. standard parts/facility and construction services)	Basic supply market orientation (e.g. operational information exchange with first-tier suppliers regarding price and availability)
	<b>Supply base complexity (Proposition 2 b)</b>	ALPHA, BRAVO, CHARLIE	High geographical dispersion (e.g. globally dispersed supply base)
ECHO		Low geographical dispersion (e.g. local subcontractors mostly in Central Europe)	Basic supply market orientation (e.g. day-to-day information exchange with subcontractors on commercial/technical developments)
BRAVO, DELTA		High supplier consolidation (high reduction of suppliers and high effort for reducing the number of suppliers; e.g. global manufacturers of hardware/devices)	Basic supply market orientation (e.g. standardized information exchange with global manufacturers on relevant developments)
ALPHA, BRAVO, CHARLIE		Low supplier consolidation (low reduction of suppliers and low effort for reducing the number of suppliers; e.g. variety of available suppliers for electronic parts)	Advanced supply market orientation (e.g. broad market and supply base analyses, supplier benchmarking, structural market analyses)
ALPHA, BRAVO		High supplier qualification (e.g. longtime suppliers of critical parts/components)	Basic supply market orientation (e.g. information exchange with suppliers on relevant developments, few broader market analyses)
ALPHA, BRAVO		Low supplier qualification (e.g. suppliers of new parts and components)	Advanced supply market orientation (e.g. technical supplier and market analyses, cost structure and process analyses, quality assessments)
<b>Supply market dynamism (Proposition 2c)</b>		ALPHA, CHARLIE	High price volatility (e.g. raw material markets)
	DELTA, ECHO	Low price volatility (e.g. construction services of local subcontractors)	Basic supply market orientation (e.g. <i>ad hoc</i> information exchange with subcontractors in case of unforeseen developments)
	ALPHA, BRAVO, DELTA	High technological turbulence (e.g. high-tech electronic parts/components/devices)	Advanced supply market orientation (e.g. technology and innovation screening, technical supplier and market analyses, competitor analyses)
	ALPHA, BRAVO, DELTA, ECHO	Low technological turbulence (e.g. standard parts, construction/facility services)	Basic supply market orientation (e.g. standardized information exchange with suppliers with regard to price and availability)

Figure 2 Summary of findings



require more advanced capabilities to generate information about their supply environment and to integrate and reconfigure the dispersed resources available in purchasing and supply management.

Our empirical results are strengthened by the existing research that relates a higher degree of outsourcing to increased reliance on the supply base (Choi and Krause, 2006), the increased relevance of supply base management to a firm's bottom line (Krause *et al.*, 2001), and an increased need to deploy supply management to create synergies across the supply chain (Gunasekaran, 1999; Narasimhan *et al.*, 2004). Moreover, scholars have argued that firms with a higher degree of outsourcing place greater emphasis on the purchasing function (Monczka *et al.*, 1998) and usually have a higher propensity to think about suppliers in a strategic way (Krause, 1999). All these arguments lead to the following research proposition:

*P1.* The higher the degree of outsourcing, the more likely elements of advanced SMO can be observed in the firm.

As a basis for the following discussion, Tables 3 and 4 also integrate information about case firms concerning the three antecedents of purchase complexity, supply base complexity and supply market dynamism, thereby indicating differences and similarities within and across firms.

Our case observations demonstrate that a large number of heterogeneous purchases (ALPHA, BRAVO, CHARLIE, DELTA) are associated with high supply-related uncertainty as firms have to deal with a broader variety of purchases and related supply markets. Similarly, the high technical complexity and innovativeness of purchases (ALPHA, BRAVO, DELTA) can result in high supply-related uncertainty (e.g. cost uncertainty due to complex component structures). On the other hand, standard goods and services typically change little over time and thus have stable patterns (Fisher, 1997), for example, regarding quality and technology.

In these instances, firms (ALPHA, BRAVO, DELTA) exhibit a greater need for advanced SMO (e.g. analyses of

bundling/standardization potentials, technical supplier analyses, innovation scouting, technology screening). Therefore, the case firms show that very innovative purchases especially lead to the emergence of more proactive, innovation-oriented elements of SMO (Figure 1). As a purchasing executive at ALPHA remarked regarding the need for SMO for innovative purchases:

For R&D, it is interesting to know which innovation roadmaps exist on the supplier side – however, only for materials with high innovativeness or materials that are subject to change. In electronics, this is permanently the case. In mechanics, things are different.

An R&D manager at BRAVO elaborated with respect to complex, non-standard purchases:

With regard to standards, we are comprehensively and adequately informed. With regard to non-standards, specific issues require individual solutions. [...] [In this case] we have many things that need to be clarified.

Thus, our cases show that different facets of purchase complexity (heterogeneity, technical complexity, innovativeness) impact the emergence of certain elements of advanced SMO (Table 4). Therefore, our understanding of purchase complexity is based on the definition by Jacobs and Swink (2011), which states that complexity is manifested by the multiplicity, diversity and functional interrelatedness of elements. With regard to purchased goods and services, an element can, for instance, be a function or a physical component.

Our results are supported by research that argues that increased complexity increases the need for the swift detection of failures, whether they are internal or external (due to the supplier) (Azadegan *et al.*, 2013). Moreover, firms with complex purchases can be considered more prone to delegate to and seek support from suppliers (González-Benito *et al.*, 2010). The purchase type (e.g. commodity, engineered part) was found to drive the required extent of supply market analysis (Kraljic, 1983). In doing so, firms reduce confusion, which becomes even more critical in a complex supply environment (Azadegan *et al.*, 2013). Based on these arguments, we state the following proposition:

P2a. The higher the purchase complexity, the more likely elements of advanced SMO can be observed in the firm.

Our cases (ALPHA, BRAVO, CHARLIE) demonstrate that a geographically dispersed supply base is associated with high supply-related uncertainty, as firms have to deal with a variety of complex factors such as legal restrictions, currency fluctuations, cultural differences and generally longer and more uncertain lead times. Thus, firms with a globally dispersed supply base are expected to exhibit elements of a more advanced SMO (e.g. analyses of global market price developments, specific regional supplier and supply market analyses).

A similar argument generally holds for the number of different suppliers in the supply base. In particular, firms with a less consolidated supply base (ALPHA, BRAVO, CHARLIE) exhibit a greater need for elements of advanced SMO (e.g. supplier benchmarking, structural market analyses) than firms with a highly consolidated supply base (BRAVO, DELTA). A senior purchasing manager at ECHO stated the following:

We already know supply markets relatively well. [...] For each material, there is only a handful of good and reliable suppliers, which we know well, plus one or two further local ones. Then, market analysis just means to stay in touch with everyone [the few suppliers], talk about capacities and equipment, and evaluate their [suppliers'] interest in our diverse projects.

Moreover, our case observations (ALPHA, BRAVO) indicate that firms that face high differentiation of suppliers concerning their technical capabilities – that is, firms with a less qualified supply base – face higher supply-related uncertainty (e.g. technology uncertainty, delivery uncertainty, input cost uncertainty). Thus, firms with a less qualified supply base for certain purchase categories (e.g. suppliers of new parts/components at ALPHA and BRAVO) require a more advanced SMO (e.g. technical supplier and supply market analyses, internal and external cost structure analyses and process analyses, supplier quality assessments).

Thus, our case firms provide evidence that several different facets of supply base complexity (geographical dispersion, supply base consolidation, supply base qualification) impact the emergence of certain elements of advanced SMO (Table 3). Therefore, our understanding of supply base complexity is based on research that defines supply base complexity in terms of the number of suppliers, the heterogeneity of suppliers, and the extent of the interaction between suppliers (Choi and Krause, 2006).

Our results are supported by research arguing that high supply base complexity requires increased efforts by firms in managing the supply base (Choi and Krause, 2006). In general, a larger number of suppliers for a part or component have been linked to an increased scope of supplier management. Supply base consolidation is thought to reduce the number of information flows, physical flows and relationships that need to be managed (Bozarth *et al.*, 2009). Moreover, a global supply base requires firms to look beyond price alone when making purchase decisions (Nellore *et al.*, 2001). We thus formulate the following proposition:

P2b. The higher the supply base complexity, the more likely elements of advanced SMO can be observed in the firm.

Our cases indicate that high supply market price volatility is related to higher levels of supply-related uncertainty for firms.

This pertains, for instance, to certain raw material markets at ALPHA and CHARLIE. Our results show that these firms require advanced capabilities to assess changes, combine them appropriately with current practice, and potentially trigger the reconfiguration of resources in purchasing and supply management. A senior purchasing manager at CHARLIE addressed the increased need for advanced SMO in the context of highly volatile raw material markets as follows:

It is clear that [supply market orientation] differs. In raw material sourcing, we can be attributed a 10 [on a scale from 1 to 10], if not an 11. You know the markets, you almost know everyone [suppliers] in person.

Furthermore, several case firms face technologically turbulent supply markets (e.g. electronic parts/modules at ALPHA and BRAVO, hardware/mobile devices/network construction technology at DELTA). These firms face higher supply-related uncertainty (technology uncertainty, input cost uncertainty). Thus, firms exhibit a greater need for certain elements of advanced SMO, including technology screening, innovation scouting and analyses of suppliers' production processes, as well as technical and design capabilities.

From a theoretical perspective, both market price volatility and technological turbulence constitute facets of supply market dynamism. In general, dynamism refers to unpredictability and an absence of patterns (Anderson and Tushman, 2001). Consequently, change occurs more rapidly and with greater magnitude (Rosenzweig, 2009). For the purpose of this paper, we define dynamism as the extent of instability and turbulence in the environment (González-Benito *et al.*, 2010). As our cases show, both increased market price volatility and technological turbulence lead to the emergence of proactive, risk- and innovation-oriented elements of SMO.

Our results are informed by research suggesting that discontinuous technological change is linked to environmental uncertainty (Tushman and Anderson, 1986). Moreover, technological turbulence is related to frequent changes in product design and functionality (Anand and Ward, 2004) and an inability to predict standards (Anderson and Tushman, 2001). In technologically turbulent market environments, characterized by emerging processes and materials, firms need to develop capabilities for observing the environment and for implementing responses more rapidly than their competitors (Stoffels, 1994; Yasai-Ardekani and Nystrom, 1996). Furthermore, technological change has been linked to firms' propensity to adopt a strategic perspective toward suppliers (Krause, 1999). All these arguments lead to our next research proposition:

P2c. The higher the supply market dynamism, the more likely elements of advanced SMO can be observed in the firm.

### Implications and effectiveness of supply market orientation

Our case analysis results demonstrate that supply market intelligence is disseminated to diverse firm-internal stakeholders, such as engineering, quality, R&D (ALPHA, BRAVO), marketing and sales (CHARLIE, DELTA), and used by these internal stakeholders in diverse ways. Moreover, our results indicate that firms increasingly use advanced

internal integration practices such as cross-functional teams and processes (ALPHA, BRAVO, CHARLIE) and liaison functions such as cost engineering and procurement engineering (ALPHA, BRAVO, DELTA). Thereby, SMO enables firms to make more informed integration decisions, for example, with regard to which functions to involve and to determining the magnitude and focus of internal integration practices in accordance with the specific supply environment. Case evidence for the type of cross-functional integration and its performance implications are summarized in Table 5.

Our cases furthermore indicate that exploiting supply market intelligence across categories on supply market structures, market prices and suppliers' capabilities enables more effective coordination and integration of the diverse purchasing departments (ALPHA, BRAVO, CHARLIE, DELTA, ECHO), thus enabling those firms to pursue purchasing strategies more effectively. Firms such as ALPHA and BRAVO exploit intelligence on suppliers' technical capabilities, cost structures and technology and innovation on supply markets for more effective integration of purchasing and technical

functions (e.g. engineering, R&D, quality), thus enabling those firms to pursue quality leadership, cost leadership or innovation strategies more effectively.

Moreover, SMO enables more effective integration of purchasing and commercial functions through the dissemination and use of knowledge on raw material market structures, price developments and trends, suppliers' technical and design capabilities, and innovation, enabling firms to pursue risk mitigation and cost leadership strategies (CHARLIE) and differentiation and innovation leadership strategies (DELTA) more effectively. A purchasing executive at CHARLIE remarked:

Seventy per cent of our purchasing strategy is based on external market developments. [...] Once we understand the markets, we derive internal activities. That means that we first look externally, then internally.

Finally, SMO enables liaison functions to conduct their tasks more effectively (ALPHA, BRAVO, DELTA).

The role played by SMO in internal integration pertains not only to internal integration practices initiated by the purchasing function. Rather, SMO enables functions across the firm to

Table 5 Supply market orientation and cross-functional integration effectiveness

Case firm (s)	Integration practice	Role of supply market orientation for internal integration and its effectiveness
ALPHA, BRAVO, CHARLIE, DELTA	Intra-functional integration (purchasing functions)	Exploitation of intelligence on global supply market structures, market price developments, new potential suppliers and markets → Increased effectiveness of strategy formulation, supplier selection/management, supply base development → Reduced cost, enhanced flexibility/delivery
ECHO	Intra-functional integration (purchasing functions)	Exploitation of intelligence on supply base characteristics, market structures, potential suppliers and markets, bundling potentials → Increased effectiveness of strategy formulation, initial supplier management efforts, basic supply base development → Reduced cost, enhanced flexibility/compliance/delivery
ALPHA, BRAVO	Purchasing and technical functions (e.g. engineering, R&D, quality)	Exploitation of intelligence on suppliers' technical capabilities/cost structures, technology and innovation on supply markets → Increased effectiveness of strategy formulation, quality management, product development, cost and process optimization → Reduced cost/development lead time, enhanced quality/flexibility/product innovativeness
CHARLIE	Purchasing and commercial functions (e.g. product management, marketing)	Exploitation of intelligence on raw material market structures, price trends, technological restrictions on markets, early indicators → Increased effectiveness of strategy formulation, risk management, demand planning, pricing, working capital optimization → Enhanced response speed and flexibility (e.g. avoidance of margin squeeze), enhanced delivery, reduced cost
DELTA	Purchasing and commercial functions (e.g. marketing)	Exploitation of intelligence on product/service trends on supply markets, market price developments, market structures, suppliers → Increased effectiveness of strategy formulation, product/service portfolio specification, demand planning → Reduced cost/time to market, enhanced product/service innovativeness/delivery
ALPHA, BRAVO, DELTA	Liaison functions (e.g. procurement/cost engineering)	Exploitation of intelligence on market prices, suppliers' technical capabilities/cost structures, market technology and innovation → Increased effectiveness of strategy formulation, value engineering, product development, quality management → Reduced cost/development lead time/time to market, enhanced quality/flexibility/product innovativeness

pursue more effective cross-functional integration (e.g. cross-functional teams, projects, processes). A purchasing manager at BRAVO noted:

If we demonstrate that we understand the product, the technology, the underlying mechanisms, and that we are able to provide R&D with good alternatives through suppliers, generating value-added on the technical side [...], then we are recognized. Then they suddenly say [...]: We have a problem, purchasing, could you join us [in cross-functional projects]? Do you have any ideas?

All these arguments and case patterns result in the next proposition:

- P3. Firms with advanced SMO exhibit more effective internal integration, as they make more informed integration decisions and allocate and deploy available resources more effectively when implementing chosen integration practices.

## Conclusions and contributions to theory and practice

We studied how buying firms configure and deploy dynamic SMO capabilities and how the configuration and deployment differ within and across firms. Our results show that firms not only accumulate and deploy dispersed resources but also integrate and reconfigure those resources in a way that best reflects their supply environment (Table 4). The application of SMO capabilities was found to vary across and within firms depending on the characteristics of the firms' purchasing categories and tasks. While firm-level elements span different purchase categories, category-level elements are specific to a certain purchase category. Moreover, reactive elements, such as basic supply base analyses and supply market research, reflect a defensive stance, whereas proactive elements, like innovation scouting and technology screening, reflect a preventive stance. Overall, SMO is a dynamic capability that firms need to compete in a complex and dynamic environment and that helps them to pursue their strategies more effectively.

### Contributions to theory

We conceptualized and defined SMO, discussing how it is developed and how it differs within and across different firms (Table 2; Figure 1). We considered our empirical observations in relation to the background literature and the DCV for a more focused exploration and stronger substantiation of the results. Throughout the study, we provided empirical evidence and theoretical reasoning to endorse SMO as a valuable dynamic capability.

Our concept of SMO recognized existing research by embracing the concept of supply market intelligence and the diverse concepts in purchasing and supply management that have often been adopted individually by firms to tackle the challenges of their particular supply environment. However, the concept of SMO addressed the beneficial exploitation of supply market intelligence in a firm's various practices, processes, and organizational routines more directly, thus extending previous research in this area. In particular, we found that exploiting supply market intelligence allows firms to better observe the peculiarities of their supply environment and to then decide whether certain resources available in purchasing

and supply management (or combinations thereof) will be more or less beneficial.

Furthermore, our concept of SMO emphasized that firms not only accumulate and deploy dispersed resources but integrate and reconfigure those resources in a way that best reflects their supply environment. Therefore, we found that firms can pursue their strategies more effectively through SMO as they sharpen their strategic focus and thus channel efforts and investments into the most relevant resources and practices. Our results suggest different elements and configurations of SMO. While firm-level elements span different purchase categories, category-level elements are specific to a certain purchase category. Moreover, reactive elements reflect a defensive stance, whereas proactive elements reflect a preventive stance and an endeavor to delve into uncharted territory.

Furthermore, our results demonstrate that firms with advanced SMO are expected to exhibit more effective integration. Specifically, SMO enables firms to make more informed integration decisions and to implement chosen integration practices more effectively, making the resulting integration more effective. In line with the DCV, we argue that the mere existence of dispersed resources in purchasing and supply management may not be critical for integration success. What is more important is how firms integrate and reconfigure these resources to reflect their supply environment. Therefore, we emphasize that SMO may well result in less integration – for example, for purchase categories sourced in a market situation where the firm is simply a price-taker.

### Contributions to practice

Our results support the notion that uncertain and erratic business environments create the need for firms to build resources and capabilities to learn and adapt to new market conditions. In this regard, we provide valuable guidance for purchasing and supply chain managers as to how SMO may support them to cope with the challenges of an increasingly dynamic and complex global supply environment. Therefore, we support the notion that there is substantial benefit in actively generating and exploiting supply market intelligence in the anticipation of its value rather than being reactive to customer market matters and internal stakeholder demands. If firms exploit supply market intelligence, their supply risk management is improved, and they are better able to respond to changes in supply market. Changing the perspective from reactive to proactive may not be easy, but, instead of focusing, for example, on basic supply base analysis and supply market research, the supply chain managers should try to boost the firm to be ahead of and faster than their competitors to understand in which direction markets are moving and developing. The purchasing and supply function is located close to new products, innovations and trends. Thus, supply chain managers should acknowledge the need for firm-level SMO capability because they have a key position and have to be able to identify market novelties and innovations as fast as possible to be ahead of their competitors. Building on the DCV, we suggest that firm managers should not only recognize the importance of transforming resources, but they should be aware of the significance of doing this in a rapid and timely manner, ahead of competitors.

Our study identified the contextual antecedents for SMO and showed the differences of those in relation to basic and advanced SMO. The managers should recognize the differences to be able to see how certain elements of SMO emerge and to ultimately be able to develop the level of their SMO. As different configurations of SMO are not equally useful in all possible situations, managers should place differing degrees of emphasis on the activities associated with generating, disseminating and exploiting supply market intelligence. Therefore, our results show that the scope and focus of SMO may well differ within the same firm, depending on the different purchase categories the firm sources and the associated supply market environments. For example, if the degree of outsourcing is high, the supply chain managers should be aware of the risk that they may lose knowledge in product development regarding that specific category. The managers should ensure that the required knowledge will still be available in purchasing and that the purchasing and supply function has capabilities for intelligence generation and exploitation in the future as well. Furthermore, it is a first step to enable firms to more effectively use the value-adding potential of their integration practices. Supplier and internal integration can be the cause or the result of supply market intelligence generation and dissemination. More generally, SMO helps managers assess how much integration is justified in which supply environment. This is particularly valuable for managers because internal and supplier integration consumes resources, poses risks and requires investments in terms of money and time (Christopher, 2000; Koufteros *et al.*, 2007; Schoenherr and Swink, 2012). Through SMO, firms can also pursue strategies more effectively and thereby be able to channel efforts and investments into the most relevant resources and practices. In this regard, SMO may prevent managers from misallocating valuable internal resources.

### Limitations and future research

As with any inductive case-based research, our study lacks generalizability to some extent, even though we pursued a methodologically rigorous research approach. Thus, the next research step would be to deductively test constructs and relationships in a survey of multiple firms in diverse supply chains and industries. Therefore, future research could investigate why some firms excel at effectively translating their dispersed resources into successful processes and capabilities while others do not. For example, there may be further critical differences between manufacturing and service firms requiring future attention.

Incorporating SMO as a potential intervening variable in the empirical tests of the relationships between dimensions of supply chain integration and dimensions of operational performance and business performance may further contribute to the understanding of underlying relationships. Therefore, our results encourage future research to empirically test causality with respect to performance implications of SMO at a firm and purchasing-category level, which we did not capture in our investigation. In addition, the environmental uncertainty types might differ across industries or across different modes of production.

Our results indicate that SMO may enable firms to better balance the supply chain and the demand chain. Schoenherr and Swink (2012) suggested that firms might achieve synergies

from the possession of superior capabilities with respect to opportunities and boundary conditions in both customer markets and supply markets. Thus, future research could investigate the role of supply and customer market orientation to attain supply chain fit and to effectively match demand and supply (Wagner *et al.*, 2012).

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