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Greasing the wheels or blocking the path? Organizational structure, product innovativeness, and new product success☆

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ABSTRACT

Research on firm-level innovativeness indicates that internal resistances in the innovating organization and external resistances in the marketplace act as critical hindrances to successful commercialization of innovations. We suggest that the translation of firm-level product innovativeness into successful commercialization of new products is facilitated when firms' organizational structures are designed to unleash their abilities to overcome these resistances. We examine the relationship between firm-level product innovativeness and perceived new product performance, and analyze how organizational structure in the form of centralization and formalization moderates (enlarges or eliminates) the focal relationship. Testing hypotheses on a sample of 137 German exporters reveals support for our theoretical predictions. Our research contributes to the literature by contextualizing the relationship between firm-level product innovativeness and perceived new product performance. Moreover, we contribute to a better understanding of effective export sales organizations.

1. Introduction

The commercial success of firms' product innovations is a key driver of overall firm performance and competitiveness (Droge, Calantone, & Harmancioglu, 2008; Griffin & Page, 1996; Kang & Montoya, 2014). In turn, innovation and marketing scholars alike study the determinants of successful commercialization of firms' product innovations—that is, new product performance (e.g., Chaudhuri, Calantone, Voorhees, & Cockrell, 2018; Najafi-Tavani, Sharifi, & Najafi-Tavani, 2016)—including firms' investment in their firm-level product innovativeness (cf. Story, Boso, & Cadogan, 2015). Despite considerable research, the existing literature on the relationship between firm-level product innovation and new product performance remains inconclusive. While most scholars agree that firm-level product innovativeness spurs new product performance (e.g., Hult, Hurley, & Knight, 2004; Story et al., 2015), some studies show that product innovativeness does not translate into successful commercialization per se (Castellion & Markham, 2013; Cooper, 1979). According to the latter literature stream, uncertainties

and risks associated with new products lead to *resistances* within (internal to) and outside (external to) the innovating firm (Droge et al., 2008; Rosenbusch, Brinckmann, & Bausch, 2011). Yet, we still know relatively little about how firms can mitigate these resistances.

The governance of employees responsible for commercialization through organizational structure enables firms to attenuate their employees' internal resistance to new products and allows firms to mitigate external resistance. Prior research emphasizes that the choice of organizational structure can affect employees' motivation and commitment to the organization (e.g., Auh & Menguc, 2007; Katsikea, Theodosiou, Perdakis, & Kehagias, 2011) and their ability to adapt strategies to customer feedback (Pertusa-Ortega, Zaragoza-Sáez, & Claver-Cortés, 2010). Consistent with this argument, marketing scholars hold that organizational structure plays a critical role in commercialization (e.g., Lee, Kozlenkova, & Palmatier, 2015; Olson, Slater, & Hult, 2005). However, while innovation scholars highlight the central role of organizational structure as a determinant of innovativeness—such as in the new product development process (Calantone, Harmancioglu, & Droge,

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2010; Pertusa-Ortega et al., 2010; Thompson, 1965)—they also recognize that organizational structure may serve as a contextual mechanism to moderate the relationship between firm-level product innovativeness and new product performance (Menguc & Auh, 2010). Consequently, there is a need to better understand how organizational structure operates as a boundary condition to determine the relationship between firm-level product innovativeness and new product performance.

In keeping with this research question, the present paper follows a twofold aim: first, we examine the relationship between *firm-level product innovativeness*, defined as a composite of the level of novelty as well as intensity of firms' new products (Story et al., 2015), and *new product performance*, defined as managements' perceived satisfaction with the *commercialization success* of new products (Bonoma & Clark, 1988). We focus on the firm level as a relevant unit of analysis because strategic decisions on the commercialization of innovative new products are made at this level; studies that examine firm-level product innovativeness go beyond single innovation activities and seek to examine general patterns underlying firms' product innovations across their entire portfolio of innovation activity. In contrast, restricting the analysis to the product level would result in a limited understanding of the perceived causes and contingencies of products' commercialization success. This is particularly the case with firms developing large numbers of new products, where the explanatory power of a single product is diluted (Damanpour, 1991; Story et al., 2015).

Second, we examine the moderating effect of organizational structure (in the form of centralization and formalization) on the relationship between firm-level product innovativeness and new product performance. We focus on centralization and formalization, as both of these structural characteristics are recognized for their influence on organizational members' psychological ownership of products (Pierce, Kostova, & Dirks, 2003) and for their impact on employees' ability to respond to customers' demands, preferences, and feedback (Pertusa-Ortega et al., 2010). Thus, the choice of centralization and formalization as moderating factors is directly tailored to the theoretical issue of the internal resistances the innovating firm faces through psychological ownership (i.e., the extent to which individuals feel that a particular product belongs to them, enhancing feelings of responsibility for the product (Pierce, Kostova, & Dirks, 2001)) and the external resistances through adaptability (i.e., firms' ability to leverage market knowledge to reduce buyers' uncertainty). While the substantive impact in terms of psychological ownership and adaptability is the same for both characteristics of organizational structure, the causal mechanisms by which centralization and formalization affect psychological ownership and adaptability are distinct in our theorizing. Focusing on centralization and formalization also ensures that our study is consistent with research that names centralization and formalization as key characteristics of organizational structure (Auh & Menguc, 2007). As a result, research most frequently examines centralization and formalization as organizational characteristics (cf. Lee et al., 2015).

Empirically, we focus on direct exporting firms, a particularly pertinent context in which to test our theorizing. While exporters can leverage their innovative products by exploiting business opportunities in multiple foreign markets (Knight & Cavusgil, 2004), they also face internal and external resistance that is due to complexities that may result from, for example, geographic spread, diverse export markets, institutional barriers, and dynamism in overseas competition (Katsikea, Theodosiou, & Morgan, 2007; Leonidou, 2004; Li & Lin, 2015; Theodosiou & Katsikea, 2007). The exporting context is also critical from a methodological standpoint: While we know that structure is a determinant of innovation and product ideas (e.g., Chandy & Tellis, 1998; Troy, Szymanski, & Varadarajan, 2001), we examine the moderating effect of organizational structure specifically for employees who are responsible for product commercialization. Since we analyze organizational structure related to export staff, a direct impact on the firm's overall product innovation is less likely.

We contribute to the literature in two ways. First, we advance the

product innovation literature by contextualizing the relationship between firm-level product innovativeness and new product performance. While previous research largely addresses antecedents of successful commercialization of new products (Henard & Szymanski, 2001; Szymanski, Kroff, & Troy, 2007), we develop theoretically and validate empirically how organizational structure intervenes in the consistency of the central relationship. In this regard, we follow calls in the literature to investigate contextual factors that complement a firm's innovation activities (Rosenbusch et al., 2011) and enhance new product outcomes (Szymanski et al., 2007). Our study is particularly relevant as some research indicates beneficial effects of mechanistic structures on product innovation (Evanschitzky, Eisend, Calantone, & Jiang, 2012; Henard & Szymanski, 2001), while our findings suggest a more organic structure in the commercialization of such innovations. Therefore, our findings may also suggest that managers use a *selective* approach when it comes to defining their organizational structure. It may be beneficial to implement different structural characteristics in different organizational units, teams, or departments or during different phases of new product development and commercialization.

Second, we contribute to the literature that seeks to uncover drivers of effective export sales organizations (cf. Katsikea & Skarmneas, 2003). Although this literature claims that innovation can determine sustained success in exporting (Golovko & Valentini, 2011; Love, Roper, & Zhou, 2016), export barriers can undermine the beneficial effect of innovation (cf. Paul, Parthasarathy, & Gupta, 2017). We propose that organizational structure can be critical in overcoming these exporting challenges. Our findings indicate that organic structures for export function members facilitate the translation of innovation into successful exporting performance. Our findings also support the notion that the degree of novelty of firm-level product innovativeness does not positively affect export performance, while intensity does (cf. Azar & Ciabuschi, 2017).

2. Development of the research model

Product innovativeness, a term that is applied at many levels, can be interpreted in several ways (Garcia & Calantone, 2002). Often, studies apply the term to product-level innovations (e.g., Gielens & Steenkamp, 2007) and in these situations, product innovativeness typically refers to a product's degree of newness or novelty compared to a previous product (Garcia & Calantone, 2002). From this perspective, the research focus is often on a single product the firm sells, sometimes in a single market (e.g., Lages, Silva, & Styles, 2009), and on studying the outcomes of product novelty on various facets of new product or business success (e.g., Calantone, Chan, & Cui, 2006; Lages et al., 2009; Sandvik & Sandvik, 2003). Although examining innovation at the product level is useful, developing a better understanding of product innovativeness at the firm level is equally important (Droge et al., 2008; Story et al., 2015).

Studies on firm-level product innovativeness predominantly focus on two dimensions of innovation. First, most studies tend to examine the extent to which firms' new product development activities result in *novel* or radical products (e.g., Cuevas-Rodríguez, Cabello-Medina, & Carmona-Lavado, 2014; Schultz, Salomo, & Talke, 2013). Second, there is also recognition that relentless innovation (Tellis, Prabhu, & Chandy, 2009) manifests itself in innovation *intensity*, the generation of a large number of innovations by the firm (Tajeddini, Trueman, & Larsen, 2006). *Novelty* and *intensity* reflect distinct but associated dimensions of firms' product innovativeness. Firms can compete through product innovation novelty to gain a differentiation advantage (Story et al., 2015; Tellis et al., 2009) and through product innovation intensity to satisfy the distinct needs of diverse markets (Kang & Montoya, 2014), but the two dimensions do not necessarily have to coincide (Garcia & Calantone, 2002). In this study, we examine firm-level product innovativeness outcomes and build on the work of Story et al. (2015, p. 47), who conceptualize firm-level product innovativeness as "a combination of the degree of novelty (newness) and intensity (number) of firms' new

product offerings” compared to those of competitors.

As outlined in the introduction, the inconclusive findings and diverging theoretical arguments regarding the relationship between firm-level product innovativeness and new product performance point to potential boundary conditions of this relationship in the form of organizational structure. Organizational structure defines the formal division and distribution of work roles and serves as a means to govern and integrate work activities (Child, 1972). A central building block of organizational structure is the structural characteristics, including the distribution of authority and the presence of rules (Lee et al., 2015). Moreover, structure serves as a management-initiated formal control mechanism for shaping individuals’ behaviors and psychological outcomes to achieve marketing objectives (Jaworski, 1988). Therefore, structure is of specific interest in the commercialization of new products in terms of how to resolve issues regarding new product acceptance to ensure new product success. We argue that centralization and formalization are central characteristics of organizational structure that moderate the focal relationship between firm-level product innovativeness and perceived new product performance, as depicted in Fig. 1. *Centralization* is defined as “the inverse of the amount of delegation of decision-making authority throughout” the marketing function and the degree of participation by marketing function members in decision-making (Cadogan, Paul, Salminen, Puumalainen, & Sundqvist, 2001; Jaworski & Kohli, 1993, p. 56), while *formalization* is the extent to which rules define marketing function members’ “roles, authority relations, communications, norms and sanctions, and procedures” (Jaworski & Kohli, 1993, p. 56).

To summarize, we expect that centralization and formalization moderate the relationship between firm-level product innovativeness and perceived new product performance, as the choice of organizational structure determines firms’ abilities to attenuate internal and external resistances against new products. We describe the direct effect of firm-level product innovativeness on perceived new product performance and the moderating effects of centralization and formalization in the next section.

3. Hypotheses

3.1. Firm-level product innovativeness and perceived new product performance

Firms that possess product innovation capabilities can achieve a competitive advantage in the marketplace (Calantone et al., 2010; Menguc & Auh, 2010). Building on Story et al. (2015), we argue that firms that innovate intensely and develop novel product innovations can discriminate their products to address multiple as well as diverse market demands and enjoy differentiation advantages when commercializing their products in the marketplace, thus improving the performance of their new products.

First, firms with high levels of *product innovation intensity* can benefit from a portfolio of highly diverse product lines that allow them to better satisfy diverse customer needs and demands than their competitors (Hua & Wemmerlöv, 2006; Kang & Montoya, 2014; Story et al., 2015). Moreover, these firms may benefit from increased perceived product advantages vis-à-vis their competitors (Hua & Wemmerlöv, 2006). Being

able to satisfy diverse customer needs is particularly important for exporters, especially those that seek to commercialize their products in a broad geographic area, as customer preferences can vary widely across countries and regions (Leonidou, 2004).

Second, firms with high levels of *product innovation novelty* can strengthen their market positions in existing markets and, critically, also expand into new international markets because novel products allow them to benefit from a differentiation advantage over competitors (Boso, Story, Cadogan, Micevski, & Kadić-Maglajlić, 2013; Story et al., 2015). Differentiating into new markets can also create first-mover advantages, such as the possibility of raising entry barriers in terms of scale, experience, or reputational effects (Kerin, Varadarajan, & Peterson, 1992). Since fierce competition is a key challenge in sustaining and expanding export operations (Makri, Theodosiou, & Katsikea, 2016; Uner, Kocak, Cavusgil, & Cavusgil, 2013), gaining first-mover advantages and positions that allow the firm to reshape market behaviors and structures is of significant value. Taking into account the positive effects of firm-level product innovation intensity and novelty, then, we hypothesize:

Hypothesis 1. *There is a positive relationship between firm-level product innovativeness and perceived new product performance.*

3.2. The moderating effect of organizational structure

Here we outline how centralization and formalization moderate the relationship between firm-level product innovativeness and perceived new product performance. We argue that an organic organizational structure with low levels of centralization and formalization allows firms to develop the abilities they need to mitigate internal and external resistances against new products. Internal resistances may reside in employees who respond unfavorably to innovative new products because these products require more time than established products do and are associated with more uncertainty and risk (Ahearne, Rapp, Hughes, & Jindal, 2010; Atuahene-Gima, 1997; Kauppila, Rajala, & Jyrämä, 2010). External resistance may reside in innovative new products’ reduced compatibility with buyers’ current usage patterns and experiences and their difficulty assessing the new products’ benefits (Hoeffler, 2003; Kuester, Homburg, & Hess, 2012). While centralization and formalization both affect the underlying mechanisms in terms of psychological ownership and adaptability, the theoretical rationales for how they do so are distinct in our theorizing.

3.2.1. The moderating effect of centralization

We argue that the influence of *firm-level product innovation intensity* on *perceived new product performance* changes with the level of centralization. Firms that serve numerous and diverse markets face *external resistances* in terms of skepticism about adopting new products from various buyers. However, centralization limits firms’ lower echelons’ ability to use their market-specific knowledge to attenuate the external resistances by adapting their marketing strategy, as centralization restricts decision-making to the upper echelons of the organization (Auh & Menguc, 2007). This restriction is problematic since upper-level managers do not always have detailed market knowledge, as they usually lack close contact with customers. Furthermore, upper-level managers may only be able to devote limited time to implementing marketing

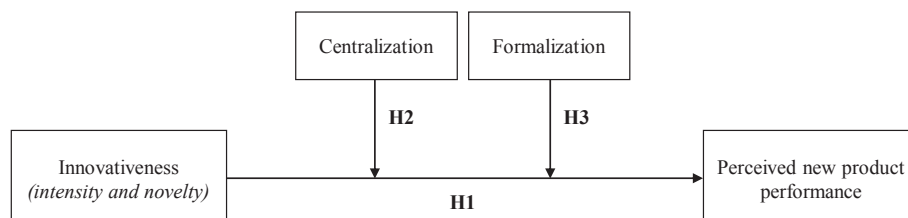


Fig. 1. Research model.

Table 1
Overview of our core constructs including their measurement and details of validity tests.

Label, definition and measurement	Standardized factor loadings from CFA	Measurement source		
Firm-level product innovativeness A composite of the level of novelty as well as intensity of firms' new products (Story et al., 2015).	Product innovation intensity ($\alpha = 0.89$; CR = 0.89; AVE = 0.73; HSV = 0.16) [1 = not at all, 7 = to an extreme extent] <i>Compared to our key competitors, over the last 3 years...</i>	From Story et al. (2015) as well as Boso et al. (2013).		
	Our company has produced more new products/services for our export countries		.83 ^b	
	On average, each year we have introduced more new products/services in our export countries		0.90***	
	Industry experts would say that we are more prolific when it comes to introducing new products/services		0.83***	
	Product innovation novelty ($\alpha = 0.71$; CR = 0.72; AVE = 0.47; HSV = 0.16) [1 = less than competitors, 7 = more than competitors] <i>Relative to our main export competitors, the products and services that we offered in our export countries over the last 3 years were...</i>			
	Revolutionary		.83 ^b	
	Novel		0.64***	
	Radical		0.56***	
	Centralization ($\alpha = 0.91$; CR = 0.91; AVE = 0.78; HSV = 0.23) [1 = very strongly disagree, 7 = very strongly agree] "The inverse of the amount of delegation of decision-making authority throughout" the marketing function and the degree of participation by marketing function members in decision-making (Cadogan et al., 2001; Jaworski & Kohli, 1993, p. 56).		<i>Over the past 3 years, when it came to export decision making in this company:</i> Even small matters had to be referred to someone higher up for a final answer Export employees had to ask their boss before they did almost anything Export employees needed to have the boss's approval first	From Cadogan et al. (2001) who adapted the scales for the export context from Jaworski and Kohli (1993).
			.80 ^b	
	0.95***			
Formalization ($\alpha = 0.85$; CR = 0.85; AVE = 0.66; HSV = 0.23) [1 = very strongly disagree, 7 = very strongly agree] The extent to which rules define marketing function members' "roles, authority relations, communications, norms and sanctions, and procedures" (Jaworski & Kohli, 1993, p. 56)	<i>In this company over the past 3 years:</i> Export employees were their own boss in most matters ^a Export employees could make their own decisions without checking with anybody else ^a How things were done was left up to the export employee doing the work ^a	Based on the new product performance scales of Boso et al. (2012).		
	.79 ^b			
	0.82***			
Perceived new product performance ($\alpha = 0.95$; CR = 0.95; AVE = 0.78; HSV = 0.11) [1 = strongly satisfied, 5 = strongly dissatisfied] ^a Managements' perceived satisfaction with the commercialization success of new products (Bonoma & Clark, 1988).	<i>Consider only your firm's NEW Products and Services. Please tick a box on each line to indicate how satisfied you are with your firm's last year performance in its export operations.</i> Export revenues from new products and services Growth in export revenues from new products and services Export market share for new products and services Export sales volumes of new products and services Growth in export sales volumes of new products and services	Based on the new product performance scales of Boso et al. (2012).		
	.82 ^b			
	0.88***			
	0.86***			
	0.95***			
	0.91***			

Significance levels: †p ≤ 0.1; *p ≤ 0.05; **p ≤ 0.01; ***p ≤ 0.001.

n = 137.

^a Reverse coded.

^b Fixed item.

strategy, especially when the firm operates in multiple export markets (Leonidou, 2004; Uner et al., 2013). The rich knowledge about the numerous and diverse market conditions and customer characteristics tends to reside in the employees who operate face to face with customers, and this is particularly pertinent in situations where businesses are operating in numerous export markets, potentially in very different parts of the world (Cadogan et al., 2001). Access to this knowledge is impeded under centralized structures because of restricted communication flows and lengthy information-filtering processes (Mihalache, Jansen, Van den Bosch, & Volberda, 2014). Therefore, we argue that centralized marketing functions are unable to leverage market knowledge to its fullest extent and are restricted in their ability to adapt to customer feedback and respond to external resistances to new products.

The impact of *firm-level product innovation novelty* on *perceived new product performance* also changes with the level of centralization. Customer-facing employees may build *internal resistances* to new products and have limited feelings of responsibility for and a reluctance to attend to selling novel product innovations (Atuahene-Gima, 1997). The early innovation literature shapes the notion that organizational decentralization may foster commitment to and acceptance of innovation (Pierce & Delbecq, 1977). Pierce et al. (2001) explain this view in detail using the notion of psychological ownership, where exercising control over an object is a central route to psychological ownership (Pierce et al., 2001). Since centralization limits marketing function members' decision-making competence and restrains participation in decision-making (Aiken & Hage, 1968; Jaworski & Kohli, 1993), employees' perceived control over their work is reduced (Atuahene-Gima, 2003; Jansen, Van Den Bosch, & Volberda, 2006). As such, employees are restricted in their ability to exercise control over product innovations and the marketing strategies employed by the firm. In contrast, with lower levels of centralization, authority is assigned to lower echelons, increasing their feelings of psychological ownership of the products they sell and their feelings of responsibility and reducing internal resistances. In sum, we argue:

Hypothesis 2. *The positive effect of firm-level product innovativeness on perceived new product performance is stronger at lower levels of centralization.*

3.2.2. The moderating effect of formalization

We argue that the influence of *firm-level product innovation intensity* on *perceived new product performance* changes with the level of formalization. As outlined before, firms with high levels of product innovation intensity are often confronted with *external resistances*. While organizations use formalization to coordinate and align customer-facing employees' behavior (Agarwal, 1999), formalization limits the firm's ability to adapt and attenuate its marketing activities to address buyers' uncertainties about adopting new products. In short, formalization constrains marketing function members' repertoires of actions. As introducing a new product is a complex task that occurs in uncertain environments (Ruekert, Walker, & Roering, 1985), firms—particularly exporters—can be regularly confronted with invalid market assumptions and unexpected opportunities during marketing strategy implementation requiring adaptations (Morgan, Katsikeas, & Vorhies, 2012) for which formalized rules may not have accounted.

The impact of *product innovation novelty* on *perceived new product performance* also changes by the level of formalization. Specifically, customer-facing employees are likely to have limited feelings of responsibility for novel product innovations' success when standardized procedures and strictly defined roles limit their opportunities to invest themselves in these innovations' commercialization. This limited feeling of responsibility might be reflected in *internal resistances* to new products. Investing the self, for example through ideas or skills, into an object is another key route to psychological ownership (Pierce et al., 2001). Formalization, however, impedes experimentation and inhibits organizational members from deviating from customary behaviors (Jansen

et al., 2006). As a result, marketing function members are limited in their ability to show creativity in how they accomplish tasks, and instead address problems based on predefined guidelines (Katsikea et al., 2011). Low formalization, on the other hand, admits openness and behavioral leeway for experimentation, which is argued to be a necessary precondition for new idea initiation (Pierce & Delbecq, 1977). Thus, less formalization permits customer-facing employees to invest themselves in the product and its marketing strategy by approaching the commercialization of new products using their own ideas and skills. As a consequence, less formalization increases employees' feelings of responsibility and decreases internal resistance. Taking these notions together, we argue:

Hypothesis 3. *The positive effect of firm-level product innovativeness on perceived new product performance is stronger at lower levels of formalization.*

4. Methodology

4.1. Sample

We drew on the established AMADEUS database (e.g., Brouthers & Brouthers, 2003) to generate a multi-industry sample and sent standardized questionnaires and explanatory cover letters to 2,913 firms that engage in direct export. We targeted the CEOs or firm representatives identified as most knowledgeable about each firm's export operations (Cadogan, Kuivalainen, & Sundqvist, 2009). The sample included only German firms, and all questions were based on established items translated into German from English using recommendations for translation and back-translation (Brislin, 1970). Two weeks after mailing the surveys, we telephoned non-respondents to elicit participation.

From the 2,913 firms in the sample, 60 proved to be ineligible for reasons like having stopped exporting or having gone out of business. We received a response of 236 questionnaires representing a response rate of 8.3 percent of eligible firms. Ninety-nine of these 236 responses could not be used because incomplete responses resulted in missing values for some variables in our analyses. Therefore, our final sample consisted of 137 firms. The response rate was equivalent to the response rates of comparable studies that address CEOs in the German context (e.g., Deutscher, Zapkau, Schwens, Baum, & Kabst, 2016; Eggers, O'Dwyer, Kraus, Vallaster, & Güldenber, 2013; Hoffmann & Meusbürger, 2018).

To determine whether our key respondents were appropriate for our study, we included four statements at the end of the questionnaire to assess respondents' knowledge about the issues we raised. For example, "I am confident that my answers reflect the company's situation." The mean score across all questions was 6.0 on 7-point Likert scales anchored by "strongly disagree" and "strongly agree", indicating that our key respondents were highly knowledgeable and appropriate for our study.

The average firm in our final sample is 76 years old (S.D. = 74), employs 389 (S.D. = 1339) people, and has a turnover of €127 million (S.D. = 511). International operations are an integral part of the firms in our sample, as they export to an average of 35 (S.D. = 31) countries. Moreover, our sample's firms operate in a variety of industries, including engineering, electronics, other technical products, chemicals and medical/pharmaceutical products, and media.

We did not find evidence that our data suffers from a non-response bias. A comparison of the early and late respondents in our final sample with regard to key firm characteristics (i.e., number of employees and sales turnover) and core constructs (i.e., firm-level product innovativeness, centralization, formalization, and perceived new product performance) did not reveal significant differences ($p \geq 0.05$) (Armstrong & Overton, 1977). In addition, comparing non-respondents with responding firms based on the number of employees (using objective secondary data (when available) obtained from the AMADEUS database) confirmed the previous result ($p \geq 0.05$), indicating that non-

response bias is not a major problem in this study.

4.2. Measures

All items are measured on 7-point Likert scales unless stated otherwise. Table 1 summarizes the measurement of our core constructs. To adhere to the export context addressed in this paper, all variables are export-specific.

4.2.1. Independent variables

We followed Story et al. (2015) in measuring our independent variable *firm-level product innovativeness* as the averaged composite of two conceptually distinct but correlated and reflectively measured first-order constructs: product innovation intensity and product innovation novelty. Product innovation intensity refers to the number of new products a firm introduces in its markets relative to competitors. We measured product innovation intensity as the average of three items from Boso et al. (2013) and Story et al. (2015). Product innovation novelty captures the extent to which a firm's new products are revolutionary, novel and radical relative to competitors' new products. We measured product innovation novelty as the average of five items from Boso, Cadogan, and Story (2012) and Story et al. (2015).¹ We used a relative measure of firm-level product innovativeness, which has the benefit of "focusing on the application of innovations in the market rather than on the nature of innovation itself" (Sandvik & Sandvik, 2003, p. 362).

We measured our moderators, *centralization* and *formalization*, with three items each from Cadogan et al. (2001), who adapt the scales from Jaworski and Kohli (1993). These measures are used extensively in export research (e.g., Cadogan, Cui, Morgan, & Story, 2006; Chi & Sun, 2013; Katsikea, Theodosiou, & Morgan, 2015).

4.2.2. Dependent variable

In terms of the dependent variable, *perceived new product performance*, the marketing literature recognizes that international marketing success is a multi-faceted construct and that its measurement must be adapted to a research study's context (Carneiro, Farias, da Rocha, & da Silva, 2016; Katsikeas, Leonidou, & Morgan, 2000). Given the current study's focus on the firm-level consequences of product innovativeness along with resistances in the innovating organization and the marketplace, we chose to investigate the market performance of firms' new product innovation activity. Indeed, in the wider export marketing performance literature, we note that performance in the marketplace is the most commonly studied facet of export success (Katsikeas et al., 2000).

For various reasons, we focus specifically on managers' perceptions of the market performance of firms' new products. First, although desirable, obtaining objective performance measures for new product performance is exceedingly challenging, and often simply not possible, as these measures are usually absent from archival databases (Molina-Castillo & Munuera-Alemán, 2009; Zhou, 2006). Consequently, most of the recent research on new product performance relies on respondents' perceptions of performance (e.g., Adomako et al., in press; Story et al., 2015; Thornton, Henneberg, Leischnig, & Naudé, 2019) in order to increase our understanding of this firm-level construct. Second, we know that subjective measures are seen as valid substitutes and approximations of objective measures if the latter are not available (Dess & Robinson Jr, 1984; Wall et al., 2004). For example, in the context of export performance (which is relevant for our empirical setting), research shows that perceived export performance is significantly associated with objective measurement of export share and indirectly associated with

¹ Two items of product innovation novelty were dropped during measurement purification to increase average variance extracted (Wieland, Kock, & Josiassen, 2018).

export sales growth through export share increase (Madsen & Moen, 2018) and that objective export sales growth data and subjective export performance measures are highly correlated ($r = 0.88$) (Assadinia, Boso, Hultman, & Robson, 2019). Third, our subjective new product performance measure correlates with objective secondary data for firms' return on assets ($r = 0.34$, $p \leq 0.01$; subsample obtained from the AMADEUS database). The correlation is acceptable in size, considering that a variety of factors other than firms' new product performance in export markets influence firms' return on assets. Hence, we view our perceived measure of new product performance as a reasonable choice.

In sum and consistent with our definition, we measured perceived new product performance on a 5-point Likert scale with five satisfaction-based items based on the new product performance scale of Boso et al. (2012).

4.2.3. Control variables

We controlled for *firm size* and *firm age* because larger firms are endowed with more resources, which enhance international performance (Makri et al., 2016), and because younger firms tend to be more innovative because of their flexibility (Soh, 2003). We measured firm size and firm age as the logarithm of the number of employees and the number of years since founding, respectively. *R&D expenses*, which can influence the performance of multinational companies (Kotabe, Sriniwasan, & Aulakh, 2002), is measured as the logarithm of firms' annual total R&D expenses.² Since *business type* may influence the number of new products a firm develops (Menguc & Auh, 2010; Yli-Renko & Janakiraman, 2008), and *industry type* may influence the extent to which a firm benefits from product innovations (Evangelista & Vezzani, 2010), we operationalized business type and industry type as dummy variables (1–B2B, 0–B2C; and 1–manufacturing, 0–services).³

We also included variables to control for the export context. *Export scope* captures the geographic spread and diversity of firms' export markets (Hultman, Katsikeas, & Robson, 2011), so it also reflects the need to adapt the marketing mix (Boehe, Qian, & Peng, 2016). We measured export scope as the logarithmic transformation of the number of countries to which a firm exports. To control for the speed with which firms introduce new products, which may also influence new products' outcomes (Kang & Montoya, 2014), we controlled for *export product rollout speed*, measured on a five-point scale based on respondents' answers to how fast their firms roll out new products across their export countries. We also controlled for environmental influences with the variable *export competitive dynamism* since new product failure could be more likely in highly competitive markets (Song & Parry, 1997). We measured export competitive dynamism with three items from Olabode, Adeola, and Assadinia (2018). As exporting occurs within the institutional environment of the export markets (Oliveira et al., 2018), we also controlled for *export institutional barriers* in export markets, measured with Oliveira's et al. (2018) three item measurement scale.

We cross-validated our subjective measures with objective secondary data using subsamples obtained from the AMADEUS database. We found high correlations between our subjective measures and objective data (number of employees: $r = 0.85$, $p \leq 0.001$; sales turnover: $r = 0.99$, $p \leq 0.001$), inspiring confidence in the conceptual reliability of our subjective measures.

² We follow common practice in adding 1 for all firms since some firms indicate that they do not have any R&D expenses and we cannot take the log of zero.

³ We complemented three cases with objective secondary data. Moreover, five cases were not clearly assignable to either a business type or an industry type. Our hypothesized effects, shown in Table 3, remain comparable in size and significance when these cases are excluded.

Table 2
Descriptive statistics and bivariate correlations.^a

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Mean	3.03	3.59	4.28	3.93	3.13	4.17	2.13	1.73	5.72	0.87	0.93	1.40	3.94	3.10	4.33	3.09
Standard deviation	0.73	1.27	0.71	0.82	1.35	1.31	0.47	0.36	1.59	0.34	0.25	0.36	1.29	1.00	1.46	1.39
VIF	–	–	–	1.11	1.38	1.31	1.75	1.33	1.46	1.11	1.11	1.50	1.16	1.09	1.18	–
1 Perceived new product performance																
2 Product innovation intensity	0.30															
3 Product innovation novelty	0.08	0.32														
4 Firm-level product innovativeness ^b	0.27	0.91	0.68													
5 Centralization	0.04	–0.04	–0.06	–0.06												
6 Formalization	0.01	0.03	0.01	0.03	0.44											
7 Firm size (log)	–0.07	0.18	0.14	0.20	–0.12	–0.08										
8 Firm age (log)	–0.13	0.06	–0.01	0.04	–0.11	–0.06	0.28									
9 R&D expenses (log)	0.03	0.14	0.12	0.16	–0.09	–0.02	0.47	0.00								
10 Business type	–0.05	–0.06	0.02	–0.04	–0.11	–0.07	0.13	–0.03	0.09							
11 Industry type	–0.09	0.05	–0.05	0.02	–0.03	–0.01	0.07	0.09	0.14	0.25						
12 Export scope (log)	0.14	0.15	0.12	0.17	–0.20	–0.07	0.49	0.32	0.29	0.07	0.12					
13 Export product rollout speed	0.26	0.20	0.07	0.19	0.10	–0.05	0.14	–0.12	–0.06	–0.03	–0.01	0.04				
14 Export competitive dynamism	0.00	0.02	–0.01	0.01	0.05	0.07	0.04	0.09	0.14	0.02	–0.01	–0.05	0.01			
15 Export institutional barriers	–0.14	–0.03	–0.11	–0.07	0.08	–0.09	0.05	0.25	0.06	–0.02	–0.01	0.17	–0.07	0.18		
16 Marker variable ^c	0.09	0.00	–0.07	–0.03	0.06	–0.07	–0.10	0.03	0.13	0.12	0.04	–0.06	0.02	–0.01	0.15	

n = 137.

^a Pearson correlations. Correlations with absolute values equal to or above 0.17 are statistically significant at p ≤ 0.05 (two-tailed test).

^b Formative index.

^c Marker variable item measuring competitive aggressiveness.

4.3. Measure assessment

To ensure the validity and reliability of the measures used, we conducted a confirmatory factor analysis (CFA) with all items that measure multi-item latent constructs. We assessed the fit of the final measurement model by examining Chi-square, the comparative fit index (CFI), the non-normed fit index (NNFI), and the root mean square error of approximation (RMSEA). Our final CFA indicated excellent fit to the data. The ratio of Chi-square (272.7) to degree of freedom (209) is 1.31, which is below the threshold of 3 (Kline, 1998), CFI (0.97) and the NNFI (0.96) exceed the threshold of 0.95 (Hu & Bentler, 1999), and RMSEA (0.047) is below the threshold of 0.06 (Hu & Bentler, 1999).

We assessed the reliability of the constructs using Cronbach’s alpha (α) and composite reliability (CR). As shown in Table 1, both indices meet the threshold of 0.7, indicating proper reliability of our measurement scales (Fornell & Larcker, 1981; Nunnally, 1978). Moreover, the factor loadings of each item on its respective construct are significant (p ≤ 0.001) and sufficiently large (≥ 0.56) (Bagozzi & Yi, 1988). The average variance extracted (AVE) for all study constructs are in excess of or close to the recommended benchmark of 0.5, providing support for convergent validity (Fornell & Larcker, 1981). Moreover, Table 1 demonstrates support for the measures’ discriminant validity, as the AVE of each construct is larger than the highest shared variance (HSV) between each pair of constructs (Fornell & Larcker, 1981).

4.4. Common method variance

We collected the data for our study from a single source using a single methodology, so our data might be subject to common method variance (CMV) (Podsakoff & Organ, 1986). We performed three tests to determine whether CMV affects our data.

First, we conducted Harman’s one-factor test (Podsakoff & Organ, 1986). A principal components factor analysis with all items of our multi-item latent constructs reveals seven factors with eigenvalues greater 1. The first factor explains 23 percent of the variance, while the cumulative variance explained by all seven factors is 81 percent. As multiple factors emerged, and none accounts for the majority of the variance, we concluded that it is unlikely that CMV is a problem in our data. Second, guided by Lindell and Whitney’s (2001) approach, we identified a marker variable item. We chose a variable that measures competitive aggressiveness, which is not theoretically related to the

study’s variables, and placed it among our dependent and independent variables in the questionnaire. Our results show that the correlation between our marker variable item and our dependent variable is not significant (r = 0.09; ns). Similarly, Table 2 shows that the marker variable item does not significantly correlate with any other core construct in our model. Correlations range from 0.06 to –0.07, supporting the claim that CMV does not substantially account for the associations in our model. Third, we performed a CFA and compared three models: loading all items onto one common method factor (Chi-square/df ratio = 7.27, CFI = 0.31, NNFI = 0.18, RMSEA = 0.215, AIC = 1810); loading all items onto their theoretically assigned constructs (Chi-square/df ratio = 1.31, CFI = 0.97, NNFI = 0.96, RMSEA = 0.047, AIC = 453); and loading all items onto their theoretically assigned constructs and a common method factor (Chi-square/df ratio = 1.23, CFI = 0.98, NNFI = 0.97, RMSEA = 0.041, AIC = 454). While the first model fit poorly, the second and third models fit similarly well to the data, indicating that considering a common method factor does not substantially improve model fit. Thus, CMV is not a severe issue in our data. Finally, the threat of CMV is reduced because our research model contains interactions, and it is unlikely that our key informants thought of such relationships (Chang, Van Witteloostuijn, & Eden, 2010).

5. Results

5.1. Descriptive statistics

Table 2 provides an overview of descriptive statistics and indicators of multicollinearity. Correlations and variance inflation factors (VIFs) stay well below the established thresholds of 0.7 and 10, respectively (Dormann et al., 2013).⁴ Therefore, we conclude that multicollinearity is not a major problem in our research model.

⁴ We acknowledge the correlation of 0.44 between centralization and formalization but do not see any concerns, as a higher correlation is not uncommon for these types of structural characteristics (e.g., Cadogan et al., 2006; Cadogan et al., 2001), does not represent a considerable overlap (Hallberg & Schaufeli, 2006; Huynh, Metzger, & Winefield, 2012), and can be attributed to a manifestation of overarching phenomena like mechanistic organizational cultures (cf. Deshpandé, Farley, & Webster, 1993).

Table 3
Results of the hierarchical OLS regressions.

Variables	Model 1 (n = 137)		Model 2 (n = 137)		Model 3 (n = 137)		Model 4 (n = 137)	
<i>Independent variables</i>								
Firm-level product innovativeness (innovativeness)			0.197*	(0.079)	0.164*	(0.071)	0.165*	(0.077)
<i>Moderator variables</i>								
Centralization			0.046	(0.051)	0.040	(0.052)	0.041	(0.052)
Formalization			-0.025	(0.050)	-0.023	(0.049)	-0.018	(0.050)
<i>Interaction terms</i>								
Innovativeness × centralization					-0.183**	(0.055)		
Innovativeness × formalization							-0.157**	(0.055)
<i>Control variables</i>								
Firm size (log)	-0.399*	(0.167)	-0.429**	(0.163)	-0.449**	(0.149)	-0.401*	(0.159)
Firm age (log)	-0.150	(0.158)	-0.153	(0.151)	-0.133	(0.149)	-0.119	(0.150)
R&D expenses (log)	0.048	(0.036)	0.038	(0.039)	0.030	(0.033)	0.028	(0.034)
Business type	-0.033	(0.134)	0.008	(0.127)	-0.054	(0.130)	-0.042	(0.133)
Industry type	-0.337	(0.221)	-0.343†	(0.198)	-0.326†	(0.193)	-0.318†	(0.179)
Export scope (log)	0.589**	(0.208)	0.574**	(0.215)	0.594**	(0.201)	0.550**	(0.201)
Export product rollout speed	0.152**	(0.050)	0.124*	(0.049)	0.138**	(0.046)	0.121*	(0.048)
Export competitive dynamism	0.032	(0.055)	0.031	(0.055)	0.029	(0.053)	0.042	(0.053)
Export institutional barriers	-0.080†	(0.043)	-0.077†	(0.043)	-0.080†	(0.043)	-0.096*	(0.044)
<i>Reliability</i>								
R ²	0.176		0.223		0.289		0.263	
Δ R ² (vs Model 2)	-		-		0.065**		0.039**	
F statistic	3.92***		3.71***		4.72***		4.39***	

Significance levels: †p ≤ 0.1; *p ≤ 0.05; **p ≤ 0.01; ***p ≤ 0.001 (two-tailed test).

Dependent variable: perceived new product performance.

Unstandardized coefficients are reported.

Robust standard errors in parenthesis.

5.2. Hypotheses Testing

We use linear hierarchical OLS regressions with robust standard errors to test our hypotheses. As firm-level innovation might require time to result in considerable commercialization output (e.g., [Steinberg, Procher, & Urbig, 2017](#)), we use quasi-lagged variables, since our questions about firms' product innovation activities refer to the last three years, while perceived new product performance is measured over the last year. [Table 3](#) depicts our regression results. As [Aiken, West, and Reno \(1991\)](#) recommend, we create four alternative models, allowing us to compare models by evaluating the explanatory power of the respective variables. Model 1 includes only the control variables, among which firm size (b = -0.399, p ≤ 0.05), export scope (b = 0.589, p ≤ 0.01), export product rollout speed (b = 0.152, p ≤ 0.01), and export institutional barriers (b = -0.080, p ≤ 0.1) are significant. The R² value of the model is 0.176. Model 2 adds the central independent variable (i.e., firm-level product innovativeness) and the moderator variables (i.e., centralization and formalization), which significantly increases the explanatory power of our model by increasing R² to 0.223. Hypothesis 1, which posits that firm-level product innovativeness positively influences perceived new product performance, is supported by our results (b = 0.197, p ≤ 0.05).⁵

Models 3 and 4 add the interaction effects. To avoid multicollinearity, we mean-center all variables involved in multiplicative interactions before including them in our analysis as [Aiken et al. \(1991\)](#) recommend. In Model 3, which includes the interaction between centralization and firm-level product innovativeness, the R² increases to

0.289 (ΔR² = 0.065** compared to Model 2), and the interaction term is significant and negative (b = -0.183, p ≤ 0.01), lending support to Hypothesis 2. In Model 4, which includes the interaction term between formalization and firm-level product innovativeness, the R² increases to 0.263 (ΔR² = 0.039** compared to Model 2), and the interaction term is significant and negative (b = -0.157, p ≤ 0.01), lending support to Hypothesis 3.

To explore the nature of the interaction effects in greater detail and to avoid overstating or understating our interaction results, we follow [Kingsley, Noordewier, and Vanden Bergh \(2017\)](#) in plotting a marginal effect line and its confidence bands across the entire range of the moderating variables for both interaction models. [Figs. 2 and 3](#) show the marginal effect of firm-level product innovativeness on perceived new product performance (y-axis and solid line), along with the 95% confidence bands (dashed lines) over all relevant values of the moderating variables (x-axis). [Figs. 2 and 3](#) also include a histogram showing the frequency distribution of the moderating variables (z-axis). As [Fig. 2](#) shows, firm-level product innovativeness has a positive and significant effect on perceived new product performance for centralization values from 0.12 to -2.13 (to the left of point A) because the confidence bands do not include zero as is the case to the right of point A (except for very high levels of centralization). For example, when centralization is -1.35 (one standard deviation below the mean), the relationship between firm-level product innovativeness and perceived new product performance is positive and significant (gradient of the simple slope = 0.41, p ≤ 0.001), supporting Hypothesis 2.

Similarly, [Fig. 3](#) shows that firm-level product innovativeness has a positive and significant effect on perceived new product performance over the formalization values from 0.06 to -3.17 (to the left of point A). For example, when formalization is -1.31 (one standard deviation below the mean), the relationship between firm-level product innovativeness and perceived new product performance is positive and significant (gradient of the simple slope = 0.37, p ≤ 0.001), supporting Hypothesis 3. Moreover, a considerable amount of the sample (model 3: 64%, model 4: 55%) falls within the regions of the respective interaction effect's significance, substantiating the reliability of our results.

⁵ The literature on organizational innovation ([Damanpour, 1991](#)) and product innovation ([Calantone et al., 2010](#)) partly indicates that organizational structure is antecedent to innovation. Although this indication does not rule out an additional moderating effect of organizational structure ([Andersson, Cuervo-Cazurra, & Nielsen, 2014](#)), we test for a direct relationship between centralization/formalization and firm-level product innovativeness but do not find significant results. This result strengthens our rationale for a moderating role of the marketing functions' centralization and formalization.

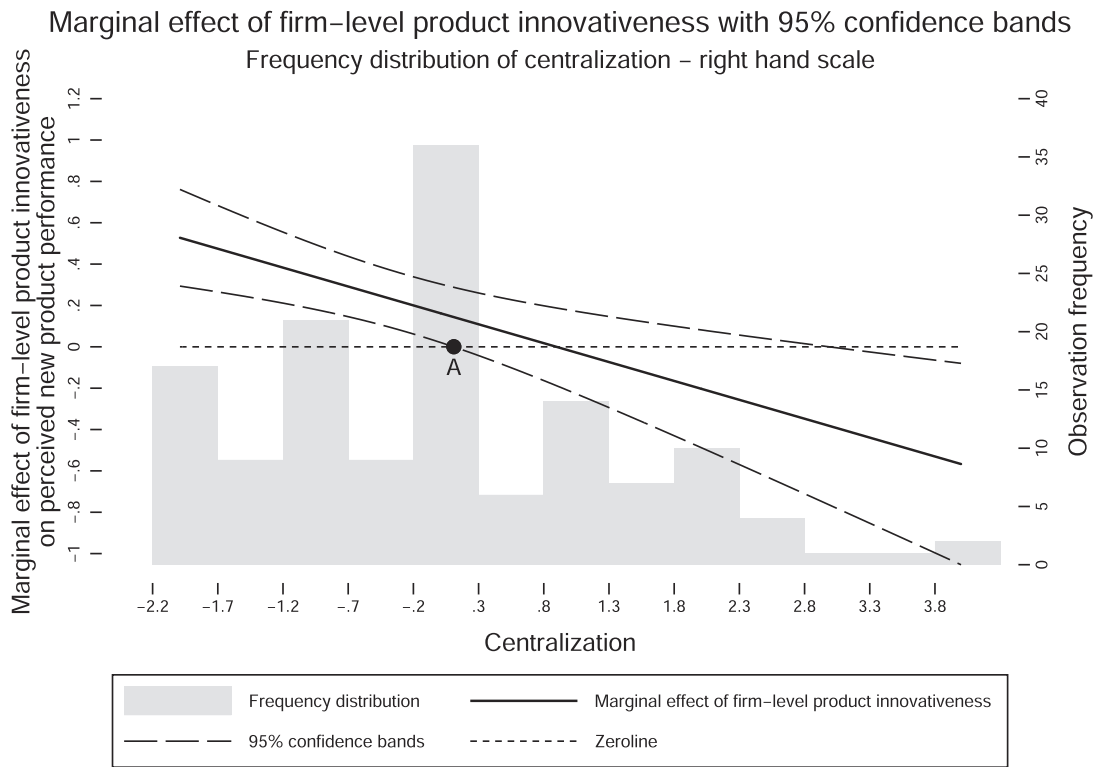


Fig. 2. Marginal effect of firm-level product innovativeness on perceived new product performance based upon model 3 in Table 3.

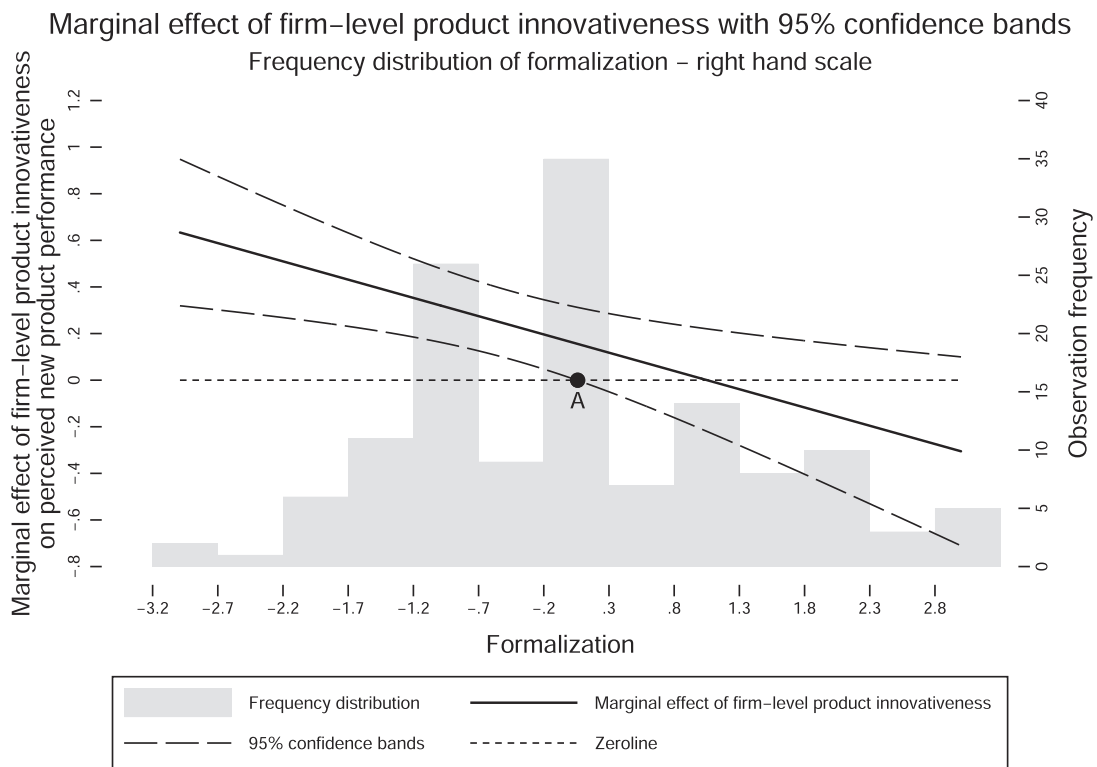


Fig. 3. Marginal effect of firm-level product innovativeness on perceived new product performance based upon model 4 in Table 3.

5.3. Supplementary analyses

To evaluate the robustness and validity of our results, we performed three supplementary analyses. First, to ensure that the two measures of organizational structure, centralization and formalization, distinctly affect the relationship between firm-level product innovativeness and perceived new product performance as theorized, we tested a full model that includes both interaction terms simultaneously.⁶ The interaction coefficient between centralization and firm-level product innovativeness is significant and negative ($b = -0.150, p \leq 0.05$), so it is consistent with the result in Model 3 (Table 3), where only the single interaction term was included. However, the interaction term between formalization and firm-level product innovativeness is no longer significant ($b = -0.068, ns$). To gain a deeper understanding of this finding, we remain consistent with procedure regarding Model 3 and 4 and refrained from solely interpreting the numerical information of the interaction term, as it may be over- or understated when looking only at the interaction coefficients (cf. Kingsley et al., 2017). As Kingsley et al. (2017, p. 286) explain, “Understating can occur when the interaction term coefficient is not statistically significant, but the marginal effect is statistically different from zero for some value(s) of the moderating variable.” To determine whether this is the case, we plotted the interaction between formalization and firm-level product innovativeness based on the full model, thus controlling for the interaction between centralization and firm-level product innovativeness.

Fig. 4 shows that the interaction effect between formalization and firm-level product innovativeness is significant ($p \leq 0.05$) for lower values of formalization, where the confidence bands do not include zero (ranging from point A to point B). Although not shown in Fig. 4 (for the sake of parsimony), the interaction effect is still weakly significant ($p \leq 0.1$) for extremely low values of formalization (to the left of point A). Thus, the result is mainly consistent with Fig. 3, which plots the interaction term based on the (significant) interaction term from Model 4. In line with Kingsley et al. (2017), our findings led us to conclude that the results support our hypotheses, as the interaction term for formalization in the full model is understated.

Second, although the direction of our main effect is theoretically sound and substantiated by the innovation literature (e.g., Boso et al., 2013; Story et al., 2015), the main effect might still be subject to simultaneous causality. To address this possibility, we identified instrumental variables and estimated a two-stage least squares (2SLS) regression analysis. Because of the nature of the survey, our range of instrumental variables is limited, so we chose a single instrument-like variable, export market-oriented capability, and estimated a just-identified model based on Model 2 (Table 3).⁷ In line with the literature (e.g., Han, Kim, & Srivastava, 1998; Sandvik & Sandvik, 2003), we consider a firm’s export market-oriented capability as a key antecedent of firm-level product innovativeness and as an only indirect cause of new product performance, thus satisfying instrumental variable requirements (Cameron & Trivedi, 2005). Following Andrews, Stock, and Sun (2019), we tested for weak instruments by comparing the robust F statistic with the critical values Stock and Yogo (2005) suggest. The robust F statistic (20.2) exceeded the critical values at 25%, 20%, 15%, and 10%. Then we drew on the “robustified” Durbin-Wu-Hausman endogeneity test (Cameron & Trivedi, 2009), which yielded a non-significant result. Our main effect remained weakly significant in the 2SLS regression at the 10% level ($p = .054$). Thus, we went beyond the standard in extant studies on new product performance outcomes to minimize the possibility of confounding effects caused by simultaneous causality.

Third, in addition to our robustness checks, we performed additional

analyses to inspect the direct effects for each of the two dimensions of our independent variable, product innovation intensity and product innovation novelty, separately.⁸ We also examined the corresponding interactions with centralization and formalization. The results, shown in Table 4, show a positive direct effect between product innovation intensity and perceived new product performance ($b = 0.164, p \leq 0.01$). Moreover, the interaction effects between product innovation intensity and centralization ($b = -0.090, p \leq 0.01$) and between innovation intensity and formalization ($b = -0.109, p \leq 0.001$) are negative and significant, and so converge with the findings obtained using the composite product innovativeness score. As for product innovation novelty, we found a negative but non-significant direct effect on perceived new product performance ($b = -0.054, ns$). In addition, while the interaction effect between product innovation novelty and centralization is negative and significant ($b = -0.235, p \leq 0.01$), substantiating our previous results, we found no such effect for formalization ($b = -0.017, ns$). We elaborate on the findings with regard to product innovation novelty in the discussion section.

6. Discussion and implications

Studies on firm-level innovativeness indicate that internal and external resistances against product innovations act as critical hindrances to innovations’ commercialization success (Rosenbusch et al., 2011). We adopted a firm-level perspective and propose that the translation of firm-level product innovativeness into the successful commercialization of new products is facilitated when structural conditions within the firm are designed to unleash abilities to overcome these internal and external resistances. Thus, we extend previous work by examining organizational structure in terms of centralization and formalization as an important contingency for the relationship between firm-level product innovativeness and perceived new product performance. The study is conducted in an exporting context, an environment in which resistances can easily flourish and affect firms’ ability to harvest the benefits of firms’ product innovation activities.

Consistent with the broader product innovation literature (Droge et al., 2008; Schultz et al., 2013), we found a positive relationship between firm-level product innovativeness and perceived new product performance, although this positive relationship is not statistically significant for firms with high levels of centralization or formalization. Instead, our results indicate that organic organizational structures (i.e., lower levels of centralization and formalization) have a performance-enhancing effect on the focal relationship. Our findings supplement those of studies that focus on structure as a determinant of product innovation. There is some evidence that the development of successful innovation requires mechanistic structures (e.g., Evanschitzky et al., 2012; Henard & Szymanski, 2001), while the classical notion is that innovation requires flexibility and agility (Kasarda & Rondinelli, 1998; Thompson, 1965). In complementing this research, we argue that organizational structure affects performance distinctly in the commercialization phase and that managers should consider a *selective* approach in choosing an organizational structure: Given the unique requirements of certain departments or tasks, firms might choose a structure that fits those requirements instead of following a “one-size-fits-all” approach, and in the commercialization phase of innovation, firms are advised to implement an organic structure for customer-facing employees. Therefore, our findings oppose the notion of the ambidextrous model

⁸ We did not expect to find non-linear effects because we focus on new products’ perceived market performance, and arguments for non-linear effects on the firm level are often based on the assertion of increasing costs (cf. Schultz et al., 2013; Story et al., 2015). However, we also analyzed whether product innovation novelty and product innovation intensity are related to new product performance in non-linear ways, but did not find significant results. Therefore, for parsimony, we report the core model findings shown in Table 3.

⁶ We thank an anonymous reviewer for this valuable suggestion.

⁷ Because of one missing observation for our instrument-like variable, we conducted the 2SLS regression analysis based on 136 observations.

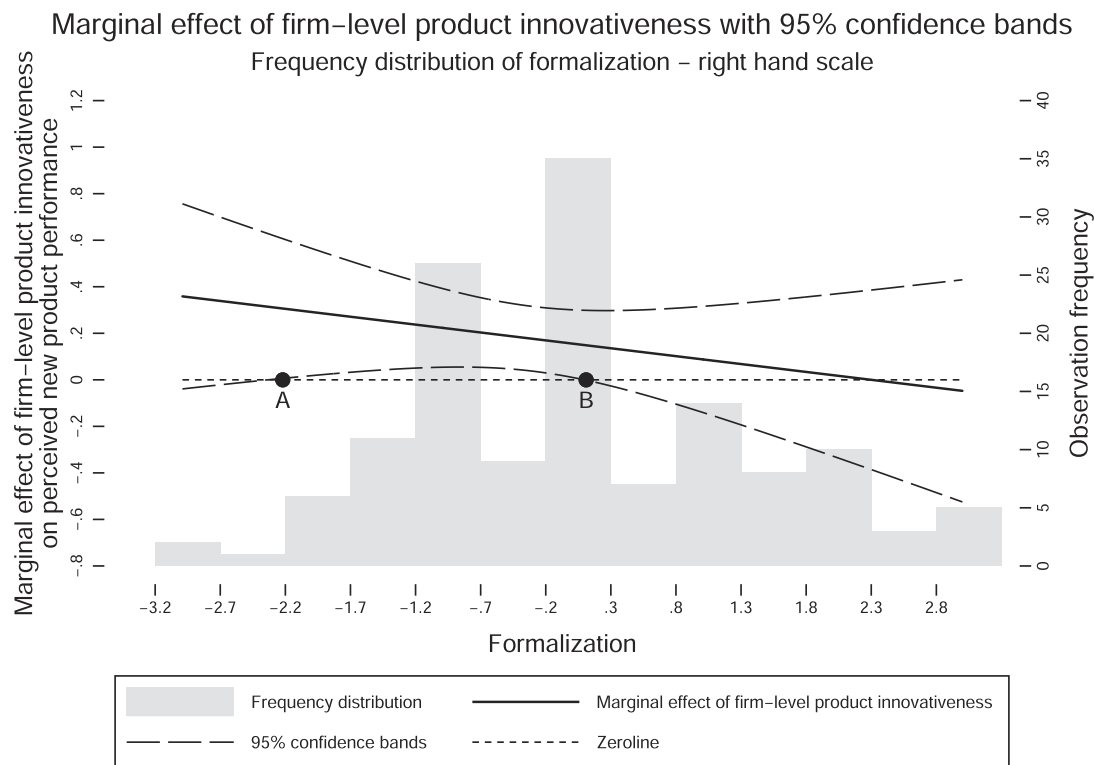


Fig. 4. Marginal effect of firm-level product innovativeness on perceived new product performance based upon a full model including both interaction terms simultaneously.

Table 4
Additional analyses: differentiating between product innovation intensity and novelty.

Variables	Model 1 (n = 137)		Model 2 (n = 137)		Model 3 (n = 137)		Model 4 (n = 137)		Model 5 (n = 137)		Model 6 (n = 137)	
<i>Independent variables</i>												
Product innovation intensity (PII)			0.164**	(0.051)	0.138**	(0.049)	0.145**	(0.046)	0.153**	(0.049)	0.164**	(0.051)
Product innovation novelty (PIN)			-0.054	(0.086)	-0.043	(0.083)	-0.051	(0.081)	-0.045	(0.087)	-0.059	(0.093)
<i>Moderator variables</i>												
Centralization			0.047	(0.051)	0.040	(0.052)	0.036	(0.051)	0.049	(0.049)	0.047	(0.051)
Formalization			-0.027	(0.049)	-0.025	(0.049)	-0.014	(0.048)	-0.027	(0.049)	-0.028	(0.049)
<i>Interaction terms</i>												
PII × centralization					-0.090**	(0.034)						
PII × formalization							-0.109***	(0.029)				
PIN × centralization									-0.235**	(0.073)		
PIN × formalization											-0.017	(0.072)
<i>Control variables</i>												
Firm size (log)	-0.399*	(0.167)	-0.429**	(0.157)	-0.439**	(0.151)	-0.408**	(0.153)	-0.456**	(0.143)	-0.426**	(0.158)
Firm age (log)	-0.150	(0.158)	-0.164	(0.149)	-0.143	(0.150)	-0.129	(0.147)	-0.165	(0.144)	-0.162	(0.150)
R&D expenses (log)	0.048	(0.036)	0.039	(0.039)	0.031	(0.034)	0.025	(0.032)	0.038	(0.036)	0.039	(0.039)
Business type	-0.033	(0.134)	0.036	(0.123)	-0.008	(0.127)	0.009	(0.131)	-0.021	(0.120)	0.030	(0.127)
Industry type	-0.337	(0.221)	-0.393†	(0.210)	-0.347†	(0.200)	-0.331†	(0.184)	-0.445*	(0.218)	-0.398†	(0.208)
Export scope (log)	0.589**	(0.208)	0.587**	(0.214)	0.589**	(0.205)	0.531**	(0.200)	0.627**	(0.205)	0.591**	(0.217)
Export product rollout speed	0.152**	(0.050)	0.117*	(0.049)	0.127**	(0.048)	0.114*	(0.047)	0.129**	(0.046)	0.116*	(0.049)
Export competitive dynamism	0.032	(0.055)	0.030	(0.053)	0.020	(0.054)	0.029	(0.051)	0.052	(0.050)	0.032	(0.055)
Export institutional barriers	-0.080†	(0.043)	-0.083†	(0.045)	-0.078†	(0.044)	-0.091*	(0.043)	-0.102*	(0.045)	-0.086†	(0.049)
<i>Reliability</i>												
R ²	0.176		0.247		0.286		0.300		0.300		0.247	
Δ R ² (vs Model 2)	-		-		0.039**		0.054***		0.053**		0.000	
F statistic	3.92***		4.23***		5.06***		6.40***		4.83***		3.94***	

Significance levels: †p ≤ 0.1; *p ≤ 0.05; **p ≤ 0.01; ***p ≤ 0.001 (two-tailed test).

Dependent variable: perceived new product performance.

Unstandardized coefficients are reported.

Robust standard errors in parenthesis.

(Duncan, 1976) that advocates organic structures in the development of product innovation but mechanistic structures in their implementation.

We also contribute to the studies that started contextualizing the relationship between firm-level innovativeness and performance with a focus on organizational structure. Our paper extends Menguc and Auh (2010) and Boso et al. (2013) by tailoring our theorizing to the *commercialization* phase of new products and focusing on abilities and resistances that are accentuated during the commercialization of innovation (Droge et al., 2008; Rosenbusch et al., 2011). While we support these authors' research in advocating for organic structure (Boso et al., 2013; Menguc & Auh, 2010), our theoretical reasoning on the role of formalization in influencing marketing personnel stands somewhat in contrast to Katsikea et al. (2015), who assert that formalization reduces role conflict, which increases export function members' job satisfaction, as standardized practices make them less vulnerable to the demands of international customers. Our reasoning contradicts their argument in part because we assert that less formalization decreases employees' potential internal resistances to new products and contributes to the implementation of marketing strategies that address the idiosyncratic conditions of foreign customers. Hence, less formalization should support the reconciliation of expectations and demands from supervisors and customers, reducing role conflict. Future research might explore these two competing logics in greater depth.

Our results also indicate that organizations can discriminate and either deploy centralization or formalization or both to influence organizational members' behavior as it relates to marketing objectives. While centralization and formalization are often weakly positively correlated in studies (e.g., Cadogan et al., 2006; Cadogan et al., 2001), they do not need to coincide and can even negatively correlate (e.g., Lukas & Menon, 2004). For example, self-managing organizations like Zappos radically decentralize but may still rely on some formalization (cf. Lee & Edmondson, 2017). Indeed, the literature recognizes that different degrees of centralization and formalization open up different design options for organizations (Burton, DeSanctis, & Obel, 2006), which tend to affect behaviors and mindsets (Linstead, Fulop, & Lilley, 2009). Thus, the degrees of centralization and formalization also have cultural implications for organizations (Linstead et al., 2009), underscoring that centralization and formalization, although both are characteristics of organizational structure, influence employees' psychological ownership and firms' adaptability in different ways. This finding is largely supported by our robustness check that includes both interactions terms in one model and reveals significant and, thus, distinct mechanisms for certain ranges of the moderating variables (Fig. 4).

Our second contribution resides in the exporting context of our study. Our findings are relevant to the literature that seeks to uncover drivers of effective export sales organizations (cf. Katsikea & Skarmas, 2003). A common notion in this literature is that innovation is a central determinant of sustained exporting success (Golovko & Valentini, 2011; Love et al., 2016). This notion holds for the classical internationalization process model (e.g., Johanson & Vahlne, 1977) but also holds for partly contrasting theories like the international new venture theory (Oviatt & McDougall, 1994). In this context, our findings indicate that the choice of organizational structure is critical to overcoming certain exporting challenges and that it influences the effective use of innovation.

Going beyond our main findings, the supplementary analyses deliver additional insights for the literature on product innovation and new product performance (e.g., Rosenbusch et al., 2011; Story et al., 2015). While we identify a positive effect of product innovation intensity on perceived new product performance, we find no such effect for product innovation novelty, which is in line with other studies (e.g., Azar & Ciabusch, 2017), nor do we find a statistically significant moderation effect of formalization on the relationship between product innovation novelty and new product performance. From a theoretical standpoint, product innovation intensity may outweigh the effect of product innovation novelty, particularly for exporters, because the fierce competition

and high dynamism that characterize the international marketing environment (Leonidou, 2004; Uner et al., 2013) may reduce the temporal differentiation advantage of novel product innovations. However, it is also apparent that more novel or radical innovations lead to more significant uncertainties for external parties and face greater resistance in the market (cf. Zhou, Yim, & Tse, 2005). As a result, positive performance effects may take longer after the initial market launches of radical products. Consequently, studies that can only account for a limited time range in their effort to capture effects on new product performance might underestimate a potential positive impact of radical innovations. Another explanation may be that intensive competition through price wars could discourage other (foreign) firms from innovating and instead encourage the imitation of products (Theodosiou, Kehagias, & Katsikea, 2012; Zhou et al., 2005) that are only new to the firm (Sandvik & Sandvik, 2003). As such, exporters that offer new-to-the-market products (Sandvik & Sandvik, 2003) might be confronted with foreign firms that are imitating their novel product portfolio, resulting in fewer benefits from product innovation novelty. This possible outcome underlines the importance of supporting novel products with exploitative activities, such as protection mechanisms, to capture value from their innovations (e.g., Broekhuizen, Giarratana, & Torres, 2017). Moreover, managers who are convinced of the value of their novel product innovations tend to be confident about their new products' chances of success because of their potential to gain large market shares quickly. However, the literature lists myriad negative forces and risks that can negatively impact new product success (cf. Szymanski et al., 2007), which managers might not fully consider. Not surprisingly, managers may often incorrectly estimate the sales takeoff of new products (Stremersch & Tellis, 2004). It seems likely that their estimates will be even more erroneous when products are characterized by great novelty.

Finally, while our robustness check confirms most of our interaction effects, we did not find a significant interaction effect for formalization and product innovation novelty. An explanation may be that rules, procedures, and guidelines safeguard marketing function members not only from overseas customers' unreasonable demands (Katsikea et al., 2015) but also from the uncertainty associated with the commercialization of novel products in potentially unknown markets.

7. Limitations and future research

Like most empirical research, the present study has a number of limitations that should be considered. First, our study faces some limitations with regard to the available data. It uses a cross-sectional research design, which raises questions about the causal direction of the central relationship (i.e., potential endogeneity). Moreover, we have to rely on subjective performance data, which might only imperfectly approximate desirable objective performance data (cf. Madsen & Moen, 2018). Although we address both these issues empirically and theoretically, we encourage future studies to implement longitudinal analyses that allow for stronger causal inferences. Such longitudinal studies would also prove helpful in investigating empirically whether certain types of innovation (e.g., more radical innovation) require more time to result in a positive performance, as we discussed with regard to our null finding of product innovation novelty in Section 6. Moreover, we encourage future analyses to be built on objective archival data as soon as such data become available and/or research that draws on perceived product quality as a (potentially more robust) proxy for new product performance.⁹ Additionally, such studies might benefit from larger samples, since our comparatively small sample could be hiding or underplaying some effects as a result of low statistical power (Aguinis, 1995).

Second, while we argue that the choice of organizational structure is

⁹ We thank an anonymous reviewer for this valuable comment.

central to mitigating internal and external resistances in the commercialization of new products, we acknowledge other highly relevant contingencies that go beyond our study's scope. For example, the effective use of protection mechanisms (e.g., trademarks) increases firms' ability to capture value from their innovations. Therefore, and especially in light of our null findings with regard to product innovation novelty, future research could explore the interplay of protection mechanisms (e.g., Broekhuizen et al., 2017; Melnyk, Giarratana, & Torres, 2014) and organizational structure in the commercialization of product innovation. Specifically relevant to the exporting context, a wide range of additional contingencies like cross-cultural differences between home and host countries may also be explored (Rank, Pace, & Frese, 2004).

Third, in line with previous research that assesses structural characteristics (e.g., Auh & Menguc, 2007; Cadogan et al., 2001; Chi & Sun, 2013), the key informants of our study are in large part CEOs. Since CEOs are the most knowledgeable persons regarding marketing operations and are likely to be aware of their organizations' structural characteristics, we are confident in the robustness of our findings. However, CEOs' perceptions of their firms' centralization and formalization levels might differ from those of the employees who are actually affected by them. Therefore, future studies might target marketing function members to evaluate the alignment between lower and upper echelons' assessment of organizational structure.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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