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How Much Does Domestic Location Matter for B2B Firms' Export Intensity? A Variance Decomposition Study

ABSTRACT

Business-to-business (B2B) firms leverage the advantages of their domestic location to export goods and services. However, little empirical research has examined the extent to which domestic location effects explain variation in B2B firms' export intensity, despite their potentially critical role. In this study, the authors explore this question with a variance decomposition analysis—an approach that allows them to quantitatively examine the relative contribution of domestic location and other effects on B2B firms' export intensity. Their analysis uses a large longitudinal sample of 7,465 European B2B firms over 15 years (2004–2018). Splitting domestic location effects into the home country and subnational region (a geographic space within a country) effects, they find that each explains a substantial portion of the variation in export intensity. Notably, the results show that the examined effects are more critical for small and medium-sized enterprises than for larger B2B firms. Domestic location factors also matter more for B2B manufacturing than service firms. The findings enhance scholarly and managerial understanding of the application and predictive power of domestic location effects in explaining firm internationalization through exports.

Keywords: variance decomposition analysis, export intensity, home country, subnational region

Exporting is the most common way firms interact with foreign markets (Campa and Guillén 1999; Golovko, Lopes-Bento, and Sofka 2022). The export share in firms' activity indicates the extent of their international engagement and is an important indicator of firm performance (Katsikeas, Leonidou, and Morgan 2000; Sousa 2004). Research has shown that export intensity (i.e., the ratio of exports to total sales) is associated with greater firm survival, greater productivity, and improved product quality (Atkin, Khandelwal, and Osman 2017; Madsen 1998; Zeriti et al. 2014).

In the business-to-business (B2B) context, firms often leverage the advantages of their domestic location to increase their export intensity (Lindsay, Rod, and Ashill 2017; Paul, Parthasarathy, and Gupta 2017). The mainstream theory of the multinational enterprise (MNE), particularly its so-called "Rugman stream" (Narula et al. 2019; Rugman 1981, 1996), emphasizes that home country-specific advantages (e.g., factor conditions, natural resource endowments, government support) help firms build a distinct resource base to overcome the liability of foreignness, making them more export intensive (Cuervo-Cazurra 2011; Rugman and Verbeke 2009). A more recent subnational heterogeneity approach acknowledges that within-country differences, specifically the subnational regions in which B2B firms are embedded, are critical to ensure the international competitiveness of these firms' goods and services (Brache and Felzensztein 2019; Ellis, Davies, and Wong 2011). Domestic subnational regions can be an important source of variation in export intensity due to positive externalities and scale economies arising from clustering economic activities (Hutzschenreuter, Matt, and Kleindienst 2020; Lorenzen and Mudambi 2013; Mudambi and Swift 2012). National governments and supranational entities also allocate funds and provide policy support to existing or emerging subnational region programs directed to firms' export initiatives (Zenker et al. 2019).

Despite being essential to B2B firms' export strategy, understanding of how effectively domestic location factors explain the variation in export intensity relative to other (e.g., industry- and firm-specific) factors is limited. While prior research has examined the relative magnitude of home country effects in a limited sample of the largest MNEs (Rugman and Oh 2013), it has neglected other contexts. Moreover, the relative importance of subnational regional effects in explaining variation in export intensity remains unexplored. Building on the Rugman stream in the mainstream theory of the MNE, we argue that home country and subnational region factors explain a substantial proportion of the variation in export intensity.

The Rugman stream also acknowledges that the extent of variation in export intensity explained by domestic location factors may be contingent on certain organizational characteristics (Narula et al. 2019; Rugman 1981, 1996). Compared with large MNEs, small and medium-sized B2B enterprises (SMEs) face the liability of newness and smallness. As such, SMEs may particularly benefit from leveraging access to social capital and other resources within the home country and subnational region to augment exports (Child et al. 2017; Tang 2011; Zhou, Wu, and Luo 2007). The relative magnitude of domestic location effects may also depend on the nature of their primary operations—namely, manufacturing versus services. While domestic location factors are important for both types of firms, the generated benefits (e.g., obtained through access to high-value research and development [R&D] or low-cost manufacturing) may have a less location-specific character in the manufacturing subsample (Bai, Chen, and He 2019; Goerzen and Makino 2007; Kirca, Fernandez, and Kundu 2016). As a result, domestic location factors (at both the home country and subnational region levels) may explain more variation in export intensity in manufacturing firms.

To investigate (1) the extent to which B2B firms' export intensity varies across their home countries and subnational regions within these countries relative to other factors and (2) whether

such variation differs between SMEs and MNEs and manufacturing and service firms, we rely on the variance decomposition methodology, an approach to quantitatively assess the sources of the variation in a given dependent variable (Guo 2017; McGahan and Porter 1997; Misangyi et al. 2006). While this methodology has been widely used in management to understand the sources of variation in firm financial performance (e.g., Chan, Makino, and Isobe 2010; Guo 2017; Makino, Isobe, and Chan 2004; McGahan and Porter 1997), it lacks application in international marketing, particularly to partition the variation in international firm performance metrics such as export intensity. We test our predictions on a large panel covering 7,465 B2B firms of varying sizes from 2004 to 2018 from the most prominent European Union (EU) economies. Our results indicate the sizable relative importance of home country and subnational region effects for B2B firms' export intensity.

Our study offers several theoretical implications. First, we synthesize international marketing and international business literature on the role of domestic location for firm export intensity (Estrin, Nielsen, and Nielsen 2017; Lee and Weng 2013; Rugman and Oh 2013; Yip, Rugman, and Kudina 2006) with variance decomposition research (Guo 2017; Ma, Tong, and Fitza 2013). As Table 1 shows, our study differs from prior work by examining the *relative* importance of domestic location effects in explaining the variation in export intensity. Importantly, our study contributes to a nascent stream of research on the role of subnational regional factors for firm internationalization (Brache and Felzensztein 2019; Freeman, Styles, and Lawley 2012; Wang and Ma 2018). This stream challenges the common assumption of subnational spatial homogeneity in international strategy development and calls for evidence to justify other levels of analysis, such as the subnational region (Hutzschenreuter, Matt, and Kleindienst 2020; Mudambi et al. 2018). We demonstrate that, similar to home country effects,

subnational region effects explain approximately 8% of the variation in export intensity deemed substantial in variance decomposition research.

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Second, our study contributes to the Rugman stream in the mainstream theory of the MNE by examining the *contingencies* under which the relative importance of home country and subnational region effects on export intensity is greater. Using insights from the Rugman stream, we contrast these effects for SMEs versus MNEs and for manufacturing versus service firms. Thus, our findings enhance scholarly understanding of the application and predictive power of domestic location effects in the mainstream theory of the MNE (Rugman and Oh 2013; Rugman and Verbeke 2009; Verbeke 2013).

Third, we contribute to the variance decomposition literature that examines the relative role of different effects in explaining variance in firm outcomes (Chan, Makino, and Isobe 2010; Guo 2017; Makino, Isobe, and Chan 2004; McGahan and Porter 1997). Scholars have called for research to consider new variables, international data sets, types of effects, and methodological advancements to explore sources of competitive heterogeneity (Ma, Tong, and Fitza 2013; Meyer-Doyle, Lee, and Helfat 2019). We extend this research stream by (1) focusing on export intensity as an indicator of internationalization effort and firm performance, (2) using a recent data set of European firms, (3) uncovering the relative magnitude of subnational region effects, and (4) employing a multilevel modeling (MLM) technique with Markov chain Monte Carlo (MCMC) estimation in a Bayesian framework. Variance decomposition research has used MLM with MCMC estimation only recently (e.g., Guo 2017). This technique represents a methodological improvement over prior variance decomposition studies as it generates more accurate estimates in cross-classified data structures (Browne 2017), such as when firms are simultaneously nested within industries and subnational regions. Finally, our study helps

managers and policy makers understand how much attention and other resources they should devote to the domestic location factors to foster internationalization through exports.

THEORY AND HYPOTHESES

The Role of Domestic Location-Specific Advantages for Firm Exporting

The mainstream theory of the MNE, particularly the so-called Rugman stream (Narula et al. 2019) acknowledges that a firm's international success does not happen in a spatially homogeneous environment; rather, location plays a significant role (Rugman 1981, 1996; Rugman and Verbeke 1992). The stream stresses so-called location-specific advantages (LSAs), which represent the set of strengths—stocks of accessible resources—characterizing a specific location and usable by firms operating in that location (Rugman and Verbeke 2009). The Rugman stream has mainly focused on LSAs at the country level, referring to them as country-specific advantages (Rugman 1981, 1996). Recent work, especially the subnational heterogeneity approach, has also considered other levels of analysis (Hutzschenreuter, Matt, and Kleindienst 2020; Mudambi et al. 2018). LSAs are vital, as they serve as additional ingredients for firms to gain a competitive advantage and become more export intensive (Verbeke 2013).

While scholars have emphasized the role of LSAs at both the domestic and host location levels, the former can play a particularly important role in firms' international expansion. Many LSAs are exploited domestically, where firms can benefit from collocation, knowledge of institutions, and privileged access to intermediate goods and intragroup transactions (Cuervo-Cazurra 2011; Cuervo-Cazurra, Luo, et al. 2018; Rugman and Verbeke 2009). This is true not only for firms originating from developed economies (Cuervo-Cazurra 2012; Porter 1990) but also for their emerging market counterparts (Ramamurti 2012; Williamson et al. 2013). Domestic LSAs are especially critical for the exporting mode that provides firms' competitive advantage, a

part of which is attributable to the internalization of these LSAs and is embodied in the quality of their final products (Verbeke 2013). By contrast, host LSAs for export-oriented firms primarily refer to the presence of customers willing to purchase their products (Verbeke 2013).

Domestic LSAs coexist on two major levels: home country (Cuervo-Cazurra 2006; Vernon 1966, 1979) and subnational region (Beugelsdijk and Mudambi 2013; Hutzschenreuter, Matt, and Kleindienst 2020; Mudambi et al. 2018). A firm's international expansion stems from the availability of LSAs in its home country (Rugman 1981, 1996; Rugman and Verbeke 1992; Verbeke 2013). Various resource endowments and a high level of competitive pressures in a firm's home country push it to innovate and upgrade systematically, which is instrumental to the international success of its goods and services (Porter 1990). A source of variation in a firm's export intensity may also be attributable to the home country's macroeconomic policies, social infrastructure, and political institutions (Cuervo-Cazurra 2006; Cuervo-Cazurra and Ramamurti 2017). For example, the development of the regulations and their application affects the predictability of business relationships, influencing uncertainty and costs for local economic agents (Khanna and Palepu 2010). In parallel with these discussions, the international marketing literature has identified the country-of-origin effect as a source of advantage that affects firm exports by shaping foreign customers' beliefs about product performance (Brouthers, Werner, and Matulich 2000; Steenkamp, Batra, and Alden 2003). The country-of-origin effect may also create variation in firm exporting by acting as a liability—consumers can discriminate against firms from particular home countries, especially less developed ones (Sharma, Shimp, and Shin 1994).

Research in international marketing and management has recently highlighted the existence of LSAs at the subnational region level—"a geographic space within a particular country, usually demarcated by an administrative border" (Hutzschenreuter, Matt, and Kleindienst 2020, p. 3).

The assumption of subnational spatial homogeneity is often unrealistic, as there may be considerable subnational differences in institutions, natural resource endowments, and economic development (Beugelsdijk and Mudambi 2013; Goerzen, Asmussen, and Nielsen 2013). For example, Nguyen, Le, and Bryant (2013) find that when subnational region authorities improve transparency and availability of information on export-related regulations, firms from such subnational regions are able to reduce procedural time and costs and export more effectively. Similarly, being located in subnational regions with more intense competition makes local firms more innovative and export oriented (Freeman, Styles, and Lawley 2012). Thus, LSAs at home country and subnational region levels are likely to explain a substantial part of heterogeneity in firms' exporting.

The Interplay of Domestic LSAs and Firm Characteristics for Firm Exporting

The extent to which domestic LSAs affect firm export intensity is not uniform across all firms and therefore may vary with their characteristics (Cuervo-Cazurra, Maloney, and Manrakhan 2007; Paul, Parthasarathy, and Gupta 2017). In some cases, firms have an insufficiently developed resource base that they can effectively deploy to overcome the liability of foreignness. Scholars have shown that SMEs often suffer from the liability of foreignness and newness more than their larger counterparts (Lu and Beamish 2001; Santangelo and Meyer 2011). Although these arguments have initially been applied to the developed market context, they also hold for emerging market firms. For example, China's large domestic market base and the increasing sophistication of its consumers provide SMEs with an opportunity to acquire experience and build cash flow to accelerate exports (Verbeke 2013).

While domestic LSAs are argued to matter for SME export intensity, their relative importance is still unknown. Another crucial question is whether domestic LSAs explain sufficient variation in larger firms' (i.e., MNEs') export intensity. We would generally expect the

relative contribution of domestic LSAs to decrease as firms grow and become less reliant on these LSAs (Dunning 1996; Rugman and Verbeke 2009), for example, by making less use of institutional support in the form of government incentives (Landau et al. 2016). However, scholars have noted that domestic LSAs are still relevant for the international success of larger firms' goods and services and this should not be neglected by researchers and practitioners (Cuervo-Cazurra, Luo, et al. 2018).

The effect of domestic LSAs on exports may also depend on the nature of firms' primary operations (i.e., manufacturing versus services). Domestic LSAs may guarantee access to high-value R&D or low-cost manufacturing for firms with primary activity in manufacturing, increasing their products' global competitiveness (Hillemann and Verbeke 2014). Importantly, Rugman's theoretical framework implies different outcomes for service firms. Domestic LSAs may restrict service firms' international activity because of the simultaneity of production and consumption that forces the customer into intimate contact with the production process (Bai, Chen, and He 2019; Capar and Kotabe 2003; Contractor, Kundu, and Hsu 2003). As a result of the high cost of service customization abroad, a strong bias may develop toward the domestic location, thus limiting exports (Elango and Pangarkar 2021). Thus, domestic LSAs should create higher variability in export intensity among manufacturing versus service firms.

The Role of Domestic LSAs for B2B Firms

Marketing literature emphasizes that domestic LSAs are important for B2B firms. For example, cohesive domestic business networks provide access to economic actors such as suppliers of specialized inputs, manufacturers of complementary products, and providers of complementary services (Bengtsson and Kock 2000; Davies et al. 1995). Recent research in industrial marketing and economic geography acknowledges the role of subnational region embeddedness in facilitating internationalization (Nicholson, Gimmon, and Felzensztein 2017).

For example, Eklinder-Frick, Eriksson, and Hallén (2011) stress the role of geographic proximity in understanding how social capital stemming from regional strategic networks affects an innovative business climate. In addition to helping B2B firms gain a technological advantage, the domestic environment can ensure the effectiveness of marketing capabilities required to increase the export intensity, such as the ability to understand business customers' current and emerging needs (Ellis, Davies, and Wong 2011). This evidence leads us to conclude that domestic LSAs play an important role in explaining export intensity of B2B firms.

The Role of Home Country and Subnational Region Factors for B2B Firm Export Intensity

Home Country Effects. International marketing and business scholars have acknowledged that home country LSAs are instrumental in exploiting a solid resource base that is critical in offsetting the liability of foreignness and allowing firms to succeed internationally (Rugman and Verbeke 2009). Raymond Vernon was one of the first authors to emphasize the symbiosis among the home country's location advantages, the firms' proprietary assets, and firm internationalization. In his product life-cycle model, Vernon (1966, 1979) argues that domestic demand can pressure firms to introduce new innovative products to satisfy their needs and desires. These products should serve as the basis for firms exporting to other countries, though customer characteristics may vary across the countries, impeding exports. However, because differences in corporate clients' needs do not always strongly affect the demand for B2B firms' products (Prahalad and Doz 1987), firms can use most of the business knowledge developed in the home country to serve customers abroad (Cuervo-Cazurra 2011).

In his Diamond model, Porter (1990) further argues that firms' international expansion is a function of factor conditions and inputs from related and supporting industries and competitive industry structure, in addition to demanding customers in the home country. The underlying logic is that these factors constitute a source of critical resources and capabilities required for

internationalization (Dunning 1996; Wan and Hoskisson 2003; Yip, Rugman, and Kudina 2006). Some of these factors are especially critical for the internationalization of B2B firms. Such firms tend to rely on horizontally and vertically related industries with multiple interfirm interactions at home (Felzensztein, Gimmon, and Deans 2018). More significant domestic rivalry pushes firms to innovate, driving exports (Porter 1990).

Another source of variation in B2B firms' export intensity may come from home country institutions (Cuervo-Cazurra 2006; Rodriguez, Uhlenbruck, and Eden 2005; Voss, Buckley, and Cross 2010). For example, governments may introduce reforms that improve external monitoring and decrease agency costs, increasing firms' competitiveness and international presence (Cuervo-Cazurra and Dau 2009). B2B firms may also benefit from institutional experiences in their home country environments by gaining knowledge about political processes and policy making (Delios and Henisz 2003). For example, facing political risk at home helps firms learn how to manage it in foreign countries with similar risks, reducing the liability of foreignness and the costs of exporting (Cuervo-Cazurra, Ciravegna, et al. 2018; Cuervo-Cazurra and Genc 2008; Holburn and Zelner 2010).

These arguments suggest that the home country is likely to constitute a significant source of variation in B2B firms' export intensity. Thus, we hypothesize the following:

H_{1a}: A significant proportion of the variation in B2B firms' export intensity is attributable to home country effects, when controlling for other (firm, industry, and subnational region) effects.

Subnational Region Effects. A relatively recent stream of research in international business and marketing emphasizes the role of spatial heterogeneity within firms' home countries for their international competitiveness (Beugelsdijk and Mudambi 2013; Mudambi et al. 2018; Nicholson,

Gimmon, and Felzensztein 2017). Specifically, scholars have uncovered subnational region effects stemming from within-country variation in agglomeration effects, factors of production, and formal and informal institutions such as business culture (Beugelsdijk and Mudambi 2013; Kleinhempel, Beugelsdijk, and Klasing 2020; Lorenzen and Mudambi 2013; Ma, Tong, and Fitza 2013).

By definition, agglomeration occurs primarily at the subnational level. The geographic concentration of firms in a location within a country gives rise to external economies, such as knowledge spillovers and a pool of specialized labor and input providers (Porter 1998). Collocation of production facilities and clustering of economic activities create positive externalities and scale economies, stimulating the development of a solid resource base that helps mitigate the liability of foreignness and drives variation in export intensity (Ma, Ding, and Yuan 2016). For example, collocation allows B2B firms to gain access to knowledge spillovers, which strengthen their technological sophistication—a vital advantage critical to the success of their exporting activities (Fernhaber, Gilbert, and Mcdougall 2008; Libaers and Meyer 2011). According to Dunning (1998, p. 52), "[regions] impinge upon spatial transaction costs and dynamic external economies, such as those to do with complex technologies, uncertain or unpredictable markets, interactive learning, face-to-face discussions and the exchange of uncodifiable knowledge."

Research in B2B marketing has highlighted the role of business networks surrounding the firm as a tool for international growth. Scholars have also emphasized the role of "cohesive networks where the participating actors are bound together through trust and reciprocity thereby bringing the regional actors more closely together as an embedded coalition" (Eklinder-Frick, Eriksson, and Hallén 2011, p. 1001). Subnational regions with cohesive networks may create an innovative business climate and increase the effectiveness of marketing capability, managerial

routines, human-resource efficiency, innovation, and product differentiation vital for sustaining exports (Paul, Parthasarathy, and Gupta 2017).

Scholars have also documented that subnational regions in a country vary in the strength of economic, social, political, and legal institutions, which influence the cost of governing business transactions and, as a result, the international marketing strategy of B2B firms (Ma, Ding, and Yuan 2016; Meyer et al. 2009; Peng et al. 2009). Well-established economic institutions in a subnational region can improve B2B firms' access to reliable information on consumers, creditors, and investors (Kambhampati and McCann 2007). Well-functioning information systems help reduce information asymmetries and lower the cost of searching for information and other resources required for firm exporting (Lu, Xu, and Liu 2009; Ma, Ding, and Yuan 2016). In both developed and emerging economies, certain subnational political institutions support firms in their efforts to expand overseas (Audretsch, Grimm, and Schuetze 2009; Luo, Xue, and Han 2010; Wang and Ma 2018). For example, to increase their economy's competitiveness, EU states developed and implemented various policies at the subnational level to help B2B firms increase their exports (Audretsch, Grimm, and Schuetze 2009). Grimm (2011) describes how certain states in Germany adopted a policy approach to promote several innovative clusters rather than subsidizing as many firms as possible without attending to geographic affiliation. Finally, informal values and norms embedded in regional social institutions shape international marketing strategy. For example, the business culture of a subnational region can help firms cope with the liability of foreignness and internationalize more successfully (Park, Li, and Tse 2006).

Given these arguments, subnational region factors significantly affect B2B firms' export intensity. Thus, we hypothesize the following:

H_{1b}: A significant proportion of the variation in B2B firms' export intensity is attributable to subnational region effects, when controlling for other (firm, industry, and home country) effects.

Home Country, Subnational Region Factors, and B2B Firm Export Intensity: SMEs Versus MNEs

Although the relative magnitude of the home country's and subnational region's effects on B2B firms' export intensity is substantial, we argue that they may not be equally important to SMEs and larger, more established firms (MNEs). First, the relative contribution of the home country and subnational region effects may decrease as B2B firms grow and expand their presence worldwide (Dunning 1996, 1993; Rugman and Verbeke 2009). Dunning's (1996) study of 144 firms from the *Fortune* Global 500 list shows that while their national and subnational environments remain an important source of skilled labor and technological capabilities that ensure international competitiveness, these firms also derive systemic advantages from the joint governance of geographically dispersed activities. In other words, both home and host LSAs guarantee the international competitiveness of MNEs versus SMEs, for which the role of home LSAs remains more significant (Dunning 1996). For example, B2B SMEs are less likely to benefit from what Meyer, Mudambi, and Narula (2011) call "multiple embeddedness," which helps firms benefit from the opportunities in several local contexts and increase foreign sales.

Second, because B2B SMEs suffer from the liability of foreignness given a lack of a strong resource base (Johanson and Vahlne 2009; Lu and Beamish 2001), national and subnational institutions are more critical in helping them develop resources and capabilities and stimulate their international expansion (Audretsch, Grimm, and Schuetze 2009). For example, SMEs often cannot undertake R&D because of limited access to resources that hinder their international

competitiveness. Because R&D is a costly and risky activity, and given frequent capital market failures, SMEs may decide to invest in R&D activities below the Pareto efficient level. Thus, national and regional governments may need to implement R&D policies aimed explicitly at SMEs (Audretsch, Grimm, and Schuetze 2009; Grimm 2011; Ortega-Argilés, Vivarelli, and Voigt 2009). Such support involves, for example, "the development of an efficient R&D infrastructure; strengthening networks between higher education, academic entrepreneurs, technological institutions, and local industries; the support of R&D projects at the individual company level; and aid in placing highly qualified personnel in businesses" (Grimm 2011, p. 1538).

Finally, in the context of B2B SME exporting, societal social capital (i.e., the structure and quality of relationships between actors in society) has important home country and subnational region dimensions. The existence of such capital plays a vital role in B2B SMEs' ability to gain access to information and knowledge, mobilize external resources (Kleinhempel, Beugelsdijk, and Klasing 2020; Laursen, Masciarelli, and Prencipe 2012), and subsequently increase the share of exports in the total revenues (Eddleston, Sarathy, and Banalieva 2019). For example, subnational regions characterized by greater network reach and network diversity allow B2B SMEs to obtain resource acquisition from diverse sources (Kwon, Heflin, and Ruef 2013). In turn, societal social capital at the home country level can provide information about promising business opportunities (Iurkov and Benito 2018; Kleinhempel, Beugelsdijk, and Klasing 2020). Therefore, we predict that domestic location factors matter more for the export intensity of B2B SMEs than for MNEs, leading us to hypothesize the following:

H_{2a}: Home country effects explain a greater proportion of the variation in export intensity in B2B SMEs than MNEs, when controlling for other effects.

H_{2b}: Subnational region effects explain a greater proportion of the variation in export intensity in B2B SMEs than MNEs, when controlling for other effects.

Home Country, Subnational Region Factors, and B2B Firm Export Intensity: Manufacturing Versus Service Industries

Both B2B manufacturing and service firms can leverage the advantages of their home countries and subnational regions to achieve the worldwide competitiveness of their offerings. In manufacturing firms, these LSAs can significantly boost exports by guaranteeing access to high-value R&D or low-cost manufacturing (Lee, Hong, and Makino 2016; Verbeke 2013). However, the relationship between domestic LSAs and firm export intensity for service firms is more nuanced (Hillemann and Verbeke 2014).

In contrast with their manufacturing counterparts, service firms provide primarily intangible items requiring more intensive customer contact, extensive customization, and local adaptation (Berthon et al. 1999; Kirca, Fernandez, and Kundu 2016; Patterson and Cicic 1995). In many B2B service industries, especially information-intensive ones, knowledge is created while doing business, making it crucial to be involved in local activities on an ongoing basis. These activities are often subnational in nature (Goerzen and Makino 2007; Lee, Hong, and Makino 2016). However, such location-specific experience and localization demands generated by the distinct features of B2B services may undermine the development of market-based capabilities required to increase export intensity. Importantly, service firms may be more prone to depend on supportive home country and subnational region institutions than their manufacturing counterparts, making internationalization more challenging (Bai, Chen, and He 2019). In addition, many countries put constraints on foreign operations in service industries, including domestic

preference policies, ownership restrictions, and unfavorable tax treatments (Capar and Kotabe 2003; Chidlow, Ghauri, and Hadjikhani 2019). Thus, B2B service firms may face more difficulties than manufacturing firms in building on domestic LSA to increase the international attractiveness of their propositions.

In summary, we argue that B2B service firms are likely to find home country- and subnational region-specific factors less relevant when expanding their operations abroad than B2B manufacturing firms. Thus, we expect the importance of home country and subnational region factors to be lesser for service firms' export intensity than for manufacturing firms', leading us to hypothesize the following:

H_{3a}: Home country effects explain a greater proportion of the variation in export intensity in B2B manufacturing than service firms, when controlling for other effects.

H_{3b}: Subnational region effects explain a greater proportion of the variation in export intensity in B2B manufacturing than service firms, when controlling for other effects.

METHODOLOGY

Data, Sample, and Measures

We obtained all data for the analyses from the Orbis database, which identifies both listed and nonlisted firms worldwide, the core industry in which they operate, and the country and subnational region of their headquarters. The period we consider for this study is 2004–2018.

We applied several screening criteria before proceeding with estimations. First, we selected only independent B2B firms as designated in the Orbis database with independence indicators "A" and "B" (i.e., no shareholders with more than 50% direct ownership). In the database, firms carrying these indicators are classified as ultimate owners (Bureau van Dijk 2013). Such firms are said to have their management independent in their decision making (Keasey, Pindado, and

Rodrigues 2015), including international expansion strategies. In turn, a B2B firm is defined in line with Delgado and Mills (2020), who classify all industries into two broad categories: B2B (i.e., selling primarily to other firms or the government) and business-to-consumer (B2C) (i.e., selling primarily to consumers). If a firm's primary activity is in the B2B industry, it is classified as a B2B firm.[1] Delgado and Mills's classification is based on the percentage of output sold to personal consumption expenditure (PCE). The PCE is a final use item in the input-output accounts that captures the value of the goods and services purchased by households. Delgado and Mills classify an industry as B2B if it sells less than 35% of its output to PCE, with the rest being classified as B2C (for the detailed methodology, see Delgado and Mills 2020). To date, theirs is the most systematic and comprehensive classification of industries into B2B and B2C. Second, we excluded B2B firms with primary activity in public administration, as well as depository institutions, following prior variance decomposition research (McGahan and Porter 1997; Misangyi et al. 2006). Firms with these designations differ in their internationalization strategies and performance, not comparable to those of other industries (McGahan and Porter 1997). Third, we excluded firms for which the data contained only one observation and those that were the only ones in their industry in a given year.

To operationalize B2B firms' export intensity, we relied on the Orbis database's only readily available metric—the ratio of foreign sales to total sales (expressed as a percentage). Therefore, we excluded from our analysis all B2B firms for which this metric was not available or was equal to zero. It should be noted that this measure is consistent with our theoretical mechanisms, and the practice of measuring export intensity with the ratio of foreign sales to total sales is consistent with research in the fields of international management and marketing (Qian et al. 2008; Tashman, Marano, and Kostova 2019). According to Rugman and Oh (2011, p. 205), being "a clear indicator of international activity, separate from the domestic activity, [the foreign

to total sales ratio] provides good information about the performance and success of the firm in foreign markets." Moreover, because foreign sales represent an early stage of internationalization, the ratio is well-suited to uncover the internationalization efforts of SMEs (Dikova et al. 2016). Finally, decomposing variance in the foreign sales-to-total sales ratio allows us to evaluate the explanatory power of the extensive research using the same metric.

To operationalize domestic *subnational regions*, we relied on the Nomenclature of Territorial Units for Statistics (NUTS) classification. NUTS is a hierarchical system for dividing the economic territory of the EU and the United Kingdom to collect, develop, and harmonize statistics or socioeconomic analyses. The classification subdivides each country into regions according to the NUTS levels (Eurostat 2018). For our analysis, we referred to subnational regions belonging to NUTS 2, which serve as a basis for applying regional policies and are used to determine eligibility for structural and investment funds. We excluded firms for which the NUTS 2 affiliation was not reported in Orbis. Finally, we performed all these screening procedures again to ensure that the data contained more than one observation per category in a given year (Guo 2017).

After we applied these screening criteria, the remaining sample included a few countries for which we had a minimal number of observations or countries with small economies (e.g., Estonia, Hungary). Keeping these countries in the analysis could have produced selection biases related to the disclosure of export intensity by mainly export-intensive firms, which would affect the power of higher-level effects (Hofmann 1997; Peterson, Arregle, and Martin 2012). Therefore, we limited our analysis to B2B firms from only major European economies. In our case, the United Kingdom, France, and Germany remained after the screening procedures. Moreover, the regional variations in these large European economies are much higher than those

in smaller countries. The resulting sample comprised 44,596 firm-year observations consisting of 7,465 firms, 306 industries, and 104 subnational regions.

Finally, to test H_2, we distinguish SMEs from MNEs by relying on the official definition provided by the European Commission, namely the EU recommendation 2003/361. According to this recommendation, a small or medium-sized firm's total sales should not exceed €50 million. Relying on this definition is important to align with our theoretical mechanisms, such as access to finance and support programs targeted specifically to these enterprises. To test H_3, we distinguish between manufacturing and service firms by examining their primary industry affiliation. All industry classifications explicitly denote manufacturing industries (i.e., NACE Rev. 2 codes 10-33). Firms with primary activities in industries other than manufacturing are classified as service firms. SMEs constitute 87% of the sample, a representative number as these firm types constitute the majority in many economies (Munro 2013). Manufacturing firms constitute 32% of the sample.

Variance Decomposition Approach

Variance decomposition analysis is a methodological approach widely applied in strategic management, international business, and economics to examine the relative importance of various effects on firm behavior and outcomes (Zaefarian, Iurkov, and Koval 2022). The methodology implies partitioning the total variance in an outcome variable (e.g., firm financial performance) into several components, such as industry, country, and firm.

Rumelt (1991) and McGahan and Porter (1997) were among the first to apply the variance decomposition approach to outline the relative importance of different groups of factors, such as business segment, corporate parent, and industry, causing variation in firm financial performance. Since then, interest has grown in applying this methodology to study the relative importance of other factors, such as country (Makino, Isobe, and Chan 2004) and ownership (Xia and Walker

2015). At the same time, an evident focus has been on methodological improvements with approaches ranging from nested analysis of variance (ANOVA) (McGahan and Porter 1997) and MLM with maximum likelihood estimation (Misangyi et al. 2006) to more sophisticated MLM using Bayesian MCMC algorithms (Guo 2017). In our study, we use the latter technique because it has several advantages and does not share certain limitations of other estimation techniques. In particular, fitting a multilevel model with MCMC methods in a Bayesian framework enables better handling of complex structures and dependencies in data, such as cross-classified data structures, and estimates unbalanced data more efficiently (Rasbash and Browne 2001).

Model Specification and Estimation

Our data have a cross-classified structure (e.g., Guo 2017; Misangyi et al. 2006). The dependent variable—export intensity—has repeated observations over time that are nested within firms. Firms are cross-classified within both industries and subnational regions, and subnational regions are nested within home countries.

To partition the variance in export intensity and calculate variance partition coefficients (relative effects), we fit an unconditional multilevel model to the data set (Guo 2017; Misangyi et al. 2006). This model does not have predictors at any level and simply partitions variance in the dependent variable into different levels (Snijders and Bosker 2012). We specify our cross-classified model, denoted as Model 1, as follows[2]:

$$(1) \qquad Y_{it} = \beta_0 + u^{(5)}_{\text{country}(it)} + u^{(4)}_{\text{region}(it)} + u^{(3)}_{\text{industry}(it)} + u^{(2)}_{\text{firm}(it)} + e_{it},$$

where $e_{it} \sim N(0, \sigma_e^2)$, $u^{(2)}_{\text{firm}(it)} \sim N\left(0, \sigma^2_{u^{(2)}}\right)$, $u^{(3)}_{\text{industry}(it)} \sim N\left(0, \sigma^2_{u^{(3)}}\right)$, $u^{(4)}_{\text{region}(it)} \sim N\left(0, \sigma^2_{u^{(4)}}\right)$, and $u^{(5)}_{\text{country}(it)} \sim N\left(0, \sigma^2_{u^{(5)}}\right)$. In addition, Y_{it} is firm i's export intensity in year t; β_0 is the grand-mean export intensity; e_{it} is the time-level error term with variance σ_e^2, which previous studies also refer to as across-time variance (Misangyi et al. 2006) or dynamic variance (Guo 2017);

$u^{(2)}_{\text{firm}(it)}$ is between-firm residual with variance $\sigma^2_{u^{(2)}}$; $u^{(3)}_{\text{industry}(it)}$ is between-industry residual with variance $\sigma^2_{u^{(3)}}$; $u^{(4)}_{\text{region}(it)}$ is between-subnational region residual with variance $\sigma^2_{u^{(4)}}$; and $u^{(5)}_{\text{country}(it)}$ is between-home country residual with variance $\sigma^2_{u^{(5)}}$. Following other variance decomposition studies (e.g., Guo 2017; Misangyi et al. 2006), we interpret firm, industry, subnational region, and home country effects as reflecting "stable" (i.e., time-invariant) differences in export intensity associated with each of these effects.

Similar to recent variance decomposition studies in strategic management (e.g., Guo 2017), we fit Model 1 using MLwiN software (Rasbash et al. 2009) with the MCMC estimation algorithm in a Bayesian framework (Browne 2017). In contrast with MLM with maximum likelihood estimation, Bayesian estimation provides inference statistics for estimated percentages of variance components (Browne 2017). Moreover, Bayesian estimation methods are preferred to maximum likelihood estimation when the number of higher-level categories, such as countries, is relatively small (Stegmueller 2013). We provide a more detailed discussion of the estimation procedure in the Web Appendix.

RESULTS

Table 2 reports the results of estimating the unconditional model (Model 1) in the full sample and provides information about the relative magnitude of firm, industry, subnational region, and home country effects on export intensity. The cross-nested design implemented in the MLwiN software allows us to estimate the variance components directly and to calculate their relative importance (Browne 2017; Leckie and Charlton 2012; Rasbash et al. 2009). We note that all effects are statistically significant at the 5% level, based on the inference statistics of the Bayesian MCMC estimation.

---INSERT TABLE 2 ABOUT HERE---

H_{1a} states that export intensity varies systematically by home country. In Table 2, home country effects constitute 7.45% of the total variance in export intensity. H_{1b} states that subnational region effects significantly contribute to variation in export intensity. Table 2 shows that the relative importance of subnational region effects is equal to 7.82%. These findings indicate that domestic location effects substantially contribute to the variation in firm export intensity, at a total level of 15.27%. H_{1a} and H_{1b} are therefore supported.

In H_{2a} and H_{2b}, we predict that the relative importance of home country and subnational region effects for export intensity is greater for B2B SMEs than MNEs, respectively. We examine the difference between these effects for B2B SMEs and MNEs by fitting Model 1 separately to the SME and MNE subsamples. Table 3 reports the results. To determine whether the data support H_{2a} and H_{2b}, we follow Bamiatzi et al.'s (2016) approach, in that we deem differences greater than 1% between SMEs and MNEs as sufficient to support the hypotheses.[3] As Table 3 shows, the total domestic location effects account for 16.60% of the total variance in the SME subsample and 10.52% in the MNE subsample, resulting in a difference of 6.08%. Similarly, the difference in both home country effects (7.55% vs. 3.98%) and subnational region effects (9.05% vs. 6.54%) exceed the 1% threshold. These results provide support for H_{2a} and H_{2b}. We also note that domestic location effects play an important role in SME export intensity, on par with industry effects. For MNEs, these effects are substantially lower in magnitude than the industry and firm effects.

---INSERT TABLE 3 ABOUT HERE---

H_{3a} and H_{3b} posit that the relative importance of home country and subnational region for firm export intensity is greater for B2B manufacturing than service firms, respectively. The results in Table 4 show substantial differences in the relative magnitude of both types of effects

between manufacturing and service firms. Home country effects are 9.78% higher in the manufacturing sample, while the difference in subnational region effects is 11.21%. In total, domestic location effects are 20.99% higher for B2B manufacturing than service firms. These findings provide support for H_{3a} and H_{3b}.

---INSERT TABLE 4 ABOUT HERE---

The results in Tables 2–4 indicate that firm export intensity varies systematically and significantly by industry. In the full sample (Table 2), the relative magnitude of industry effects equals 16.17%. In Tables 3 and 4, the relative importance of industry effects ranges from 11.31% (manufacturing subsample, Table 4) to 28.55% (MNE subsample, Table 3). The substantial magnitude of industry effects may be due to differences in industry globalization, which cause firms to pursue a more international strategy to stay competitive globally by achieving economies of scope across markets (Wiersema and Bowen 2008).

Table 2 indicates that firm effects constitute the largest proportion of total variation in firm export intensity, equal to 61.44%. Tables 3 and 4 affirm that this result holds for all subsamples: The relative importance of firm effects ranges from 53.87% to 65.80%. The substantial size of firm effects is in line with the assertion that the distinct resource base available to a firm is the most critical resource for determining success in the international marketplace (Rugman, Verbeke, and Nguyen 2011).

Additional Analyses

While the main purpose of any variance decomposition study is not to establish causality per se, sample selection and comparability issues may be present. We tried to minimize this issue by limiting the sample to firms from major EU economies (as of 2018, the United Kingdom was part of the EU) with subnational region heterogeneity. Nevertheless, we extended our sample to include firms from outside the EU in a sensitivity analysis. The subnational region heterogeneity

and our data availability were the main criteria for including firms from other countries. Orbis provides a sufficient amount of data for Turkey. Turkey is also characterized by subnational region heterogeneity. Moreover, as Turkey is a candidate country of the EU, it classifies its regions similarly to the EU's NUTS classification. We also included firms from the United States and Canada. Data to calculate the export intensity of these firms come from the Compustat Historical Segments database. Subnational regions of the United States and Canadian firms are operationalized as states and provinces, respectively. We report the results for the Bayesian MCMC estimation on the extended (full) sample in Table 5. The relative importance of home country and subnational region effects constitutes 25.90% and 17.25%, respectively. The results are consistent with our arguments and provide additional support for H_{1a} and H_{1b}.

---INSERT TABLE 5 ABOUT HERE---

Marketing research argues that B2B manufacturing firms may adopt business models that include a provision of both products and services (Hakanen, Helander, and Valkokari 2017). While servitization could be the case among manufacturing firms, studies also show that it is often not a dominant business model. For example, in their large-scale study of manufacturing firms worldwide, Mastrogiacomo, Barravecchia, and Franceschini (2020) show that 62% of firms are entirely focused on manufacturing. Among the remaining 38%, almost 80% offer only a single service. Moreover, SMEs are less likely to be servitized, and they constitute the majority of firms in the EU, according to Eurostat (2018).

Product-related services normally cover the following categories: consultancy, design and development, finance, logistics, installation and setup, management and operations, maintenance and support, and retail and distribution. Relying on Mastrogiacomo, Barravecchia, and Franceschini (2020), we calculated the total service intensity for each two-digit NACE code by averaging the service intensity of these categories within each manufacturing sector. Then, we

excluded firms in manufacturing sectors with high servitization (in the upper quartile) from the analysis. Table 6 reports the MCMC estimation results. The relative importance of home country effects is equal to 13.41%, similar to the estimates in Table 2. The percentage of variation in export intensity explained by subnational region effects is 8.83%. The results are also consistent with our predictions and again provide support for H_{1a} and H_{1b}.

---INSERT TABLE 6 ABOUT HERE---

DISCUSSION

We examine the sources of the variation in B2B firms' export intensity using a sizable longitudinal sample. Our motivation in this study was driven by a theoretically important but empirically underresearched topic in the international business and international marketing literature: the role of domestic location for B2B firms' export intensity. As Cuervo-Cazurra and Ramamurti (2017, p. 218) note, "The distinctive characteristic of international business is the attention paid to location as a driver of firm behavior, unlike other fields of inquiry where it may be considered unimportant or not discussed at all. All the same, there is a need for additional research on the role of location in international business."

Using insights from the mainstream theory of the MNE, particularly the Rugman stream (Narula et al. 2019; Rugman 1981, 1996), we develop a set of hypotheses on the relative importance of domestic location for B2B firms' export intensity. We then test these with a variance decomposition analysis. That is, we quantitatively examine whether and to what extent domestic location effects contribute to the variation in firms' export intensity. The analysis shows that export intensity varies significantly by domestic location, decomposed into home country and subnational region effects. In comparison with prior research that finds that home country effects solely account for 15.49% of the total variation in export intensity but does not consider

subnational region effects (Rugman and Oh 2013), we find that domestic location (home country and subnational regional) effects jointly account for approximately 15%, ranging from 7 to 28% across the subsamples. Our results show that home country effects account for only 7.45% of the total variation in export intensity while subnational region effects account for another 7.82% (see Table 2).

Importantly, while prior research has conducted variance decomposition analysis of export intensity on an older (2000–2007) sample of MNEs (Rugman and Oh 2013), we contribute to the literature by including SMEs in our sample and covering a more recent and wider range of years (2004–2018). Guided by insights into SME internationalization from international marketing research (e.g., Child et al. 2017; Tang 2011; Zhou, Wu, and Luo 2007), we also estimate the extent to which the relative importance of domestic location effects differs between B2B SMEs and MNEs. While we observe that domestic location factors affect SMEs' export intensity to a greater extent than MNEs', the role of these factors remains substantial for the latter. Moreover, subnational region effects are stronger than home country effects for both B2B SMEs and MNEs. Further building on the international marketing and international business literature (e.g., Bai, Chen, and He 2019; Berthon et al. 1999; Capar and Kotabe 2003) and introducing boundary conditions, we argued and found empirical evidence that domestic location effects matter more for B2B manufacturing than service firms.

Theoretical Contributions

Our study makes several important theoretical contributions. First, we extend the limited international marketing and international business research on the role of domestic location for firms' exporting presented in Table 1 (e.g., Brache and Felzensztein 2019; Freeman, Styles, and Lawley 2012; Lee and Weng 2013) by showing the extent to which the domestic location factors as a group explain the variation in B2B firms' export intensity. Use of a variance decomposition

approach allowed separating the variation in export intensity into firm, industry, subnational region, and home country components. Our findings show that both home country and subnational region effects are as important as industry effects in explaining the variation in firms' export intensity. However, existing research has not devoted equal attention to the two groups of factors. While the international marketing literature has long analyzed how industry structures shape firms' exports (e.g., Javalgi, White, and Lee 2000; Katsikeas, Leonidou, and Morgan 2000; Zhao and Zou 2002), it has largely overlooked the effect of domestic location, especially subnational region characteristics, which can be critical for B2B firms' international success (Nicholson, Gimmon, and Felzensztein 2017).

Second, by distinguishing between home country and domestic subnational region effects and how each set of effects contributes to explaining B2B firms' export intensity, we also contribute to a nascent stream of research on spatial variation in international business (Beugelsdijk and Mudambi 2013; Hutzschenreuter, Matt, and Kleindienst 2020; Mudambi et al. 2018). By showing that B2B firms' export intensity varies significantly by subnational region, we present evidence on the extent to which subnational differences (e.g., for agglomeration effects, the density of local networks, factors of production, and formal and informal institutions) affect this heterogeneity (Beugelsdijk and Mudambi 2013; Kleinhempel, Beugelsdijk, and Klasing 2020; Lorenzen and Mudambi 2013; Ma, Tong, and Fitza 2013). As Hutzschenreuter, Matt, and Kleindienst (2020, p. 10) note, "there is little theory-building on the subnational level of analysis in empirical studies," and we hope that our study helps attract more scholarly attention in this direction.

Third, we contribute to the mainstream theory of the MNE, particularly the Rugman stream, by introducing the boundaries of LSAs and examining how firm attributes shape the role of domestic location. We demonstrate that home country and subnational region effects are

influenced by firm size (SMEs vs. MNEs) and firm sector (manufacturing vs. services). Importantly, we find that the relative importance of domestic location factors is rather substantial for MNEs (11%, or approximately 6% less than that for SMEs). While research highlights the critical role of domestic location factors in SMEs' export intensity (Paul, Parthasarathy, and Gupta 2017), MNEs usually remain out of scholarly attention. However, a few studies have shown that domestic locations can produce a so-called lock-in effect when larger firms become oriented to the domestic location and are no longer motivated to sell abroad (Iurkov and Benito 2018). Identifying possible contingencies, we thus provide a more nuanced understanding of the applicability and predictive power of domestic location effects in the mainstream theory of the MNE (Rugman and Oh 2013; Rugman and Verbeke 2009; Verbeke 2013).

Finally, we introduce variance decomposition analysis to international marketing research. Although previous management research has also applied the variance decomposition approach to explain variance in firm financial performance (Chan, Makino, and Isobe 2010; Guo 2017; Makino, Isobe, and Chan 2004; McGahan and Porter 1997), it has not employed it in the context of international marketing strategies. By focusing on export intensity and showing how much different groups of factors explain it, our study demonstrates how a variance decomposition approach can be relevant to international marketing.

Managerial Implications

Our study provides important implications for managers. The findings suggest that managers should pay close attention to domestic location factors (at both home country and subnational region levels) when developing their export strategy. This may especially concern managers of B2B SMEs, which struggle to grow internationally given the scarce availability of financial and managerial resources. Here, attention could be paid to resources localized at the subnational region level (Nicholson, Gimmon, and Felzensztein 2017) that help SME managers

complement their firms' competitive advantages, thus facilitating exporting. Specifically, SME managers could actively participate in subnational region programs (e.g., cluster programs in the EU) to build networks and find attractive partners for collaborations (e.g., at cluster events). Such programs might also help them develop the right skill sets and gain knowledge and information critical to successful internationalization.

The findings also suggest that managers of B2B manufacturing firms, particularly, should pay attention to resources, social capital, and government programs available at home that can be effectively leveraged to accelerate exports. For example, being located in a region with strong linkages between universities and the industrial sector can improve a firm's R&D competence and demand for its goods worldwide. One such region is Gothenburg, Sweden, where the institutes (e.g., SP Technical Research Institute of Sweden, Chalmers) and industrial research departments (e.g., Volvo, Scania, Autoliv) provide innovative solutions for the automotive and related industries (Kergel et al. 2015). Thus, managers of manufacturing firms should also consider participating in programs within their subnational region to gain new competences, knowledge, and resources to facilitate their firms' internationalization. By contrast, domestic location factors play a lesser role in B2B service firms' exports, implying that managers of these firms may find leveraging their domestic location's advantages more difficult because customer preferences are not uniform across international environments (Goerzen and Makino 2007; Kirca, Fernandez, and Kundu 2016).

Policy Implications

Our findings can help policy makers evaluate the effectiveness of policies to increase the international competitiveness of B2B firms' goods and services. Promoting firm internationalization is one of the most frequently mentioned objectives of national and subnational policy programs (European Commission 2019). Many of these programs are

designed for SMEs to help stimulate international expansion and integration into global value chains (Organization for Economic Co-operation and Development 2008) and are often subnational in nature (Audretsch, Grimm, and Schuetze 2009). In the EU, firm internationalization is commonly supported through cluster policy programs employed by national and subnational governments. Approximately one-quarter of the European cluster programs' budget directly includes specific support activities in internationalization (Zenker et al. 2019). Despite innumerable efforts of policy makers and the allocation of substantial resources, the role of these programs in firm internationalization is not well understood. For example, the outcomes of the fourth European cluster policy forum explicitly state this as a "common challenge that still needs to be addressed to maximize the use of clusters in promoting internationalization and skills development" (European Commission 2019). Our analysis addresses this challenge by unveiling how much heterogeneity in firms' internationalization efforts is explained by domestic location factors. In identifying substantial national and subnational region effects, we suggest that the existing programs (especially those targeting SMEs and manufacturing firms) could be extended at both national and subnational levels.

Limitations and Future Research Directions

Our study has several limitations that warrant future research. While using a large longitudinal sample of European B2B firms increases the reliability and accuracy of the estimates, examining the magnitude of domestic location effects for B2B SMEs and MNEs from other global markets, such as emerging economies, would be worthwhile. Future research could also explore the magnitude of domestic location effects over earlier periods, as the relative magnitude of effects could change over time. For example, various cluster organizations in the EU have begun to offer customized supporting measures and tools to B2B SME managers on their path toward market expansion (Kergel et al. 2015). Over time, these organizations have

acquired more resources and become more experienced in internationalization matters (Kergel et al. 2015; Zenker et al. 2019). Finally, while variance decomposition research is essential to estimate the extent to which firm behavior differs across a set of factors, it does not aim to explain why firms belong to different populations. Thus, endogeneity is outside the conceptual framing in this and any other variance decomposition study (Ma, Tong, and Fitza 2013). Importantly, our additional analyses show that the results are robust when including countries outside the EU (home country and subnational regional effects significantly contribute to variation in export intensity), alleviating the selection issues to some extent.

ENDNOTES

[1] Our analysis ultimately relies on the statistical classification of economic activities in the EU known as NACE Rev. 2.

[2] We do not apply the hierarchical notation (i.e., ijt ... subscripts) to present our multilevel model. Instead, we adopt the classification notation, which Browne, Goldstein, and Rasbash (2001) introduce as a simpler notation for multilevel models.

[3] In line with Bamiatzi et al. (2016), we adopt this methodology because of a lack of tests for the statistical significance of variance component estimates in multilevel models.

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Table 1. Study's Positioning in the Literature on Domestic Location Effects and Exporting.

Study	Sample	Data Source	Role of Domestic Location		Dependent Variable(s), as Specified by the Authors	Boundary Conditions	Variance Decomposition Approach
			Country Factors	Subnational Regional Factors			
Brache and Felzensztein (2019)	Cross-sectional database of the representative population of Chilean firms (SMEs) at 2011–2012 and 2013–2014	Survey of Innovation from the National Institute of Statistics from Chile	No	Yes (colocation)	Export performance (measured as export intensity)	Cooperation; natural resource advantage; competition	No
Estrin, Nielsen, and Nielsen (2017)	592 largest firms from 18 home countries observed over 2006–2010	Thomson One Banker/Worldscope	Yes (home country urbanization)	No	Firm internationalization (measured as export intensity)	Firm tangible and intangible resources	No
Freeman, Styles, and Lawley (2012)	Six case studies (SME exporters) in both regional and metropolitan areas in Australia	Australian Bureau of Statistics	No	Yes (regional competitive rivalry, access to industry networks, infrastructure development)	Export performance (measured as export intensity)	No	No
Lee and Weng (2013)	7,227 firms (mostly SMEs) based in 23 countries in 1999, 2002, and 2008–2009	Business Environment and Enterprise Performance Survey	Yes (bribery in the home country)	No	Export intensity	No	No
Wang and Ma (2018)	2,230 exporting firms from China observed over 1998–2007	Annual Census on Industrial Enterprises from the National Bureau of Statistics of China	No	Yes (institutional quality at the province level)	Export intensity	Type of ownership	No

Table 1 (continued).

Study	Sample	Data Source	Role of Domestic Location		Dependent Variable(s), as Specified by the Authors	Boundary Conditions	Variance Decomposition Approach
			Country Factors	Subnational Regional Factors			
Yip, Rugman, and Kudina (2006)	1,884 public British companies	Osiris	Yes (national economic competitiveness)	No	Export intensity	Industry affiliation	No
Rugman and Oh (2013)	655 of world's largest MNEs observed over 2000–2007	*Fortune* Global list	Yes (a group of factors)	No	Multinationality (among which is export intensity)	No	Yes
Our study	**7,465 firms (SMEs and MNEs) in Europe observed over 2004–2018**	**Orbis**	**Yes (a group of factors)**	**Yes (a group of factors)**	**Export intensity**	**SMEs/MNEs, manufacturing/service firms**	**Yes**

Table 2. MCMC Estimation Results for the Full Sample.

	Variance Estimate	% Total Variance
Home country	73.410	7.45
Subnational region	77.068	7.82
Industry	159.290	16.17
Firm	605.381	61.44
Error	70.124	7.12
Total	***985.273***	***100.00***

Table 3. MCMC Estimation Results for SMEs and MNEs.

	SMEs (Total sales ≤ €50 m)		MNEs (Total sales > €50 m)	
	Variance Estimate	% Total Variance	Variance Estimate	% Total Variance
Home country	72.932	7.55	41.878	3.98
Subnational region	87.413	9.05	68.811	6.54
Industry	145.170	15.03	300.454	28.55
Firm	590.760	61.16	570.376	54.21
Error	69.599	7.21	70.741	6.72
Total	***965.874***	***100.00***	***1052.260***	***100.00***

Table 4. MCMC Estimation Results for Manufacturing and Service Firms.

	Manufacturing		Services	
	Variance Estimate	% Total Variance	Variance Estimate	% Total Variance
Home country	136.842	13.51	35.652	3.73
Subnational region	149.629	14.77	34.006	3.56
Industry	114.610	11.31	185.454	19.41
Firm	545.794	53.87	628.717	65.80
Error	66.242	6.54	71.698	7.50
Total	***1013.117***	***100.00***	***955.527***	***100.00***

Table 5. MCMC Estimation Results for the Extended Sample.

	Variance Estimate	% Total Variance
Home country	371.746	25.90
Subnational region	247.618	17.25
Industry	122.467	8.53
Firm	616.077	42.92
Error	77.561	5.40%
Total	***1435.469***	***100.00***

Table 6. MCMC Estimation Results for Manufacturing Firms with a Low Degree of Servitization.

	Variance Estimate	% Total Variance
Home country	116.792	13.41
Subnational region	76.913	8.83
Industry	93.567	10.74
Firm	517.861	59.46
Error	65.806	7.56
Total	***870.938***	***100.00***