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Richter, Nicole Franziska; Schlägel, Christopher; Midgley, David F.; Tressin, Tabea

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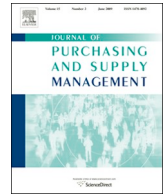
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# Organizational structure characteristics' influences on international purchasing performance in different purchasing locations

Nicole Franziska Richter<sup>a,\*</sup>, Christopher Schlaegel<sup>b</sup>, David F. Midgley<sup>c</sup>, Tabea Tressin<sup>d</sup>

<sup>a</sup> University of Southern Denmark, Department of Marketing and Management, Campusvej 55, 5230 Odense, Denmark

<sup>b</sup> University of Groningen, Faculty of Economics and Business, Department of Global Economics & Management, Nettelbosje 1, 9747 AE Groningen, The Netherlands

<sup>c</sup> INSEAD, Boulevard de Constance, 77305 Fontainebleau Cedex, France

<sup>d</sup> KION Group, Hamburg, Germany

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## ABSTRACT

This study contributes to the understanding of how firms should structure their purchasing organization to improve their performance. While the research into structural characteristics' impacts on purchasing performance is evolving, it is still incomplete, especially concerning the contingencies on different purchasing environments. Drawing on ideas from the organizational information processing and contingency approaches as well as the international business literature, the present study proposes a model in which three key organizational structure characteristics – centralization, standardization, and specialization – are associated with purchasing performance. This study posits that the relationships are contingent on a purchasing location's formal and informal institutional context. Based on a sample of 195 German manufacturers, the model is empirically tested using structural equation modeling. The findings support the relevance of organizational structure characteristics for international purchasing and firm performance and they also support the notion that the effects are contingent on the purchasing location's institutional context.

## 1. Introduction

While prior research claims that firm's international purchasing is important for the overall performance of a firm (Quintens et al., 2006b), the success of different international purchasing activities vary considerably from one firm to another (e.g., Horn et al., 2013). Thus, unsurprisingly, international purchasing has become a focus of business practice (e.g., Das and Handfield, 1997). Likewise, researchers have devoted more attention to the purchasing function in the last years (e.g., Spina et al., 2013). However, as our understanding of the performance implications of international purchasing remains limited (e.g., Vos et al., 2016, yet is evolving, e.g., Foerstl et al., 2016), managers may not be able to fully exploit the profit potentials for the firm that lie hidden in an effective purchasing structure. The focus of past research was on demonstrating the strategic relevance of the function (e.g., Schiele et al., 2011), on the question what constitutes organizational structure characteristics of (strategic) international purchasing (e.g., Jia et al., 2017), and on outlining propositions on the relation between organizational structure characteristics' and purchasing performance (e.g., Bals et al., 2018). The focus was less on empirically

testing these associations. Moreover, we only have a limited understanding of the role of the purchasing locations' institutional environments as a contingency factor when evaluating the influence of organizational structure on purchasing performance and firm performance (though authors started to develop conceptual frameworks on these contingencies, e.g., Bals et al., 2018). Given the increasing internationalization of firms purchasing activities, understanding these contingencies is of high relevance. It provides valuable information for purchasing managers on how to revise or design the organizational structure of purchasing to successfully handle different institutional environments in different purchasing locations.

We make use of the conceptual models developed in previous studies building on information processing and contingency theory to fill the gap of empirically testing the de facto performance implications of a comprehensive set of organizational structure characteristics in international purchasing. More specifically, we argue that a specific organizational structure allows firms to handle the higher complexity and uncertainty of specific national institutional contexts, resulting in higher purchasing performance and, ultimately, higher firm performance.

\* Corresponding author.

E-mail addresses: [nicole@sam.sdu.dk](mailto:nicole@sam.sdu.dk) (N.F. Richter), [c.schlagel@rug.nl](mailto:c.schlagel@rug.nl) (C. Schlaegel), [david.midgley@insead.edu](mailto:david.midgley@insead.edu) (D.F. Midgley), [tabea.tressin@kiongroup.com](mailto:tabea.tressin@kiongroup.com) (T. Tressin).

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The key structural characteristics of purchasing organizations that theoretically matter concerning creating an effective and efficient organization of the purchasing function (e.g., [Glock and Hochrein, 2011](#); [Jia et al., 2017](#)) include centralization (e.g., [Quintens et al., 2006a](#); [Hartmann et al., 2008](#)), standardization (e.g., [Trent and Monczka, 2003](#)), and specialization (e.g., [Feisel et al., 2011](#); [Ordanini and Rubera, 2008](#)). Authors have begun to analyze these structure variables' performance effects, with mixed results: Some assert that decentralization is positively related to performance, while others point to a positive influence of centralization (e.g., [Li and Shi, 2019](#)). Some authors bundle different aspects of structure, such as standardization and specialization, in a broader construct and show its positive influence on performance (e.g., [Kerkfeld and Hartmann, 2012](#)). [Schneider and Wallenburg \(2013\)](#), who reviewed 50 years of research on organizing the purchasing function, called for future research into organizational structures in purchasing that will ultimately contribute to performance. We respond to this call and address existing research gaps. We contribute to the field by empirically examining the influence that this set of key organizational characteristics has on performance. This offers generalizable findings and a systematic picture of how structure drives the purchasing function's success and how this then translates into firm performance. This is a primary concern for the managers and boards, and is relevant to test propositions in academic research on a larger scale.

[Zimmermann and Foerstl \(2014\)](#), who considered the performance implications of a collection of different purchasing and supply management practices outline that a positive influence of purchasing on performance is contingent on moderators. The moderators discussed are different company and environmental contexts. Authors mostly refer to these moderators by looking at how firms structure their purchasing organizations in these contexts. [Trautmann et al. \(2009a\)](#), for instance, examined three groups of 12 case firms and show that the centralization level and the adoption of clearly defined roles and responsibilities vary depending on three contingencies: the purchasing location, the category characteristics, and the interdependence of purchasing units. [Bals et al. \(2018\)](#) studied two cases to explore how external (e.g., environmental complexities) and internal (e.g., strategy) contingency factors affect the purchasing function's organizational structure. Despite this progress made, our knowledge about the actual performance effects of different purchasing structures in different contexts remains limited ([Spina et al., 2016](#)). [Stanczyk et al. \(2017\)](#) called for research that further explores the boundary conditions under which global sourcing becomes fruitful, since they found mixed arguments and results in a structured literature review of the field. Similarly, [Schneider and Wallenburg \(2013\)](#) called for research into how organizational structure characteristics become effective in different dynamic and volatile environments. Addressing these calls and existing research gaps, our second contribution is to introduce contextual factors commonly studied in the international business literature, namely the formal and informal institutional environments of the country in which the supplier is located, into our analysis (e.g., [Contractor et al., 2003](#); [Gomes and Ramaswamy, 1999](#)). The location from which a firm purchases its inputs (i.e. the purchasing location) is a key contingency in the field that strongly influences the organization of the purchasing function and is supposed to influence performance (e.g., [Andersson et al., 2007](#); [Mohamad et al., 2009](#); [Schiele et al., 2011](#)). The formal institutional environment includes factors such as political stability, the institutional administration quality, and infrastructure, which may impact the sourcing of inputs. The informal environment includes factors that relate to the local business culture and whether it is similar or dissimilar to that of the purchaser's country, potentially leading to problems of communication or conflicting business practices. [Salmi \(2006\)](#), for instance, outlined the key roles of overcoming cultural and psychic distance in buyer and supplier relationships. Also, [Lorentz et al. \(2018\)](#) outlined the need to more specifically evaluate the roles of different distance types, such as administrative and cultural distances, in

purchasing. Thus, analyzing these different institutional context types offers relevant implications for researchers and business practitioners on the importance that can be attributed to different distance types in organizing the purchasing function. Finally, entering and managing international purchasing locations and related relationships are key strategic topics on the research agendas of both purchasing and strategic international management ([Christopher et al., 2011](#); [Griffith et al., 2008](#)) which we hope to also advance by incorporating these contingencies.

Based on original survey data of 195 German manufacturers we test the influence of three organizational structure characteristics on purchasing performance and firm performance with structural equation modeling (SEM) techniques. To test our contingency hypotheses we combined our primary data with secondary data of the formal and informal environment of the purchasing locations. We moreover use different sources of secondary data to obtain more robust results.

In [Section 2](#), we introduce the theoretical frameworks we used and derive our conceptual model. In [Section 3](#), we set out our six specific research hypotheses and discuss past research. In [Section 4](#), we describe our methods, including the sample, our survey measures, secondary data, and our analysis approach. In [Section 5](#), we present the results of our analyses for each of our models in turn. In [Section 6](#), we discuss these results' implications for both theory and practice in detail, and the possible limitations to our work. In [Section 7](#), we make concluding comments.

## 2. Theoretical framework and conceptual model

To derive a conceptual model on how a purchasing organization's structural characteristics affect performance, we combine arguments from organizational information processing (e.g., [Galbraith, 1973](#); [Egelhoff, 1991](#)) and contingency theory (e.g., [Lawrence and Lorsch, 1967](#); [Stanley, 1993](#)). Our primary argument is that organizational structures' effectiveness depend on the fit between the organization's information processing capacity (determined by its structural characteristics) and the information processing requirements that stem from the national institutional environment of the purchasing country ([Lorentz et al., 2018](#)). [Fig. 1](#) summarizes this conceptual thinking.

In the following sections, we define the three organizational structure characteristics and describe their relations with international purchasing performance. Subsequently, we explain the role of the informal and formal institutional environments as moderators of the relationship between structure and performance.

### 2.1. A purchasing organization's structural characteristics

A key task of the purchasing organization is processing information that supports the firm's managers' decision-making (see also the overview of definitions for international purchasing by [Mohamad et al., 2009](#)). Ideally, the purchasing organization collects appropriate information and ensures the on-time and distortion-free transfer of information between different organizational units. Particularly, it must ensure the timely delivery of inputs that meet the firm's quality and cost targets and thereby ensure the continuity and efficiency of the firm's operations. Achieving effective and efficient purchasing on a global scale is driven by a purchasing organization's information processing capacity, which is determined by its structure as well as its coordination and control mechanisms ([Tushman and Nadler, 1978](#); [Egelhoff, 1991](#); [Premkumar et al., 2005](#)).

The structural variables referred to by organizational information processing theorists are centralization, formalization, leadership, communication, and the distribution of power and control ([Tushman and Nadler, 1978](#)). Research into purchasing and supply chain management has identified the following further structural characteristics that are thought to determine performance: standardization (with a strong overlap to formalization), specialization, the hierarchical position of

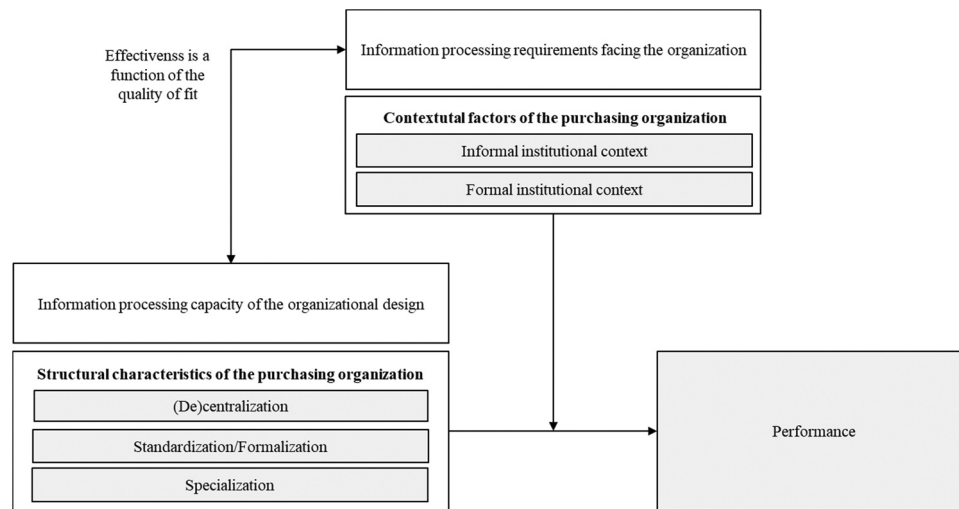


Fig. 1. The conceptual model.

the purchasing department, and involvement, i.e. the extent to which other organizational members or departments are involved in the purchasing-related decision-making process (Johnston and Bonoma, 1981; Glock and Hochrein, 2011). In the international business literature, most strategy and structure typologies stem from the thinking of Bartlett and Ghoshal (1989), and Prahalad and Doz (1987). The two most frequently discussed structures are the global and the multinational types. In global organizations, which aim at performance through efficiency, information processing is centralized and standardized, and there is a low capacity to process market-specific information (Bartlett and Ghoshal, 1989). In contrast, in a multinational organization, which aims at performance through local responsiveness, information processing is decentralized, not standardized, and there is a high capacity to process information specific to local markets (Bartlett and Ghoshal, 1989). Studies have shown that these sets of organizational structure characteristic are related to performance (e.g., Kolchin, 1986; Sanchez-Rodriguez et al., 2006; Stanley, 1993; Tirimanne and Ariyawardana, 2008; Trent, 2004).

We will refer to the three key structural variables incorporated in the above typologies: centralization, standardization, and specialization. These characteristics also represent the most commonly adopted organizational structure characteristics in the purchasing literature (e.g., Glock and Hochrein, 2011; Jia et al., 2017; Schneider and Wallenburg, 2013). Since firms often use various combinations of different structural characteristics rather than any one specific characteristic (Lee et al., 2015) the assessment of a characteristics set better reflects the reality of firms. Multiple facets of organizational structure are at play simultaneously and ultimately form a strategic setup of the organization in international business and management and in the purchasing field. For instance, Quintens et al. (2006a) developed a global purchasing strategy typology that refers to centralization and different standardization types. Thus, examining these three structural characteristics enables us to derive implications both to the purchasing and supply chain literature as well as to the international business literature.

## 2.2. The fit with contextual factors in the purchasing organization's environment

The international purchasing process is embedded in the institutional contexts of the purchasing firm and the supply firm. Contingency theory (Lawrence and Lorsch, 1967) states that the best organizational structure depends on a firm's specific contingencies. A critical contingent variable is the nature of the institutional environment, the argument being that the dynamics, insecurity, and longer distance

between institutional environments of the home and the supply market may generate higher management and information costs for a firm in the absence of adequate organizational structures (e.g., Palich and Gomez-Mejia, 1999; Wolf and Egelhoff, 2002; Richter, 2014; Marano et al., 2016). Hence, building on contingency theory, we posit that purchasing organizations are most successful if their information processing capacity is designed to fit the information processing requirements of the informal and formal institutional context of the supplying firm (see Galbraith, 1973 from a general perspective, and Lorentz et al., 2018; Hartmann et al., 2008; Trautmann et al., 2009b; Bals et al., 2018 from a purchasing perspective).

The informal institutional environment includes values, social obligations, binding expectations, codes of conduct as well as the shared understanding, constituting schemas, and mental models applied (Scott, 2001; Orr and Scott, 2008). There are two approaches to assess differences in the informal environment: cultural distance and psychic distance. *Cultural distance* refers to the extent to which the cultural norms and values in one country differ from those in another country (Kogut and Singh, 1988). Cultural distance is often constructed from Hofstede's (2001) cultural value dimensions: individualism-collectivism, masculinity-femininity, power distance, uncertainty avoidance, and long-term orientation. If the purchasing firm's managers possess cultural norms and values comparable to those of the supply firm's managers – resulting in a low cultural distance – managers better understand the other side and are better understood by the other side, reducing uncertainty about a transaction's outcomes, and vice versa. *Psychic distance* refers to the extent of sociocultural difference between the home country and the foreign country (e.g., Johanson and Vahlne, 1977). Differences in factors that usually constitute psychic distance, such as language, culture, and the political and educational system disturb the "flow of information" (Johanson and Wiedersheim-Paul, 1975: 308) and "make it difficult to understand foreign environments" (Johanson and Vahlne, 2009: 1412). Thus, psychic distance is a broader construct than cultural distance, since it also encompasses societal factors, such as educational systems. Further, the research shows and argues that perceived distance is highly relevant in decision-making in purchasing organizations (e.g., Carter et al., 2008; Salmi, 2006). The formal institutional environment comprises the laws and regulations enforced through legal sanctions in a society, providing guidelines for behavior, lending stability and regularity (Scott, 2001; Orr and Scott, 2008). Thus, formal institutional distance refers to the differences between the legal institutions, laws, and regulations of the foreign country compared to the home country (Arregle et al., 2013; Holmes et al., 2013; North, 1990). All three of these distance measures potentially influence the uncertainty level experienced by purchasing firms when

purchasing from foreign markets.

We will argue that the extents to which organizational structure characteristics are effective in terms of purchasing performance are contingent upon the extent of differences in the informal institutional environment (i.e. the level of psychic distance and cultural distance) as well as the extent of differences in and the stability and predictability of the formal institutional environment (i.e. the laws and regulations) of the country being purchased from. Thus, we respond to recent calls for research to analyze different distance types' effects in the purchasing context (Lorentz et al., 2018). Further, we explore whether the moderate relevance attached by some purchasing managers to these contingency factors is justified. Knudsen and Servais (2007), for instance, found that factors such as geographical distance are perceived as moderately important by managers, while most firms consider cultural factors to be fairly unimportant. We argue that the greater the distance between the informal environment and the more dynamic, changing, unstable, and distant the formal environment, the greater the uncertainty faced by a firm. The greater the uncertainties faced, the greater the information processing needs that the organizational structure must satisfy (Tushman and Nadler, 1978).

### 2.3. Performance

Several authors have underlined the importance of the fit between organizational structure and its environment for performance (e.g., Ford and Slocum, 1977; Prahalad and Doz, 1987; Bartlett and Ghoshal, 1989; Donaldson, 2008; Williams, 2008), and have shown how different structures entail different performance levels, depending on environmental characteristics (e.g., Ghoshal and Nohria, 1993; Williamson, 2000; Garbe and Richter, 2009). Further, authors in the purchasing field acknowledge environmental factors' effects on purchasing success (e.g., Trautmann et al., 2009b; Glock and Hochrein, 2011; Schneider and Wallenburg, 2013). We expect that the success of adapting information processing tools to the uncertainty of the supply market will contribute more immediately to a firm's purchasing performance, which ultimately translates into overall firm performance. Thus, we help to illuminate the ambiguous findings on the performance implications of different organizational alternatives of purchasing: For instance, Vos et al. (2016) stated that "it remains unclear whether global sourcing actually produces the supposed benefits" (Vos et al., 2016: 338). Zimmermann and Foerstl (2014) outline that a positive influence of purchasing on performance is contingent on moderators, and Stanczyk et al. (2017) called – in light of mixed results in the field – for research into the boundary conditions under which international purchasing becomes fruitful.

We consider the immediate effects of these antecedents on the major elements of international purchasing performance identified in the prior literature: (i) process time and flexibility, (ii) quality of products purchased and the reliability of delivery and innovation, and (iii) the total cost of purchasing the goods in question (e.g., Bals et al., 2009; González-Benito, 2007). We also tested purchasing performance's effect on firm performance to set the results in a broader context, as well as to determine whether popular references to a high influence of purchasing performance on firm performance have merit.

## 3. Development of research hypotheses

### 3.1. The centralization and performance relationship contingent on institutional environments

Centralization refers to the concentration of decision-making authority on the purchasing process from requirements planning to supplier evaluation in a single organizational unit (Pugh et al., 1963; Glock and Hochrein, 2011). This single unit can be the headquarters, yet centralization can also imply that purchases are made from some regional or divisional level (e.g., Stanley, 1993). Thus, this definition

involves the activity level, and the unit level at which the activities are performed, such as a (de)centralization at product categories, business units, plants, or international purchasing offices (e.g., Bals and Turkulainen, 2017).

The (de)centralization continuum was the focus of many authors who have begun to look closely at the purchasing function and it is still a key topic in the field. Authors have derived first lines of arguments on building a purchasing organization (e.g., Giunipero and Monczka, 1997; Arnold, 1999), have referred to activities pursued by single firms, or have summarized the thinking of managers interviewed about effective structures (e.g., Taylor and Tucker, 1989; Narasimhan and Carter, 1990). Most of these early studies advocated a centralization of the purchasing organization, pointing to economies of scale and scope (Wagner, 1984; Arnold, 1999), a reduction of data processing costs (Taylor and Tucker, 1989), and lower costs since efforts are not duplicated (Narasimhan and Carter, 1990; Stanley, 1993). Nonetheless, authors have also acknowledged the advantages of implementing de-central elements into the centralized organizational structure, namely higher speed and more direct control (Narasimhan and Carter, 1990), improved service and lower costs by pushing decision-making responsibility to the end-user (Johnson and Leenders, 2004), and sensitivity to local needs (e.g., Taylor and Tucker, 1989). Finally, authors have begun to draw attention to the advantages of regional purchasing departments in the case of highly internationalized firms (e.g., Arnold, 1999) or have discussed cases in which the change from a centralized to a more hybrid structure was envisaged to achieve cost savings (Johnson and Leenders, 2004). Many of these early studies followed a conventional wisdom, indicating that some centralization of the purchasing organization – at the headquarters or at the regional level – is advantageous. Yet, they offered no empirical support for this wisdom: For instance, Giunipero and Monczka (1997) called on researchers to test whether specific outlined efficiencies are reached, while Johnson and Leenders (2004) admitted that they were unable to determine whether cost savings objectives were in fact achieved.

Reviewing the more recent studies published on (de)centralization in purchasing (see Table 1), we found that the focus is still on theorizing and the outline of propositions and conceptual models about how to best structure a purchasing organization. However, the authors do engage more in discussing internal or external contingencies: Hartmann et al. (2008), for instance, showed that there are higher centralization levels in purchasing if a firm pursues an overall globalization strategy (strategy-structure paradigm). Trautmann et al. (2009b) supposed that firms that follow an economy of scale motive should adopt centralized purchasing structures. Bals et al. (2018) outlined a conceptual model that relates micro-structural to macro-structural characteristics of the purchasing organization and assumes a performance effect in terms among others of cost, time, and quality. Further, authors have shifted the focus to one of the units of (de)centralization: the international purchasing office (buying offices in foreign countries purchasing the relevant inputs for production, see Goh and Lau, 1998). Building on role theory, Jia et al. (2014) developed an activity-based typology of purchasing offices and showed that the depth and breadth of activities of these offices increased with a higher strategic importance of purchasing (see also Sartor et al., 2014). Quintens et al. (2006a) referred to purchasing offices and other forms of unit-related (de)centralization to derive a model of global purchasing strategy affecting performance outcomes. Bals and Turkulainen (2017), who specifically looked at (de)centralization at different unit levels, highlight that further depth is needed in the (de)centralization debate.

While some of these studies point to the performance effects – for instance, Karjalainen (2011) showed that centralization leads to economies of process and scale – most studies still point to future research concerning actually testing the outlined performance implications. We found four studies that engage in more large-scale empirical testing of hypotheses on structural alternatives' performance effects: Gonzalez-Padron et al. (2008) referred to the resource-based view,

**Table 1**  
Overview of empirical studies on structure characteristics and performance in purchasing.

Article [chronological]	Structure construct(s)	Theory [and/or research objectives]	Method	Environmental contingencies	Structure and performance implications: A) Propositions derived from case study research B) Propositions derived from large-scale survey C) Large-scale testing of propositions/hypotheses
Nassimbene, 2006	Decentralization. Specialization [specialized personnel].	Analyzes the motivations that justify international sourcing, and the organizational and management approaches used.	Survey: n = 78 purchasing managers in Italian firms. Descriptive statistics.	None.	B) Findings on structure: Firms adopted specific organizational solutions for international sourcing, decentralizing the responsibility to foreign branches, setting apart resources in the purchasing unit, and working with specialized personnel. Findings on performance: Advantages of international sourcing mentioned were rationalization of manufacturing and distribution processes, differentiation opportunities and expansion to new markets, and cost advantages (this is general for international sourcing, not related to structures). B) Development of a reflective second-order construct <i>global purchasing strategy (GPS)</i> , comprising elements of centralization and standardization; outline of a conceptual model and formal hypotheses to be tested about GPS's effect on performance: "The conceptualization and operationalization of GPS is a crucial step in the development and testing of a resource based perspective on global purchasing performance". [No test of the performance effects.]
Quintens et al., 2006a	(De)centralization [4 types: HQ, product, regional group, purchasing center]. Standardization [purchasing process, product, organization of staff].	Resource-based view.	Survey: n = 151 purchasing managers. Confirmatory factor analysis to operationalize purchasing strategy.	None.	A) For Western supply personnel, specialization in terms of social and communication skills as well as interest in the local culture are key to bridge psychic distance to Chinese suppliers. C) Autonomy has a strong and significant relationship with cycle time when market turbulence is high. [Yet this is not significant for organizations with a stable customer base.] A) Propositions: Global firms show higher centralization levels than transnational firms to integrate global sourcing activities. Category managers at the HQ remain responsible for strategic purchasing; operational activities remain at local sites. No significant differences concerning the formalization of activities; while managers say formalization is indispensable for global sourcing, they warned that it may lead to demotivation and rigidity. A) Risk management systems comprising postponement, speculation, hedging, control, security, and avoidance as a key to mitigate risk. A) Propositions derived on structural characteristics to be followed by firms in specific environments or markets. Firms following the motive of economies of scales adopted a strategic purchasing organization centralized in the category manager and an operational purchasing organization at each site. Also, they adopted a standardized purchasing process with clear definitions of roles and responsibilities.
Salmi, 2006	Specialization [language and communication skills, cultural understanding]	Analysis of motives for sourcing, requirements, and characteristics of successful supplier relationships. Relates the purchasing literature to distance arguments in the Uppsala model.	Interviews: 11 managers in purchasing/CEOS in 7 firms located in Finland that source from China.	None. [Implicit: setup].	
Gonzalez-Padron et al., 2008	Decentralization [specifically: autonomy].	Resource-based view. "Autonomy in the purchasing process has a positive effect on the relationship quality with participants and process cycle time".	Survey: n = 200 directors of corporations. Structural equation modeling.	Market turbulences in the purchasing environment.	
Hartmann et al., 2008	Centralization. Standardization [labeled formalization].	Information processing theory. Studies the control mechanisms applied by multinational firms to implement sourcing strategy.	Case studies: 8 firms.	None. [Yet: internal contingency on global, multinational, transnational strategy].	
Manuj and Mentzer, 2008	Standardization [specifically: risk management].	Explores the phenomenon of risk management and mitigation strategies in supply chains.	Interviews: 14 in-depth interviews and a focus group with senior supply chain executives.	None [yet: supply chain complexity and extent of inter-organizational learning].	
Trautmann et al., 2009b	Centralization. Standardization. [labeled formalization].	Information processing theory and "Effectiveness as a function of fit of information processing capacity and requirements".	Case study: 12 case studies.	Market stability, transparency, delivery risk [plus: purchase novelty, product complexity, importance of the purchase and demand volatility].	

(continued on next page)

Table 1 (continued)

Article [chronological]	Structure construct(s)	Theory [and/or research objectives]	Method	Environmental contingencies	Structure and performance implications: A) Propositions derived from case study research B) Propositions derived from large-scale survey C) Large-scale testing of propositions/hypotheses
Tsai et al., 2009	Standardization [in the form of information-based mechanisms: internationally integrated software, information and communication systems, databases].	Social capital theory. Derives various hypotheses, including that information-based mechanisms relate positively to global responsiveness, negatively to global sourcing barriers, and positively to performance.	Survey: n = 118 respondents in multinational firms engaged in global sourcing in China. Structural equation modeling.	None.	C) They found among others that information-based mechanisms relate positively and significantly to global responsiveness, which has a positive significant effect on sales growth rate and a negative significant effect on global sourcing barriers (i.e. there is no direct effect of information-based mechanisms on performance and barriers, but a mediated one via global responsiveness).
Reuter et al., 2010	Specialization [dynamic capabilities].	Dynamic capabilities view. How do successful firms design and configure global supplier management (GSM) to respond to changing requirements? How can GSM capabilities be a source of competitive advantage? Outline and classify global sourcing (benefits and) risks, and collect and classify risk mitigation strategies.	Case study: 4 case studies among top 10 European chemical companies.	None [implicit: discussion of external pressures (regulations, shareholders) on case firms].	A) Derivation of propositions: Capabilities [specialization] improve responses to environmental pressures, mitigate risk, and have positive implications for operational processes; they argue that responsiveness is a major ingredient of dynamic global supplier management capabilities. A) The authors outline global sourcing risk mitigation strategies, including a risk management approach. They acknowledge: "Further research is needed to improve the generalisability of the findings".
Christopher et al., 2011	Standardization [risk management].	Analyzes centralization's effects on economies of process and scale.	Case study: 15 case studies of UK-based companies involved in global sourcing.	None [implicit: Discussion for different industries]	A) Centralization leads to lower tendering process costs (economies of process) and lower purchasing prices (economies of scale).
Karjalainen, 2011	Centralization.	Dynamic capabilities and resource-based view.	Case study: 21 interviews with respondents in Finland's government.	None.	C) Significant positive association between LCC sourcing competencies [specialization] and performance (i.e. improvement in performance objectives: SCM, product quality, R&D performance, and lower total cost of ownership) found in correlation analysis.
Kusaba et al., 2011	Specialization [low-cost country (LCC) sourcing competencies: skills, training]; [elements of standardization in further constructs, e.g., standard templates].	One research hypothesis is that LCC sourcing competencies relate positively to sourcing performance in these countries. Research questions: What are the motivations for sourcing from China? What outcomes have been achieved? What difficulties are encountered, and how are these dealt with?	Survey: n = 199 employees who know about extent and impact of LCC sourcing (automotives). Factor and correlation analyses.	None.	C) (not really large-scale); they find that while significant cost reductions were achieved via sourcing from China, these are on average less than expected.
Wang et al., 2011	Specialization [different facets: cost-benefit analysis, communication skills, and cultural skills].	Lean thinking, inter-organizational theory, new institutional economic theory, and transaction cost economics. Focus: Evaluate factors that inhibit or enable effective supplier relationship management.	Survey: n = 35 Australian manufacturing firms sourcing from China. Descriptive statistics.	None [implicit: setup].	C) Descriptive statistics showed that both social and formal control mechanisms should be implemented in a governance structure. Further, a lack of English language skills and communication difficulties are important barriers in the sourcing process. A regression model shows that a governance structure established on formal and informal control positively affect quality, delivery, and price.
Giannakis et al., 2012	Specialization [language and communication skills]	Resource-based view.	Survey/Interviews: n = 91 Chinese suppliers, n = 78 international firms trading with these suppliers. Descriptives, regression analyses.	Impact of Chinese culture on sourcing process, governance structure, and performance.	C) Purchasing and supply chain management enablers significantly predict operational performance (cost reduction, improvement of quality and reliability, and the introduction of innovative products and capabilities).
Kerkfeld and Hartmann, 2012	[Formalization, in parts close to what others have in standardization].	Empirically evaluates the effects of resources and capabilities in purchasing and supply chain management on operational performance.	Survey: n = 273 major companies, international, cross-industry. Regression and structural equation modeling.	None.	C) Purchasing and supply chain management enablers significantly predict operational performance (cost reduction, improvement of quality and reliability, and the introduction of innovative products and capabilities).
Specialization [IT system support, performance tracking, employee capabilities bundled in construct purchasing and supply management enablers].					

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Table 1 (continued)

Article [chronological]	Structure construct(s)	Theory [and/or research objectives]	Method	Environmental contingencies	Structure and performance implications: A) Propositions derived from case study research B) Propositions derived from large-scale survey C) Large-scale testing of propositions/hypotheses
Jia et al., 2014	(De)centralization [International purchasing organizations (IPOs) and departments].	Role theory. "Much of the existing mainstream research on global sourcing takes a HQ-centric view, ignoring the proactive roles played by other internal stakeholders".	Case study: 14 IPO in 14 Western multinationals in China, interviews with 34 individuals.	None.	A) Propositions on structure: IPO is the dependent construct; the idea is that if the strategic importance to the parent company increases, the breadth and depth of activities of IPOs increase. "We set out to develop an activity/role based IPO typology and an IPO evolution model." A) All resources/capabilities in IPOs included are key sources of value to the IPOs. That is, (de)centralization to IPOs can generate a source of competitive advantage for a firm if these show relevant specialization in terms of resources and capabilities. C) Their results provide support for their H1b and H2b, not for H1a and H2a. That is, using SEM, they found that formalization has a significant positive impact on project performance in the U.S., yet is insignificant in China. Formalization has a significant negative effect on buyer learning in China, yet is insignificant in the U.S.
Sartor et al., 2015	(De)centralization [(IPOs)] Specialization [resources and capabilities in IPOs].	Resource-based and capability view, contingency theory. The focus is on resources/ capabilities required by IPOs, their typologies, and their evolution over time.	Case study: 14 Western IPOs located in China, interviews with 34 individuals.	None [yet: characteristics of commodity and global sourcing experience].	A) All resources/capabilities in IPOs included are key sources of value to the IPOs. That is, (de)centralization to IPOs can generate a source of competitive advantage for a firm if these show relevant specialization in terms of resources and capabilities.
Yan and Nair, 2016	Centralization. Standardization [labelled formalization: rules and standard procedures] [focus on inter-organizational elements, i.e. buyer-supplier perspective].	Relational view, organizational learning; in buyer-supplier pro-duct development. H 1a: positive effect of formalization on performance (P) > in the U.S. than in China. H1b: negative effect of formalization on buyer learning (BL) < in the U.S. than in China. H2a: negative effect of centralization on P < in China than in the U.S. H2b: negative effect of centralization on BL < in China than in the U.S.	Survey: n = 186 OEMs in the US; n = 212 in China, responsible for engineering, manufacturing, product development, project management, and purchasing. Structural equation modeling.	National context as a moderator (China vs. U.S.). Ideas: Chinese collectivistic, interpersonal culture a low fit to formalization; centralization more congruent with China's power distance.	C) Their results provide support for their H1b and H2b, not for H1a and H2a. That is, using SEM, they found that formalization has a significant positive impact on project performance in the U.S., yet is insignificant in China. Formalization has a significant negative effect on buyer learning in China, yet is insignificant in the U.S.
Bals and Turkulainen, 2017	(De)centralization [Distinction between category, business unit, geography, and activity level] [Standardization and specialization as topics related to decentralization].	Refines theoretical models on purchasing organization, focusing on the (de) centralization debate, enhancing these with illustrative empirical data.	Case study: Single-case study to illustrate organization design change and subsequent outsourcing decisions.	None.	A) The study outlines how structuring the purchasing organization can contribute to outsourcing. It suggests that for understanding purchasing and supply organizations both (de)centralization frameworks and structural alternatives (i.e. along category, business unit, geography, and activity level) are relevant.
Ates et al., 2018	Centralization [plus formalization: rules, procedures, and cross-functionality].	Strategy-structure paradigm. They test whether a strategy-structure misfit results in lower performance (costs and innovation).	Secondary data: n = 6,469 firms.	None [yet: purchasing category as internal contingency].	C) The results confirmed the following hypotheses: H1: For purchase categories with a cost strategy, the higher the deviation from the ideal structure for that strategy (high centralization, high formalization, low cross-functionality), the lower the purchasing cost performance. H2: For purchase categories with an innovation strategy, the higher the deviation from the ideal structure for that strategy (low centralization, low formalization, high cross-functionality), the lower the purchasing innovation performance.

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Table 1 (continued)

Article [chronological]	Structure construct(s)	Theory [and/or research objectives]	Method	Environmental contingencies	Structure and performance implications: A) Propositions derived from case study research B) Propositions derived from large-scale survey C) Large-scale testing of propositions/hypotheses
Bals et al., 2018	Centralization. Specialization Standardization. [Plus formalization and involvement, all at the micro-level].	Contingency theory. Research questions: How can purchasing and supply organization (PSO) structure be comprehensively described? How do contingency factors influence the evolution of the purchasing and supply organization?	Case study: 2 case firms, 5 and 6 interviews with executives responsible for purchasing at different points in time.	Environmental complexity and dynamics [plus internal factors: (corpo-rate) strategy, supplier management practices].	A) They outlined a conceptual model that related micro-structural to macro-structural characteristics (e.g., category, business unit geography) and assumed a performance effect on cost, time, quality, flexibility, innovation, and sustainability. While they discussed external contingencies, they did not outline propositions on the external contingencies, focusing on the internal structure perspective – propositions focus on the organizational interactions. “...our goals is to identify and develop a comprehensive PSO research framework that can be used for future research testing purposes”.
Foerstl et al., 2018	(De)centralization [e.g., hierarchical referral, distance reduction]. Standardization [e.g., rules, programs, formalization]. Specialization [e.g., experts].	Information processing theory. Analyzes how to achieve a match between information processing needs and information processing capacity via various information processing practices/mechanisms.	Case study: 8 firms and multiple interviews in each case firm.	None [yet: task uncertainties].	A) The results were summarized in conceptual models: A model that outlined mechanisms to reduce information processing needs points to: reduction of spatial distance to suppliers [decentralization], experts at supplier sites [specialization]. A model that outlines mechanisms to enhance information processing capacity points to: training of employees [specialization], standardized supplier evaluation criteria. [The effects on performance were not analyzed.]
Li and Shi, 2019	(De)centralization.	Examines the choice of centralization vs. decentralization; assume that for durable goods, decentralized procurement is strictly preferred to centralized procurement in a two-period setting.	Numerical simulations, analytic equilibrium.	None [yet: durable goods as contingency].	Other: Two-period model with profit as dependent construct and time inconsistency problem of durable good procurement in focus. Finding: From period 2, they found that for a given durable product, the firm can benefit from decentralized procurement. “Industry practitioners and academic researchers usually hold the convention wisdom that centralized procurement is better for firms... This paper proves that such convention wisdom may be false. In particular, our study demonstrates that decentralization can actually prove to be useful when a firm with multiple horizontal divisions procures durable goods from an external supplier”.

Notes: We identified empirical studies that specifically address (de)centralization, standardization, and specialization in combination with (purchasing) performance. For this purpose, we used the overview of [Tressin and Richter \(2014\)](#), who screened 14 journals from 2006 to 2012 along the keywords and journal set proposed in [Quintens et al. \(2006b\)](#). Further, we focused on the journals that published more than 6 articles between 2006 and 2012 from that list and screened these issue-by-issue from 2013 to 2018. Finally, we performed a keyword search in the Business Source Complete database. We have not integrated literature reviews in this overview. Relevant reviews related to the above are: [Jia et al. \(2017\)](#) used a literature review to develop a conceptual model on the relationship between global sourcing strategy and structure. [Najafi et al. \(2013\)](#) identified three approaches to emerging country sourcing during the internationalization process from their review. [Sartor et al. \(2014\)](#) reviewed the literature on international purchasing offices. Finally, [Foerstl et al. \(2016\)](#) provided a meta-analysis of the impacts of purchasing and supply management practices on performance.

showing that autonomy (as a resource that points to decentralization, yet see the critical reflection of the relationship between autonomy and decentralization in: Young and Tavares, 2004) has a significant effect on process cycle time. Yan and Nair (2016) found that centralization negatively influences project performance and buyer learning, referring to organizational learning theory in an inter-organizational setting; they also show that this effect is contingent on the purchasing location (Yan and Nair, 2016). Ates et al. (2018) showed that, for purchase categories for which a cost strategy is followed, a high centralization is beneficial, while for purchase categories with an innovation strategy, low centralization results in higher performance.

In sum, typical arguments on the (de)centralization continuum outline that some centralization of processes and decision-making authority positively influences performance, since it enables global scale efficiency and integration advantages (see also Bartlett and Ghoshal, 1989; Cavinato, 1992; Alonso et al., 2008): These can be synergies, an improved information base, company-internal learning effects at the central location, process optimization, or bundling requirements and thus increased negotiating power (for an overview of the debate, see also Brandes, 1994; Faes et al., 2000). However, empirical findings routed in different theoretical frameworks do not unambiguously support this wisdom. Specifically, findings point to relevant internal and external contingencies.

We focus on centralization at a central unit, headquarters, following a company-internal perspective and discarding buyer-supplier integration and supplier-side learning effects. Based on information processing theory (e.g., Egelhoff, 1991) we argue that centralization increases the capacity to process routine information in purchasing, such as information relevant for planning requirements, comparing and selecting suppliers, and contracting. We assume that this information capacity is advantageous, since it enables the exploitation of global scale efficiencies and integration advantages, as long as the uncertainties in the environment don't require higher capacities for processing non-routine information (e.g., Ghoshal and Nohria, 1993; Stank et al., 1994; Moser et al., 2017). Thus, we assume that the efficiencies of bundling decision-making power in a central unit (e.g., the synergies achieved via bundling requirements) are on average higher compared to the responsiveness advantages of the costlier decentralized structures in a purchasing context. Therefore:

**H1.** Centralization is positively related to international purchasing performance.

The information advantages can be exploited to the fullest in environments that don't require the processing of peripheral information, i.e. environments that resemble the firm's home informal institutions and involve low uncertainties about the formal institutions. Environments with high pressure for local market responsiveness, i.e. with a greater psychic and cultural distance to the home market and less predictable formal institutions involve more uncertainty, and require a higher information processing capacity via decentralizing decision-making authority (e.g., see Bartlett and Ghoshal, 1989). The same logic is found in Foerstl et al. (2018), who derived a conceptual model outlining among others that decentralization is a mechanism to reduce information processing needs in purchasing.

If psychic distance is high, the purchasing firm is not familiar with the supplying firm's sociocultural context (e.g., language, mental models), giving rise to potentially inaccurate sense making about the other side and therewith uncertainty. Further, a high distance may negatively influence the ability to communicate and coordinate with supply firms. Thus, the challenges and adjustments associated with purchasing from firms in countries with a dissimilar institutional context represent significant costs (e.g., Ghemawat, 2001). When the purchasing firm and the supply firm are from countries with different cultural norms and values (and, thus, greater cultural distance), managers understand or are understood to a lower extent, increasing the uncertainty about the other side. For instance, a German purchasing

firm with a rather high uncertainty avoidance culture may face difficulties in cooperating with a risk-taking supplier who undervalues the purchasing firm's need for certainty concerning delivery time and product quality. From the perspective of a purchasing firm, differences in the informal environment may be an opportunity to behave opportunistically, since these differences make it difficult to verify a supply firm's motives and prospective actions (Chauhan et al., 2017). Thus, a higher psychic and cultural distance may increase information and monitoring costs for a purchasing firm, ultimately reducing the effectiveness of a centralized organizational structure. The distance of formal institutional contexts as well as differences in the quality of formal institutional contexts are another source of uncertainty. The more familiar a purchaser is with the laws and regulations of the country in which the supply firm is located and the more stable, predictable, and effective the laws and regulations in this regulatory framework, the more decisions can be made in a centralized manner and the less control is needed by the purchasing firm. In contrast, purchasing from a supplier located in a country with very different legal institutions as well as less predictable and less stable laws and regulations will render centralization less effective, owing to the greater need for peripheral information processing and more control, ultimately increasing the time to take decisions and the coordination costs involved in the information and control process. Therefore:

**H2.** The positive relationship between centralization and international purchasing performance is stronger in (a) less distant informal institutional environments and (b) in formal institutional environments with less uncertainty.

### 3.2. The standardization-performance relationship contingent on institutional environments

Standardization refers to the extent to which (purchasing) activities or organizational routines are precisely defined (Glock and Hochrein, 2011). Well-defined guidelines, rules, and standard procedures seek to reduce uncertainty and variation in business outcomes (Garrido-Samaniego and Gutiérrez-Cillán, 2004; Johnston and Bonoma, 1981; Sanchez-Rodriguez et al., 2006). They are reflected in the standardization and formalization of purchasing tools along all phases of the supplier relationship (i.e. from search, selection, negotiation and contracting to evaluation and follow-up). They comprise for instance suppliers' rating systems and auditing, information sharing systems, tools for reporting and evaluating performance, risk planning, and quality management tools (as given in the catalogue of Karjalainen and Salmi, 2013).

Past research into the standardization of the purchasing organization argues in favor of a direct positive effect on performance: Authors highlight risk management approaches to mitigate international purchasing and supply chain risks (e.g., Manuj and Mentzer, 2008; Christopher et al., 2011). Kotabe et al. (2008) followed a transaction and information cost logic, theoretically arguing that e-commerce reduces transaction and communication costs. Tsai et al. (2009) focused on information-based mechanisms and the resources for standardization such as internationally integrated software, information and communication systems and databases. They found that these positively and significantly relate to being responsive in purchasing, which – in turn – positively affects performance measured in the form of sales growth and barrier reduction (Tsai et al., 2009). Likewise, Kerkfeld and Hartmann (2012) results point to a positive effect of standardization on operational performance.

In addition to the outlined direct performance implications, research into standardization has also shifted to a contingency perspective. Trautmann et al. (2009b) looked at internal contingencies, referring to information processing theory. They showed that firms pursuing an economy of scale motive adopted a standardized purchasing process with clear definitions of roles and responsibilities. Foerstl et al. (2018)

argued that standardization in the form of rules, programs, and formalization enhance a firm's information processing capacity. While the latter arguments are based on theoretical conceptualizing or qualitative and case study research, few studies have provided results from larger-scale testing. Yan and Nair (2016) found that standardization (comprising rules and standard procedures) has a positive influence on project performance in buyer-supplier projects; they showed that this influence is contingent on the national context, since the effect is significant in the U.S., yet insignificant in China. Ates et al. (2018), who more directly refer to a formalization of rules and procedures, show that formalization is advantageous for purchase categories that follow a cost strategy. Yet, for purchase categories in which it is about innovation, they show that lower formalization is advantageous to purchasing performance. Thus, while there is some research into the direct and moderated effects of standardization on performance, the literature remains inconclusive regarding the validation of the association between standardization and international purchasing performance. This is true for the relative influence of individual standardization facets and in light of analyzing environmental contingencies.

We hypothesize that standardization seeks to improve the routines and processes within firms, helping to reduce the costs of information search and evaluation as well as the cost of business transactions (e.g., between the manufacturer and suppliers and between internal information processing units). We also follow previous thinking, arguing that standardization reduces buying group members' influence in the purchasing process, since it limits the flexibility of business partners' behavior in business conduct, reducing uncertainty (Glock and Hochrein, 2011; Spekman and Stern, 1979; Stanley, 1993). Standardized tools increase efficiency and free up time for more value-creating activities (Ruekert et al., 1985; Sanchez-Rodriguez et al., 2006). Firms with standardized international purchasing use formalized procedures, routines, and performance expectations to address routine purchasing tasks and to prescribe and guide employees' behaviors in the purchasing process. Thus, standardization reduces information costs (e.g., written rules eliminate employees' need to search for individual solutions for routine tasks), costs of uncertainty (e.g., costs associated with unnecessary variation in employee actions in routine tasks), and the potential costs associated with employee mistakes in the purchasing process. In contrast, firms with a less standardized purchasing process are prone to inefficient outcomes. For instance, if employees are not guided by written procedures, they spend more time on routine tasks (e.g., they must search for a solution for a problem themselves and, in essence, often must 'muddle through' rather than work efficiently on a task), which lengthens the purchasing process, increases costs and errors, and reduces quality. Therefore:

**H3.** Standardization is positively related to international purchasing performance.

These advantages can be exploited to the fullest in environments that don't require the processing of non-routine information. These are environments that are close in terms of informal institutions, involving low uncertainties. Further, organizational units in a stable formal environment (i.e. stable and predictive laws and regulations) can develop routines and standard operating procedures to process context-relevant information whereas, in a changing, dynamic or unstable formal environment (i.e. changing and unpredictable laws, rules, and regulations), standard operating procedures are ill-equipped to deal with the amount of environmental uncertainty (Tushman and Nadler, 1978).

We argue that a high psychic and cultural distance will likely weaken the association between standardization and purchasing performance. When psychic and cultural distance are high, a purchaser's preferences, needs, and requirements (e.g., related to the availability of specific products and the terms of purchase) are harder to articulate for a purchasing firm. They are also harder to understand and appreciate for supply firms, given the lack of shared expectations and mutual understanding. When preferences and needs are poorly understood, the

purchasing firm may undervalue the supply firm's capabilities and benefits. To avoid misunderstandings, discrepancies in expectations, and the resulting uncertainty, purchasing firms should use more flexible and less standardized organizational procedures, policies, and processes when purchasing from suppliers located in a more distant informal institutional context. More flexibility and individualization requires more information for coordination, since decisions need to be made on a case-by-case basis rather than using standardized guidelines and routines. A greater psychic and cultural distance may for instance require continuous – and costly – one-to-one communication between the business partners that goes against the notion of a *standardized* toolset (Gonzalez-Padron et al., 2008) designed to achieve less communication activities in a specific time. In short, standardization is unlikely to be as successful in terms of purchasing performance at high levels of psychic and cultural distance.

Similarly, a higher distance in the formal institutional context and different quality levels in this context will render standardization ineffective, because standardized routines and procedures are tailored to a specific formal institutional context's specific laws and regulations, and therefore require stability in these laws and regulations to be efficient over time. Frequently changing laws and regulations, limited predictability of the direction of changes, and an ineffective enforcement of laws require more flexible and less structured purchasing processes. In such an unstable environment, the purchasing process must respond to the new realities and require one to swiftly adapt to the specific circumstances of the changing institutional context. While more flexibility means more freedom in the selection of actions, it also means less stability, guidance, and efficiency in the purchasing process.

Overall, flexibility as well as customized processes and procedures in a firm may be a key feature when sourcing from distant markets. Likewise, greater uncertainty and instability of the institutional environment may require specific, flexible solutions adapted to changing business requirements, and therefore a lower applicability of standards. We assume that these information processing requirements may hinder the full exploitation of the advantages from standardization (yet on average don't fully outweigh standardization's efficiency gains). Therefore:

**H4.** The positive relationship between standardization and international purchasing performance is stronger in (a) less distant informal institutional environments and (b) in formal institutional environments with less uncertainty.

### 3.3. The specialization-performance relationship contingent on institutional environments

In a purchasing context, specialization refers to the purchaser's skills and capabilities, as well as knowledge specific to the purchasing activities and the purchasing environment. These capabilities and skills comprise communication and intercultural skills or skills related to understanding specific industry and political or economic environments (e.g., Trent and Monczka, 2003; Feisel et al., 2011).

The research and thinking on specialization and its influence on performance rather unambiguously point to a positive link between the two constructs. Salmi (2006), taking an Uppsala internationalization perspective on purchasing, looked at specialization in terms of language, communication, and cultural understanding. She found, in qualitative interviews, that these are tools to bridge and minimize the perceived distance to suppliers (Salmi, 2006). Reuter et al. (2010) derived propositions from case studies, outlining that dynamic capabilities improve responses to environmental pressures, mitigate risk, and have positive implications on operational processes. Sartor et al. (2015) combined ideas on specialization with research into international purchasing offices, finding – in case study research – that these offices can generate a source of competitive advantage for a firm if they show relevant specialization in terms of resources and capabilities.

Wang et al. (2011), who descriptively analyzed a sample of 35 Australian manufacturers, found that specialization (in terms of cost-benefit analysis skills, communication skills, and cultural skills) is a means to handle challenges faced in relationships with Chinese suppliers and may therewith contribute to achieving expected cost savings. Further, several larger-scale surveys also found that specialization has a positive performance outcome: Kusaba et al. (2011) found that there is a significant positive association between low-cost country sourcing competencies (e.g., skills and trained personnel) and improvement in different performance objectives (dynamic capabilities and resource-based view). Kerkfeld and Hartmann (2012), also following the resource-based view, found that employee capabilities (bundled with other items in the context of a structural equation model) significantly predict performance in terms of cost, quality, and reliability aspects.

While the environmental contingency aspect was fairly implicit in some of the abovementioned studies, which often focused on the relationship between Western manufacturers purchasing from an Asian context, there are first studies that have derived conceptual models that more directly call for testing contingency factors: For instance, Foerstl et al. (2018) focused on task uncertainties in their contingency approach, deriving conceptual models that outline that specialization in the form of experts and training employees at supplier sites are means to enhance information processing capacity and to reduce information processing needs (Foerstl et al., 2018). Further, this is done in the conceptual model outlined by Bals et al. (2018), who discussed external contingencies of the relationships between structural characteristics (including specialization) and performance. Neither of these studies tested the contingencies, but they did call for future testing (Foerstl et al., 2018; Bals et al., 2018).

We answer this call for research, and first hypothesize that specialization increases a firm's (non-routine and peripheral) information processing capacity: it enables early risk detection, leads to an improved understanding of the industry as well as the product and international business relationships, enhancing performance. The higher a firm's purchasing skills or capabilities, the higher its information processing capacity, the higher its advantage in organizing the purchasing process and thus its operational performance (e.g., Kerkfeld and Hartmann, 2012; Stanley, 1993). In firms that apply specialization in organizing their international purchasing activities, tasks are assigned to the employees who are best equipped to handle them. These employees possess specific knowledge, expertise, and skills that are relevant to effectively and efficiently completing tasks and activities in international purchasing (e.g., expertise and knowledge related to the industry and to the products and skills related to the peculiarities in language and communication). The knowledge and expertise that these employees have and further develop in their task domain enable them to evaluate and prioritize information and to identify information requirements in the purchasing process (e.g., to ask the right questions if a modification to the product is necessary), which increases the firm's information processing capacity. Firms with a more specialized structure enhance employees' abilities to develop specialized, distinct knowledge and skills related to international purchasing of a product or product group and/or to international purchasing in a specific country or region. This specialization ensures that relevant knowledge is with the employee who must fulfill purchasing-related tasks (e.g., knowledge of the product in negotiations with international suppliers), resulting in specialization advantages (e.g., reduced purchasing costs, shorter purchasing time, and better product quality). Therefore:

**H5.** Specialization is positively related to international purchasing performance.

Further, specialization is assumed to be of special relevance in distant, unstable, and dynamic sourcing environments, which need locally customized information processing (see also the ideas in Reuter et al., 2010; Wang et al., 2011; Foerstl et al., 2018). We posit that specialization will be optimal at higher levels of psychic and cultural

distance, since it increases the capacity to process the non-routine information involved in these environments. Specialization allows one to limit and overcome the business difficulties that arise from differences in language, cultural standards, and preferences, and will be more efficient for more distant suppliers. The development of a specialized purchasing unit (e.g., having specific product knowledge as well as specific industry and communication knowledge) requires time, the investment of resources, and ongoing costs. A purchasing firm may for instance need to hire a purchasing professional with specific language skills, international experience in a specific geographic area, and knowledge of the codes of business conduct in this institutional context. A purchasing firm should stress such an organizational structure characteristic if the potential benefits of this specialization outweigh both these initial investments and the ongoing costs. We assume that these benefits are more pronounced in distant environments, positing higher information processing requirements. Thus, specialization will be more important for purchasing performance when the psychic and cultural distance between a purchasing firm and a supply firm is high.

Likewise, specialized units will be more efficient for firms that purchase from suppliers located in countries with more distant formal institutional contexts as well as suppliers located in countries with less stable and less predictable laws and regulations. As Giunipero et al. (2005) argue, managing business transactions in dynamic environments requires purchasers to have planning, communication, and persuasion abilities that enable a firm to respond swiftly to environmental changes. Higher formal institutional distance may heighten uncertainties and costs if the purchasing firm must use ad hoc solutions for arising problems. When the purchasing firm uses a specialized organizational structure, the purchasing unit can focus on the specific regulatory framework and the differences in foreign regulations. Thus, the purchasing firm can avoid misunderstandings and costly non-compliance with local laws and regulations that may result in costly monetary fees or fines. Investments in specialization pay off to better, the larger the differences in the formal institutions between the purchasing firms home country and the country in which the supply firm is located and the higher the instability in the supply firm's formal institutional environment. Therefore:

**H6.** The positive relationship between specialization and international purchasing performance is stronger in (a) more distant informal institutional environments and (b) in formal institutional environments with more uncertainty.

## 4. Research methodology

### 4.1. Sample and data collection

To test our hypotheses, we drew on a sample of 195 purchasers interviewed in April and May 2014 via computer-assisted telephone interviews (of on average 20 min). We took the sampling frame from one of the largest databases of German firms (Bisnode). In this database, we focused on firms in the manufacturing industry (specifically the EU's NACE codes 2\*\*\*\*, 30\*\*\*, and 325\*\*). This is a key industry for global purchasing (see the discussion in Durst, 2011), and these industry groups offer comparability with previous studies (45 out of 54 international purchasing papers reviewed by Tressin and Richter, 2014 have a similar industry focus). The final sampling frame, filtered for industry, comprised 3171 contacts. The contacted respondents qualified for the survey if they purchased direct goods (that directly flowed into the final product) from international suppliers. There was a dropout rate of 71% of the sampling frame (3% of contacted respondents did not qualify for the study, since they did not purchase direct goods from international suppliers, 31% of addresses were either generally blocked or did not provide the relevant contact details, and a remaining 37% of contacts simply was not reached). From the 914 remaining contacts, we generated 195 full interviews, a 21.3% response rate. Since survey response

rates vary considerably (e.g., Manfreda et al., 2008), we benchmarked against comparable studies. Following projections by industry experts prior to the survey (9–15%) (see also Fawcett et al., 2014), a 21.3% response rate is deemed good. However, we also examined the potential for non-response bias.

We followed Rogelberg and Stanton (2007), testing for response and self-selection bias (Armstrong and Overton, 1977). First, we compared the average found for the sampling frame with the average found for the responding firms concerning the number of employees as well as concerning their sales volumes (archival analysis). The sampling frame compared well with the responding firms. Second, we analyzed reasons given for non-participation if a person was contacted. The primary reason for non-participation was a general refusal to take part in telephone interviews (11%); only 2% declined owing the specific survey topic. We also examined the influence of the time taken by the respondents to answer the questions (interest level analysis). The average time per survey did not correlate significantly with the different constructs. These findings reduce concerns about potential response and self-selection bias.

Further, we analyzed the following descriptive statistics (see also Appendix A) against data retrieved from the German statistics office on the manufacturing sector. Most sample firms had between 250 and 1999 employees and generated a turnover of €50 to €500 million per year. This suggests that larger firms are somewhat over-represented in our sample, since most German manufacturing firms employ up to 100 persons and generate an average turnover of €39 million (www.destatis.de). The sample comprised 37 different purchasing locations (nations in which the major supplier is located), spanning industrialized and developing countries, and covering the major current purchasing locations of purchasers (see Lockström, 2007; Karjalainen and Salmi, 2013). Hence, the sample shows comparability to previous samples and enough variance in the purchasing locations for analysis. Thus, the sample data (i.e. 195 purchasers in 195 different firms) is comparable with previous studies concerning the sampling process and industry focus, and is reasonably representative for medium-sized to large international purchasers from a (German) industrialized context.

The questionnaire concentrated on the most frequently purchased, most important, or highest value product purchased internationally.

Also, a further questions' set focused the respondents on the most important international supplier for this product. Thus, here, the unit of analysis represents an important international purchasing relationship of the firm. This procedure corresponds to the best practices followed in previous purchasing-related studies (e.g., Handfield, 1994; Murray et al., 1995).

#### 4.2. Analytical methods

To test our hypotheses, we made use of partial least squares structural equation modeling (PLS-SEM) and SmartPLS 3.0 (Ringle et al., 2015). We chose PLS-SEM rather than individual regressions owing to the former's advantage of a simultaneous estimation of relationships with more than one dependent construct. We used PLS-SEM rather than covariance-based SEM techniques owing to the former's methodological advantages for complex models, including the various options for multigroup analyses and its ability to easily incorporate both formative and reflective measurement models, as well as its better fit to the early phase of theorizing in a field (e.g., Wold, 1985; Sosik et al., 2009, Shmueli, 2010; Richter et al., 2016b; Richter et al., 2016a; Rigdon, 2016; Henseler et al., 2016; see also the simulation study by Reinartz et al., 2009).

Our analyses involved three steps (Fig. 2). First, we evaluated a base model of purchasing performance (testing H1, H3, and H5). Second, we assessed the influence of the informal context using multigroup analyses: we created groups referring to the cultural distance and to the psychic distance involved in the purchasing relationship (testing H2a, H4a, and H6a). Third, we tested the influence of the formal context using multigroup analyses: we created groups referring to the institutional distance involved in the purchasing relationship and the quality of the institutional environment at the foreign location (testing H2b, H4b, and H6b). The dependent constructs in all these models were international purchasing performance and firm performance; specifically, we tested purchasing performance's effect on firm performance.

We obtained PLS-SEM results using the following settings in all steps of the analysis: path weighting scheme, 300 iterations, stop-criterion 0.0000001, and replaced missing values by mean value. We determined significance by applying the bootstrapping procedure (see Henseler

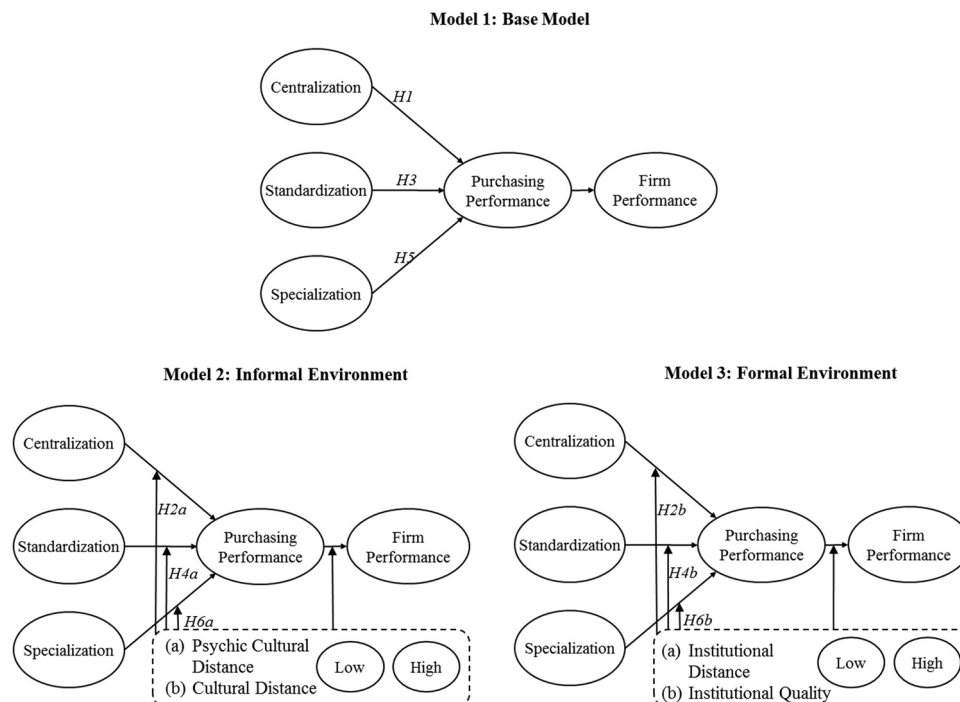


Fig. 2. Three steps of analyses.

et al., 2009; Chin, 1998) with the following settings: 5000 bootstrapping subsamples, as many observations per subsample as in the original sample, and the no sign change option.

#### 4.3. Construct measures

We took the measures used to operationalize the constructs in our survey questionnaire from the literature. We conducted the survey in German; following Brislin (1980), we used a translation-back-translation procedure to translate the English items from the literature into German. Following Presser et al. (2004) and Guest et al. (2006), we validated the questionnaire by pre-tests with managers from different companies. Appendices B, C, and D provide further details on our measures, including citations to their sources, associated statistics, and quality criteria. We measured all items along a five-point Likert scale (anchored by 1 = strongly disagree to 5 = strongly agree).

We used four reflective items, supposed to be manifestations of a centralized purchasing function, from Quintens et al. (2006a) and Bals et al. (2009) to measure *centralization*. These items all reflect basically the same domain: the bundling of purchasing functions from requirements planning, supplier selection, negotiation, and contracting to supplier evaluation at a central buying unit for which we referred to the headquarters example. We used eight formative items (from the catalogue by Karjalainen and Salmi, 2013) that cover the main aspects of *standardization* in the key phases of the purchasing process (from requirements planning to supplier evaluation). The measure comprises a) forecasting methods for requirements planning, b) cost-benefit analyses for supplier selection, c) auctions, d) standard contracts, and e) eProcurement for negotiating and contracting, f) risk management, g) standardized performance tracking, and h) standardized quality management for supplier evaluation and follow-up. In sum, these eight items constitute the formatively measured construct, as an index of the extent to which the process is standardized. Finally, we measured *specialization* using five reflective items adapted from different sources (see Appendix D). These cover the main skills relevant for purchasing and build on research by Giunipero and Percy (2000) and Giunipero et al. (2006). Specifically, these items cover purchasing skills relevant in the foreign countries: a) technical, b) cost-analysis skills, skills related to c) understanding the industry and the political and economic environment, and informal institutional environments, d) communication and foreign language skills, and e) intercultural skills.

We measured the *institutional environments* with reference to secondary data and by means of our individual surveys. We measured *psychic distance* (informal institutional environment) between Germany and the various purchasing locations by a single item in our survey that refers to the managers perception of a *low distance in terms of values, norms, business conduct and language* (along a five-point Likert scale) (adapted from Stöttinger and Schlegelmilch, 2000). We measured *cultural distance* using secondary data, following the Kogut and Singh's (1988) approach and the four basic Hofstede (1980) cultural value dimensions (power distance, individualism, masculinity, and uncertainty avoidance) (see Hofstede, 1980, 2001; and www.hofstede-insights.com). We discuss potential limitations of these approaches in the limitations section. Since we focused on purchasers located in Germany, we calculated the extent of the overall standardized difference from Germany to the country from which the firm sourced. Larger values in the cultural distance calculation indicated greater difference in cultural values between the purchaser located in Germany and the supplier located in the purchasing location. We operationalized the *formal institutional environment* through the distance from Germany and the purchasing locations as well as by reference to the quality of the formal institutional environment, both of which we sourced from secondary data. We followed previous studies (e.g., Meyer et al., 2009), using the Economic Freedom Index (EFI), since it captures aspects of the institutional environment that support or hinder international purchasing activities from a supplier located in a particular market. We based our

*distance* measure on the EFI data for 2013 and included 10 items: business freedom, freedom from corruption, financial freedom, fiscal freedom, government spending, investment freedom, labor freedom, monetary freedom, protection of property rights, and trade freedom. Also for this construct, we used Kogut and Singh's (1988) method. We followed prior research (He et al., 2013) and used the overall score (i.e. the average of the 10 underlying dimensions) of the EFI to measure *institutional quality*. Compared to the institutional distance construct, the institutional quality variable does not focus on distance, but measures whether a less or more favorable institutional environment exists in the purchasing location.

To test the moderating hypotheses, we applied the polar extremes approach (see George and Prybutok, 2015; Hair et al., 2017b) and built groups that represent the lower and the upper third of a tri-partition of the underlying construct. Thus, we classified each of the four institutional moderators into three groups. For instance, for the cultural distance moderator, the outer or polar extreme groups are countries that are less distant from Germany at one end (i.e. 33% of cases purchasing from locations with the lowest distance to Germany) and countries with the highest distance to Germany at the other end (i.e. 33% of cases purchasing from locations with the highest distance to Germany). The middle group was dropped from the analysis. This approach reduced the bias resulting from comparing different groups with only low differences in their mean or median values, which would be the case if the middle group was included (George and Prybutok, 2015; Hair et al., 2017b).

We used three reflective items (adapted from Chen et al., 2009) to measure *firm performance* (the items relate to profit, customer satisfaction and loyalty, and competitive advantage). We followed previous studies (González-Benito, 2010), using cost, quality, and time as the three dimensions to assess *international purchasing performance*. Thus, we also responded to calls by the international business community to look at more operational performance indicators (e.g., Richter et al., 2017; Richter, 2010). Each dimension represents a latent variable. We measured international purchasing cost with three items. A sample item of this scale is *By means of our international sourcing, we were able to reduce the purchasing costs*. We measured the second dimension, international purchasing performance quality, with three items. A sample item is *By means of our international sourcing, we were able to improve the reliability of purchased goods*. We also measured time with three items; a sample item of this scale is *By means of our international sourcing, we were able to better meet planned delivery dates*. The measurement mode of these (first-order) latent variables is reflective. We then applied a two-stage approach for hierarchical component models to the measurement of purchasing performance (see Becker et al., 2012). We used the three latent variable scores of purchasing performance (purchasing cost, quality, and time) as formative indicators for the overall construct, purchasing performance. Thus, the model had only one latent (second-order) construct of international purchasing performance and became less complex, making interpretation easier.

Finally, we included firm size as a *control variable* in our analyses, since large firms may have distinct purchasing advantages over small and medium-sized ones (e.g., as shown in González-Benito, 2010; Hartmann et al., 2008; Goerzen and Beamish, 2003).

## 5. Analyses and results

### 5.1. Measurement models, common method bias, robustness, and model fit

We first evaluated the reliability and validity of our reflective, formative, and second-order measurement models. For firm performance, centralization, and firm size (Appendix B), outer loadings (> 0.7), indicator reliability (> 0.5), average variance extracted (> 0.5) and composite reliability (> 0.7) correspond to threshold values for evaluating the reliability of reflective measurement models. For

specialization, three indicators showed reliabilities slightly below 0.5, yet we retained the indicators, for two reasons: the composite reliability of the construct was 0.8 (i.e. clearly above the threshold), and the deletion of indicators did not increase the internal consistency reliability (see Hair et al., 2017b). Finally, all measures met the discriminant validity criteria (evaluated by the heterotrait-monotrait / HTMT ratio) (see Henseler et al., 2015; Appendix C). The quality of our formative construct standardization (Appendix D) had to be evaluated theoretically. Statistical tests could support these evaluations and showed that some indicators have insignificant weights and thus only partially met the quality criteria. However, evaluating the loadings of the formative indicators and their significance levels in a second step, we did not eliminate any indicators, for the sake of the construct's theoretical completeness (see Hair et al., 2017b). International purchasing performance is a second-order construct, i.e. each indicator (purchasing cost, quality, and time) represents a latent variable, again measured with items. The measurement mode of these (first-order) latent variables was reflective. All loadings except for one were above 0.7 (we retained the indicator with a loading below, since its deletion did not increase internal consistency reliability). Composite reliabilities were all above 0.7; the AVE were above 0.5 for time and quality, and for costs equal to 0.5; an analysis of the HTMT criterion showed that our measurements had discriminant validity. We then used the three latent variable scores as formative indicators for the second-order construct of purchasing performance (two-stage approach, see Becker et al., 2012). Finally, we assessed the second-order construct's quality by referring to the coefficients that describe the relationships between the final construct (i.e. purchasing performance) and its three dimensions (Becker et al., 2012) along standard evaluations of formative measurement models (see the discussion above). The weights were between 0.17 for time and 0.57 for costs; the weights for cost and quality were significant, at  $p < 0.05$ . Further, the variance inflation factors were all below 2, suggesting that collinearity was not an issue with these measures (for further information, see Appendix D).

Appendix E provides an overview of the correlations between our (latent) constructs, showing for instance a positive correlation between cultural distance and psychic distance (correlation coefficient: 0.3), i.e. the perceived cultural distance went in the same direction as secondary data would indicate, yet did not fully correspond to it. Also, we learn from the correlations that standardization was not correlated with centralization in our sample firms (coefficient around 0), and thus that standardization and specialization are not extreme poles on one scale, but – as we hypothesized – are separate and different constructs.

We took two steps to account for potential common method bias. First, we separated survey items related to the dependent and the independent variables in the survey and randomized them in blocks to reduce any potential bias arising from their sequencing. Second, we used post hoc procedures to assess the potential influence of common method bias. Following the recommendation in the literature (Podsakoff et al., 2003), we tested for common method variance by including a common latent variable in the structural model. Specifically, we applied the procedure outlined by Liang et al. (2007). The test results showed that the variance explained by the hypothesized

variables was higher than the variance explained by the common latent variable, indicating that common method variance was unlikely to influence our findings.

Next, we checked our model's robustness in two ways (see also Braojos-Gomez et al., 2015; Rojo et al., 2016): First, we estimated a first alternative version of our base model (retaining all structural paths), in which all the constructs were reflective at both second-order and first-order level. Second, we estimated a second alternative version of our base model, in which the construct on second-order level remained formative, while all first-order constructs were reflective. In both cases, the results did not significantly differ from the original base model. This analysis suggests that construct specification or measurement were not issues in our data, supporting our model's robustness.

Finally, we evaluated the fit of our base model (Model 1), as measured by the Standardized-Root-Mean-Square-Residual (SRMR). The base model generated a SRMR of 0.079 for the saturated model and a SRMR of 0.080 for the estimated model. Thus, the model performed below (as it should) or on the threshold value of 0.08 defined for good models in a covariance-based SEM context. This threshold is thought to be a demanding (and conservative) threshold for PLS-SEM models and researchers recommend accepting higher values in a PLS-SEM context. (see Henseler et al., 2014; Hu and Bentler, 1998; Henseler et al., 2016; Hair et al., 2017a). We therefore conclude that the base model still demonstrated an acceptable fit to our survey data, and provides a solid platform for further analyses, though a better model fit would be desirable. This is especially true for our multigroup-analyses for which we find SRMR values which do not all meet the more conservative threshold; as this is likewise reflected in the lower amount of variance explained in the subgroups concerned, we will concentrate on the latter criterion in the following. In our limitations section, we will discuss several aspects, such as measurements, additionally relevant constructs, and sampling focus, which may further increase the model fit in future research designs.

5.2. Results for a purchasing organization's structural characteristics

Having ensured appropriate levels of reliability, validity, robustness, and fit, we now focus on the structural model and first discuss the results from the full sample and our base model. Table 2 provides an overview of the results obtained for the base model. In addition to the path coefficients, it provides the R-square values and some further quality criteria (namely the variance inflation factors, which are all below common thresholds, effect sizes, and the predictive relevance of constructs).

H1 predicted that centralization is positively related to purchasing performance. The results show that centralization was positively and significantly related to purchasing performance (path coefficient of 0.13;  $p = 0.03$ ). Thus, H1 is supported. H3 predicted that standardization is positively related to purchasing performance. The results show that standardization was positively but insignificantly related to purchasing performance (path coefficient of 0.15;  $p = 0.11$ ). Thus, H3 is not supported. H5 predicted that specialization is positively related to purchasing performance. The results show that it was positively and

Table 2  
PLS-SEM analysis: base model.

Relationship	Path coefficient	p value	VIF	R <sup>2</sup>	f <sup>2</sup>	Q <sup>2</sup>
Centralization → IPP	0.13*	0.03	1.05	IPP:0.25	0.02	IPP: 0.10
Standardization → IPP	0.15	0.11	1.14		0.03	
Specialization → IPP	0.40***	0.00	1.13		0.19	
Firm size → IPP	- 0.11†	0.09	1.00		0.02	
Firm size → Firm performance (FP)	0.17*	0.04	1.00	FP: 0.10	0.03	FP: 0.05
IPP → Firm performance	0.28***	0.00	1.00		0.08	

Notes: †  $p < 0.1$ ; \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ ; IPP = international purchasing performance. The values for R<sup>2</sup> and Q<sup>2</sup> for IPP are given in the first row. The values for R<sup>2</sup> and Q<sup>2</sup> for firm performance (FP) are given in the last row.

**Table 3**  
Multigroup analyses: psychic cultural distance (informal environment).

Relationship	Low psychic distance (n = 91)		High psychic distance (n = 49)		Differences (PLS-MGA)	
	Path coefficients	p value	Path coefficients	p value	Δ Path coefficients	p value
	Centralization → IPP	0.26**	0.00	0.32*	0.02	0.07
Standardization → IPP	0.29†	0.09	0.07	0.96	0.22	0.20
Specialization → IPP	0.27**	0.00	0.59***	0.00	0.31*	0.97
Firm size → IPP	-0.09	0.35	-0.17	0.21	0.08	0.31
IPP → Firm performance	0.29†	0.07	0.47**	0.00	0.18	0.82
Firm size → Firm performance	0.27†	0.06	0.07	0.78	0.20	0.22
IPP R <sup>2</sup>	0.286		0.554			
Firm performance R <sup>2</sup>	0.140		0.216			

Notes: † p < 0.1; \* p < 0.05; \*\* p < 0.01; \*\*\* p < 0.001. Further, for the differences in the PLS-MGA: † p > 0.9; \* p > 0.95; \*\* p > 0.99; \*\*\* p < 0.999. Significant probability levels for the delta in path coefficients depend on the effect's directionality (significance with low probability numbers implies the first coefficient > the second, and high numbers that the second coefficient > the first). IPP = international purchasing performance.

significantly related to purchasing performance (path coefficient 0.40;  $p < 0.001$ ), providing support for H5. The most important driver of purchasing performance is specialization, followed by centralization.

We found that international purchasing performance had a significant and positive effect (path coefficient 0.28;  $p < 0.001$ ) on firm performance, after controlling for firm size. The effect size was medium ( $f^2 = 0.08$ ) (see Hair et al., 2012), supporting the assumption of an association between purchasing performance and firm performance. We are able to explain a rather moderate-to-good share of variance in international purchasing performance (25%) and a moderate-to-low share of variance in firm performance (10%) in the total sample.

### 5.3. Results for a purchasing organization's informal institutional context

When analyzing contextual factors' contingency effects, we used multigroup analyses (i.e. PLS-MGA) (see Sarstedt et al., 2011 and the recommendation in Hair et al., 2017b). We referred to the purchasing managers' psychic distance as well as to the cultural distance measured via secondary data to test for the informal institutional context's effects. Tables 3 and 4 summarize the results.

In interpreting the results, we identified whether the importance of the purchasing organization's structural characteristics for purchasing performance differed between (culturally) distant and close purchasing locations. If their influence differed strongly between the two subsamples (i.e. a positive significant driver in one group and an insignificant driver in the other group, and/or a statistically significant difference between the characteristics within the two subsamples), the effect would either confirm or disconfirm our hypotheses. If a structural characteristic were insignificant in both subsamples, it may simply be not relevant in both location types, which would disconfirm the general tenor of our hypotheses.

H2a predicted that the positive relationship between centralization and international purchasing performance is stronger in less distant informal institutional environments. The path coefficients of centralization on international purchasing performance showed no significant differences between the purchasing locations with a low or high psychic as well as cultural distance, nor were there path coefficients that were significant in one, yet insignificant in the other context. Thus, there was no contingency of the relationship between centralization and international purchasing performance on the informal institutional environments in terms of psychic or cultural distance. H2a was not supported.

H4a predicted that the positive relationship between standardization and international purchasing performance is stronger in less distant informal institutional environments. Our results showed that in purchasing locations with a low cultural distance, standardization enhanced performance (path coefficient 0.48;  $p < 0.05$ ), while standardization did not contribute to purchasing performance in locations with a high cultural distance (path coefficient 0.12;  $p = 0.52$ ). Further, the multigroup analysis showed that these path coefficients differed significantly ( $p = 0.07$ ). Likewise, our results indicated that in purchasing locations with a low psychic distance, standardization related positively and significantly (path coefficient 0.29;  $p = 0.09$ ) to purchasing performance, while it did not significantly influence purchasing performance in locations with a high psychic distance (path coefficient 0.07;  $p = 0.96$ ). Thus, standardization's effect on purchasing performance was contingent on the informal institutional environment's information processing needs, supporting H4a.

H6a predicted that the positive relationship between specialization and international purchasing performance is stronger in more distant informal institutional environments. For cultural distance, we found that specialization was significantly more relevant for purchasing performance in distant locations than in close ones (path coefficient 0.52;  $p < 0.01$  in distant vs. path coefficient 0.16;  $p = 0.38$  in close locations; MGA showed that the difference between the two was statistically significant). The same was true for psychic distance, with the only



**Table 4**  
Multigroup analyses: cultural distance (informal environment).

Relationship	Low cultural distance (n = 65)		High cultural distance (n = 72)		Differences (PLS-MGA)	
	Path coefficients	p value	Path coefficients	p value	Δ Path coefficients	p value
Centralization → IPP	− 0.15	0.45	0.09	0.38	0.25	0.84
Standardization → IPP	0.48*	0.04	0.12	0.52	0.36†	0.07
Specialization → IPP	0.16	0.38	0.52***	0.00	0.36*	0.97
Firm size → IPP	− 0.01	0.97	− 0.26**	0.01	0.26†	0.08
IPP → Firm performance	0.07	0.74	0.51***	0.00	0.44*	0.96
Firm size → Firm performance	0.35†	0.08	0.09	0.38	0.26†	0.08
IPP R <sup>2</sup>	0.315		0.425			
Firm performance R <sup>2</sup>	0.125		0.253			

Notes: †  $p < 0.1$ ; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ . For the differences in the PLS-MGA, additionally: †  $p > 0.9$ ; \*  $p > 0.95$ ; \*\*  $p > 0.99$ ; \*\*\*  $p < 0.999$ . Significant probability levels for the delta in path coefficients depend on the effect's directionality (significance with low probability numbers implies the first coefficient > the second, and high numbers that the second coefficient > the first). IPP = international purchasing performance.

**Table 5**  
Multigroup analyses: institutional distance (formal environment).

Relationship	Low institutional distance (n = 74)		High institutional distance (n = 66)		Differences (PLS-MGA)	
	Path coefficients	p value	Path coefficients	p value	Δ Path coefficients	p value
Centralization → IPP	0.20	0.17	0.19†	0.05	0.02	0.43
Standardization → IPP	0.25*	0.03	0.05	0.83	0.20	0.19
Specialization → IPP	0.35*	0.01	0.49***	0.00	0.14	0.78
Firm size → IPP	− 0.07	0.63	− 0.26**	0.00	0.19	0.14
IPP → Firm performance	0.03	0.89	0.58***	0.00	0.55***	0.99
Firm size → Firm performance	0.23	0.13	0.15	0.28	0.07	0.33
IPP R <sup>2</sup>	0.294		0.442			
Firm performance R <sup>2</sup>	0.052		0.300			

Notes: †  $p < 0.1$ ; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ . For the differences in the PLS-MGA, additionally: †  $p > 0.9$ ; \*  $p > 0.95$ ; \*\*  $p > 0.99$ ; \*\*\*  $p < 0.999$ . Significant probability levels for the delta in path coefficients depend on the effect's directionality (significance with low probability numbers implies the first coefficient > the second, and high numbers that the second coefficient > the first). IPP = international purchasing performance.

difference that specialization remained a statistically significant driver of purchasing performance even in locations that were perceived to be fairly close (path coefficient 0.59;  $p < 0.01$  in distant vs. path coefficient 0.27;  $p < 0.01$  in close locations; MGA showed that the difference between the two was statistically significant). Thus, specialization's importance increased when sourcing from highly distant informal institutional environments, supporting H6a.

All models had a moderate to high explanatory power for purchasing performance, with a better explanatory power for locations with high distance in informal institutional environments: 43% of the variance in purchasing performance was explained in purchasing locations with high cultural distance, and 55% of the variance in purchasing performance was explained in purchasing locations with high psychic distance. Likewise, the models explained a moderate-to-good share of the variance in firm performance; again, the explanatory power was somewhat higher in distant purchasing locations: 25% in locations with high cultural distance and 22% in locations with high psychic distance. This is due to the stronger importance attached to specialization in these locations, and to the stronger effect of purchasing performance on firm performance in locations with high cultural and psychic distance. Thus, especially when sourcing from distant locations, purchasing performance's role as a determinant of firm performance increased.

This is consistent with the current trend of sourcing from more distant emerging markets as one of the key drivers of firm performance in business practice. To verify this conclusion, we did an additional analysis and tested for the group effect of sourcing from emerging markets vs. sourcing from developed markets, which showed considerably differing path coefficients of purchasing performance on firm performance (path coefficient 0.58  $p < 0.01$  in emerging markets vs. an insignificant path around 0 for the developed markets).

In sum, two of the three structural characteristics of the purchasing organization – standardization and specialization – were strongly contingent on the informal institutional environments. For centralization, there was no contingency on the informal institutional environment.

#### 5.4. Results for a purchasing organization's formal institutional context

We analyzed the influence of the formal institutional context by reference to the distance of formal institutional contexts between the home market and the purchasing location, as well as by reference to the quality of the formal institutional contexts of the purchasing locations. We referred to institutional environments as showing less uncertainty if they are less distant and/or relatively higher in formal institution quality. Tables 5 and 6 summarize the multigroup analysis results along the formal institutional environments.

H2b predicted that the positive relationship between centralization and international purchasing performance is stronger in formal institutional environments with less uncertainty. The path coefficients of centralization on purchasing performance showed no significant differences between purchasing locations with a low vs. high distance of formal institutions. This is also true for the path coefficients in purchasing locations with low-quality vs. high-quality formal institutional contexts. Thus, H2b was not supported.

H4b predicted that the positive relationship between standardization and international purchasing performance is stronger in formal institutional environments with less uncertainty. We found that in purchasing locations with a low institutional distance, standardization was a positive and significant determinant of purchasing performance (path coefficient 0.25;  $p = 0.03$ ), yet was an insignificant determinant of purchasing performance in purchasing locations with high institutional distance (path coefficient 0.05;  $p = 0.83$ ). Similarly,

**Table 6**  
Multigroup analyses: institutional quality (formal environment).

Relationship	Low institutional quality (n = 66)		High institutional quality (n = 65)		Differences (PLS-MGA)	
	Path coefficients	p value	Path coefficients	p value	Δ Path coefficients	p value
Centralization → IPP	0.19 <sup>†</sup>	0.05	0.26*	0.04	0.07	0.69
Standardization → IPP	0.05	0.83	0.36	0.46	0.31	0.65
Specialization → IPP	0.49***	0.00	0.17	0.21	0.32*	0.03
Firm size → IPP	- 0.26**	0.01	- 0.05	0.71	0.21 <sup>†</sup>	0.90
IPP → Firm performance	0.58***	0.00	0.13	0.63	0.45*	0.04
Firm size → Firm performance	0.15	0.29	0.25	0.25	0.10	0.72
IPP R <sup>2</sup>	0.442		0.271			
Firm performance R <sup>2</sup>	0.300		0.078			

Notes: <sup>†</sup>  $p < 0.1$ ; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ . For the differences in the PLS-MGA, additionally: <sup>†</sup>  $p > 0.9$ ; \*  $p > 0.95$ ; \*\*  $p > 0.99$ ; \*\*\*  $p < 0.999$ . Significant probability levels for the delta in path coefficients depend on the effect's directionality (significance with low probability numbers implies the first coefficient > the second, and high numbers that the second coefficient > the first). IPP = international purchasing performance.

standardization was more important to purchasing performance in high-quality formal environments (path coefficient 0.36;  $p = 0.46$ ) than environments with low-quality formal institutions (path coefficient 0.05;  $p = 0.83$ ); in spite of this strong difference in path coefficients, the difference between the two coefficients was insignificant. Building on the above, H4b was partially supported.

H6b posited that the positive relationship between specialization and international purchasing performance is stronger in formal institutional environments with high uncertainty. Our results showed that specialization was only slightly more important in sourcing environments with distant institutional environments: The path coefficients differed slightly and are significant in both contexts, i.e. contexts with low and high institutional distance. However, what seemed to matter is the formal institutional environment's quality. Specialization is more important in environmental contexts with low-quality formal institutions (path coefficient of 0.49;  $p < 0.01$ ) compared to environmental contexts with high-quality formal institutions (path coefficient of 0.17;  $p = 0.21$ ). This difference is statistically significant ( $p = 0.03$ ). Thus, H6b was partially supported.

Again, all models had a moderate-to-good explanatory power for international purchasing performance, with a better explanatory power for the purchasing locations with higher uncertainty: 44% of the variance in purchasing performance was explained in purchasing locations with high distance (29% in purchasing locations with low distance in formal institutions), and 44% of the variance in purchasing performance was explained in purchasing locations with low-quality formal institutional environments (27% in purchasing locations with high-quality formal institutional environments). Likewise, the models explained a moderate-to-good share of the variance in firm performance; again, the explanatory power was somewhat higher in highly distant or low-quality purchasing locations: 30% in purchasing locations with high distance, and 30% in environments with low-quality formal institutions. This is (at least partially) due to the stronger importance attached to specialization in these locations, and to purchasing performance's stronger effect on firm performance in locations with higher uncertainty.

In sum, two of the three structural characteristics of the purchasing organizations were contingent on the formal institutional environments: standardization and specialization. For centralization, there seemed to be no contingency effect.

## 6. Discussion

### 6.1. Overview of contributions

Past research into international purchasing focused primarily on understanding the structural decisions firms pursued in seeking to become successful in their global purchasing activities. Mostly qualitative and case-based studies, often concentrating on single characteristics, contributed to theorizing in the field: Authors outlined propositions or

conceptual models on organizational structures' performance effects. Research into a purchasing organization's structure has primarily concentrated on the resource-based view and transaction cost economics, using these theories to argue about resources relevant to purchasing (e.g., Sartor et al., 2015; Quintens et al., 2006a) or to explain unforeseen costs involved in purchasing processes (e.g., Wang et al., 2011) (see also the overview of theory use in the purchasing field in Defee et al., 2010; Glock and Hochrein, 2011; Chicksand et al., 2012). Also, authors have referred to information processing theory (e.g., Foerstl et al., 2018) to outline the potential performance outcomes of different purchasing organizations. There has been very little de facto testing of the effects on (both purchasing and firm) performance resulting from different purchasing organizations in larger-scale settings. Thus, our first contribution has been to identify and empirically examine a set of key organizational structure characteristics' influences on international purchasing performance and their relationships to firm performance. We incorporated centralization, standardization, and specialization, which – taken together – can be used to describe multinational or global organizational structures typical of international firms. Thus, our study began to respond recent calls (e.g., Vos et al., 2016; Glock and Hochrein, 2011; Quintens et al., 2006a) to examine the links between a more comprehensive set of organizational structure characteristics and international purchasing performance and to assess these characteristics' relative importances in explaining purchasing and firm success.

Our second contribution has been to identify key boundary conditions under which specific structure characteristics of the purchasing organization relate to international purchasing performance. Theorizing on relevant contingencies in a purchasing organization and performance relationship has come into focus in the past few years, and authors have called for testing these contingencies (e.g., Bals et al., 2018; Stanczyk et al., 2017). Although researchers have presented conceptual contingency arguments, including the purchasing location's moderating role (see Quintens et al., 2006a; Trautmann et al., 2009b; Sartor et al., 2015; Yan and Nair, 2016), there has been little attention to testing these specific contingencies. Thus, our findings respond to recent calls in the purchasing literature for a better understanding of the conditions under which organizational settings have a stronger or weaker effect in increasing purchasing performance (e.g., Glock and Hochrein, 2011; Tressin and Richter, 2014). We tested boundary conditions common in the international business literature: the informal and formal institutional environments, as key sources of uncertainty that an organization must deal with. Thus, we also responded to calls to look closely at different distance types' effects in the purchasing context (e.g., Lorentz et al., 2018). Finally, we responded to calls to theoretically integrate organizational information processing theory and contingency perspectives on international purchasing (e.g., Foerstl et al., 2018; Bals et al., 2018; Trautmann et al., 2009b).

Having said this, we built on organizational information processing and contingency theory, in combination with established approaches in

**Table 7**  
Hypotheses and results.

Hypothesis	Empirical results
<b>The purchasing organization's structural characteristics</b>	
1: Centralization relates positively to international purchasing performance	supported
3: Standardization relates positively to international purchasing performance.	not supported
5: Specialization relates positively to international purchasing performance.	supported
<b>Contextual factors of the purchasing organization</b>	
2: The positive relationship between centralization and international purchasing performance is stronger in (a) less distant informal institutional environments and (b) in formal institutional environments with less uncertainty.	(a) not supported (b) not supported
4: The positive relationship between standardization and international purchasing performance is stronger in (a) less distant informal institutional environments and (b) in formal institutional environments with less uncertainty.	(a) supported (b) partially supported
6: The positive relationship between specialization and international purchasing performance is stronger in (a) more distant informal institutional environments and (b) in formal institutional environments with high uncertainty.	(a) supported (b) partially supported

the international business and management literature. We derived six hypotheses on the general influence of a set of structure characteristics of the purchasing organization on purchasing performance and considered the contingencies on institutional sourcing environments. Four hypotheses were supported, and two were not (see Table 7).

## 6.2. Theoretical implications

We found that *centralization* positively influenced purchasing performance, providing support for the economies of scale advantage that is often stated in the literature. This finding was generated for an activity-based centralization type that looks at the bundling of purchasing functions performed along the purchasing process in a central buying unit. It does not explicitly refer to other discussed centralization levels, namely a (de)centralization at the unit, category, or regional level (or at a micro-level and macro-level, as referred to in Bals et al., 2018). For instance, previous studies have outlined that centralization's positive effect on performance may depend on the goods or categories purchased and the options offered by these categories for a bundling of activities at the category level (e.g., Trautmann et al., 2009b). Contingent on the effect of the purchase category, authors came to different performance implications; for instance, Li and Shi (2019) used a simulation to demonstrate that for durable goods this argument maybe false. Other authors focused on a specific (de)centralization type at the geographic level, the international purchasing office (e.g., Sartor et al., 2014), and outlined that creating an international purchasing office contributes to performance. The latter studies further addressed these offices' additional characteristics that may be relevant for the purchasing performance outcome. In particular, the specialization of these offices is discussed (e.g., Sartor et al., 2015). Although we don't explicitly look at (de)centralization to specific regional levels using a purchasing offices lens, we have integrated specialization and could put the findings on centralization and specialization into relationship. Specialization is the key antecedent concerning purchasing performance. Thus, while centralization matters, we agree with studies on international purchasing offices in that we confirmed that it is about (de)centralization with the right specialization level. Further, while some firms may be fully (de)central, most firms adopt a hybrid approach that involve elements of centralization and decentralization (e.g., Quintens et al., 2006a). Thus, we conclude that a *relatively* stronger centralization of the purchasing function enables efficiency and integration advantages, such as synergies, an improved information base, company-internal learning effects at the central location, process optimization, bundling requirements, and increased negotiation power (see also Cavinato, 1992; Alonso et al., 2008; Karjalainen, 2011).

While decentralization may arguably be a tool to reduce distance to suppliers, as argued in Foerstl et al. (2018), it does not lead to a higher performance outcome when purchasing from these distant locations. We came to this conclusion, since our results did not support arguments common in the international business literature, namely that uncertainties and differences in the international environment should

require a firm to further decentralize to the different environments in order to remain competitive. That is, we observed no contingency of institutional distance or quality on the centralization-performance relationship. From an international business perspective, this may seem counter-intuitive: purchasing locations characterized by a high distance (whether informal or formal) or a lower-quality institutional environment will induce potentially higher information and monitoring costs for such locations. This is also argued in Trautmann et al. (2009b), who pointed to the need for high information capacity in high uncertainty environments. Still, from the purchasing literature, we derived the following propositions to argue why there is less need to adapt or respond to different environments by decentralizing: other ways to increase information processing capacity are simply more fruitful. Authors that have researched aspects of responsiveness focused on higher specialization to increase the purchasing function's responsiveness (e.g., Reuter et al., 2010). Thus, other structural mechanisms of the purchasing organization may be more relevant concerning achieving advantages of responsiveness. Finally, there are authors that provide more specific arguments on the culture in which the organizational (de) centralization takes place, arguing, for instance, that centralization is more congruent with locations with relatively high power distance being prone to accept centralized structures (e.g., Yan and Nair, 2016). Thus, this would imply that it is not about distance or quality, but about the cultural values.

*Standardization's* influence on purchasing performance is contingent on the purchasing location's institutional environment. Standardization is advised only if the environments in which the sourcing take place are characterized by low uncertainty and therewith pose low information processing requirements on the purchasing organization. This is the case in environments with relatively low cultural distance, low institutional distance, and high-quality formal institutions. In environments with high uncertainty and thus high information processing requirements, the standardization of information processing does not contribute to an organization's effectiveness and efficiency. Thus, standardization in the form, for instance, of standardized forecasting, standardized cost-benefit analyses, and quality management does not per se positively affect purchasing performance. These findings further enrich past research that conceptualized on and discussed standardization's effect on a purchasing organization's performance: First, a specific look at both standardization and specialization contributes to studies that bundled both facets and found a positive influence of this bundle on operational performance (e.g., Kerkfeld and Hartmann, 2012). We found that differentiating the two is relevant and contributed to our understanding, since the effects for the two structural elements differ. Further, authors found that standardization positively influences performance in joint projects between buyers and suppliers, but negatively affects buyer learning (e.g., Yan and Nair, 2016). Although we retained an internal perspective, the learning aspect may be a mechanism of specific relevance in more distant locations, which is why standardization did not contribute to performance in these locations. Finally, we have enriched previous concepts of purchasing strategy:

Quintens et al. (2006a) conceptualized that a global purchasing strategy is manifested in both centralization and standardization, outlining their strategy construct's influence on performance. We have provided additional insights into the facets of purchasing strategy that are contingent on the environment and that ultimately affect performance.

Thus, concerning standardization, the classical information cost logic applies if combined with contingency approaches and classical international business thinking – standardization contributes to efficiency if the environment's information processing needs are low (e.g., Westney and Zaheer, 2003). Here, the approach to differentiate between informal and formal institutional environments to assess information processing needs in international purchasing offers deeper insights into standardization's performance implications. This also fits arguments by researchers in the purchasing field (e.g., Glock and Hochrein, 2011; Sanchez-Rodriguez et al., 2006), for which we now provide statistical or empirical support.

*Specialization* is a positive determinant of both purchasing and firm performance. Indeed, in our results, it was the strongest of the three characteristics we tested. Thus, increasing non-routine and peripheral information processing capacity by specializing the purchasing organization is advantageous. This supports assumptions about competitive advantages owing to specialized capabilities outlined by other authors in purchasing (e.g., Sartor et al., 2015; Kerkfeld and Hartmann, 2012; Stanley, 1993). Comparing this finding to what we found for centralization, it offers valuable insights, also into the literature on specialized international purchasing offices, as argued above (e.g., Sartor et al., 2015 outlined a positive performance effect of these offices, depending on their capabilities and resources). Thus, for improving performance, it is arguably more about processing non-routine and peripheral information by specialization than (de)centralization of the purchasing function.

Specialization's effects are also contingent on the institutional environment: Specialization turns out to be even more important in environments with higher uncertainty owing to a higher cultural distance, and a lower quality of the formal institutional environment. This is in line with contingency theory and the notion that environmental uncertainty must be faced with higher information processing capacity – to understand the industry and environment and to identify potential risks from them (e.g., Foerstl et al., 2018; Hartmann et al., 2008). This contingency effect was tested more implicitly in studies that related their findings to the purchasing location of a specific supplier and a specific buyer. We explicitly tested for the contingencies, providing the empirical tests called for by Foerstl et al. (2018) or Bals et al. (2018).

Thus, our findings support the arguments of international business scholars who drew on Bartlett and Ghoshal (1989) only concerning standardization and specialization. In contrast, decentralizing the purchasing function to the different purchasing locations found no support in our analyses. In most of the multigroup analyses and overall, centralization – not decentralization – is driving purchasing performance. While decentralization may be a key design aspect of organizational structure in other business functions such as marketing, where it is about understanding customer needs, in the context of purchasing, other structural characteristics seem to have greater importance. However, before making this conclusion definitive, we suggest further theorizing and empirical testing of the different information types processed in different units of a firm, the different functions performed by different partners, and different product and regionalization strategies. In some circumstances, decentralizing purchasing may be more beneficial than in others. We will offer more concrete ideas for future research later.

Our results partially support the moderation hypotheses for the formal institutional environments for two of our structural characteristics: although in terms of tendency, all path coefficients point in the hypothesized direction for standardization and specialization, these did not prove to be significant in all tests, and the difference between the

two path coefficients was not always significant. This must be contrasted to the sample size, which is why we posit that we identified a fairly consistent pattern for specialization and standardization across the different operationalizations of the formal environment. To nonetheless offer a potential explanation why we did not observe even more pronounced effects for the different formal institutional environments, we argue that the purchasing firms may have had the opportunity to adapt, or partially adapt, to differences in the supplying firm's formal institutions (e.g., Jia et al., 2016). Over time and with the development of the relationship between the firms, the distance may fade and may become less important. The firms develop a better understanding of the other side's procedures, reducing the need for more costly solutions. Thus, the organizational structure characteristics are also becoming more effective in purchasing locations, characterized by a different formal and informal institutional context. Researchers may want to further examine the effects along the persistence of purchaser-supplier relationships over time in this regard.

Further, although not formally hypothesized, our results confirm purchasing performance's key role on firm performance. There is a positive influence of purchasing performance on firm performance, with a medium effect size. The effect sizes yielded in the subgroups are even higher and, ranging between 0.28 and 0.50, can be considered to be strong, especially for purchasing locations with high psychic distance, high cultural distance, high institutional distance, and low-quality formal institutional environments. Since the purchasing locations characterized by the above mentioned contextual factors were mainly emerging countries, our results support the assumption of the role of purchasing in driving firm performance, at least for emerging market sourcing. This provides justification for calls to increase attention on the purchasing function. Based on these strong effects, we support the argument that strategic purchasing must get more attention in the international and strategic management literatures, where it is largely ignored as a business function (see potential avenues in Tchokogué et al., 2017).

### 6.3. Managerial implications

Our results highlighted the importance of the purchasing department, and its business processes and tools, as a major contributor to overall firm success, especially if sourcing from emerging markets. From our work, the claim of double-digit improvements in performance from purchasing (e.g., Quintens et al., 2006b) is not unrealistic. By the right or wrong choice of organizational structure, a firm can markedly enhance or impede its overall performance.

Our findings inform practitioners about the organizational structures that can improve international purchasing performance and overall firm performance. This is one of the first efforts to examine the organizational structures required for different purchasing locations to successfully manage international purchasing. It supports practitioners' assertions that firms need to implement a specific organizational structure in response to the conditions and circumstances faced by firms sourcing from countries with different institutional frameworks. Managers must be aware that it is not only about the contingencies of the formal institutional environments in these organizational design decisions, but also about the contingencies of the informal institutional environments. Adapting to the needs of informal institutional environments strongly influence the performance outcome of the purchasing function and thus on performance.

We found that specialization is key to the success of purchasing activities for any location; managers should even increase the importance of specialization if purchasing from locations that are (perceived to be) distant in terms culture, formal institutions, and have lower-quality formal institutions. In these contexts, specialized capabilities to successfully manage the business transactions involved are even more important if one is to be successful. The skills that purchasing managers should look for to specialize their purchasing

organizations are intercultural skills, technical skills, and cost analytical skills. Further, when thinking about the standardization of purchasing tools and instruments, managers need to carefully analyze their sourcing environments, since standardization's performance influence is strongly contingent on the sourcing context. The advice is to only standardize if sourcing from environments that are (perceived as) close in terms of culture and formal institutions, and have a fairly high-quality formal institutional environment. In all other contexts, standardization is not a wise choice. Finally, as the only characteristic that does not depend on the context, it would seem advisable to implement a centralized structure in which purchasing activities are bundled in a central unit to ensure good performance.

#### 6.4. Limitations and recommendations for future research

Our study has limitations, which present potential avenues for future research. First, limitations of our sample restrict our results' generalizability. We considered German manufacturing firms, which limits the generalizability of the results by country, industry sector, and purchasing locations. Research should examine other sectors, a broader purchasing locations set, and firms with different heritages or more diverse national contexts, so as to gain a better understanding of the relationships between organizational structure, international purchasing, and firm performance. Given the differences in the industry structure of firms in different countries, focusing on firms in countries in other geographies (e.g., in Asia and South America) would allow researchers to investigate whether similar organizational structure characteristics are appropriate for firms located in different countries and purchasing from different locations. Further, while we grounded the causal relationships between variables in theory, the cross-sectional nature of our survey limits our ability to assert causality and over-time effects of learning and relationship-building. Studies should use a longitudinal research design to reach firmer conclusions regarding the causal direction of the observed effects. The use of a single-respondent questionnaire design also has the potential for a single-source bias. Future research should use a multi-respondent approach to further enhance the data's objectivity or should use secondary data on performance constructs to decrease common method bias *ex ante*. Finally, increasing the sample size would be desirable, since it would provide more freedom for statistical significance testing, especially when performing moderator and multigroup analyses.

Second, there are limitations in the measures we used, primarily owing to the lack of common measures with proven reliability that are accepted and agreed on by purchasing researchers. Thus, our measures for operationalizing the purchasing organization's structural characteristics have been specifically developed to fit the theoretical ideas behind our concepts. This is especially true for the measurements of standardization and specialization, which we developed from articles in the international purchasing literature with the aim of covering the overall domain of the concepts. We drew our standardization items from a catalogue of tools used in purchasing to cover the standardized and formalized tools and processes in any of the purchasing process steps. Likewise, specialization is a customized measure that covers the ideas of several authors who have measured specialization in former studies. There may be criticisms of our item selection, despite their selection in part deriving from pre-testing with purchasing managers and their quality in the later statistical analyses. The evaluation of items showed that they have acceptable quality, yet we also detected some weaknesses in the reliability and validity evaluation. Hence, researchers are invited to further elaborate on stronger measurements for these constructs. An interesting route to go in this context might be to pick-up an intercultural competence perspective and to investigate the potential effects of intercultural competencies among purchasing employees and

managers on performance (as these have been shown to have an effect on many work-related outcomes in the international context, e.g. [Schlaegel et al., 2017](#)). Further, our single-item measure of psychic distance may be subject to criticism concerning whether a single-item measure can cover the overall construct (e.g., see the discussion in [Smith et al., 2011](#)). Likewise, there is ongoing debate about the concept of measuring cultural distance, starting with the dimensions to be used (e.g., either Hofstede, GLOBE, or other). We referred to the four original Hofstede dimensions, since these are the most prominent in intercultural research (see [Taras et al., 2009](#); [Tung and Verbeke, 2010](#); for criticism of the Hofstede model, see [McSweeney, 2002](#)). Also, we employed a very common procedure of arriving at a distance value, which – however – has also been criticized (see [Shenkar, 2001](#)).

Finally, there are limitations concerning the concepts incorporated into the model or the research design: while we have applied a specific set of key structural characteristics of purchasing organizations, from organizational theory and purchasing research perspectives, there are further relevant drivers of international purchasing performance we did not incorporate (e.g., formalization, as mentioned in [Glock and Hochrein, 2011](#)) that studies could explore. Incorporating further constructs into the design is desirable also from the viewpoint of explanatory power of models or the model fit which was not fully convincing for all subgroups analyzed. Researchers may look closely at specific levels of structural variables or at the distribution of activities between different units. For (de)centralization, this has already been triggered in recent articles (see [Bals et al., 2018](#); [Ates et al., 2018](#); [Hartmann et al., 2008](#); [Jia et al., 2017](#); [Jia et al., 2014](#); [Sartor et al., 2014](#)). Further, researchers may further look at specific performance outcomes. For instance, for standardization, researchers may look at risk-adjusted performance measures, since studies that take a risk perspective argue that standardization may help to reduce risks involved in purchasing (e.g., [Christopher et al., 2011](#)). Finally, specific national contexts with specific value patterns may favor certain organizational structures. Researchers may further tap the potential of an adaptation to specific cultural value patterns, rather than just look at the concept of distance (e.g., as triggered by [Yan and Nair, 2016](#)) – an avenue that may be worth pursuing at least for the major sourcing locations. Another research avenue would be to investigate international purchasing using a strategy lens towards understanding international purchasing success. From a strategic management and purchasing perspective, there are two key determinants of international firm performance that are strongly interrelated: structure and strategy. While we have presented a first quantitative assessment of the specific organizational structure that can increase international purchasing performance in different purchasing locations, researchers could explore the different purchasing strategies' effects in different contexts or the strategy and structure fit in different locations (as also triggered by [Ates et al., 2018](#)).

All of the above recommendations regarding measurement, sampling and research approaches are potential starting points to also develop empirical designs with stronger overall model fit.

## 7. Concluding comments

Notwithstanding these limitations, our study makes the following key contributions: First, it advances our understanding of the strategic role of purchasing, an under-represented field in the current research landscape. Second, it provides insights into the mechanisms through which organizational structure influences purchasing and firm performance. Third, it identifies the environmental conditions in which organizational structure characteristics relate to international purchasing and firm performance. Thus, it contextualizes the relationship between organizational structure and performance, enhancing our understanding of environmental variables' moderating roles.

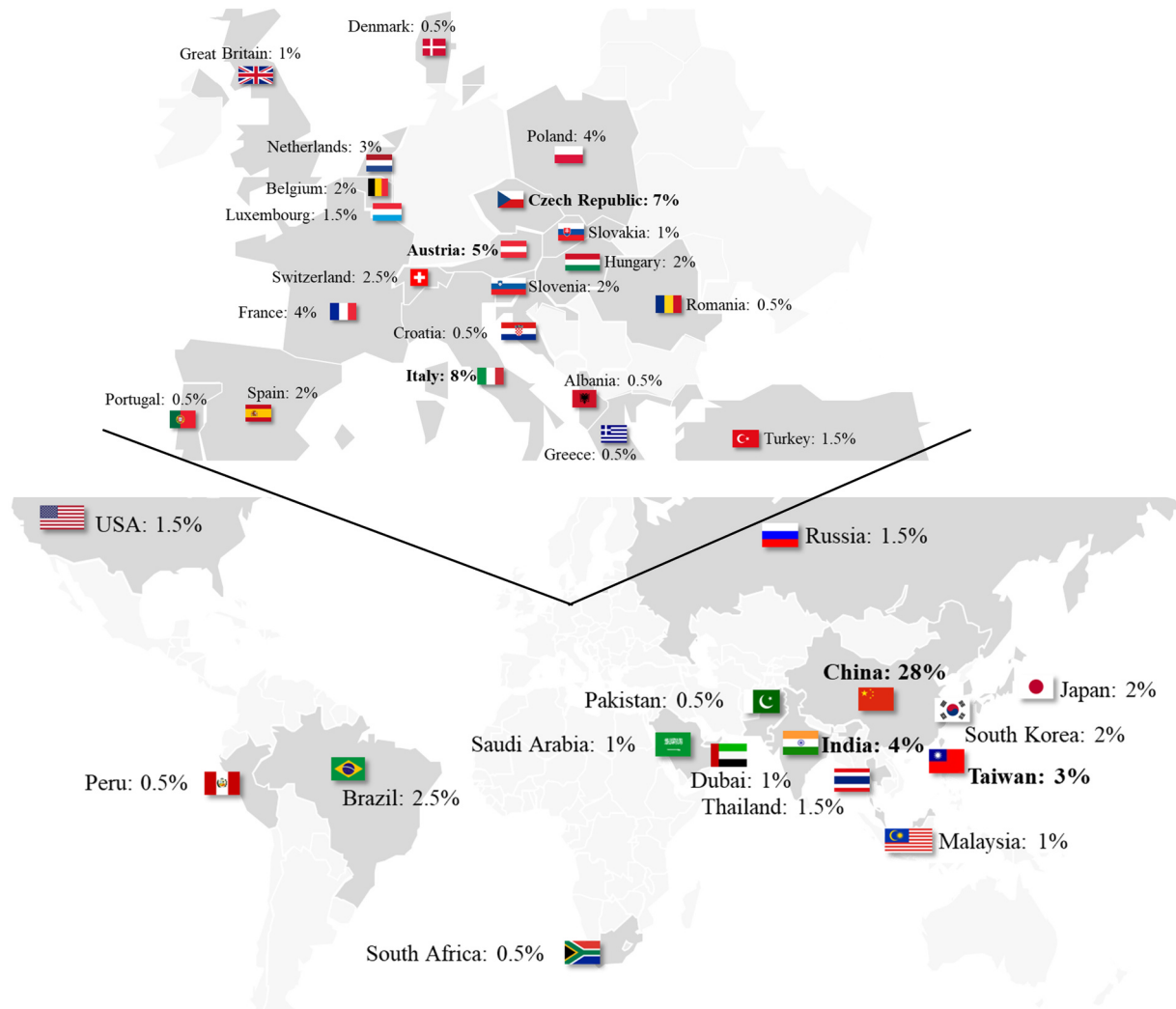
Appendix A. Sample descriptions

NACE	Industry groups	Frequency
20	Manufacture of chemicals and chemical products	12.3
21	Manufacture of basic pharmaceutical products and pharmaceutical preparations	1.0
22	Manufacture of rubber and plastic products	7.2
23	Manufacture of other non-metallic mineral products	1.5
24	Manufacture of basic metals	6.7
25	Manufacture of fabricated metal products, except machinery and equipment	11.3
26	Manufacture of computer, electronic, and optical products	3.6
27	Manufacture of electrical equipment	12.8
28	Manufacture of machinery and equipment n.e.c.	23.6
29	Manufacture of motor vehicles, trailers and semi-trailers	11.3
30	Manufacture of other transport equipment	4.1
32.5	Manufacture of medical and dental instruments and supplies	2.1
32	Other manufacturing	2.6

Number of employees	Frequency	Turnover for 2013	Frequency
10–249	12.8	Up to €10 million	2.0
250–1999	56.9	Up to €50 million	7.2
2000 to 4999	12.8	Up to 500 million	53.8
5000 and above	16.4	More than €500 million	18.5
No answer	1.0	No answer	18.5

Location of the Most Important International Supplier (Europe and the rest of the world)



**Appendix B. Reflective measures**

Construct (source)	Item	Outer loading	Item reliability	AVE	CR ( $\alpha$ )
<i>Firm performance</i> (Chen et al., 2009)	In the last years, we...				
	...achieved our profit objectives.	0.70	0.50	0.57	0.79 (0.63)
	...improved our customer satisfaction and loyalty.	0.80	0.62		
...had an important competitive advantage.	0.75	0.55			
<i>Centralization</i> (Quintens et al., 2006a; Bals et al., 2009)	The product's entire purchasing process is highly centralized, i.e. bundled for instance in the company headquarters' central buying unit, in terms of...				
	...the requirements planning	0.71	0.50	0.59	0.85 (0.76)
	...the supplier selection	0.81	0.65		
	...negotiation and contracting	0.77	0.59		
	...the supplier evaluation	0.77	0.57		
<i>Specialization</i> ( <sup>a</sup> Petersen et al., 2000; <sup>b</sup> Trent and Monczka, 2003; <sup>c</sup> Bygballe et al., 2012; <sup>d</sup> Fawcett and Scully, 1998; <sup>e</sup> Giunipero and P-earcy, 2000; Wang et al., 2011)	My purchasing unit has specialized skills for purchasing this product international in terms of...				
	...communication and foreign language skills <sup>a</sup>	0.70	0.50	<u>0.45</u>	0.80 (0.70)
	...technical skills: product knowledge and IT skills <sup>b</sup>	<u>0.67</u>	<u>0.45</u>		
	...cost analysis skills <sup>c</sup>	<u>0.64</u>	<u>0.41</u>		
	...an understanding of the industry and the political/economic environment <sup>d</sup>	<u>0.60</u>	<u>0.36</u>		
	...intercultural skills: cross-cultural business practices, negotiation in different cultures <sup>e</sup>	0.77	0.59		
<i>Firm size</i>	Number of employees	0.80	0.66	0.75	0.85 (0.68)
	Sales	0.93	0.84		
<i>Psychic distance</i> (Stöttinger and Schlegelmilch, 2000)	Low cultural distance in terms of values, norms, business conduct and language. [Single item, recoded so that high values represent high distance]				

Notes: AVE = average variance extracted; CR = composite reliability;  $\alpha$  = Cronbach's alpha. Values which do not meet the quality thresholds are underlined and will receive further assessment.

**Appendix C. Heterotrait-monotrait-ratio**

	Centralization	Specialization	Firm size
Specialization	0.24		
Firm size	0.16	0.21	
Firm performance	0.16	0.49	0.24

**Appendix D. Formative measures**

Construct	Item	Weights	p	CI	Loading	p	VIF
<i>Standardization</i> (Karjalainen and Salmi, 2013)	Our purchasing department uses the following methods and instruments:						
	...forecasting methods	0.44	0.120	- 0.02/0.93	0.57	0.016	1.22
	...cost-benefit analyses	0.59	0.072	0.08/1.00	0.69	0.002	1.65
	...auctions	0.55	0.042	0.18/0.96	0.68	0.005	1.15
	...standard contracts	- 0.15	<u>0.556</u>	- 0.61/0.32	0.15	<u>0.503</u>	1.14
	...eProcurement	- 0.07	<u>0.824</u>	- 0.68/0.51	0.37	<u>0.141</u>	1.34
	...standardized performance tracking	- 0.02	0.955	- 0.66/0.63	0.46	0.063	1.45
	...risk management	- 0.23	<u>0.488</u>	- 0.91/0.34	0.24	<u>0.383</u>	1.40
	...standardized quality management	0.18	<u>0.513</u>	- 0.32/0.75	0.36	<u>0.118</u>	1.21
<i>International purchasing performance</i> (González-Benito, 2007; González-Benito, 2010)	By means of our international sourcing, we were able to:						
	...reduce the purchasing costs (0.65 <sup>†</sup> )	0.57	0.000	0.27/0.87	0.80	0.000	1.14
	...reduce the stockhold costs (0.72 <sup>†</sup> )						
	...reduce the costs of supplier handling (e.g., negotiations) (0.74 <sup>†</sup> )						
	...improve the reliability of purchased goods (0.84 <sup>†</sup> );	0.52	0.012	0.10/0.88	0.82	0.000	1.72
	...improve the quality of our final product (0.88 <sup>†</sup> )						
	...improve our suppliers' service quality (0.72 <sup>†</sup> );						
	...better meet planned delivery dates (0.84 <sup>†</sup> )	0.17	0.484	- 0.28/0.70	0.66	0.000	1.66
...increase flexibility of our purchasing process in terms of changes in quantities (0.87 <sup>†</sup> )							
...increase the flexibility of our purchasing process in terms of changes in product specifications (0.77 <sup>†</sup> ) (first-order loading; <sup>†</sup> p < 0.1)							

Notes: CI = 95% bias corrected confidence interval; VIF = variance inflation factors. Values which do not meet the quality thresholds are underlined and will receive further assessment; insignificant weights are only underlined, if the factor loadings were likewise insignificant.

Appendix E. Correlations

Variable	1	2	2a	2b	2c	3	4	5	6	7	8	9
1 Firm performance												
2 IPP	0.27											
a) cost (stage 1)	0.21	0.79										
b) quality (stage 1)	0.23	0.83	0.34									
c) time (stage 1)	0.20	0.66	0.29	0.63								
3 Centralization	0.08	0.21	0.14	0.21	0.17							
4 Standardization	0.12	0.23	0.24	0.15	0.10	- 0.00						
5 Specialization	0.32	0.45	0.36	0.38	0.28	0.17	0.27					
6 Firm size	0.16	- 0.03	- 0.03	- 0.01	- 0.05	- 0.12	0.25	0.15				
7 Institut. distance	0.06	0.08	0.16	- 0.01	- 0.04	- 0.07	0.29	0.15	0.13			
8 Institut. quality	- 0.02	- 0.03	- 0.10	0.01	0.11	0.11	- 0.20	- 0.12	- 0.06	- 0.83		
9 Cultural distance	0.11	0.01	0.13	- 0.09	- 0.09	- 0.08	0.14	0.09	0.06	0.63	- 0.59	
10 Psychic distance	- 0.11	- 0.07	0.03	- 0.14	- 0.09	- 0.06	0.03	- 0.06	0.01	0.27	- 0.28	0.30

Notes: IPP = international purchasing performance; n = 195; correlations above |.14| are significant at p < 0.05.

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