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Abstract: This paper examines the role of wholesale firms as facilitators of exports for small and medium-sized Swedish businesses. Our findings suggest that wholesale firms do facilitate access to difficult markets located outside Europe. For exports of a particular good to a given market, we observe a positive correlation between the export volumes of wholesale and manufacturing firms. Finally, we present evidence that supports a prediction from recent trade models with differentiated firms, namely that wholesale firms can facilitate exports for firms that are not themselves capable of direct exports.

Keywords: Trade, Wholesale, Intermediation, Productivity, Manufacturing, Institutions

Jel codes: D22, F14, F18

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1 Introduction

It has been argued that wholesalers were the dominant, if not the only, international participants in most long-distance trade relationships from ancient Phoenicia and Greece until the first quarter of the 20th century (Rosenbloom and Andras 2008 on either side of the transaction,). Wholesalers and other trade intermediaries were instrumental in connecting nations in early medieval Europe, managed trade between Europe and its colonies in the Americas and Africa from the 16th century, and monopolized the bilateral trade between European countries and East Asia in the 17th and 18th centuries. In the second half of the 20th century, Japan's general trading companies, the "sogo shosha", facilitated the country's export miracle, and accounted for more than half of Japanese exports in some years.

Wholesalers are still important actors in the global economy. Today, they facilitate international trade not only by their extensive networks, their expertise on foreign markets, and their ability to manage complex transactions with counterparts in distant countries. Wholesale firms also contribute by upgrading goods and may act as guarantors for product quality. They fill a role as an intermediary agent that is especially valuable for SMEs that otherwise would find it difficult, or even impossible, to reach foreign markets with their products.

The maybe easiest way to highlight the importance of the wholesale sector is to look at import and export statistics. In Sweden, the wholesale sector accounts for approximately 25 percent of all manufacturing imports and 10 percent of manufacturing exports. If the trade shares of wholesalers are similar in Sweden's partner countries, it is possible that Swedish and foreign wholesalers taken together are involved in one-third or more of Swedish foreign trade. Hence, the importance of wholesale firms can hardly be overstated. Yet, despite their central role in international exchange there are several aspects of their operations that are relatively unexplored.

As seen in the literature survey below, wholesalers have gone from being largely absent in the economics literature to a gradually more visible position (although they are still relatively unknown in comparison with the multinational firms that dominate international trade). Since the early 2000s, there has been a steady increase in the number of studies focusing on different aspects of wholesale firms. One strand of this literature takes as its point of departure the Melitz (2003) model of international trade with heterogeneous firms.

A common result from these theoretical models that have been developed in this tradition is that wholesale firms help grease the wheels of international trade, making it possible for relatively small and weak firms reach international markets. Firms that export indirectly through wholesalers are expected to have a productivity level between those of direct exporters and firms that only sell in their domestic market. Examples of empirical and theoretical studies focusing on the choice between direct and indirect exports include, but are not limited to, Schröder et al. (2003), Rauch and Watson (2004), Petropoulos (2008), Blum et al. (2008), Åkerman (2018) and Fujii et al. (2017). A related strand of research adds foreign direct investment as alternative foreign entry mode, in addition to indirect and direct exports see e.g. Felbermayr and Jung (2011), Kleinert and Toubal (2013), and Crozet et al. (2013).

A more empirically oriented body of research studies the characteristics of wholesale firms and firms exporting through wholesale firms. Examples of features included in the analyses are the size of the firm and the type and number of goods exported through wholesaler networks (Bernard et al. 2010; Bernard et al. 2015; Abel-Koch 2013; Lu et al. 2017). We may also note that there is a limited set of papers analyzing potential spillovers and learning-to-export effects from wholesalers to their suppliers (Atkins et al. 2017; Ahn et al. 2011; Cheptea et al. 2014; Carballo et al. 2016).

We contribute to the literature on wholesale firms in several ways. First, by using both Swedish firm level data and Estonian firm-transaction level data, we are able to analyze the productivity relation between local firms, firms exporting via wholesale firms and direct exporters in some detail. Second, using data on the product-country distribution of exports, we study whether the entry of a wholesale firm on an export market results in competing and a reduction of the incumbent exporters market shares or whether it opens up new export channels for firms previously not exporting to that market. Finally taking an institutional approach we analyze whether the ability of wholesalers to address asymmetric information, adverse selection, and contract problems makes these firms especially important for exports to distant markets with weak institutions.

Our results suggest a productivity hierarchy positioning the productivity of indirect exporters below direct exporters but above local non-exporting firms. Looking at the question whether wholesale exports compete with directly exporting firms, we find no negative effects of wholesale exports on direct exports. Finally, using a series of proxies for institutional quality of the destination market, the results suggest that the importance of wholesale exports grows larger with declining institutional quality of the destination

market. In addition, this effect seems to increase with geographical distance. Hence, wholesale firms seem to be especially important for exports to distant markets with weak institutions.

The remainder of this paper is structured as follows: An extensive literature overview is presented in section 2. Section 3 presents a description of data and characteristics of Swedish wholesale firms. The empirical method is presented in section 4 followed by section 5 where the results are presented. Section 6 concludes.

2 Literature review

The purpose of this chapter is to provide a detailed overview of the economics-oriented literature on trade intermediaries. The first part of the chapter (2.1) traces the antecedents of the theoretical and empirical models that have emerged in the international trade literature since about 2010. This includes building blocks from trade theory and the theory of economic intermediation, as well as empirical accounts of the high importance of export wholesalers in economic history. The international business and management literature is briefly summarized in section 2.2 because it predates the main contributions in the international economics area: although the international economics and business fields are not closely integrated they ask similar questions and some cross-fertilization does take place (and is desirable). Section 2.3 turns to the formal theoretical models from the international trade literature, while section 2.4 covers the empirical evidence published in the international economics and trade literature.

2.1 Antecedents: trade theory, intermediation, and economic history

The theoretical foundations for the economic analysis of the role of wholesalers in international trade are drawn from two bodies of literature. The first building block comes from international trade theory. Various frameworks, including Ricardian models and models of international trade with scale economies and imperfect competition, have been used to provide the basic analytical setting, although several of the most influential contributions are based on Melitz' (2003) model with heterogeneous firms. Drawing on Hopenhayn's (1992a, 1992b) models of firm dynamics with heterogeneous firms and empirical evidence on the existence of fixed export costs (Roberts and Tybout 1997; Bernard and Jensen 2004; Bernard and Wagner 2001; Das et al. 2001), Melitz (2003) sets out to explain why there is a strong correlation between firm productivity and the firm's export status in most industries. The common pattern is that more productive firms are much more likely to be exporters. Adapting Krugman's (1979, 1980) model of international trade under monopolistic competition and increasing returns to scale to a setting with heterogeneous firms, he derives a productivity ladder where the most productive firms become exporters and the least productive firms are forced to leave the market – firms with intermediate productivity serve only the domestic market. The results are due to the presence of fixed export costs. Only the most productive firms are able to cover export costs and still break even; less productive firms select not to export in order to

avoid losses. The very least productive firms are driven out of business when trade is allowed (or when trade barriers are reduced) because of import competition from the most productive foreign firms. In a related paper, Helpman et al. (2004) extend the analysis by allowing firms to engage in FDI and find that the least productive firms are still purely domestic, more productive firms become exporters, and the most productive firms establish affiliates abroad.

The second building block is made up of theories of intermediation and “middlemen”. Simple neoclassical theory typically assumes that buyers and sellers meet in a virtual marketplace where they can trade without costs. However, in most real-world cases, imperfect and asymmetric information will result in uncertainty and trade friction that make trade transactions costly. This creates scope for the emergence of firms specialized in trade intermediation. Summarizing an extensive body of literature on market microstructure and intermediation, Spulber (1996a: 135) defines an intermediary as “an economic agent that purchases from suppliers for resale to buyers or that helps buyers and sellers meet and transact”. The specific functions of these middlemen depend on the type of information imperfection in the market, with the following activities identified as the most important ones (Spulber 1996a):

- Intermediaries facilitate market clearing by engaging in arbitrage between buyers and sellers and by providing the price signals that bring the decisions of buyers and sellers together.
- By holding inventories, intermediaries eliminate the need for suppliers and customers to coordinate their transactions in time. Using Spulber’s (1996a) terminology, intermediaries provide both liquidity and immediacy: they are ready to buy when their suppliers want to sell, and they are able to sell when their customers want to buy.
- Intermediaries reduce both the buyers’ and the sellers’ search and matching costs by providing matchmaking and brokering services and information about supply, demand, and prices from multiple markets and market actors.
- When information about buyers, sellers, or market conditions is imperfect or too costly for individual market actors, intermediaries can exploit economies of scale in producing market information and making it available to their suppliers and customers at lower (shared) cost. Their ability to obtain reliable information allows them to overcome adverse selection problems and provide guarantees for product quality, as well as monitoring and contracting services.

The financial industry and the labor market were among the first sectors where intermediation was analyzed in formal models. Banks and finance companies act as matchmakers, channeling funds from depositors to borrowers. However, borrowers know more about their own projects and repayment capabilities than lenders do – in addition to search and matching, financial intermediaries are therefore also engaged in generating, assessing, and monitoring information about the characteristics of individual borrowers and specific project types and distributing risk among market participants (Gurley and Shaw 1960, McKinnon 1973, Leland and Pyle 1977, Diamond 1984, Yavas 1994, Allen and Santomero 1997). In the labor market, there are challenges related to costly information, adverse selection, and collective action (Autor 2009). Both workers and employers spend resources looking for matches: employment agencies, headhunting firms, casting bureaus are examples of intermediaries that reduce search and matching costs (Bull et al. 1987). Other intermediaries address adverse selection problems that arise because job seekers and potential employees may not provide full or accurate information in applications and job postings (Autor 2001), or organize collective action in the form of unions engaging in collective bargaining and regulation of working conditions (Schmitter 1977, Müller-Jentsch 1985, Autor 2009). More general early theoretical contributions explain how middlemen reduce search costs (Rubinstein and Wolinsky 1987, Spulber 1996b, Gehrig 1993), how adverse selection problems can be alleviated by intermediaries with expert knowledge (Biglaiser 1993), and how middlemen may reduce producer moral hazard and induce firms to produce higher-quality goods (Biglaiser and Friedman 1994).

Traders in economic history

In addition to the necessary theoretical building blocks, economic analysis of trade intermediaries has been motivated by the simple empirical observation that wholesalers, retailers, agents, and other trade intermediaries play an important role in international trade and have done so for a long time. In fact, Rosenbloom and Andras (2008) argue that wholesalers were the only international participants in most international channels of distribution until the first quarter of the 20th century. Historically, trade intermediaries were instrumental in long distance trade across the globe, from the “emporos” of ancient Greece who owned ships and imported foreign goods (Beckman et al. 1959) and the merchants of medieval Europe in Mediterranean trade (Reyerson 2002) to Europeans intermediating trade between China and the New World from the 16th century (Flynn and Giraldes 1995) and the East India Company and other trading houses dominating European trade with the Far East from the 17th century (Chaudhuri 1978, Cho 1987, Carlos 1992).

With the beginning of industrialization in late 19th century Japan, companies like Mitsui and Mitsubishi became important trade intermediaries (Cho 1987), and a new generation of general trading companies took on a large share of Japan's growing trade after the Second World War (Kojima and Ozawa 1984, Ozawa 1987, Yamamura 1976). By the early 1980s, it was reported that these "sogo shosha" accounted for around half of Japan's exports (Yoshihara 1982). Concurrently, Western researchers did not have to look beyond their own region to find relevant empirical cases of trade intermediation. Multinational traders have played significant roles in several European countries throughout the 20th century: the contributions in Jones (2013) discuss influential and important British, Dutch, French, German, Swedish, and Swiss trading companies. Moreover, by the early 1970s, policy makers in several countries had recognized Japan's rapid emergence as a global player and identified Japanese-style general trading companies as interesting vehicles for export promotion. Legislation facilitating the establishment of such trading companies was passed in several countries during the 1970s and 1980s, including Brazil, South Korea, Taiwan, Turkey, China, and the US (Pinto 1983, Cho 1984, Fields 1989, Togan 1993, Terpstra 1988, Bello and Williamson 1985).

2.2 Trade intermediaries in international business and management

International business (IB) and management scholars began to discuss trade intermediaries in detail well before they appeared in the economics analysis of international trade. While economists generally saw countries and industries as the relevant units of analysis until new trade theory gradually introduced firms as actors after the early 1980s (albeit in a very stylized manner), business and management scholars were more directly interested in the firm's resources, organizational structures, and strategies. Internationalization was not so much a matter of relative prices and country-specific comparative advantages, but rather strategic decisions about how to best handle the challenges of entering a foreign market. In this context, using a trade intermediary is one several strategic alternatives for firms that are about to start their internationalization process or consider entering a new foreign market. Questions about when to select an indirect rather than direct foreign entry mode, how to manage the relationship between the producers and the export intermediary, and how the intermediaries should organize their operations are some of the issues discussed in this literature. Although international trade theory in general remains fairly disconnected from the business and management literature, there are good reasons to briefly summarize the main contributions from the business field here. Stronger integration between the research field would be desirable. At the very least, comparing the assumptions underlying

international trade models and hypotheses derived from them with established findings from the business literature would provide a valuable check on relevance and generalizability.

When to use intermediaries

The question when to use wholesalers and other trade intermediaries instead of exporting directly is at the very core of the IB field. Early IB theories offered relatively simple and clear answers. For example, the Uppsala School (Johanson and Wiedersheim-Paul 1975, Johanson and Vahlne 1977, 1990, 2009) suggests that internationalization is a gradual process, where the firm's first steps outside the home country are generally small and cautious. Commitment decisions, i.e. decisions about the mode of internationalization (for example, indirect or direct export, establishment of foreign sales subsidiary, or wholly-owned foreign affiliate) and the geographic and cultural distance to the destination (proximate and familiar or more distant and challenging) are made on the basis of existing market knowledge, which to some extent is experiential. Current activities (i.e. the consequences of past decisions) add to the firm's knowledge base, which in turn plays into future commitment decisions in a gradual and dynamic process. In the present context, the Uppsala School would categorize export through trade intermediaries as a low-commitment mode of internationalization that would typically be carried out by a firm with limited knowledge and experience with regard to the destination market. This could be a relatively small and young firm taking its first steps to nearby markets, or a more experienced firm that enters more distant markets where it has not operated before. Low commitment equals relatively low cost – for new and inexperienced exporters, this is therefore a low-risk strategy. The reliance on export intermediaries during the early stages of the firm's international expansion is also consistent with most other process-oriented internationalization models from the IB field (Leonidou and Katsikeas 1996).⁶

The question whether new and inexperienced exporters should use trade intermediaries is asked also in most textbooks on international marketing (Balabanis 2000), and the export

⁶ However, Turnbull and Valla (1986) note that using export intermediaries is a permanent choice for many firms, rather than a transitional strategy leading to direct exports. This highlights the importance of company owners' and managers' individual ambitions and entrepreneurial intent (Schlaegel and Koenig 2014) which are not easy to capture in general models. It has also been observed that many firms are "born global" (Oviatt and McDougall 1994, Knight and Cavusgil 2004) and internationalize much earlier than what the Uppsala model suggests (i.e. before they have accumulated much experiential knowledge). While some researchers argue that this calls for a new theory (e.g. Oviatt and McDougall 1994, 2005), others suggest that born global firms have acquired the necessary knowledge assets through other channels than the firm's own cumulated experience: the past experience of founders and employees or the firm's network of partners and collaborators are possible sources that can readily be included in existing models (Madsen and Servais 1997, Johanson and Vahlne 2009).

marketing literature has analyzed the decisions related to export channel choice in greater detail. Ramaseshan and Patton (1994) examine a sample of small exporters and highlight three factors distinguishing those firms that decided to export via trade intermediaries. Surprisingly, they find that companies with higher export shares and stronger international family networks are more likely to export via wholesalers and agents. The result regarding export share is contradictory to the Uppsala model assumption that indirect exports are chosen by smaller and less internationalized firms, and raises questions about causality: perhaps export shares are larger because intermediation is efficient? The role of family network is also contrary to the hypothesis that indirect exporters have relatively weak knowledge about foreign countries: one possible interpretation is that foreign networks also lead to knowledge about foreign intermediaries. The authors also find that firms depending more on pre and post-sales services are more likely to choose direct exports, which is easier to rationalize. Klein and Roth (1990) discuss how psychic distance and firm experience influence the choice of export mode. While the standard assumption is that large psychic distance and limited experience will make indirect export more attractive, the authors argue that the effects may sometimes be the opposite, depending on asset specificity and degree of market imperfections. For example, if asset specificity is high, exporters may insist on an integrated export channel when they are unfamiliar with the foreign market and the quality of potential foreign trade intermediaries. With more experience, exporters will understand the foreign market better, learn to monitor and enforce market transactions better, and build stronger relationships with local partners. This reduces the costs and risks related to transactions with foreign intermediaries and may motivate the firm to select the less costly indirect export mode instead. A general observation, which also applies to some of the other business and management contributions, is that the very rich survey and interview data sets employed in business research reflect a level of detail and complexity that makes it hard to describe patterns and simple causal effects: theoretical models are necessarily simplifications of reality that can be expected to match reality mainly (or, at best) in those cases where the models' key assumptions hold.

Relations between intermediaries, suppliers, and customers

Questions about how the relations between suppliers, intermediaries, and buyers could best be managed are not only common in the export marketing field, but also in sourcing, logistics, and supply chain management. A common starting point for many of the contributions in this field is the understanding that exporters, importers, and intermediaries

may have conflicting interests. For example, Karunaratna and Johnson (1997) discuss how the exporter can reduce the potential for opportunistic behavior by the intermediary and emphasize pre-contractual screening (to assure goal congruence) and efficient communication and non-coercive monitoring (to build trust and a collaborative atmosphere). Analyzing the same issues from the perspective of the trade intermediary, Balabanis (1998) also stresses the importance of efficient communication, and adds the need to develop “solidarity and flexibility norms” (or what we may today refer to as “shared values”) in the relationship with suppliers. He also cautions against mixing affiliated and independent suppliers: the perception that that independent suppliers may be used as a reserve or temporary supplement to prioritized affiliates suppliers is likely to cause conflict. Bello et al. (1991) show that the relations between intermediaries and producers are assessed more positively when the relationship is formalized in a contract detailing the roles and responsibilities of each partner – this will strengthen the incentives for the intermediary to invest in the specific assets needed to uphold the quality of their export services. The assessments are also more positive when the producer does not simultaneously carry out its own direct export operations – firms that have both direct and indirect exports to a given destination market tend to provide particularly unfavorable assessments of the intermediary. However, Madsen et al. (2012) note that the desired clarity in the division of responsibilities is hard to achieve, and that producers often internalize too much of the decision-making related to foreign marketing.

Chintakananda et al. (2009) explore both sides of the relationship between export producer and intermediary dyads and find substantial differences that lead them to propose three stylized dyad types. Depending on how communications, negotiations, transaction costs and other dimensions of the collaboration look, they classify their pairs into competitive, cooperative, and mismatched relationships. Considering producer and intermediary characteristics and objectives simultaneously, they suggest that both competitive and collaborative relationships may work well, depending on specific characteristics of the participating firms, but that mismatched relationships are most likely to fail. They also note that export transactions can be initiated by either producers or intermediaries, contrary to earlier findings, which assume that it is the producer that is the active party.

Kumar and Bergstrom (2007) confirm the role of transparency, communication, and trust, and note that the most common reason exporters are dissatisfied with their intermediaries and end the relationship is lack of trust. In addition, they explore other “evolutionary” reasons why exporters no longer require the services of an intermediary. The most

important factors identified by the 191 exporters, intermediaries, and distributors in the authors' survey are the development of market-specific expertise and increasing firm size. Both of these contribute to reducing the unit costs for direct export activities. Kumar and Bergstrom also ask how long an intermediated export relationship can be expected to last, and what size the exporters need to reach before they no longer need intermediation. The median answers are 10 years and 200 employees – unsurprisingly, intermediaries typically believe that more experience and larger size are needed before firms can manage independent export activities.

More recent contributions have recognized the need for intermediaries to manage multiple relations at the same time. Fung et al. (2007) argue that globalization has resulted in a shift from competition between firms to competition between complex supply chains. This has added new challenges to intermediaries, who now have a stronger role in linking both suppliers and customers: instead of just facilitating trade transactions, intermediaries are now charged with a supply chain management and integration function (see also Mudambi and Aggarwal 2003). These challenges do not only apply for wholesalers but also other types of intermediaries, including retailers (Swoboda et al. 2008).

Functions of trade intermediaries

This last point is related to questions about what trade intermediaries do. Obviously, the tasks of trade intermediaries have not been constant over time. Perry (1990, 1992) outlines how changes in the international environment, including government policy, oil crises, changes in exchange rates, increasing competition from foreign actors, and technological change influence the conditions for industry. The US intermediaries included in her study were hit by all of these factors during the 1980s, and made changes in the products they handled, the markets they served, and the services they provided. They also appeared to gradually shift from operating as pure export management companies toward a trading company format, where they act less as agents on behalf of manufacturers and more as merchants taking ownership of the goods they sell abroad.

Several contributions to the literature have tried to categorize the different functions performed by trade intermediaries and to identify specific types of intermediaries on the basis of the services they provide. Balabanis (2000) provides a list of eight “transaction-creating” services and seven “physical-fulfillment” services performed by trade intermediaries in the UK. The transaction-creating services include market research, product research and design, development of marketing strategies, advertising and

promotion, selection of foreign distributors/customers, training of distributors, after-sales services, and negotiation of collaborative agreements on behalf of suppliers. Providing these services requires deep knowledge of the relevant foreign markets. The physical-fulfillment services mainly require competence and skills related to international trade transactions (although local market conditions and regulation are different across countries, which necessitates country-specific expertise). They comprise the necessary documentation, cost, insurance and freight quotes, export packaging and marking, warehousing, freight forwarding, quality control of exported goods, and financing and credit. Exploring data on 135 British export intermediaries, Balabanis (2000) suggests that firms providing mainly physical-fulfillment services often act as merchants and serve a larger number of suppliers at the same time. The intermediaries that focus on transaction-creating services are instead larger (in terms of number of employees), serve more markets, export relatively many undifferentiated products, and work with fewer suppliers than the physical-fulfillment providers. Revisiting the data, Balabanis (2005) adds a third category: in addition to physical-fulfillment providers and transaction-creators, many trade intermediaries are best described as full service providers, offering both types of services. The full service providers make up the largest group of intermediaries, and they are often physically present in the foreign markets, serve a larger number of markets than the others, and cover the most geographically distant markets of all intermediary types.

Rosenbloom and Andras (2008) also highlight the many functions of export intermediaries and argue that they are involved in several “flows” that link producers of goods and services to final users. These flows relate to the physical movement of products, ownership, promotion, negotiation, financing, distribution of risk, ordering, and payments. International export transactions are made up of all these flows; “the distribution tasks performed to create a physical product flow between producer and final consumer would likely need to be preceded by the flows of promotion, negotiation, and ordering, while the flows of ownership, financing, and risking would likely unfold simultaneously with the product flow. Finally, the payment flow between buyers and sellers in the channel, depending on the terms of the trade agreed upon in the negotiation flow, could precede, occur concurrent with, or follow after the product flow” (Rosenbloom and Andras 2008: 244-245). The various types of export intermediaries differ from one another depending on which of these flows they handle. Table 1 summarizes the twelve most common forms of export intermediaries and their main functions, as identified by Rosenbloom and Andras (2008). In most of the following analysis, we will not distinguish carefully between the

different types of export intermediaries: the implicit assumption, unless otherwise stated, is that the intermediary is a merchant wholesaler.

Table 1 Common Types of Export Intermediaries

Type of export intermediary	Activities performed by export intermediary
Traditional Merchant Wholesaler with Global Operations	Full service, wholesale distributors who follow clients to foreign markets and establish global operations
Foreign Agents	Carry out global marketing operations, do not take title, and receive a commission
Foreign Distributors	Buy and sell on their own behalf and take title and ownership risk
Export Merchant	Buy and sell on their own account, but typically export as well as import, thus, with facilities across many national markets
Export Management Company	Act as an export department for a firm, representing multiple noncompeting firms
Manufacturer's Export Agent	Similar to an export management company, but often with fewer functions and operating in its own name rather than that of the manufacturer
Export Commission House	Represents the buyer, and the buyer pays the commission. Low-risk/cost alternative for exporter
Resident Buyer	Export commission house with long-term continuous contact
Confirming House	Provides limited functions for an exporter, primarily related to financing
Export Desk Jobber	Buys and sells, typically raw materials, never taking physical possession
Freight Forwarder	Mainly transportation and documentation, but increasingly moving into additional distribution channel functions
Third-Party Logistic Provider	Providing extensive distribution functions for global companies

Source: Rosenbloom and Andras (2008), Table 1.

Another limitation in the summary above, as well as in much of the rest of this report, is that focus lies on export intermediaries. However, intermediaries play an important role also for imports – in many cases, wholesalers are simultaneously involved in two-way trade, which is rational given that they have to develop networks on both sides of the

international border.⁷ The import side has not received much attention in past business research (Ha and Dyer 2008) but this is slowly changing with the need to manage and integrate global value chains, as noted by Fung et al. (2007) and Mudambi and Aggarwal (2003). New roles and functions are added, in particular when products are sourced from countries where the export skills of domestic firms and intermediaries are weak. For example, Vedel and Ellegaard (2013) examine how buying companies use sourcing intermediaries to manage supply risks in global sourcing. They find that sourcing intermediaries perform a broad range of different supply risk management functions, and that different sourcing intermediary types can be characterized by the set of functions they handle. This notwithstanding, most of the subsequent analysis focuses on export intermediation.

Performance of intermediaries

Apart from discussing the different roles of intermediaries, the literature has also explored how the performance of intermediaries is related to product and market characteristics. Peng and Ilinitch (1998) highlight the relative scarcity of detailed studies on the organizational form and performance of export intermediaries and suggest that they should be more prominent in distant and unfamiliar markets and in products that have higher commodity content.⁸ They also posit that more successful intermediaries are more knowledgeable about foreign markets and export processes, better at handling export negotiations, and more willing to take title to the goods they export, to avoid monitoring and enforcement costs. Peng et al. (2000) provide a first partial empirical test, and argue on the basis of survey data from 195 US export intermediaries that the best conditions for high intermediary performance come about when cultural distance is high and product complexity is low. Under these conditions, producers are unwilling to invest in market-specific knowledge, at the same time as intermediaries do not have to invest heavily in product-specific knowledge and after-sales services. The least attractive alternatives, from the point of view of the intermediary, are those where product complexity is high and cultural distance is low – in these markets, intermediaries only have weak competitive advantages in comparison with directly exporting producers. Other permutations, with low product complexity and cultural distance, and high product complexity and cultural

⁷ In addition, even the firms that engage only in one-way trade and see themselves as pure export intermediaries working on behalf of producers in the home country can be regarded as import intermediaries from the perspective of customers in the foreign country.

⁸ This strand of literature is also relevant for the first of the questions discussed in this section, namely “When to use trade intermediaries?”

distance, are harder to generalize, since transaction costs and opportunities for entrepreneurial discoveries pull in opposite directions.

Peng and York (2001) add a more formal theoretical foundation to the previous contributions by referring explicitly to transaction cost theory (Bello and Williamson 1985), agency theory (Jensen and Meckling 1976) and resource-based theory (Barney 1991). They find that the transaction cost constraints and principal-agent conflicts that threaten to weaken intermediary performance are best handled by those intermediaries that possess valuable, unique, and hard-to-imitate resources that can effectively minimize their clients' transaction and agency costs. The results from their regression analysis support the hypotheses that more knowledgeable intermediaries (i.e. those possessing a strong resource base) with commodity focus (allowing lower transaction costs) and a stronger willingness to take ownership of the goods they export (reducing principal-agent conflicts) perform better, no matter if performance is measured in terms of sales margin, per capita sales, or self-rating. The hypothesis that superior negotiation skills improve performance is not supported by the data. Trabold (2002) addresses the first two hypotheses from Peng and Ilinitch (1998), on cultural distance and product characteristics – that intermediaries are more frequently chosen to manage exports to distant and unfamiliar markets and shipments of products with high commodity content. Both hypotheses are strongly supported by data covering about 20,000 French exporters in 1985, 1988, and 1990.

2.3 Trade intermediaries in theoretical models of international trade

The first formal theories of intermediaries in the international trade literature date back to the early 2000s. Some of the earliest contributions in this field are Schröder et al. (2003), Rauch and Watson (2004) and Petropoulou (2008). The analysis of Schröder et al. (2003) is based on an intra-industry trade model similar to that of Krugman (1980), but with the standard iceberg trade cost assumption replaced by a fixed cost can be seen as a market entry cost (related to setting up a foreign distribution network, dealing with foreign red tape, or enforcing legal contracts abroad) and a variable cost that primarily covers transportation. Intermediation is introduced by assuming that the country and industry-specific fixed costs can be pooled among exporters, so that a trade intermediary (that faces the same fixed costs as other exporters) can spread these among its suppliers. The fraction of exporters that will use intermediaries is endogenously determined in the model. Even though the model assumes identical firms (which may differ in terms of size and productivity in equilibrium, depending on whether they are randomly selected to be exporters or not), the model generates results that are very similar to later models with

heterogeneous firms. In equilibrium, there are large direct exporters, smaller firms exporting via the intermediary, and small non-exporting firms: direct exporters are the most productive and home-market firms the least productive. The model also predicts that the share of intermediated exports will be higher in smaller and more complex export markets. Changes in variable trade costs do not have any effect on the intermediary share. However, since all firms share the same technology, it is impossible to tell which firms become direct exporters and which ones decide to go through an intermediary.

Starting out with the observation that imperfect information and networks have significant effects on the development of international trade relations, Rauch and Watson (2004) set out to study the supply of network intermediation. They develop a general-equilibrium model in which market actors with networks of foreign contacts can either use their networks to support their own exports or become intermediaries and make their networks available for others to use: if their network and the returns from intermediation are large enough, they will become intermediaries and reduce search and matching costs for exporters. One of the findings from their welfare analysis is that the incentives for intermediaries to maintain or to expand their networks may be lower than what would be socially optimal, which suggests that government might intervene to raise their returns. This would provide an argument for the policies encouraging large-scale trading companies, which have at times been implemented in several countries, such as South Korea, Turkey, and the US. Several related empirical papers examine various features of networks in international trade (Chadee and Zhang 2000, Rauch 2001, Rauch and Trinidad 2002, Casella and Rauch 2002, Combes et al. 2005).

While Rauch and Watson (2004) and related studies focus on how existing network relations can best be exploited, Petropolou (2008) studies the incentives for network building and the question how trade intermediation can reduce search and matching costs. This is done in a pairwise matching model with a continuum of importers and exporters and a single trade intermediary. Exporters and importers can engage in independent costly search for matches or turn to the intermediary. The intermediary, in turn, decides how much to invest in network building, which determines the likelihood that it can offer a match. The optimal investment depends on the level of information costs as well as the relative effectiveness of direct and indirect matching technologies—when information costs are high, it is more expensive to build a network, but the bargaining power and revenue of the intermediary may also be higher when it is more difficult for firms to find matches on their own. The model shows that intermediation will unambiguously lead to

more trade and higher social welfare. In addition to highlighting the value of intermediation, the model also suggests that the relationship between information frictions and aggregate trade volumes may be non-monotonic. For example, lower information costs strengthen the prospects for direct matching but, for some parameter values, may also reduce the incentives for network building, the efficiency of intermediation, and perhaps even the volume of aggregate trade.

A similar “counter-intuitive” result is reported by Antràs and Costinot (2010, 2011). They model intermediation in a simple Ricardian model with two goods and two countries, where producers (farmers) cannot access the market directly but must go through an intermediary. Farmers and intermediaries are engaged in a random search process, and bargain over the price when they have found a match. Looking at the impact of integration, the authors conclude that trade liberalization – i.e. convergence of prices across countries – makes all agents in both countries weakly better off, while factor mobility – in this case, mobility of intermediaries – may well reduce the welfare of some agents. In particular, this may occur as a result of the entry of competitive foreign intermediaries with high bargaining power relative to the producers they are matched with. Their entry will reduce the welfare of domestic intermediaries at the same time as they are able to absorb most of the benefits resulting from more efficient intermediation, leaving domestic producers more or less unaffected. Changing the model setting to a directed search process, where intermediaries post their price offers in advance, Fernández-Blanco (2012) shows that farmers will be able to avoid exploitation, and that integration will always result in welfare gains.

Trade intermediaries and heterogeneous firms

Models of trade intermediation with heterogeneous firms begin to appear after 2008. One of the earliest models is developed by Blum et al. (2008), who begin by outlining some of the characteristics of the firm-level trade contacts between Chile and Colombia. More specifically, they match all Chilean exporters with their Colombian importers over the period 2004-2006 and find several features that are not easily explained by extant trade models. One, they note that there is substantial heterogeneity among Chilean exporters and Colombian importers, with a few large firms and many small ones among both exporters and importers. Two, almost all the exporter-importer pairs are dissimilar, with small/large exporters matched with large/small importers: almost no matches are made between small exporters and small importers. Three, the distribution of Chilean exporters is skewed, with most exporters selling to only one importer, but the largest exporters selling to many

foreign importers.⁹ Adapting a Melitz (2003) type framework, Blum et al. (2010) aim to develop a heterogeneous firm model that can replicate these stylized features.

The resulting model is based on two intermediation or matching technologies that are more closely linked to size than productivity (although size and productivity covary, since firms operate with increasing returns to scale), and that assume that both firms and consumers must spend resources on searching for a match. The first technology – direct export – is used mainly by large firms that sell directly to the foreign market. These firms do not have to spend much resources on finding matches among consumers, since their large size makes them visible and easy to find for buyers. Hence, their high productivity / large size guarantees a low matching cost. Small firms cannot easily use this intermediation technology, since matching a small exporter to a small importer/consumer will be costly for both parties. The second intermediation technology – indirect exports – therefore matches small exporters to large foreign intermediaries that can relatively easily be found by small exporters as well as by foreign consumers. Since the intermediaries are large, they are also able to spread intermediation costs over a large number of exporting firms. Accordingly, in equilibrium, the largest and most productive firms will be involved mainly in direct exports, somewhat smaller and less productive firms that cannot afford the costs for finding foreign consumers will export via foreign trade intermediaries, and the least productive firms will opt out of exporting, because intermediation is also connected with some costs. Moreover, large exporters match with many (small) importers while small exporters sell to large importers, which is one of the empirical facts that the paper set out to explain.

A point to note is that Blum et al. (2008) is primarily not a model of export intermediation, but rather of import intermediation. We will come back to this distinction later. The model posits that both exporters and importers are active in (and incur costs for) the matchmaking process, and that consumers pay a fixed cost for identifying exporting firms. The authors see this as the cost of establishing an import intermediary, buying a data base of foreign producers, investing in industry contacts or other similar measures to keep track of potential foreign supply. The question of how the costs for matching exporters to foreign customers are shared between sellers and buyers is not discussed by many of the other contributions: the most common assumption is instead that exporters or intermediaries (that charge exporters for their services) are responsible for the matching costs.

⁹ Blum et al. (2010) present similar data for Chilean imports 2004-2008 and matched Chilean-Argentine importer-exporter pairs.

Another early contribution is Åkerman (2018),¹⁰ who focuses on export intermediation and adds a sector of homogenous wholesalers to the Helpman et al. (2004) model. Wholesalers are not engaged in any production, but they can buy goods in their domestic market and export these to foreign markets. They pay the same fixed cost for entering each foreign market as the exporting manufacturer does. However, once they have established presence in the foreign market, they can export several varieties of goods (i.e., goods from more than one home country manufacturer). This adds to their fixed cost, which increases monotonically and convexly with the range of goods they export.

Wholesalers buy their goods in the domestic market at the going market price, and add a markup to their foreign sales price to cover their fixed costs. They manage to compete in the foreign market by exploiting economies of scale and scope. This is done by selling several different product varieties in each market, since the pooled costs may be lower than the sum of fixed costs would be if each of the manufacturers were forced to pay the full country-specific entry cost. The general equilibrium of the model results in productivity sorting among home country manufacturers. As in Melitz (2003), the most productive firms have sufficient margins to cover their own fixed export cost, and they will do so since they get to keep any additional profit from foreign sales. The least productive firms self-select out of exporting. In contrast to Melitz (2003), there are also some indirect exporters – firms that are not quite productive enough to export on their own, but whose products are sold in the foreign market by wholesalers. The distribution of firms into the three trade categories – direct exporter, indirect exporter, and non-exporter – is determined by the size of fixed export costs. Wholesalers hold a larger share of aggregate exports when fixed costs are larger. Moreover, with higher fixed costs, wholesalers have to grow larger and export more product varieties to each market. Given the small country assumption of the model, market size does not enter, nor does variable transport cost that is equal between exporters and wholesalers. Some of the predictions regarding trade patterns are confirmed using empirical data for Sweden, although it may be noted that Åkerman (2018) does not attempt to test the relationship between productivity and export mode: Swedish trade data show the exports of producers and wholesalers, but not the origin of the goods exported by wholesalers.

Ahn et al. (2011) present a similar setup, with intermediation in an otherwise standard heterogeneous firm model of the Melitz (2003) type. Firms can either export their goods directly, which requires a country-specific fixed cost, or they can export their products via

¹⁰ The working paper version of the article was published in 2010.

a trade intermediary. The cost structure differs from that in Åkerman (2018). Here, firms pay a fixed cost to buy the intermediary's services, which gives them access to all international markets – this fixed cost is lower than the county-specific fixed cost.¹¹ However, to cover its own variable export costs, the trade intermediary also has to add a markup when selling in the foreign market. The resulting sorting of firms according to export mode is the same as in Åkerman (2018). The most productive firms choose to become exporters, somewhat less productive firms that are not able to cover the bilateral fixed cost but can manage the fixed cost for intermediary services become indirect exporters, and the least productive ones remain in the domestic market. The model predicts that the share of indirect exports increases with variable and fixed costs of exporting and falls with market size: both higher export costs and lower market size result in lower profits from exporting, which means that only the most productive firms survive as direct exporters. Several of these theoretical hypotheses are confirmed using Chinese data on exports. In addition, it is noted that the productivity sorting of firms largely reflects size differences: it is mainly the largest firms that are direct exporters, while small and medium-sized firms use intermediaries. Intermediaries seem to have a clear country focus, exporting a relatively large aggregate amount of many different goods to each destination, while direct exporters have a clear product focus. Moreover, trade intermediaries seem to play a smaller role for exports to countries with a large Chinese-speaking population presumably because common language and cultural understanding reduce trade costs (as argued by e.g. Chadee and Zhang 2000 and Rauch and Trinidad 2002). Ahn et al. (2011) also hypothesize that there may be learning effects related to indirect exports, so that firms using intermediaries at an early stage of their development may more easily become direct exporters at later stages. This is another issue that we will come back to below.

Felbermayr and Jung (2011) differ from the previous contributions in assuming that the potential exporter chooses between setting-up a wholesale affiliate abroad and selling through a trade intermediate. The trade intermediate is assumed to enjoy cheaper access to the foreign consumers (i.e. lower fixed entry cost) because it is based in the destination country – it is not specified exactly how this cost advantage is determined. The exporter's decision problem is whether to establish an own affiliate to handle its distribution abroad,

¹¹ This difference in how costs are distributed is not trivial. In Åkerman (2018), goods could, in principle, be exported without the producer's knowledge – in Ahn et al. (2011), producers seek out the wholesalers in order to export their goods. Both engage in indirect exports, but the former is an example of "passive" exports while the latter could be termed "conscious" export. Our pilot interviews with Swedish wholesalers indicate that both types of indirect exports occur. It should also be noted that many wholesalers operate both in the domestic market and in multiple foreign markets and may not always engage in detailed discussions with producers about the final destination of their goods.

which requires higher fixed cost, or to export via the intermediary, which has a low fixed cost but will result in higher variable cost. The higher variable cost comes about because the intermediary introduces a hold-up problem, since cross-country contracts are not fully enforceable. The resulting contract frictions are assumed to be proportional to the trade volume. Like in most other models, the firms establishing their own affiliates (or engaging in direct exports) exhibit high productivity and competitiveness, including high perceived product quality, whereas those opting to use trade intermediaries have lower values for the same characteristics. Kleinert and Toubal (2013) look at the related problem of choosing between establishing a foreign wholesale affiliate or a foreign production affiliate, i.e. a horizontal FDI venture. The choice depends on the relationship between trade costs, plant-level fixed costs, and marginal production costs abroad, as well as the size of the parent firm and the foreign market. Using data for German affiliates, their regression analysis shows that high trade costs (i.e. a low value for the trade openness index of the World Economic Forum) and low estimated fixed and marginal production costs abroad have a positive effect on the likelihood to produce abroad, and so do larger parent firm size and foreign market size. These results mirror those for the choice between exports from the home country and FDI (Helpman et al. 2004).

Trade intermediaries and product quality

Crozet et al. (2013) note that the productivity-sorting mechanisms employed in the models discussed above imply that intermediaries will export relatively expensive product varieties, since they sell goods from manufacturers with relatively high production cost. As an alternative, Crozet et al. (2013) suggest that firms with higher marginal costs may supply higher quality product varieties. Although they charge a higher price, they are also assumed to face greater demand for their product variety. The model also includes a very simple (unspecified) intermediation technology, which simply states that exporting through wholesalers requires a destination-specific fixed cost that is lower than the fixed cost for direct exporters (but there is no marginal export cost for indirect exports). The resulting model shows that the share of wholesalers in bilateral exports is smaller the larger the destination market but increasing in all types of trade costs. Moreover, for goods with productivity-sorting, wholesalers will charge higher prices than direct exporters. For goods varieties with quality-sorting, the price premia of wholesalers will be smaller, and sometimes negative, depending on demand and cost parameters. Crozet et al. (2013) also test their hypotheses on French trade data for 2007 and confirm that wholesalers have higher trade shares in “difficult” markets. Distinguishing between industries with

productivity-sorting and quality-sorting using the procedure suggested by Baldwin and Harrigan (2011), they also find support for their pricing hypotheses.

Using a similar modelling framework, Tang and Zhang (2012) begin by noting that intermediaries can help alleviate quality problems in markets with differentiated products, asymmetric information, and adverse selection, since they can invest in expert knowledge and inspection technology, and have strong incentives to protect their reputation as a reliable business partner (as hypothesized by Biglaiser 1993 and Biglaiser and Friedman 1994 and shown for traders in Hong Kong by Feenstra and Hanson 2004). This suggests that trade intermediaries should be more prevalent in markets with differentiated goods. However, Tang and Zhang (2012) note that there is also a potential hold-up problem that adds costs to the relationship between producers and trade intermediaries: when complete contracts between producers and intermediaries are not possible, the intermediaries may underinvest in quality verification, and producers may underinvest in exports (as in Felbermayr and Jung 2011). This leads the authors to distinguish between product groups with horizontal differentiation and vertical differentiation. Since vertical differentiation requires stronger quality signaling, the hold-up problem will be more serious, and the model predicts a negative correlation between the share of wholesalers and vertical differentiation, contrary to the standard assumptions. The opposite holds for horizontally differentiated products with a lower degree of substitutability, since even relatively weak exporters can capture a sufficiently large market share to motivate exporting through a wholesaler. These hypotheses are supported in empirical tests using detailed data on Chinese product level exports. Bernard et al. (2015) also find a negative correlation between the share of wholesalers and the degree of product differentiation for Italy.

Blanchard et al. (2017) presents an alternative model where wholesalers can introduce “private labels”, where multiple firms’ goods are pooled and re-sold under a new private brand name established by the intermediary. The empirical motivation for the analysis is that private label sales make up a large share of retail sales – referring to ACNielsen, Blanchard et al. (2017) quotes a share of 17% of sales in a major cross-country survey – and the observation that private labels appear to be more important at the lower end of the market. This suggests that the private label mechanism addresses the quality concerns of customers, as the intermediary takes on a stronger role for guaranteeing product quality: all products sold by the intermediary will be assessed according to the “brand equity” of the intermediary. In addition to the standard productivity and quality-sorting outcomes, it is shown that the share of exports going through the private brand label depends on the costs

advantage of the intermediary as well as the consumers' preferences for product differentiation: when product differentiation is less important, the private label will hold a larger market share. Changes in fixed and variable export costs will also affect the relative market shares of private label and direct exports – as trade cost increase, the number of firms exporting directly will fall. Overall, in comparison with the situation where only direct exports are possible, private label intermediation will result in greater total trade volumes and lower average prices, but fewer independent varieties available to consumers in equilibrium.

Poncet and Xu (2017) challenge the result that trade intermediation is negatively related to vertical differentiation by assuming that there can be two types of intermediaries: specialized and generalized wholesalers. Specialized wholesalers are assumed to have a much narrower product focus and to spend more effort on developing expertise and capacity to verify the quality of the limited range of products they handle. Generalized wholesalers carry a larger variety of goods and are more likely to face disincentives to investment in quality verification. Accounting for this type of heterogeneity among intermediaries, Poncet and Xu (2017) are able to show that the empirical pattern for China suggested by Tang and Zhang (2012) changes: using the same data set, they find that intermediaries in general focus on products that are less differentiated, but specialized intermediaries are more often associated with a high degree of vertical differentiation (although the products with the highest quality rankings are still linked to direct exporters). Hence, it is likely that one of their roles is related to quality verification and guarantees.

Trade intermediaries and financial frictions

Apart from firm heterogeneity in terms of productivity and product quality, there are also some theoretical contributions highlighting other factors that may contribute to a positive role for trade intermediaries. For example, Lin (2007) argues that the choice between direct and indirect export modes is related to the firm's access to credit markets. In a simple model, it is assumed that all costs associated with exporting are incurred before production takes place, whereas all revenue is realized after trade has taken place. There is a trade intermediary that does not face any liquidity constraints. The manufacturers, however, are not able to carry over retained earnings from one period to the next, e.g. because all profits must be paid out as dividends to stockholders. The manufacturer's choice of export mode therefore depends on its ability to raise external funding for production and trade costs. Direct export is more profitable but requires more capital to cover upfront costs. Indirect export is less profitable but requires less capital, since some of the initial costs can be

covered by the trade intermediary. Hence, firms without credit constraints will select to export directly and firms with credit constraints will be forced to rely on export intermediaries; the former type of firms will record larger profits. Testing these hypotheses on Chinese survey data for 2011 confirms that indirect exporters generally face higher financial constraints than direct exporters, and that they are less productive and profitable than direct exporters. A more formalized model looking at the same issue is presented by Chan (2018). Allowing two types of firm heterogeneity in a standard Melitz-type model, the author finds that both low productivity and credit constraints drive firms to export indirectly through intermediaries. Hence, wholesalers and other intermediaries can be seen as partial solutions both to the traditional transaction cost and search and matching problems discussed earlier and to capital market frictions. Empirical evidence from firm-level data covering 115 countries and macro-level data from 56 countries exporting to Hong Kong confirm the theoretical predictions. Firms facing stronger financial constraints are more likely to use trade intermediaries, and exporters from financially less developed countries are more likely to rely on trade intermediation.

Trade intermediaries and corruption

Olney (2015) introduces another asymmetry into the standard heterogeneous firm trade model – corruption. It is assumed that trade intermediaries are relatively skilled at managing various types of bureaucratic intervention, since they are frequently engaged in the various tasks associated with exporting. Thanks to the institutional knowledge, connections, and experience they have accumulated over time, they are better at dealing with red tape, bribes, and corruption. Several kinds of specialized intermediaries helping firms deal with corruption – “despachantes” in Brazil, “coyotes” in Mexico, “tramitadores” in Peru and El Salvador, and so forth – have also been identified in the literature (Fredriksson 2014). Corruption enters into the model in the form of a variable costs for direct exporters and firms operating in the domestic market, but trade intermediaries are assumed to avoid this additional burden. The result, in comparison with the standard productivity sorting outcome, is that the profits of domestic firms and direct exporters fall, while indirect exporters are not much affected by corruption. The productivity cutoff in the domestic market increases, so that the least productive firms select to exit the market. The sum of direct and indirect exporters does not change, but some of the least productive direct exporters switch export mode and start exporting through intermediaries. The theoretical propositions are tested using the World Bank’s Enterprise Survey data bank, which covers 23,000 firms in 11 industries in 80 countries during the period 2005-2010.

The empirical estimations support both the prediction that corruption reduces the likelihood that firm will only sell in the domestic market, and the proposition that corruption increases the probability that firms become indirect exporter rather than direct exporters. Apart from highlighting some of the costs of corruption, Olney (2015) also stresses that intermediaries play a crucial role in shielding manufacturers from corruption. A contrasting perspective is provided by Liu et al. (2016), who argue that domestic trade intermediaries were able to facilitate tax evasion by indirect exporters in the specific institutional setting in China around 2005, and present empirical evidence suggesting that the resulting tax revenue loss to the state was about USD 1 billion in 2005.

Trade intermediaries and learning to export

A final theoretical issue to note concerns the dynamic aspects of intermediated trade: what is likely to happen over time to the firms exporting via trade intermediaries? Does intermediated trade leave room for a learning process where the indirect exporter is able to shift to direct exports over time, or are any export-related learning effects limited to the trade intermediary? Few theoretical contributions address these questions. One exception is Bai et al. (2017), who examine the dynamic trade-offs that would occur if there are different learning-by-exporting effects for direct versus indirect exporters. For example, while the costs for direct exports may be higher in a static comparison with intermediated exports, it is possible that direct exports generate stronger learning effects over time. The authors therefore estimate a structural dynamic model that is designed to highlight the static and dynamic trade-offs and evaluate the cost of restrictions on direct trading. Their model draws on the heterogeneous firms setting of Ahn et al. (2011), which is extended to be dynamic and allow learning-by-exporting effects that can vary by export mode. Estimating the model using an extensive data set for Chinese firms during the period 2000-2006, the authors find that the productivity of previous indirect exporters is 0.5% higher than that of previous non-exporters, and the productivity of previous direct exporters is 2.3% higher. This learning effect gives firms an incentive to remain in the direct exporting mode even if they are making short-run losses, even if shifting into an indirect export mode would be optimal in a static context. Moreover, using an intermediary to export in the first period helps firms transit into direct exporting in later periods, presumably because intermediaries help small firms learn about foreign markets, reducing the cost of market and research and promoting matching with potential buyers in later periods. Yet, the main policy conclusion of Bai et al. (2017) is that policies encouraging direct exporting

should be considered, and that the removal of controls on Chinese firm-level exports from 2004 had a strong positive effect on China's overall export growth.

A related view is suggested by Jansson and Sandberg (2008), albeit in a very different context. They examine 116 Swedish SMEs trading with emerging economies in the Baltic sea region and note that many firms opt for indirect exports via trade intermediaries, expecting that this will provide a low-cost linkage to the foreign market, facilitating information flows and communication with foreign customers. However, they also warn that the indirect export relationship could also isolate the producer from its foreign customers, in particular since it may be in the interest of the intermediary not to provide full information about market developments. Another reason for limited knowledge flows is that a large share of the relevant market knowledge is experiential and tacit, and therefore hard to transfer between parties. This creates a paradox – mirroring the dynamic trade-off in Bai et al. (2017) – in that the insufficient learning about local markets provided by the simplest entry modes may obstruct further internationalization.

Other authors are more optimistic about the prospects for learning from intermediated exports. As noted earlier, Ahn et al. (2011) hypothesize that firms using export intermediaries could more easily become direct exporters in subsequent periods. While this dynamic effect is not explicitly introduced in their heterogeneous firm model, they address the question in their empirical analysis, where they examine data on export values of new and pre-existing product varieties across markets. They find that new directly exported varieties have relatively larger transaction values in smaller markets with high trade costs, which are often markets where intermediaries play a relatively important role. One possible explanation could be that these varieties are not new to the market but have instead been supplied to the market by trade intermediaries in the past. When the producers start exporting directly, they can immediately enter at a larger scale because they have cumulated market-specific knowledge during their time as indirect exporters and because their product is already known in the foreign market. However, the authors are not able to exclude other possible reasons for their observations, e.g. that more difficult markets necessitate larger sales volumes in order to cover larger fixed costs. In addition, Ahn et al. (2011) explore a panel data set on Ghanaian firms that documents change in the firms' export modes over time. Firms using intermediaries in the past are more likely to export directly in later periods than firms that did not use intermediaries. Yet, only 278 firms are included in the panel data set, out of which less than 40 were engaged in any sort of export activity – the small number of observations cautions against strong conclusions.

The most convincing evidence to date of learning-by-indirect-exporting instead come from Atkin et al. (2017), who carry out a randomized experiment that generates exogenous variation in indirect access to foreign markets (i.e. exports through a wholesaler) for rug producers in Egypt. Using detailed data from repeated surveys both before and after the establishment of the relationship with the wholesaler, the authors identify a causal impact of indirect exporting on firm performance. The firms randomly selected to become indirect exporters report 16–26% higher profits and large improvements in quality in comparison with a non-exporting control group. The increase in performance is at least partly due to knowledge transfers from intermediaries (and, indirectly, foreign buyers) to producers, documented in correspondences between foreign buyers and intermediaries and logbooks outlining discussions between intermediaries and producers. Referring to the quality-sorting mechanisms described in the models above, it is reasonable to assume that the improvements in performance and product quality could help some of the treated producers become direct exporters in the future. However, the economics literature has little to say about which firms are most likely to learn and graduate from indirect exports. This can be contrasted with some of the international business models discussed earlier (e.g. Johanson and Vahlne 1977) which suggest that this is a common route to more advanced forms of internationalization.

Summary: theoretical models

The theoretical literature on trade intermediaries can broadly be summarized as follows. The existence of intermediaries in international trade is based on three functions that facilitate internationalization of firms that would be too weak (either in terms of productivity or product quality) or too small to manage as direct exporters. First, they reduce the search and matching costs involved in bringing together sellers/exporters and foreign buyers. Second, they reduce the costs for managing international trade transactions. This includes distributional and shipping logistics, financing, overcoming informational barriers, and dealing with bureaucratic procedures both at home and abroad. Three, they mitigate adverse selection problems by providing information or guarantees that are accepted by foreign buyers. These functions can be fulfilled either by export intermediaries or import intermediaries. Both kinds of intermediaries are involved in the first of these functions, but it is reasonable to assume that the export intermediaries are more directly involved in reducing transaction costs while import intermediaries may have a bigger role in managing adverse selection problems. However, theory is not entirely clear on how the costs for international trade transactions are distributed. They can be borne mainly by the

exporter or the importer – they can also be shared in different ways between the producer/consumer and the trade intermediary.

2.4 Empirical studies: testing hypotheses and discovering new dimensions

The wave of theoretical contributions since the early 2000s has resulted in a series of empirical studies on intermediaries in international trade. Apart from testing the specific hypotheses generated by new theoretical models, several empirical studies have also described patterns of indirect trade in more general terms, including characteristics of various types of trade intermediaries. An early example of this is Bernard et al. (2010), who use US census data to compare US exports and imports of wholesalers, retailers, pure “producing and consuming” firms (i.e. firms that do not own any establishments in the wholesale or retail trade sectors), and firms with mixed characteristics (i.e. that have establishment belonging to several of the other categories). A first point to note is how “new” the focus on trade intermediaries in this analysis is. In the authors’ comprehensive review of “Firms in international trade” published only three years earlier (Bernard et al. 2007), the terms wholesaler and indirect import were referred to only in passing, in a footnote – terms like “export intermediary” and “indirect export” were not mentioned at all. Instead, that review stressed the shift in analytical focus from countries to firms, firm heterogeneity, and differences between exporters and non-exporters, reflecting both the relatively new data sets on firm-level trade data and the strong impact of trade models with heterogeneous firms, such as Melitz (2003) and related contributions.¹²

Trade patterns

Turning to the findings from Bernard et al. (2010), several observations stand out. First, although pure wholesalers and retailers account for a large share of all trading firms, they only hold a limited share of the value of total trade. Pure wholesalers and retailers jointly have 9% of export value and 16% of import value – most of this is accounted for by wholesalers. Pure producing/consuming firms account for about one-fifth of both exports and imports. This means that the mixed enterprise categories, with both trade and production/consumption establishments, are the dominant trade actors, particularly on the import side. They are also larger than both the pure producers/consumers and the pure wholesalers and retailers, and they trade a larger number of products with a larger set of

¹² It could be argued that there are indirect references to the use of trade intermediaries. Bernard et al. (2007:128) note that “Further progress in this area [analysis of firms in international trade] will likely require explicit consideration of the boundaries of the firm, including the decisions about whether to insource or outsource stages of production, and whether such insourcing or outsourcing takes place within or across national boundaries”. Using a wholesaler could be interpreted as outsourcing part of the value chain.

countries than the other firm categories. Moreover, a large share of their trade is with related parties abroad. In other words, the main actors in US international trade are large multinational enterprises with both production and trading establishment. This is consistent with broader data showing that a large share of world trade involves multinational enterprises (Kleinert and Toubal 2013), which is probably partly explained by the hold-up problem discussed by Felbermayr and Jung (2011). The fact that the mixed enterprise categories are mainly found in differentiated goods industries is also consistent with this type of vertical integration. The pure wholesalers, by contrast, are found mainly in agriculture and related sectors. More generally, Bernard et al. (2010) conclude that intermediaries and non-intermediaries specialize in different categories of goods. The geographic distribution of trade also differs between firm types: in particular, China and other low-wage economies are important sources of imports for the specialized trade intermediaries, at the same time as they export more (in relative terms) to smaller markets. Bernard et al. (2010) note cautiously that this is not entirely in line with predictions from the gravity equation.

Bernard et al. (2015) employ Italian firm-level data to compare export intermediaries and manufacturing exporters, and find trade patterns that are very similar to those for the US. In particular, wholesalers and manufacturing firms that export directly serve different markets and export different products. Wholesalers are smaller than direct exporters, they handle a larger number of product varieties, and focus on a smaller number of destination markets than direct exports. These destination markets are smaller and have weaker institutional environments, and higher fixed entry costs. They focus on products that are less differentiated, have lower contract intensity or relationship-specificity, and larger sunk entry costs. Their special ability to manage product and country-specific fixed costs mean that they are more flexible and can adjust their product mix easier than exporting manufacturing firms. Hence, their overall sales are less sensitive to changes in real exchange rates than those of manufacturing firms that export directly. The difference with respect to Bernard et al. (2010) is that the Italian data do not single out the mixed enterprises type that dominate US exports, presumably because Italian multinationals are smaller and less dominant.

Who exports through intermediaries?

Abel-Koch (2013) turns her attention to the characteristics of firms that export through trade intermediaries. Noting that most previous empirical analyses of trade intermediation have relied on data sets from customs authorities, which provide information on who the

exporters are and how direct exporters and intermediaries may differ from one another, she points out that these data sets say nothing about where intermediaries acquire their products. Therefore, she turns to an Enterprise Survey data set from the World Bank covering more than 1,200 manufacturing firms in Turkey in 2005. Apart from identifying direct exporters, the survey also includes information on firms that export indirectly, i.e. via retailers and wholesalers. In line with the predictions from most of the theoretical models discussed above, the data show that indirect exporters are significantly and robustly smaller than direct exporters. In addition, indirect exporters are less likely to hold internationally recognized quality certificates, which suggests that product quality matters for the choice of export mode. Firms introducing new products or product lines are more likely to choose indirect exports, suggesting that the intermediaries are engaged in search and matching with new customers. However, credit constraints do not appear to have any impact, contrary to the hypotheses of Lin (2017) and Chan (2018). Abel-Koch (2013) also notes that many firms using wholesalers for exports also rely on wholesalers for imports, suggesting that many of the benefits related to transaction costs, search-and-matching, and quality standards may also apply for the sourcing of foreign inputs through trade intermediaries.

Lu et al. (2017) take the analysis a step further by using a more extensive data set from the World Bank's Enterprise surveys, covering 12,679 firms in 29 developing economies during the period 2002-2006. Apart from looking at firm size, they also compare the capital-intensity and productivity of direct and indirect exporters. Moreover, they note that firms can simultaneously export directly and through wholesalers, given that they may sell several different product varieties to several different markets. Overall, for their whole sample, it is found that 27% of exporters record only indirect exports, 11% of exporters have both direct and indirect exports, and the remaining 62% focus on direct exports only. However, the great majority of firms – to be precise, 71.05% of all firms – do not export at all.¹³ The comparisons show that direct exporters always have the highest values for all the size and productivity indicators, followed by the firms recording both direct and indirect exports, the indirect exporters, and finally, the firms selling only on the domestic market. These results are robust to adjustments in the sample (dropping foreign-owned firms, focusing only on manufacturing firms), alternative assumptions about the distribution of the error term, alternative estimation methods (linear as well as non-linear models), and

¹³ As noted earlier, this refers to “conscious” exports: if the trade intermediation mechanism follows Åkerman (2018), where the intermediary acquires goods at the going domestic market price, there could also be “passive” exporters that have not made any active decision to market their products in foreign markets.

separate estimations for subsamples depending on WTO membership. Considering that firm characteristics are not constant over time – on the contrary, firms are not only heterogeneous but also dynamic – these results open up for the possibility that indirect exports can sometimes constitute an intermediate stage in a firm’s development from a non-exporter to a direct exporter.¹⁴ Similar results are reported by McCann (2013), who examines traders in a set of Eastern European and Central Asian economies, and Davies and Jeppesen (2015), who explore the impact of exporter characteristics on the productivity differences between direct exporters, indirect exporters, and non-exporters in a wider set of countries. McCann (2013) adds the observation that multi-product firms frequently use trade intermediaries although their productivity levels are generally high. This indicates that they employ mixed strategies, so that some (more important) destination markets are supplied through direct exports, while other markets are served through wholesalers. Davies and Jeppesen (2015) note that the characteristics of the exporting country will have an impact on the productivity sorting. For example, higher trade costs will raise the productivity gap between direct and indirect exporters, but reduce the gap between indirect exporters and non-exporters.

Import intermediaries

An important observation by Abel-Koch (2013) is that indirect exporters also tend to be indirect importers. The role of imports intermediation is also stressed by Blum et al. (2008), which essentially is an import-intermediation model, and Bernard et al. (2010), who look both at exports and imports. Grazzi and Tomasi (2016) extend Abel-Koch’s (2013) study by adding more observations and including the import side. They use the BEEPS data set (compiled by the World Bank and EBRD) for the 2002-2005 period, which yields information for 27,298 firms in 95 countries. Import and export activities are linked by categorizing firms into four groups: direct two-way traders (firms exporting and importing directly), mixed two-way traders (firms trading indirectly on either the export or import side), indirect two-way traders (firms exporting and importing indirectly), and non-traders. An important observation is that a large share of the firms that trade is engaged in both imports and exports: 42% of all traders are two-way traders. Out of these, 68% are directly involved in both exports and imports, 23% are only involved in indirect exports and imports, and 9% of the two-way traders belong to the mixed group. Around one-quarter of traders are only exporters; out of these, 70% are directly engaged in export

¹⁴ Which, as stated earlier, is postulated in part of the international business field (Johanson and Vahlne 1977, 1990, 2009).

operations. One-third of traders are only importers, with direct and indirect importers accounting for equally large shares. Comparing the productivity of the different categories of firms, Grazzi and Tomasi (2016) find a ranking that is very similar to that of Abel-Koch (2013) and Lu et al. (2016). The most productive firms export directly, indirect exporters are somewhat less productive, and home-market firms are the least productive. The same ranking applies to importers. The most productive firms import directly, firms with medium productivity acquire imported inputs through wholesalers, and the least productive companies are not actively engaged in imports.¹⁵ Looking at both imports and exports simultaneously reveals that direct two-way traders are the most productive, followed by mixed two-way traders and indirect two-way traders. Acharya (2016), who focuses more narrowly on Canadian firms, finds a similar productivity premium for two-way traders. A likely reason is that few firms are able to become competitive exporters if they are restricted to rely exclusively on domestic inputs and standardized foreign goods that are available in arm's length markets – successful exports may require imported inputs that are sourced and tailored for their specific needs (Bas and Strauss-Kahn 2014). This role of trade intermediaries is important to keep in mind although it will not be discussed in detail in the remainder of this report.¹⁶

New types of trade intermediaries

Several contributions have focused on new or non-traditional types of trade intermediaries. Most of the contributions discussed so far refer to wholesalers when the term “trade intermediary” is used, but there are other actors that play a potentially important role. Retail firms were singled out as one of the firm categories in Bernard et al. (2010) – for the case of the US, it was noted that pure retailers only accounted for about one percent of the value of imports and exports. Enterprises engaging in both retail and production were substantially more important, with companies like Walmart accounting for well over 15% of US imports of consumer goods from China before 2007 (Basker 2007) and over 10% of total US imports of goods from China between 2001 and 2013 (Scott 2015). Overall, Bernard et al. (2010) identified the fashion and footwear industries as examples of sectors where retailers are important for US imports (although many of the enterprises were

¹⁵ This should not be interpreted to mean that they do not use imported inputs. Even pure home-market firms are likely to acquire standardized imported inputs from wholesalers and retailers in the domestic arm's-length market.

¹⁶ In addition, it should be noted that both Abel-Koch (2013) and Grazzi and Tomasi (2016) focus on the behaviour of producers. In the same way that many producers are two-way traders, there are also many wholesalers that are both exporters and importers. Considering the role of wholesalers as intermediaries between agents in different countries, straddling two markets and institutional environments, it is not surprising that they often engage in two-way trade.

grouped in the “mixed” category, with wholesale and production establishments included in the company group).

Cheptea et al. (2014) emphasize the role of retailers for their home countries’ exports. Formulating an empirical model that relates bilateral exports to the foreign sales of the world’s 100 largest retailers over the 2001-2010 period, they find strong positive effects: the presence of a home-country retailer in a foreign market raises the home country’s exports to that market. The effects are particularly strong for the food industry. The authors hypothesize that this could be related to an intermediation effect that is not noted elsewhere in the international economics literature – the modification of consumer’s preferences. Although retailers adapt their product portfolio to each foreign market, they also introduce home country products that may be new to the foreign market. Their large size, substantial marketing budget, continuous presence, visibility, and repeated contact with local customers may result in the development of “new” preference, as local customers are exposed to foreign consumption and lifestyle patterns. In addition, multinational retailers will reduce market entry costs for their home country suppliers. Recalling the findings of Bernard et al. (2010), it is also obvious that multinational retailers may facilitate the exports of host country firms.¹⁷ However, multinational retailers are heavily concentrated to a few home countries. US retailers hold the largest share, with over one-fourth of the global retail market. German and French retailers jointly account for nearly half of the global market, with the Netherlands, Belgium, and Hong Kong also acting as homes to large multinational retailers. Only six other countries (Japan, the UK, Australia, Canada, Italy, and Spain) have any companies on the top-100 list of global retailers. Swedish data confirm that wholesalers are substantially more important than retailers in foreign trade, as will be discussed in the next chapter.

Carballo et al. (2016) examine how the postal service acts as a trade facilitator in Peru. Several Latin American countries (with Brazil as the earliest adopter in 2001) have introduced an innovative postal regime called “Exporta Fácil” to simplify the exports of SMEs and other firms shipping small quantities of goods to foreign customers. Under the scheme, firms can deliver their shipment at the local post office and carry out a simplified export customs declaration procedure. In other words, the Exporta Fácil program functions as a publicly provided intermediation service that reduces foreign entry costs. Analysing the full data set of Peru’s export transactions during the period 1999-2014, the authors

¹⁷ See Nordås et al. (2008) and Head et al. (2014). Casual observation confirms this effect. For example, the German retail multinational Lidl regularly sets aside space in its stores throughout Europe to promote specific food products from other countries where it operates.

show that scheme has resulted in larger regional exports, primarily because firms have been able to access a larger number of foreign customers. It has allowed new entrants to start exporting at lower export values, and it has been used extensively by firms that introduce new products and enter new markets. Furthermore, the authors conclude that export entry and exit rates have increased, and that the scheme has contributed to learning both within and across firms. Firms that start with *Exporta Fácil* transactions and eventually switch to regular export channels ship larger export volumes and their export spells survive longer than those of exporters that enter directly through the regular export channels.

Carry-Along-Trade

Another important analytical dimension has recently been added by Bernard et al. (2018), who note, on the basis of detailed data on the production and trade activities of Belgian firms in 2005, that most manufacturing exporters export many products that they do not produce. Some of the largest manufacturing firms also record export volumes of specific goods that are significantly higher than their total production volumes of those goods. In other words, large manufacturing firms engage in trade intermediation, exporting goods produced by other companies. The authors refer to these additional export activities as Carry-Along Trade (CAT). Nearly one-third of the total export value of the manufacturing companies in the Belgian data set can be classified as CAT. The great majority of the firms in the sample – nearly 90% – are engaged in CAT but the firms recording the largest amount and variety of CAT are the most productive firms. Earlier research has shown a positive relationship between firm productivity and the number of products exported by multi-product firms – the new insight brought by Bernard et al. (2018) is that most of this increase in the number of export products is due to CAT. They infer that CAT is “a systematic and quantitatively important feature of firms’ cross-border activities” (Bernard et al. 2018: 526).

In addition to a careful analysis of the data, to confirm that they do not misrepresent the behavior of firms due to classification, sample selection, or other technical issues, the authors also formulate a theoretical model to account for the new empirical observations. In particular, they aim to replicate three features from their empirical analysis: the number of goods produced and export per good should increase with firm productivity; the number of CAT products and export per product should increase with firm productivity; and the number of CAT products should be more responsive to firm productivity than number of regular produced and exported goods. To do this, they develop a model of heterogeneous,

multi-product manufacturers that can also source from arm's-length suppliers. To replicate data patterns, they add complementarities between firm productivity and sourcing on both the demand and supply side. Firms choose the number of products to sell, as well as prices and quantities, and decide whether to produce goods in-house or source them from outside suppliers. Two spillover effects are introduced on the demand side. Demand-scope complementarity refers to the possibility that larger product scope (a larger set of products offered to the market) could increase demand for the firm's existing products.

Alternatively, it can be assumed that demand is heterogeneous, so that the most productive firms also are the most "popular" (or have stronger "brand equity" as discussed by Blanchard et al. 2017). This could allow them sell more internally manufactured as well as externally sourced products to the market in equilibrium – more generally, their demand curve would lie to the northeast of the demand curves of other firms. On the supply side, the simplest mechanisms generating the intended results include economies of scale in distribution and more efficient distribution technologies enjoyed by the most productive firms. This would, however, require that the advantages on the distribution side are stronger than those on the production side to generate the faster growth in CAT products as overall firm productivity grows. Similar results can be generated if more productive manufacturers also have lower marginal costs of sourcing, although this cost advantage cannot be so large that it leads the firm to start replacing internally produced goods with sourced goods. Going back to the data to explore how these alternative mechanisms match existing information on trade flows and prices, Bernard et al. (2018) find empirical evidence in favor of the demand-side rather than supply-side explanations for CAT. Their company interviews also lend support for the demand-scope complementarity.

Pass-On-Trade

A related observation about firm-level trade patterns is made by Damijan et al. (2013), who study Slovenian trade data for 1994-2008. They point out that a large share of trade flows at the firm level are made up of simultaneous exports and imports of the same narrowly defined product varieties (at the 8-digit level). Over two-thirds of all exporting firms engage in simultaneous imports and exports of the same product varieties. Averaging across firms, they find that one-quarter of all exported product varieties and 40% of all newly added exported product varieties (in any given year) are identical to the product varieties that a firm has imported in the same or in the previous year. They use the term Pass-On-Trade (POT) to describe this practice of exporting previously imported goods. Relating the use of POT to firm characteristics, they find that it is increasing in firm size,

product diversification, multinationality, productivity, and profitability. These results mirror the patterns for CAT discovered by Bernard et al. (2018): in fact, it is highly likely that a substantial share of CAT is actually POT. Discussing possible explanations for engaging in POT, Damijan et al. (2013) end up with arguments like those suggested by Bernard et al. (2018). Firms with efficient distribution networks can sell a wide range of sourced products through their own network, particularly if the POT products are complementary to the firms' own products. The authors also note that some firms are parts of a multinational network and may have responsibility for sourcing specific goods on behalf of affiliated firms in other countries. Firms with wide international networks may also utilize their knowledge about international price differences in order to engage in price arbitrage across markets. Damijan et al. (2014) look more broadly at product churning in Slovenian firms' imports and exports, and document that the average firm changes about one-fourth of imported and exported product-market combinations every year. Altogether, these results suggest that a large share of indirect exports and imports are carried out outside the formal wholesaler sector that is visible in national register data.

Characteristics of trade intermediaries

As noted earlier, trade intermediaries have historically been of great importance for Japan's internationalization. Although the share of pure wholesalers has fallen over time, they still account for about one-quarter of Japan's export value. A set of empirical studies on Japanese data have revealed some patterns that have not been observed elsewhere. For example, Fujii et al. (2017) set out to compare the size and productivity of direct exporters, indirect exporters, and non-exporters using a detailed firm-level transaction database covering more than 120,000 manufacturing firms in 2014. Their results on size and productivity align with studies for other countries, revealing a very robust pattern where direct exporters are the largest and most productive, with non-exporters at the other extreme. This pattern does not hold only for the manufacturing sector as a whole, but also separately for each of the 24 two-digit manufacturing industries in the Japanese classification system. Exploiting the transaction data, the authors are able to identify the network of suppliers and customers of all companies. Here, one result is that firms with large supplier networks are more likely to be direct exporters – a possible reason is that foreign entry costs are shared with the supplier network. A larger number of customers raises the probability of both indirect and direct exporting. Apart from possible spillovers from firm size, this may imply higher “brand equity”, for example in the form of a more unique product. Tanaka (2013) focuses on the wholesalers and finds productivity sorting

also for this set of companies. Only the most productive wholesalers are able engage in foreign direct investment, somewhat less productive wholesalers participate in export activities, and the least productive wholesalers are only involved in domestic transactions. Ito et al. (2017) provide a similar, but also record a geographic pattern of indirect exports, where the probability of linking up with a wholesaler is negatively correlated with the distance between manufacturers and wholesalers in Japan. Since exporting wholesalers are predominantly located in Tokyo and Osaka, they express some concern about the internationalization of manufacturing firms from more peripheral provinces, who may not find suitable matches with trade intermediaries.

Summary: empirical patterns

Summarizing the empirical evidence on the role of intermediaries in international trade, there is evidence from several economies that wholesalers play an important role for the internationalization of SMEs, less productive firms, and firms with products of lower or unclear quality. The theoretical predictions regarding firm size and productivity are confirmed across the board. Only the largest and most productive firms are able to cover the costs related to direct exports. Other firms that aim to enter foreign markets are forced to use the services of trade intermediaries and become indirect exporters. The least productive firms sell only in the domestic market. This provides strong evidence that intermediaries contribute by reducing market entry costs. Trade intermediaries themselves are subject to similar productivity sorting. There is also evidence of a quality sorting, where firms with high-quality products become direct exporters and firms with lower-quality goods may be able to reach foreign markets through intermediaries, who either reduce asymmetric information (from the perspective of foreign customers) or sell under their own private labels. Trade intermediaries are not only important for exports, but perhaps even more visible on the import side. They include wholesalers and retailers, but also other firms that are not necessarily registered as wholesalers or retailers. Many large companies have their own trading establishments, which means that they may be invisible unless data are at the establishment level, most exporting manufacturers also export goods that they have not produced themselves (Carry-Along Trade) or import and export identical products (Pass-On-Trade), and even postal service organizations can operate as trade intermediaries. In some cases, intermediated trade is the result of the strategic choice of exporters and importers; in other cases, exporters may not even be aware of the final destinations of their goods and importers do not reflect on the origins of the inputs they

acquire. Evidently, international trade flows at the firm and transaction level exhibit substantial complexity.

3 Description of qualitative and quantitative data: Wholesalers in Sweden

One conclusion from the literature review is that the population of trade intermediaries is highly diverse. As a group, they perform a large set of different functions. Rosenbloom and Andras (2008) argue that intermediaries may be involved in any of the different “flows” that are linked to transactions between sellers and buyers, including the physical movement of products, changes of ownership, promotion, negotiation, financing, distribution of risk, ordering, and handling payments. Balabanis (2000) provides a long list of functions ranging from “transaction-creating” services such as market research, product design, and search for foreign customers to “physical-fulfillment” services including preparation of customs documents, freight forwarding, and trade financing. Individual intermediaries can be “full-service providers” and offer most of these services or specialize in selected functions. They can either be focused on exports or imports, but given their “boundary-spanning” role, it is common that they engage in both. They can serve suppliers and buyers in their home country or focus on customers in foreign countries. With the emergence of global value chains, some intermediaries have evolved from handling exports and imports to participating in the management and integration of the entire value chain. Their value propositions and ways of making money differ. Some acts as agents on behalf of the firms producing or sourcing goods and charge the buyer or seller for their services; others take ownership of the goods they trade and add a markup that covers their costs. In some cases, suppliers and buyers are the active parties in the relationship and seek out intermediaries; in other cases, the intermediaries are actively looking for clients and customers.

The present report does not aim to cover all types of trade intermediaries. With our focus on exports, we are not mainly interested in import intermediaries. Moreover, given the limitation that our empirical work is mainly based on Swedish register data, we focus on Swedish export intermediaries (with a small appendix discussing new Estonian data that allow unique insights into the relation between intermediaries and their suppliers). The classification of firms into industries also guides our work: the largest group of trade intermediaries in Swedish register data is the wholesalers.

The purpose of this chapter is to briefly describe the Swedish export wholesale sector before we turn to the empirical analysis in the next chapter. Section 3.1 summarizes some observations from a round of interviews with Swedish wholesalers carried out at the early

stages of this project. The purpose of this summary is to illustrate some of the wholesaler characteristics that are not easy to distinguish in quantitative register data. In particular, this refers to the specific functions performed by the wholesalers: some of the diversity highlighted above can be seen also in this relatively narrowly defined group of intermediaries. The interviews also touch on import wholesalers. We recognize that a foreign import intermediary working with Swedish firms is actually also intermediating Swedish exports. We are not able to cover import intermediaries based in other countries, but we assume that Swedish import intermediaries operate the same way as their foreign counterparts. Section 3.2 provides a brief description of the broad patterns that can be seen in the registry data.

3.1 Swedish wholesalers: observations from pilot interviews

In the early stages of the research leading up to this report, the authors carried out a set of pilot interviews with a small number of Swedish wholesalers based in the Southern Swedish province of Skåne. The interviews had a two-fold purpose. The first objective was to add more detail to the brief and often abstract discussions about the roles and functions of trade intermediaries in economics and business literature. Apart from a better understanding of the business models operated by intermediaries, the ambition was to informally assess some of the assumptions and mechanisms in the many theoretical models of trade intermediation that have appeared in recent years (see Section 2.3). For example, most models assume that producers pay a fee to wholesalers in order to reach foreign markets -- is this an acceptable simplification, or would it be more reasonable to assume that wholesalers buy goods from producers at the going market price and sell them abroad at a premium? The second objective was to explore to what extent wholesalers would be willing to divulge information about who their suppliers in Sweden are. This is one of the weaknesses in the Swedish register data set: we can see who the wholesalers are and how they trade with other countries, but not where they source their goods. If firms were prepared to share such information, it would have been possible to design and carry out a survey to collect data on indirect exporters. However, the wholesalers we interviewed were generally not willing to talk about their suppliers in detail, with a few valuable exceptions. Our conclusion from the interviews was that a survey on the wholesalers' suppliers would probably not generate sufficient data for quantitative analysis.

The companies approached for interviews were chosen in collaboration with the Chamber of Commerce in Malmö. The final selection comprised 20 wholesalers in Malmö and surrounding areas. These 20 companies included small as well as large firms, with a

minimum cut-off of three employees. We aimed to cover several different industries, as well as both importers and exporters (in fact, a large share of the firms were involved in both imports and exports). The companies were contacted through email before a first telephone call to identify the appropriate interviewee (in most cases an owner or manager of the firm). Semi-structured personal interviews, with the interview guide designed after pilot interviews with former managers of wholesalers in Copenhagen, were carried out with 17 company representatives: three firms eventually declined to participate.

The interview guide included four sets of open-ended questions. The first set focused on the firm's business model, including value propositions, customer segments, and revenue streams. Questions about the general characteristics and the background of the enterprises were also included (in a few cases, additional data were accessed on the firms' home pages). The second set honed in on the firm's perceptions of their own competitive advantages -- a provocative question asked in all interviews was "Why does the producer not approach the customers more directly (or vice versa)?" The last two groups of questions targeted the wholesalers' clients (i.e. their suppliers and/or buyers). In addition to details about suppliers and customers (which were rarely provided), the questions covered more general issues, such as how contacts with existing clients had been established and how new clients were found.

Findings: general characteristics of wholesaler sample

The wholesalers in the sample represented several industries ranging from imports of seeds, garden supplies, and safety equipment to exports of forest products and apparel. The company histories were as diverse as the companies themselves -- some of the firms had existed for decades and built up large and stable networks of contacts in Sweden as well as abroad, while others were still in an expansion phase. The founders of several of the wholesalers had worked in large manufacturing companies with international operations where they had built up deep knowledge of market conditions in Sweden and abroad, and eventually spun off the wholesaling firm. A few of these were still collaborating with the former employers of their founders. In some cases, the firm itself had made the transition from manufacturing to wholesaling. A small number of companies were wholesale affiliates of foreign multinationals, supplying products from their parent to customers in Sweden and the other Nordic countries. This pattern, with imports and exports of the same good (POT) was common not only among the wholesale affiliates but more generally for the wholesalers that imported goods from distant markets.

The most common destination markets for exporting wholesalers were the neighboring Nordic countries, although a few firms claimed to operate globally. Most wholesalers reported that their suppliers were predominantly small and medium-sized enterprises, but the firms with global sales were also exporting goods from large producers. Their customers comprised both other wholesalers and retailers and corporate clients. None of the firms reported export sales directly to individual private consumers. The geographic reach of the importing wholesalers was wider than that of the exporters, in many cases including the Americas, Asia, and North Africa. Their main customers in Sweden were retailers or corporate clients. Several of the importing wholesalers stressed that they often added value to the goods they were importing, both by repackaging and labeling goods in accordance with EU standards, and through further processing. These wholesalers were also likely to export the processed goods to other Northern European markets.

Findings: functions and competitive advantages

The interviews suggest that Swedish wholesalers recognize four areas where they believe they have competitive advantages that allow them to provide valuable services to other enterprises. These can be classified under the headings Scale and scope, Expert knowledge, Market Knowledge, and Value added. These can also be interpreted as their main functions in the trading system. In addition, several of the firms consider their Strategic networks as fundamental for their competitiveness. Some direct quotations from the interviews (translated from the original Swedish by the authors) are useful to reflect the range of arguments provided by the wholesalers.

On the importance of scale and scope:

"...in terms of volumes, we purchase maybe 10 times as much as ICA [the largest Swedish retail chain] would buy, which gives us better opportunities to negotiate with suppliers about prices, delivery times, and other matters."

"We purchase larger volumes and are able to bargain stronger for discounts than what our customers could have done."

"We provide all products in one and the same place. We buy both from intermediaries and directly from producers... and they all have their particular specialties and different offers depending on season".

"Our products have low unit value, so you need to trade rather large volumes to make it profitable."

These quotations are consistent with the theoretical argument that wholesalers can reduce transaction costs by pooling export goods from several producers and distributing fixed costs across products. However, the statements also reflect a cost dimension that is rarely found in theoretical analyses, namely the bargaining power that wholesalers have thanks to their size. The statements about bargaining and negotiations with suppliers show that wholesalers acquire goods that they export on their own account, rather than providing services for a fee. Some wholesalers also engage occasionally in specialized “transaction-creating” services, operating as export agents on behalf of producers, but these activities account for a small share of their operations. Our sample includes only one firm reporting that it operates mainly as a specialized export agent. This is in accordance with expectations: there is a separate category in Swedish register data for firms that are primarily export or import agents, but their shares of the total number of trade intermediaries and total trade are much lower than those of wholesalers. It can also be noted that the bargaining dimension is likely to complicate empirical analysis of the quality-sorting function of wholesalers. Low cost in this context does not necessarily reflect manufacturers productivity of the quality of goods (as assumed in theoretical models like Crozet et al. 2013), but could also signal strong bargaining power among wholesalers.

On expert knowledge:

“[Our products] are in the heavily regulated agricultural sector where you need a great deal of expertise to get around.”

“We know how to select suppliers and designs.”

“We help the customer to understand which parameters of an order they can decide about: color, pattern, and so forth.”

“Our strength is our broad expertise in food products.”

“We help large producers find buyers for their output globally, but we also assist the customer by eliminating overhead costs and by providing logistics, transport and financing services.”

The statements in this group reflect two sets of skills and knowledge that provide competitive advantages to wholesalers: first, technical competence and understanding of production processes, and second, competence related to “physical-fulfillment” services that are linked to the export transaction itself. The full service provision suggested by the

last quote appears to be relatively rare in Swedish wholesaling, judging from the interviews (although we cannot claim that our small sample is in any way representative).

On market knowledge:

"...it is not always easy to deal with suppliers from India, Egypt, and China unless you do it on a daily basis."

"We focus on markets that are not 'mature' yet. If there is a business deal between Germany and Italy, the partners will be able to handle even large volumes on their own. If the customers are in Egypt or Ecuador, it will be difficult for them to handle large transport volumes on their own, and they will have to wrestle with new terms of payment."

On value added:

"We have our own product development department with 8-10 staff member who develop new concepts for our customers on the basis of the products of our suppliers."

"Some goods we sell right away, in other cases, we first process and package the goods."

The market knowledge arguments match earlier theoretical arguments and empirical evidence, which suggest that wholesalers have their strongest advantages in culturally distant markets (Peng and York 2001, Trabold 2002). The observations regarding value added activities have also been made in earlier empirical studies (Spulber 1996a). Theoretical studies rarely discuss the value-adding role of wholesalers, except for Blanchard et al. (2017), who suggest that wholesalers can reduce asymmetric information regarding product quality by establishing private labels: this requires, at the very least, packaging and new private labels.

On strategic networks:

"50% of what we deliver to the Nordic region is manufactured by our German parent company."

"We are mainly a sales organization and we distribute goods from our parent company and our factories in Denmark, Germany, and Poland to customers in Sweden and Norway."

“To some extent, we supply products that are complementary to the goods that customers buy directly from our Norwegian parent company. “

“We have a strong brand name and a sales organization with a network of customers and partners all over the world.”

The strategic networks that wholesalers consider as major competitive assets are perhaps best understood as resources that are “valuable, rare, and costly to imitate”, in line with the resource-based view (Barney 1991). Firms that operate as wholesale affiliates typically have exclusive distribution rights to the branded goods from their parent company, which guarantees a market position. It is interesting to note that most of these wholesale affiliates also trade goods that are not produced by their parent company. The reason is probably a wish to exploit economies of scale in the distribution system, perhaps together with the kinds of demand complementarities discussed by Bernard et al. (2018). In other words, these wholesalers illustrate the prevalence of CAT and POT in multinational networks (Bernard et al. 2018, Damijan et al. 2013, 2014).

Our questions about how wholesalers find their suppliers and customers are intended to show how wholesalers match producers to customers in practice, and to reveal whether intermediaries find their suppliers and buyers or if it is the other way around.

On how wholesalers find their buyers:

“Trade fairs, other firms in our company group, and staff members with strong networks of contacts are important for reaching new customers abroad.”

“We know pretty well which actors in Scandinavia are large enough to handle the volumes that we work with. I would say that, initially, we were the ones to actively seek them out, rather than the other way around.”

“There are rarely any new customers in our world – the Swedish grocery sector is rather stable and we already have our existing network of contacts there.”

The search for buyers does not differ much from the search for suppliers -- the importance of trade fairs is emphasized here as well, and both intermediaries and their customers are active in the process. However, our particular sample suggests that the buyer side may be more concentrated. While the supplier side is dynamic and to some extent chaotic, with new producers emerging and old ones fading away, there seems to be more stability on the buyer side. With the caveat that our sample is not representative, this is consistent with the picture that wholesalers source their products from SMEs that are too small to carry the

fixed costs for direct exports. The population of potential suppliers is large, and a significant search effort is needed to find suitable matches. Wholesalers of consumer goods do not sell directly to private consumers, but reach them through retailers and distributors. Hence, the number of direct customers is smaller, which reduces the necessary search effort. Wholesalers of industrial inputs, on the other hand, may sell directly to SMEs and face a more fragmented market. They are forced to work harder to identify new customers and will therefore rely more on networks, trade fairs, and active marketing of their products.

Summarizing these observations from the interviews, it is clear that the Swedish wholesale sector exhibits much of the diversity that is reflected in the empirical literature discussed in the previous chapter. This is a challenge for theory building, since it is not obvious how assumptions and stylized facts should be selected. It is also a challenge for quantitative analysis, since data limitations make it hard to control for all differences between trade intermediaries in value propositions, customer segments, revenue streams, and other fundamental characteristics. Keeping these caveats in mind, we will proceed to explore the role of wholesalers in Swedish exports using the available register data sets.

3.2 Wholesalers in Swedish foreign trade: statistics from registry data

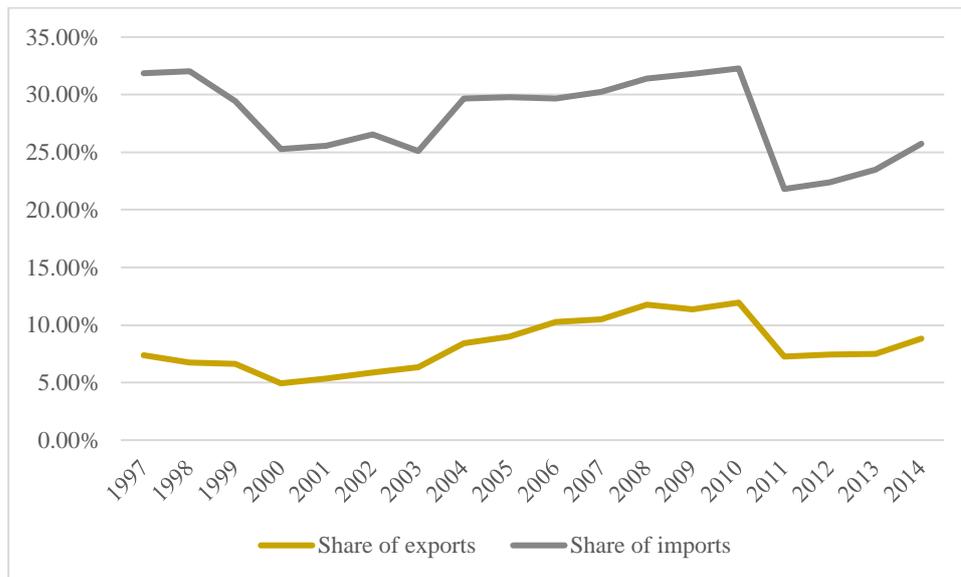
Before we turn to our empirical estimations, the following figures and tables provide a brief summary description of wholesale firms in Swedish international trade. Figure 1 shows the shares of wholesalers in Swedish aggregate goods trade over the period 1997-2014. Their share of exports has fluctuated between 5% and 12% over the period, with an average around 8% in recent years. The wholesalers' share of imports is higher, at just below one-quarter of the total imports.¹⁸ Looking at the development over time, Figure 1 indicates a weakly negative long-term trend for the import share, and a weakly positive trend for exports. The drop in wholesaler import and export shares in 2011 is also notable: some of this is related to a reclassification of individual enterprises from the wholesale to the manufacturing sector. As noted by Bernard et al. (2010) for the US, it is common that large enterprises have establishments in wholesale as well as manufacturing, and their industry classification depends on the relative shares of these two sectors in their mix of activities. Already small shifts in sector shares may result in reclassification of the marginal enterprises. The same applies for Sweden and warrants a caution: formal data underestimate the true share of indirect exports, since the wholesale exports of

¹⁸ These figures are close to those found by Bernard et al. (2010) for the United States, where wholesalers accounted for about 9 % of export value and 22 % of import value in 2002.

manufacturing enterprises with relatively small wholesale units are not covered.

Furthermore, the Carry-Along-Trade identified by Bernard et al. (2018) in US data and the Pass-On-Trade noted by Damijan et al. (2013, 2014) in Slovenia are not captured in aggregate data but are likely to exist in Sweden as well -- in fact, in the previous section, we noted the existence of POT among Swedish wholesalers.

Figure 1 Wholesalers' share of Swedish trade over time



Source: Own calculations based on registry data.

Another point to note is that the data in Figure 1 refer to wholesalers registered in Sweden. The survey of empirical literature in Section 2.4 revealed similar patterns in several other countries as well. It was also noted that many trade intermediaries have extensive global networks, both in countries where they have permanent physical presence and elsewhere outside their home market. This suggests that some of the goods exported from Sweden to other countries are handled by foreign trade intermediaries that are not identified in the Swedish data -- if foreign patterns are similar to the Swedish one, this share could be around one-third or more. Similarly, in addition to the imports carried out by Swedish wholesalers, there are foreign wholesalers shipping products from foreign exporters to the Swedish market. Detailed data on foreign wholesaler participation in Swedish exports and imports are not available, but the aggregate wholesaler shares, including the activities by both Swedish and foreign wholesalers, are likely to be substantially higher. It is not

unreasonable to presume that domestic and foreign wholesalers jointly take part in perhaps one-half of Swedish exports and imports.

Table 2 ranks product categories according to the share of wholesalers in aggregate exports. Wholesalers play a particularly important role in four product categories, accounting for around 40% of exports in each of these: non-metallic mineral products, apparel, agricultural products, and printed media. The shares are above average also for goods such as other transport equipment, computer, electronic and optical products, and other manufactured goods. Both theoretical and empirical evidence from other countries suggest that wholesalers have advantages in goods with a high commodity content, which to some extent is reflected in the pattern emerging from Table 2. However, some of the product groups with high wholesaler shares -- such as computer, electronic and optical products and other manufactured goods -- are difficult to fit into the commodity category. These differentiated products tend to require investments in product-specific knowledge, which is costly and reduces the wholesalers' cost advantages relative to direct exporting. Hence, one possibility is that the more differentiated products are shipped to more distant destinations. Another possible explanation has to do with the knowledge base of wholesalers. An interesting observation from analysis of "relatedness" among Swedish industries -- with "relatedness" defined on the basis of inter-industry job mobility -- is that wholesalers in the more technologically advanced sectors are often closely related to the relevant manufacturing sector (Henning and Nedelkoska 2014). In other words, when employees from manufacturing firms change jobs, they relatively often find new jobs in the related wholesaler firms. These investments in product-specific knowledge could explain the ability of Swedish wholesalers to compete in some categories of differentiated goods. A third explanation is that Swedish wholesalers are also present in other Northern European markets and may sometimes have centralized their sourcing functions to Sweden. In these cases, they would be engaged in POT although their main occupation might be import wholesaling -- as noted earlier, many wholesalers are engaged in imports as well as exports.

Table 2 Wholesalers' export share per product category

Product category	Wholesalers' share of exports	Products share of total exports
Other non-metallic mineral products	43,74%	4,52%
Wearing apparel	42,29%	0,54%
Products of agriculture, hunting and related services	41,55%	0,37%
Printing and reproduction services of recorded media	38,52%	0,46%
Other transport equipment	26,71%	1,28%
Computer, electronic and optical products	18,66%	4,35%
Other manufactured goods	16,60%	5,21%
Natural water; water treatment and supply services	16,51%	1,20%
Products of forestry, logging and related services	15,55%	0,07%
Wood and of products of wood and cork, except furniture	12,22%	1,20%
Rubber and plastic products	10,54%	1,20%
Furniture	10,25%	2,94%
Repair and installation services of machinery and equipment	9,85%	1,85%
Fabricated metal products, except machinery and equipment	8,72%	2,64%
Leather and related products	8,50%	2,05%
Chemicals and chemical products	8,38%	4,43%
Coke and refined petroleum products	8,17%	3,68%
Electrical equipment	7,67%	7,25%
Other mining and quarrying products	7,31%	0,04%
Food products	6,73%	1,35%
Basic metals	6,46%	9,61%
Machinery and equipment n.e.c.	6,05%	7,54%
Paper and paper products	4,80%	3,94%
Textiles	3,85%	1,24%
Motor vehicles, trailers and semi-trailers	3,51%	12,60%
Basic pharmaceutical products and pharmaceutical preparations	3,20%	7,16%
Beverages	2,93%	0,26%
Coal and lignite	1,94%	0,55%

Electricity, gas, steam and air conditioning	1,19%	1,04%
Fish and other fishing products; aquaculture products	0,96%	0,64%
Metal ores	0,00%	0,90%

Exports during the period 2008-2014.

Table 3 shows the top-10 destinations for wholesale exports from Sweden. Worth to note is that the list is dominated by Sweden's Nordic neighbors, Denmark, Norway and Finland. Another interesting fact is that two hubs for entrepôt trade,¹⁹ Malta and Gibraltar, are in the top 10. Yemen is the only country in the top 10 which is not located in Europe (Greenland is often considered part of the Nordic region). The emphasis on markets that are geographically and culturally not so different from Sweden suggests that the producers using the wholesalers' services are primarily young and/or small companies at relatively early stages of their internationalization processes. Since the market-specific entry costs related to destinations that are culturally and institutionally similar to the home country are relatively small, most larger firms are probably exporting directly to these destinations.

Table 3 Top 10 destinations with the highest shares of wholesale exports

Country	Total exports (SEK bn)	Wholesalers' share of exports	Share of total Swedish exports
Gibraltar	15	33%	0,09%
Faroe Islands	3,6	33%	0,02%
Greenland	11	30%	0,07%
Malta	5,2	23%	0,03%
Iceland	40	23%	0,24%
Denmark	1093	22%	6,44%
Estonia	116	21%	0,68%
Yemen	3,8	21%	0,02%
Finland	1004	18%	5,92%
Norway	1602	18%	9,45%

Exports during the period 1997-2014. Only countries with at least SEK 1 bn. in total exports are included in the list.

¹⁹ An entrepôt is a port where goods are imported, possibly stored and then re-exported, rather than being consumed locally. The entrepôt thus functions as a marketplace or logistics hub in international trade.

Table 4 shows the ten countries with the *lowest* share of wholesale exports. Wholesale exports amount to less than 1% of overall exports to all of these destinations. Most of these countries are distant from Sweden, both geographically, culturally, and institutionally, and their economies are small, exerting very limited gravity pull on Swedish exporters. Overall exports are small and likely to consist of products with relatively high value-to-weight and profit ratios. Although wholesalers are able to pool goods from many exporters and divide country-specific trade costs among all these export goods, it is obvious that there are markets that remain out of bounds even for most specialized wholesalers.

Table 4 Top 10 destinations with lowest shares of wholesale exports

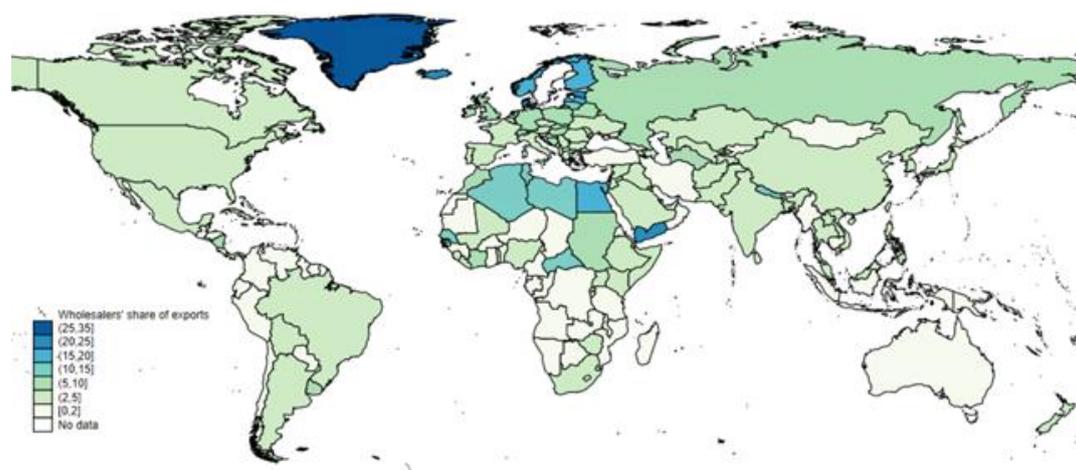
Country	Total exports (SEK bn)	Wholesalers' share of exports	Share of total exports
Botswana	3,9	0,07%	0,02%
Barbados	1,7	0,12%	0,01%
Jamaica	4,5	0,25%	0,03%
Papua New Guinea	1,2	0,27%	0,01%
Congo	2,7	0,41%	0,02%
Paraguay	2,0	0,52%	0,01%
Honduras	3,0	0,61%	0,02%
Guinea	1,5	0,64%	0,01%
Burkina Faso	1,3	0,65%	0,01%
Dominican Republic	4,0	0,67%	0,02%

Exports during the period 1997-2014. Only countries with at least SEK 1 bn in total exports are included on the list.

Figure 2 summarizes the information from Table 3 and Table 4, including all export destinations. The pattern confirms the dominant position of the Nordic region as the most important destination for Swedish wholesale exports -- the shares of wholesalers are large, and aggregate export volumes are also significant, with the exception of Greenland and the Faroe Islands, who jointly account for less than 0.1% of Swedish exports. The map also reveals that wholesaler shares do not diminish with distance in a linear manner: there is a zone of relatively high wholesaler shares running across North Africa into the Middle East and some South Asian economies. It is likely that the producers exporting indirectly to these more distant countries are not the same ones that export through wholesalers to the Nordic region. Instead, it is likely that the firms behind the high wholesaler shares in this zone are somewhat larger and more experienced -- probably so much so that they can manage as direct exporters to relatively familiar European destinations -- but not so

qualified that they are able to reach culturally and institutionally distant markets outside Europe on their own. As noted earlier, Swedish register data do not provide information on who supplies to wholesalers. The reasoning above suggests that average supplier size increases with distance, be it geographic, cultural, or institutional.

Figure 2 Wholesaler shares of Swedish exports by country



Source: Own calculations based on registry data.

Looking at wholesale firms from a labor market perspective, it can be noted that the wholesale sector employed 3.4% of the Swedish labor force in 2014 (source: RAMS). The sector accounted for 3.8% of GDP (source: FEK). The number of firms registered as wholesalers in 2014 was about 16,000, excluding firms with zero full-time employees.²⁰ These firms had an average of 10 employees; the median number was 2. A slight majority of the 160 000 employees in the wholesale sector worked in small firms, with fewer than 50 employees. Among wholesale firms, the vast majority of the firms were involved in both imports *and* exports; 10 % of the employees worked in pure importing firms, and even fewer, 3.5 %, worked in pure exporting wholesale firms.

²⁰ Firms with zero employees accounted for 10 % of wholesale exports in the year 2014, or about SEK 10 bn. These likely include individuals who run an exporting business as a part-time job.

4 Empirical method, variables and variable description

The empirical analysis of wholesale exporters in Sweden is divided into three parts. First, we analyze the link between the wholesalers' export shares and their productivity. Focus is then turned to the relationship between manufacturing exports and wholesale exports: the specific research question is whether new wholesale exports of a particular product variety influences direct exports of the same goods. Lastly we analyze the relationship between institutional characteristics of the destination markets and the wholesale export share.

4.1 Wholesale exports and productivity

The focus in the first part of our analysis is on the relation between wholesale exports of a particular good and the total factor productivity (TFP) gap between direct exporters and firms registered as non-exporters in the same industry. Melitz (2003) shows that the level of TFP is a key factor determining the exporting behavior of firms. For firms to profitably engage in exports, the level of productivity must be sufficiently high to cover the fixed costs associated with exports. Since lower productivity firms do not expect to profit from exports, they decide to produce for the domestic market only. However, direct export is not the only option for firms that cannot recover the fixed cost of exporting. Åkerman 2018, Ahn et al. (2011), and other contributions identified in Section 2 that build on Melitz (2003) point out that while the most productive firms will engage in direct export, firms with intermediate levels of productivity can use an intermediary, such a wholesale firm, to reach foreign markets with their products. While these firms cannot recover the fixed costs from direct exports, their productivity levels are sufficiently high to cover the margins of export intermediaries. Firms with the lowest productivity still remains local, suggesting the following productivity hierarchy:

$$TFP^{Direct\ exp} > TFP^{indirect\ exp} > TFP^{local} \quad (1)$$

While any direct export flows are readily observed in the data, indirect exporters can unfortunately not be identified in Swedish register data. This means that within the group of firms categorized as non-exporters it is not possible to distinguish indirect exporters from firms that are solely focusing on the local market. To account for the former group's characteristics (such as their TFP), we therefore use aggregate data at the industry level to see how the productivity gap between the two firm categories that are visible -- direct exporters and other firms -- is related to the share of industry exports handled by wholesalers. The idea, based on (1), is that the average productivity of all firms categorized

as non-exporters is an increasing function of the share of indirect exporters to purely local market oriented firms in that industry.

To model the wholesale export share, we consider a modified (ratio type of) gravity model (see e.g. Head and Mayer 2000, Eaton and Kortum 2002) that takes the following form,

$$\left(\frac{X_w}{X_{tot}}\right)_{i,j,t} = \alpha_{(ij)} + \delta_t + \beta \ln \left(\frac{\varphi_{exp}}{\varphi_{noexp}}\right)_{i,t} + X_{i,j,t} \Theta + \epsilon_{i,j,t} \quad (2)$$

While the standard gravity model with a ratio-type estimation normalizes bilateral trade flows using a reference country, we measure the share of wholesale exports (rather than the volume) of wholesale exports to total exports of goods that are produced in the manufacturing industry i , and exported to country j in year t . The main explanatory variable is the productivity ratio $\varphi_{exp}/\varphi_{noexp}$ (expressed in log form), where the numerator corresponds to the average productivity of exporting firms in industry i , and the denominator gives the average productivity of non-exporting firms in the same industry. Based on the reasoning above, we expect that wholesale firms should play a larger role exporting manufactured goods produced in industries where this ratio is small, compared to in industries where it is large. A higher productivity ratio is therefore hypothesized to be inversely related to the export share of wholesale firms.²¹

One benefit from a ratio specification is that it reduces the number of control variables needed. Yet, we include a set of control variables $X_{i,j,t}$ that characterize the set of direct exporters and non-exporters and that may impact exports. To assess whether the productivity differences reflect differences in the use of labor or capital in productivity, we specifically control for the ratio of average firm size (labor gap), relative capital intensity (capital gap) and output ratio (output gap) for exporting and non-exporting firm.

One of the comparative advantages of wholesale firms is their ability to deal with a multitude of different goods, suggesting that the number of exported goods in an industry may be indicative of wholesaler presence. For this reason, we also consider the ratio of the number of different products exported by wholesalers to the number of products exported directly by other firms within the industry.

As noted in the descriptive statistics, wholesale firms do not only export goods, they also play a vital role as importers. Hence some of their exports to a given market may consist of imported goods from another market, rather than goods produced by and sourced from

²¹ Since the productivity ratio is expressed in logarithmic form, interpretation of /100 is the unit change in X_w/X_{tot} that results from a 1 percent change in $\varphi_{exp}/\varphi_{noexp}$.

domestic firms. In some industries we have close to zero wholesale imports and positive volumes of exports whereas in other industries wholesale imports exceed the export figures by a large margin. In industries with limited wholesale imports, wholesale exports originate from domestic suppliers whereas in industries with substantial wholesale imports, some wholesale exports are likely to consist of re-exported imports. In the case with re-exported imports we may expect the productivity closing gap effect of wholesale exports to be weaker, since re-exports break the connection to domestic indirect exporters. At the same time, to the extent that wholesale firms are efficient suppliers they may also act as suppliers of imported intermediate goods, increasing productivity levels among those firms that do not have any direct own import activities. To control for imports, we include the level of imports of a good j from all countries at time t . Finally, we control for the economic size of the exporting industry and the destination market by way of industry sales and destination market GPD. We note that since the dependent variable constitutes a share rather than the volume of exports, the expected sign of destination market size is negative, as in Åkerman (2018).

In this part, all regressions are fitted with unit fixed effects at the level of industry(spin)-country captured by $\alpha_{(ij)}$, together with fixed effects at the year level.

4.2 The relationship between direct exports and wholesale exports

The second part of the analysis considers the relationship between manufacturing exports and wholesale exports. That is, the analysis seeks to capture how direct exports to a given market is affected by wholesale export to that same market. This relationship is analyzed using a constant elasticity model given by

$$\ln X_{i,j,t}^m = \alpha_{(ij)} + \delta_t + \beta \ln X_{i,j,t}^w + X_{i,j,t} \Theta + \epsilon_{i,j,t}, \quad (3)$$

where $X_{i,j,t}^m$ here refers to the direct exports from manufacturing industry i to country j in year t , and $X_{i,j,t}^w$ to the total exports of wholesale of goods produced in the manufacturing industry i and exported to country j in year t .

The specification in (3) measures the elasticity of direct exports to that of wholesale exports and thus requires a simultaneous flow of both parties to the same market. To analyze what happens with direct exports if wholesale firms emerge as exporters in a product/market cell, we use a dummy variable to account for wholesale exports, instead of $\ln X^w$. It takes the value of 1 for positive exports flows from wholesale firms and zero otherwise.

The emergence of wholesale exports may impact direct exports in a series of ways. First, wholesale firms may establish new trade channels to the destination market, which may open the door for new direct exporters as well as benefiting already existing exporters, hence boosting direct exports. In this case, wholesale exports partly function as a complement to direct exports. On the other hand, if wholesale firms compete with direct exporters their emergence would rather lead to a loss of market shares and a reduction direct export. Therefore, we also consider how the number of different goods exported by manufacturing firms relate to the number of different goods exported by wholesale firms.

The control variables are gathered in $X_{i,j,t}$, which here comprise total industry output (log) of firms in the manufacturing industry i at time t , and the GDP (log) for country j at time t . In this model we consider two sets of fixed effects. In addition to year fixed effect (δ_t), the model is estimated using both separate country and industry fixed effects and unit country-industry(spin) fixed effects. While the former model deals with inter industry(spin)- and inter country variation in manufacturing exports, the latter looks at inter country-by-industry(spin) variation, which subsumes the separate country and industry(spin) fixed effects.

4.3 Destination market characteristics

In the third and final part of the analysis, we take a closer look at the destination markets and consider the relationship between the wholesalers' export share and institutional quality of the destination market. In the process of exporting a good, wholesale firms contribute with their networks and export experience in solving a contract problem. The difficulties in arranging a contract with firms in any given export destination is related to the quality of the institutions of the destination market. Well-functioning institutions are known to reduce search costs, to ease the hold-up problem, and to reduce the contract cost (Rauch and Watson 2003). Hence, if wholesale firms are efficient in solving the contract problem, the share of wholesale firms' exports is supposed to be relatively large in markets with weak institutions (Nunn 2007, Söderlund and Tingvall 2014, Bernard et al. 2015, Olney 2015). To further analyze this relationship, we consider the modified gravity model in (2)

$$\left(\frac{X_w}{X_{tot}}\right)_{i,j,t} = \alpha_{i,j} + \delta_t + \beta_1 IQ_{j,t} + \beta_2 \ln Distance_{j,t} + X_{i,j,t}\theta + \epsilon_{i,j,t}, \quad (4)$$

where the dependent variable is the same as in the previous model, but here the main explanatory variables that enters the model are here $IQ_{j,t}$ and $\ln Distance_{j,t}$ that capture

the quality of institutions in country j and the geographical distance (log) to that country at the time t . As discussed in the gravity of trade literature (see e.g. Bergstrand 1990; Anderson and van Wincoop 2003), geographical distance is a powerful determinant for world trade in that trade between two parties decreases with distance. In addition to geographical distance, it has been shown that a host of other factors related to distance such as e.g. language, religion, political cultural, and institutional factors play a role for trade (Srivastava and Green 1986; Dow and Karunaratna 2006; Sousa et al. 2008; Tadesse and White 2010). Put differently, trade is associated with a series of distance related costs, including transport-, information-, control-, and contract costs (Rauch and Watson 2003, Kokko and Tingvall 2014). As pointed out above, one characteristic of wholesale firms is their capacity to solve the contract problem. Since the contract cost is relatively high in countries with weak institutions this suggests a relatively high wholesale export share to countries with weak institutions. We might also hypothesize that the impact of weak institutions is further reinforced by geographical distance. That is, poor institutional quality is likely to matter more for trade to more distant markets. To allow for this kind of nested relationship, we include an interaction term between $IQ_{j,t}$ and $\ln Distance_{j,t}$.

The remaining control variables collected in $X_{i,j,t}$ are given by the total industry output (log) of the firms in manufacturing industry i at time t , and the GDP (log) for country j at time t . As in the model (3), we allow for two sets of fixed effects, at the industry(spin) and country level as well as the industry(spin)-by-country level.

4.4 Variables

Descriptive statistics for the regression variables are presented in Table 5. The top panel contains variables reflecting trade characteristics. *Wholesale export share* corresponds to the total exports of goods by wholesalers in a given manufacturing industry as a share of the total exports of these goods to a given country. Goods are here defined via the correspondence between the 5-digit industry classification codes (NACE rev. 2) and trade goods classification of exported goods (SPIN.) Across industries, wholesale exports account for on average of 30 percent of total exports. Compared to the average volume of direct exports of manufacturing goods (*Direct export*), wholesale exports (*Wholesale export*) are considerably lower. However, in terms of the number of different types of goods exported to a given country, wholesale exports are much more heterogeneous, with on average 35 types of goods (*Nr. wholesale goods*) compared to merely 5 for manufacturing firms (*Nr. manufacturing goods*) that export directly. Of the total number

of different goods exported from an industry, wholesalers account for 43 percent (Goods share). The variable *Wholesale import* measures the total import volume in million SEK for each product category, aggregated across all countries. From input-output analysis, we know that the own industry usually is the largest supplier of intermediate goods, connecting intra-industry imports to inputs of intermediate goods (Miller and Blair 2009). Hence, whether wholesale imports will have a closing or widening impact on the TFP-gap is to some extent an empirical question.

We define the variable *Productivity gap* as the difference between the average productivity of non-exporting firms and exporting firms in a given industry. Productivity in turn is estimated using the proxy variable approach suggested by Akerberg, Caves, and Frazer (2015), which accounts for the transmission bias that can arise from the level of production inputs (labor and capital) being predetermined in response to unobserved productivity shocks. We choose to express the productivity gap in terms of the logarithmic difference: the data show that the productivity of exporters is 5 percent higher on average than that for non-exports. Similarly, we define the *Labor gap* and *Capital gap* as the logarithmic difference between the same groups of firms and find that exporting firms are considerably more labor intensive than non-exporting firms, but that the reverse relationship is true for capital. In terms of skills (*Skill gap*), i.e. the share of the workforce with post-secondary degree, we note that exporting firms on average are endowed with a higher share of skilled labor.

To measure institutional quality, we rely on three different measures retrieved from the World Bank database, namely *Governmental efficiency*, *Rule of law*, and *Regulatory quality*, where a higher score represents better institutions.

Table 5 Descriptive statistics of regression variables

Variables	Obs.	Mean	Std.var	Min	Max
<i>Trade characteristics</i>					
Wholesale export share	104.743	.304	.361	0.000	1.000
Direct export (log)	82.895	7.298	3.122	-7.398	16.664
Wholesale export (log)	96.797	5.159	3.269	-7.292	16.408
Wholesale dummy	168.953	.573	.495	0.000	1.000
Nr. manufacturing goods	86.272	8.656	16.876	1.000	396
Nr. wholesale goods	109.884	35.186	115.314	1.000	2937
Goods share	109.884	.433	.262	.007	1.000
Wholesale import (in MSEK)	168.953	191.706	392.223	0.000	4014.167

Industry sales (log)	145.861	14.641	1.871	7.170	18.720
<i>Industry characteristics</i>					
Productivity gap (log)	115.162	.0580	.248	-1.614	1.633
Sales gap (log)	115.162	1.040	2.390	-10.260	10.965
Labor gap (log)	115.162	4.023	1.870	-4.497	9.287
Capital gap (log)	115.162	-1.888	1.356	-8.822	8.499
Skill gap	145.861	.251	.129	0.000	.767
<i>Country characteristics</i>					
Governmental efficiency	168.557	.398	.978	-2.446	2.437
Rule of law	168.744	.311	1.026	-2.606	2.100
Regulatory quality	168.557	.391	.966	-2.645	2.261
Distance (log)	165.363	8.220	.922	6.109	9.764
GDP (log)	164.374	25.478	2.032	17.303	30.445

5 Results

5.1 Productivity sorting: the TFP hierarchy

We begin by presenting the results from estimating the model in (1), where we analyze how the share of indirect exports co-varies with the productivity gap between direct exporters and non-exporters. The hypothesis is that firms exporting directly display higher productivity levels than firms that do not export directly, and that indirect exporters in turn have higher productivity than purely local firms. This suggests that a relatively small productivity gap between direct exporters and non-exporters is related to a relatively large share of indirect exporters among the group of firms that do not export directly. The results are presented in Table 6.²²

In the first column of Table 6, we find, controlling for fixed effects at the level of Spin-Country and years, a significant coefficient of -0.024, suggesting that the wholesale export share is decreasing with the TFP-gap. This result is in line with the hypothesis that indirect exporters have higher levels of productivity than local firms, and that a large productivity gap in a given industry-country pair is connected with a lower export share of wholesalers. This result holds when adding controls for country GDP and total industry sales.

A closer look at the results suggest that an increase in productivity gap of one percent would reduce the wholesale export ratio by -0.024/100 percent. At a first glance this may not appear to be a large effect. To investigate the economic significance, we can look at the polar case, when the effect is assumed to be entirely driven by φ_{noexp} and only affects the export share through the numerator, i.e. X_w . Hence, keeping φ_{exp} and the difference

$X_{tot} - X_w$ fixed, we start from the approximation $\frac{\hat{\beta}}{100} \% \Delta \frac{\varphi_{exp}}{\varphi_{noexp}} \approx \Delta \hat{y}$. Adding $\frac{X_w}{X_{tot}}$ to both

sides of the relation, we can rewrite the right hand side as follows $\Delta \hat{y} + \frac{X_w}{X_{tot}} \equiv \frac{X_w + \delta}{X_{tot} + \delta}$ such

that δ gives the change in monetary value of exported wholesale goods that reflect $\Delta \hat{y}$.

From the relationship

²² For the estimates to be unbiased, we would have to assume that that $Cov(Productivity\ gap, Measurement\ error)=0$ and therefore that $Cov(Productivity\ gap^*, Measurement\ error)=0$, where $Productivity\ gap^*$ is the true (unobserved) average productivity of the indirect exporting manufacturing firms. If on the other hand, as in the classical errors-in-variables assumption, that $Cov(Productivity\ gap^*, Measurement\ error)=0$, it would mean that $Cov(Productivity\ gap, Measurement\ error)=0$ which could lead to bias in all estimates. While it is not possible to test for any of these assumptions explicitly, we did exclude $Productivity\ gap\ (log)$ from the model (with the risk of introducing endogeneity in the model) and re-estimated the different specifications to find that the point estimates and significances remained largely the same.

$$\frac{X_w}{X_{tot}} + \frac{\hat{\beta}}{100} \% \Delta \frac{\varphi_{exp}}{\varphi_{noexp}} \approx \frac{X_w + \delta}{X_{tot} + \delta}$$

it is then possible to solve for an expression of δ , which is given by,

$$\delta \approx \frac{X_{tot} \hat{\beta} \% \Delta \frac{\varphi_{exp}}{\varphi_{noexp}}}{100 \left(1 - \frac{X_w}{X_{tot}}\right) - \hat{\beta} \% \Delta \frac{\varphi_{exp}}{\varphi_{noexp}}}$$

Table 6 Wholesale firms' share of industry exports and the productivity gap between exporting and non-exporting firms.

Variables	(1)	(2)	(3)	(4)	(5)	(6)
Productivity gap (log)	-0.024*** (0.005)	-0.022*** (0.006)	-0.017*** (0.006)	-0.022*** (0.006)	-0.022*** (0.006)	-0.016*** (0.005)
Output gap (log)			-0.004** (0.002)	0.002** (0.001)		
Labor gap (log)			0.008*** (0.002)			
Capital gap (log)				-0.003*** (0.001)		
Imports					0.000*** (0.000)	0.000*** (0.000)
Nr. of exported goods ratio						0.610*** (0.011)
Industry output (log)		-0.013*** (0.003)	-0.013*** (0.003)	-0.014*** (0.003)	-0.013*** (0.003)	-0.010*** (0.003)
GDP (log)		-0.011 (0.018)	-0.012 (0.018)	-0.011 (0.018)	-0.014 (0.018)	-0.024 (0.016)
Constant	0.193*** (0.002)	0.690 (0.465)	0.667 (0.464)	0.687 (0.464)	0.7657 (0.465)	0.770* (0.421)
Observations	75,876	74,062	74,062	74,062	74,062	74,062
R-squared (within)	0.011	0.011	0.011	0.011	0.011	0.118
Number of panels (country/spin)	15,821	15,406	15,406	15,406	15,406	15,406

*Dep var. The share of wholesale firms in total exports. All productivity estimates within industry averages computed by ACF-adjusted Levin-Petrin TFP. Estimation comes from OLS with fixed effects on the level of years and country-by-industry(spun). Clustered (at country/spin level) robust s.e. in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.*

Consider then e.g. a decrease in φ_w that correspond to a one percent increase in $\frac{\varphi_{exp}}{\varphi_{noexp}}$. If both X_w and X_{tot} would be evaluated at their respective sample means, the estimated effect of $\hat{\beta} = -0.024$ would result in a δ of -23 KSEK. As a share of mean wholesale exports (of 11,167 KSEK), it translates into a decrease of 0.21 percent. For a one percent decrease in φ_{noexp} , a decrease of 0.21 percent is not negligible. One caveat, however, is that $\hat{\beta}$

corresponds to the mean of the ratio $\frac{X_w}{X_{tot}}$, and not the ratio of the means used in the calculation of δ . Nevertheless, we believe that the above calculation can give an appreciation of the economic significance of the estimated effect.²³ If we instead consider a one standard deviation decrease in φ_w , it roughly translates into a 25% increase of $\frac{\varphi_{exp}}{\varphi_{noexp}}$, which then would result in a δ of 565 KSEK, or in terms of mean wholesale exports (11,167 KSEK), a decrease by 5 percent, again evaluating φ_{exp} and φ_{noexp} at their respective means.

For the control variables, we note that the estimate for industry output is negative and significant in all specifications, suggesting that direct exports is dominating in industries with high total output values and that the level of GDP in the destination country never turns out significant.

The input of capital and labor are key variables in the productivity estimations. To further explore the robustness of the results we hold constant the output gap and one of the input gap variables for exporting and non-exporting manufacturing firms, which allows us to see whether the productivity effect is driven by differences in the partial productivities of average labor and capital inputs. The results are presented in columns 3 and 4. While both the labor gap and capital gap variables are highly significant when controlling for the output gap, the estimated coefficient of the TFP-gap remains negative and significant. If anything, the TFP-gap is affected slightly when we (in column 3) control for the labor gap. Hence, although the resulting partial productivity estimate is robust with respect to differences in capital and labor inputs, labor inputs seems somewhat more important than differences in capital inputs.

In the last two columns (5 and 6), we add controls for wholesale imports and the number of exported goods. Imports turn to be significant but with little impact on the productivity estimates. However, when the number of different exported goods (Goods ratio) also added, we find a somewhat larger effect on productivity. Thus, if the number of different export goods are controlled, the productivity estimate drops from -0.024 to -0.016. The estimated coefficient for Goods ratio is -0.61, which suggest that a one percentage point increase in the goods ratio reduces the export share of wholesale firms by -0.61/100 percent.

²³ To confirm the magnitude of the implied effect of a percentage change in φ_{noexp} on X_w , we regress X_w on $\ln\varphi_{noexp}$, holding $\ln\varphi_{exp}$ and X_{tot} fixed, with fixed effects on the country-spin and year level. While the estimated parameter of $\ln\varphi_{noexp}$ did not turn out to be significant, it gave a point estimate of -1598, which amounts to a decrease in wholesale export by 15 thousand SEK, should φ_{noexp} increase by 1%.

One of the characteristics of wholesale firms is that they specialize in exporting many different goods, which naturally is strongly correlated with their export volume and therefore also with their export share. If we control for economies of scope -- i.e. the ability of wholesalers to export many different product varieties and share fixed costs among all these varieties -- then we already explain much of the wholesalers' share of exports. Economies of scale -- i.e. pooling fixed costs among several producers of the same product variety -- foreign market knowledge, and the ability to overcome information asymmetries and quality risk are the remaining competitive advantages of wholesalers (see Sections 2 and 3), and these factors jointly explain why the productivity gap variable remains significant.

5.2 Entry of wholesale firms

In this section, we examine the relationship between direct exports and wholesale exports with regard to their elasticity and how manufacturing exports are affected when a wholesale firm emerges on a new export market. The results from estimating the model in equation (3) are presented in Table 7. We split the analysis into two parts: how direct export is affected by wholesale exports and how direct export in terms of the number of different exported goods is affected by the corresponding number of goods in wholesale exports. In the first part, we use two different variables to capture wholesale exports, namely (i) the value of total exports (log) that gives the elasticity between manufacturing export volumes with respect to wholesale export volumes going to the same destination market, and (ii) a dummy variable that captures how the entry of wholesale exports impacts direct exports. For each part, we present the results with two levels of fixed effects: spin and year (columns 1 to 3), and at the level of country-spin pair and year (column 4 to 6).

Specifically, columns 1 and 4 present the results when we use a dummy variable to indicate the emergence of wholesale exports; Columns 2 and 5 present the estimated elasticity of manufacturing export with respect to changing volumes of wholesale exports; finally, columns 3 and 6 present the results for the relationship between the number of different exported goods for manufacturing and wholesale exports.

Table 7 The relationship between manufacturing exports and wholesale exports.

	MfExp (log)	MfExp (log)	MfNrGoods	MfExp (log)	MfExp (log)	MfNrGoods
Variables	(1)	(2)	(3)	(4)	(5)	(6)
Wholesale dummy	0.299*** (0.034)			0.001 (0.024)		
Wholesale exp. (log)		0.143*** (0.007)			0.005 (0.006)	
Nr. of exported goods by wholesale			0.063*** (0.005)			-0.002 (0.006)
Industry output (log)	0.714*** (0.043)	0.664*** (0.046)	1.991*** (0.136)	0.719*** (0.040)	0.728*** (0.044)	1.997*** (0.106)
GDP (log)	0.836*** (0.129)	0.873*** (0.157)	5.474*** (0.534)	1.311*** (0.116)	1.469*** (0.143)	6.374*** (0.432)
Constant	-25.610*** (3.471)	-26.433*** (4.222)	-167.843*** (14.464)	-37.574*** (3.072)	-41.911*** (3.816)	-187.341*** (11.795)
Fixed effects:						
Country, spin, year	Yes	Yes	Yes			
Country by spin, year				Yes	Yes	Yes
Observations	71,222	50,773	56,341	71,222	50,773	56,341
R-squared (within ^A)	0.553	0.608	0.637	0.029 ^A	0.035 ^A	0.044 ^A
Number of panels (country/spin)				14,691	10,856	11,696

Estimation comes from OLS. Clustered (at country/spin level) s.e. in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Beginning with the elasticity, we find an estimated coefficient of 0.14 using industry and country fixed effects (column 2), which becomes insignificant when using unit fixed effects (column 5). A similar pattern occurs when analyzing the dummy variable to denote wholesale exports in regressions (1) and (4): when controlling for unit fixed effects, the positive and significant effect of the wholesale dummy becomes insignificant. Hence, we conclude that there is no robust evidence that wholesale exports co-vary with direct exports, i.e. wholesale exports neither boost nor crowd out direct exports in a systematic manner.

Turning to the results for the number of different goods in columns (3) and (6), we find that with separate fixed effects at the country and SPIN level there is a positive effect of the number of goods exported to a market by wholesale firms and the number of goods directly exported to the same markets by manufacturing firms. The estimated effect of 0.61 is highly significant, -- however, when we control for unit fixed effects the effect becomes insignificant here as well.

To some extent these results are compatible with the notion that wholesale exporters are not in direct competition with direct exports, which may explain why wholesale exports do not crowd out direct exports. However, it is unclear at what level (if at all) and through which channels direct exporters benefit from e.g. established wholesale networks, as suggested by anecdotal evidence (see e.g. Ahn et al. 2011).

5.3 Wholesale firms and destination market characteristics

As pointed out above, one characteristic of wholesale firms is their ability to solve the contract problem, a problem that is regarded to be especially severe in markets with weak institutions (Nunn 2007). Drawing on the literature on trade and institutions, we turn to the results from estimating the model in equation (4) that focuses on the link between wholesale exports share and institutional quality of the destination market. We use three complementary variables to characterize the institutional quality of the destination market; *Governmental efficiency*, *Rule of Law*, and *Regulatory quality*, all of which are relevant for the exporting agent and reflect different aspects of institutional quality (Nunn 2007, Kokko and Tingvall 2014).

The results in Table 8 show that better, or well-functioning, destination country institutions are negatively associated with the share of wholesale exports. This results holds using all three proxies for institutional quality. That is, the more problematic a market is from an institutional perspective, the larger the share of exports that is mediated through wholesale firms. Hence, the results are consistent with the notion that wholesale firms are capable of solving the contract problem and that this is especially valuable in markets with relatively weak institutions. The results are robust with respect to different specifications of the fixed effects. However, the point estimates decrease somewhat when including unit fixed effects. Looking at the estimated coefficients, the results suggest that if e.g. regulatory quality increases by one unit, this would translate into a decrease in the wholesale export share of - 2.8% (column 6).

Table 8 Wholesale exports and institutional quality at the destination market. Dependent variable. Wholesale firms' share of industry exports

Variables	(1)	(2)	(3)	(4)	(5)	(6)
Governmental efficiency	-0.0386*** (0.0110)			-0.0146* (0.0088)		
Rule of law		-0.0526*** (0.0137)			-0.0391*** (0.0114)	
Regulatory quality			-0.0360*** (0.0109)			-0.0280*** (0.0087)
$\ln(y)$	-0.0147*** (0.0035)	-0.0145*** (0.0035)	0.0147*** (0.0035)	-0.0150*** (0.0030)	-0.0150*** (0.0030)	-0.0150 (0.0030)
$\ln(\text{GDP})$	-0.0489*** (0.0182)	-0.0382** (0.0185)	-0.0370* (0.0192)	-0.0368** (0.0154)	-0.0271* (0.0156)	-0.0235 (0.0162)
Country fe	yes	yes	yes			
Industry fe	Yes	Yes	Yes			
Unit fe				Yes	Yes	Yes
Year fe	Yes	Yes	Yes	Yes	Yes	Yes
R ²	0.33	0.33	0.33	0.73	0.66	0.66
Obs.	88,104	88,177	88,104	86,850	86,923	86,850

Note: Robust standard errors within parenthesis (-). ACF-adjusted Levin-Petrin TFP productivity estimates, with significance level given by *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

From earlier empirical evidence as well as the description of Swedish wholesalers, it could be seen that wholesalers are relatively important for exports to relatively distant markets. One way to account for this feature is to include a distance measure to the analysis. Geographical distance alone indicates a non-linear relationship where wholesale exports are pronounced in distant but also in nearby and neighboring markets (as seen in Section 3). To shift focus toward the interplay between geographical distance and institutional quality, we add an interaction term between institutional quality and the distance in Table 9. This model, however, requires some adjustments of the regression specification. Firstly, as distance constitute a key variable, we cannot include country fixed effects in the estimation. Hence, geographical distance enters the models and country fixed effects are dropped. Secondly, as shown in Table A1 (in the appendix) and Figure 2, the share of wholesale exports is not linearly related to distance. We therefore apply both distance and distance squared to the regression model. Hence, the marginal effect of institutional quality on the destination market consists of two parts, the direct effect of institutional quality and the interaction effect between distance and institutional quality. Specifically, the

interaction term indicates whether a longer distance to the destination market amplifies the contract problem, which makes wholesale firms relatively more important whenever the distant markets also have weaker institutions. The results are presented in columns 1-3 in Table 9 with marginal effects depicted in Figure 3.

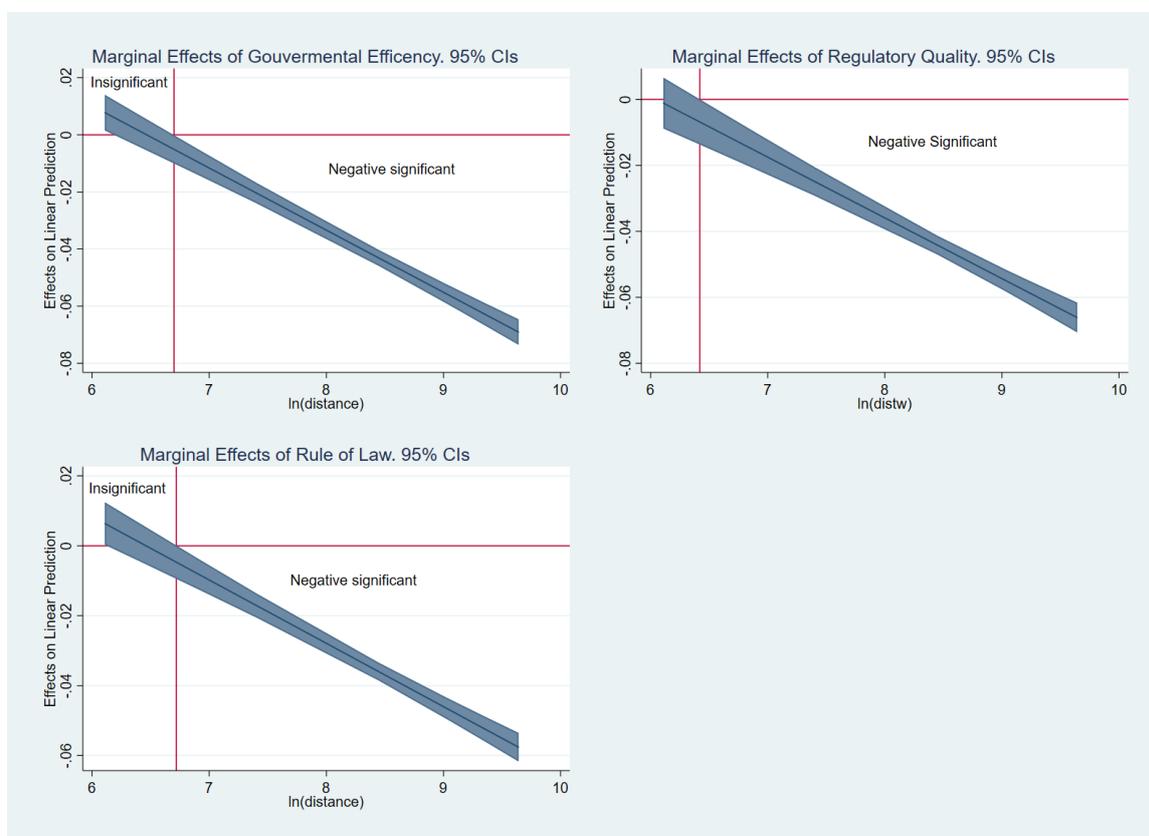
As shown in Figure 3, the marginal effect of institutional quality grows and becomes more negative as the distance to the destination market increases. Specifically, we note that already at a distance of approximately 850 km ($e^{6.75}$) the impact of institutional quality becomes negative significant and as shown in Figure 3, the marginal effect of institutional quality of the destination market rapidly becomes stronger with distance. We also note that the results are stable with respect to choice of proxy for institutional quality (*Governmental efficiency, Rule of law, and Regulatory quality*). Hence, the results are consistent with the hypothesis that wholesale firms not only help in solving the contract problem, but also contribute by facilitating market entry to more distant markets with relatively weak institutions.

Table 9 Wholesale exports, distance and institutional quality at the destination market.
 Dependent variable. Wholesale firms share of industry exports

Variables	(1)	(2)	(3)
Governmental efficiency	0.1407*** (0.0110)		
Rule of law		0.1170*** (0.0106)	
Regulatory quality			0.1113*** (0.0131)
(Gov eff) x (ln Distance)	-0.0218*** (0.0013)		
(Rule of law)x (ln Distance)		-0.0181*** (0.0013)	
(Reg. quality)x (ln Distance)			-0.0184*** (0.0015)
$\ln(\text{distance})$	0.2117*** (0.0207)	0.2356*** (0.0206)	0.1737*** (0.0213)
$\ln(\text{distance})^2$	-0.0109*** (0.0013)	-0.0128*** (0.0013)	-0.0089*** (0.0013)
$\ln(y)$	-0.0144*** (0.0036)	-0.0142*** (0.0036)	-0.0143*** (0.0036)
$\ln(\text{GDP})$	-0.0530*** (0.0006)	-0.0548*** (0.0006)	-0.0541 (0.0006)
Industry fe	Yes	Yes	Yes
Year fe	Yes	Yes	Yes
R ²	0.31	0.31	0.31
Obs.	86,850	86,923	86,850

Note: Robust standard errors within parenthesis (-). ACF-adjusted Levin-Petrin TFP.

Figure 3 Wholesale share of exports, institutional quality and distance to the destination market



Note: Based on regressions in Table R3.

In the last step analyzing the relation between wholesale exports and institutional quality of the destination market, we divide exports into four different categories; *Resource intensive*, *Labor intensive*, *Scale intensive*, *Differentiated goods*, and *Science based industries* mirroring different product categories.²⁴ The results are presented in Table 10 and show a considerable variation across different types of goods. For science-based goods (R&D intensive) we do not find any significant impact of institutional quality. To some extent this is an expected result, since wholesale firms are not likely to have any strong comparative advantage in R&D intensive goods. The exports of advanced goods often require deep knowledge of products and relationship specific interactions between the producer and the buyer, making wholesale intermediates less important for this type of goods (Peng and Ilinitch 1998, Rauch and Watson 2003, Nunn 2007, Kokko and Tingvall 2014, Söderlund and Tingvall 2014). Hence, the lack of significance for science-based good is to some extent an expected result.

²⁴ Following OECD classification of industry grouping.

Similar as for *Science based goods*, there is only a weak connection between wholesale exports and institutional quality for *Differentiated goods*. Differentiated goods can be thought of as targeted toward the consumer market where advertising plays an important role in segmenting the market. Specifically, we only find that *Regulatory quality* is significant for *Science based goods* whereas the other two other institutional variables are insignificant. This suggests that some aspects of institutional quality in the destination market may be of importance but that the result does not hold across all three measures of institutional quality.

Out of the three remaining industry categories, labor- and capital-intensive industries are related to the inputs used in production, whereas scale intensive industries can be thought of as industries with high fixed cost for entry. Among these industries it appears that wholesale firms play a relatively large role in labor- and scale intensive industries. Specifically, we find a negative and significant estimate for two out of three measures on institutional quality for these two industry groups. The firms in these industries are likely to manufacture relatively standardized products or goods with a high commodity content, which means that wholesalers are not required to invest in much product-specific knowledge, which is primarily the domain of the manufacturers. Instead, they can draw heavily on their competences related to market-specific knowledge. Trabold (2002) finds a similar pattern for French companies, with both distance and commodity content of products as strong predictors of wholesaler exports. For resource intensive industries, finally, the results are somewhat contradictory, with a negative and significant estimate for *Governmental efficiency*, an opposite positive estimate for *Regulatory quality*, and a non-significant estimate for *Rule of law*. One possible reason for these contradictions is that many sub-sectors in the resource-intensive industry category exhibit significant economies of scale. This means that companies are often quite large and are often able to become direct exporters since they can distribute fixed export costs -- including costs related to contracting and risk management -- across a large volume of exports. Hence, although wholesalers should have the skills needed for intermediating exports of resource intensive goods to distant markets with difficult institutions, it is common that the producers are large enough to build their own export organizations. In other cases, including some that were highlighted in our interviews with Swedish wholesalers, resource intensive goods may be of such low value that exporting simply requires larger transaction volumes than what individual exporters normally handle. These contradictory results suggest that further analysis is warranted, optimally using data that controls more carefully for both product and firm characteristics.

Table 10 Wholesale exports, institutional quality and type of goods.

Dependent variable. Wholesale firms share of industry exports

	(1)	(2)	(3)
	Inst. Var. Gov eff.	Inst. Var Rule of law	Inst. Var, Reg. quality
(Inst)• Resource-intensive industries	-0.0355* (0.0203)	0.0379 (0.0256)	0.0398** (0.0190)
(Inst)•2 Labour-intensive industries	-0.0285 (0.0192)	-0.1272*** (0.0236)	-0.0396*** (0.0180)
(Inst)•3 Scale-intensive industries	0.0299* (0.0174)	-0.0441** (0.0214)	-0.0242 (0.0165)
(Inst)•4 Differentiated goods	-0.0146 (0.0166)	-0.0060 (0.0200)	-0.0754*** (0.0165)
(Inst)• Science-based industries	-0.0385 (0.0262)	-0.0314 (0.0311)	-0.0271 (0.0252)
<i>ln(y)</i>	-0.0150*** (0.0030)	-0.0147*** (0.0030)	-0.0148*** (0.0030)
<i>ln(GDP)</i>	-0.0362** (0.0153)	-0.0277*** (0.0156)	-0.0232 (0.0162)
Unit fe	Yes	Yes	Yes
Year fe	Yes	Yes	Yes
Obs.	86,850	86,923	86,850

Note: Robust standard errors within parenthesis (-). ACF-adjusted Levin-Petrin TFP.

6 A look into the future: what do Estonian transaction data say about indirect exporters?

One of the main shortcomings in the quantitative analysis of Swedish register data is that the suppliers to exporting wholesalers are not identified. We know how much wholesalers export, but we don't know from which firms they acquired the export goods. Hence, we cannot provide direct evidence regarding some of the central hypotheses in the literature on trade intermediation – that wholesalers export the goods of companies that are not productive enough or not large enough to cover the fixed costs related to direct exports. This is the reason for examining e.g. the productivity gap between direct exporters and firms that are not registered as exporters. While we cannot observe indirect exporters, we can test hypotheses about how cross industry variation in indirect exports (as indicated by the data on the export shares of wholesalers) should influence the productivity gap. The estimation results discussed in the previous section are consistent with the hypotheses about productivity sorting of firms into of direct exporters, indirect exporters, and non-exporters.

Moreover, in the section discussing findings from interviews with wholesalers in Southern Sweden (Section 3.1) we reported that we had not been able to systematically collect survey data on the supplier networks of wholesalers. A conclusion from the pilot interviews was that small wholesalers were rarely willing to provide detailed information on the identity and characteristics of their suppliers, let alone facilitate direct interviews or the distribution of survey questionnaires to them.

This section will therefore provide a first look at a unique data set that we have been able to partially access through collaboration with researchers in Estonia.²⁵ Unlike most other countries, Estonian authorities have provided (limited and carefully supervised) access to a data set on VAT transactions between all enterprises in the economy. Using this data set, it is possible to construct firm-specific value chains, where all the firm's purchases and sales are recorded, including information on their suppliers and customers. These firm-level descriptions can then readily be aggregated to industry and product-level value chains. In combination with detailed data on foreign trade transactions at the firm level, this allows us to compare direct exporters, indirect exporters, and non-exporters in several dimensions.

²⁵ In particular, we are grateful to Uku Varblane, Tartu University, for assistance and advice on compiling and interpreting the data presented in Table 11.

This brief section contains three parts. The first part (Section 6.1) presents data and methodology, the second part (6.2) provides a summary of estimation results, and the final part (6.3) summarizes this brief look into the future. The type of transaction data discussed here offer unique opportunities to ask (and possibly also answer) a host of interesting research questions that have only rarely been analyzed with firm and transaction level register data before. The main exception is a series of empirical studies on a similar Belgian data set (Dhyne et al. 2015, Dhyne and Rubinova 2016, Dhyne and Duprez 2015, 2016, 2017), which explore e.g. business-to-business networks, value chain characteristics, and firm performance.

6.1 Data and methodology

To construct firm-level value chains and link this to performance measures, it is necessary to combine data from several different sources. The current data set draws on information on Estonian companies from several different registers managed by Statistics Estonia. All data were anonymized and processed in a secure working environment created by Statistics Estonia for analysis by researchers. The following data sources were used to define variables for the analysis:

- Annual reports of enterprises 2012-2016
- VAT returns for companies 2010-2017, including business-to-business transaction information for 2015-2017
- Corporate Income and social tax declarations 2010-2017
- Foreign trade data of goods and services of enterprises 2010-2017
- Statistical profile of Statistics Estonia 2010-2017
- Country-specific Input-Output Database (WIOD) 2014

On the basis of these data source, it has been possible to calculate proxies for the relationships between companies on the basis of purchase and sales transactions, including measures of turnover sold directly to final consumers, to other domestic enterprises, and to customer abroad (i.e. exports). Data on the firm's international trade transactions have been used to identify import and export goods and trade partners – these data have then been used for calculating the distance of the enterprises from the final consumer and raw material source. Economic indicators from the firms' annual reports have been employed to calculate the number of employees, capital stocks and value added indicators.

Antras et al. (2012) has used macro-level input-output tables to define indicators for the positions of countries and sectors in production chains. This has yielded specific measures

of the distance from the end user (which is termed as the degree of *upstreamness*, U) and the distance from raw materials (labeled *downstreamness*, D). Instead of using input-output tables, the cash flow data between companies can be used to define measures of U and D at the company level. Similar measures have been calculated based on Belgian data, and the current measures of U and D are calculated according to the methodology proposed by Dhyne et al. (2015).

The distance to the end user is the average number of steps required to bring the goods and services sold by the company to the final consumer. The final consumers can be located either in the domestic economy or in export markets. If Company A sells all of its production directly to end users, it is located one step away from the final consumer. If Company B sells its entire production to Company A, which in turn sells all for final consumption, Company B is considered to be two steps away from the final consumers. The higher the U value, the more steps are needed to bring the output from the company to the final consumer.

The company's distance from raw materials D equals the average number of steps or sequential transactions needed to produce the company's output. The value of company D is one in case it has direct access to raw materials, i.e. no suppliers. Labor is not considered a separate input in this context. The higher the value of D, the larger the share of inputs that have passed through several stages in the production process.

In an open economy like Estonia, where exports and imports are important, it is important to consider relations with foreign business partners. A firm exporting raw materials does not necessarily record an *upstreamness* measure of one, since the foreign buyer may have to engage in further processing (possibly in several steps) before the good is sold to the final consumer. To calculate U and D measures for exports and imported inputs, data from the World Input-Output Database (WIOD) (for 2014) are therefore used estimate the *upstreamness* and *downstreamness* measures for companies that have interactions with foreign partners. Country and sector-based distances from end-users and raw materials are entered into the calculations using a similar computation as for enterprise-based domestic U and D measures (for further details, see Unt et al. 2018).

On the basis of the U and D values, it is possible to find the length of the corresponding value chain for the company (VCL) using the formula

$$VCL = U + D - 1$$

Using the calculated value of the chain length VCL, following Dhyne and Duprez (2015), we can also define the relative position of the firm in the value chain (x) as

$$x = \frac{(D - 0.5)}{VCL}$$

A higher value for x means that the firm is closer to the final consumer.

6.2 Results

Table 11 presents a summary of the Estonian firm-level data on enterprise types, productivity, value chain characteristics and export share for the year 2017. The table distinguishes between direct exporters, indirect exporters, and non-exporters, with the direct exporters defined as firms that record at least EUR 1 in sales to foreign countries. In addition, exporting wholesalers and retailers are included as separate categories. A first point to note concerns the distribution of firms into the different categories. Overall, there were 82,963 firms in the Estonian industrial sector (including services). Out of these, 3,065 were exporting wholesalers and 1,264 were exporting retailers, and 12,984 were direct exporters outside the intermediary sector. When we only look at direct exporters, the data show that about 21% of Estonian firms are involved in exports (including both producers and intermediaries). Both the direct exporters and the exporting wholesalers have an average export ratio of 37%, while exporting retailers are somewhat less focused on foreign markets, exporting on average 20% of their output.

However, if we include indirect exporters as well – here defined as firms located one step away from direct exports, i.e. firms that sell to exporting enterprises²⁶ – the share of exporting firms climbs over the 50% mark. If we also include all firms located two steps from exports, the share of firms involved in exports exceeds 80%.²⁷ This is a crucially important insight for small open economies: the great majority of firms are involved in the international economy and will be affected by the various fluctuations that affect a country's international competitiveness. Unt et al. (2018) show that the same pattern also applies for imports: relatively few firms are directly involved in imports, but their share increases dramatically if indirect importers are included.

²⁶ In this version of the report, we have not been able to separate those firms that export through wholesalers from those that export through other firms (e.g. providing goods for Carry-Along-Trade). Hence, indirect exporters export both through trade intermediaries and through other types of companies. A share of these firms should be considered as first-tier suppliers to exporting manufacturers. In future work, we aim to compare those firms that export through intermediaries and those that participate as first-tier suppliers in global value chains: extant literature has little to say about how these two types of firms differ from each other.

²⁷ This result is not presented here but discussed in Unt et al. (2018).

Table 11 Direct exporters, indirect exporters, trade intermediaries, and non-exporters in Estonia 2017

Firm Type	Number of firms	VA per employee	VCL: value chain length	x: position in value chain	Direct export share
Direct exporters	12984	68014	4.58	0.42	0.37
Exporting wholesalers	3065	68198	5.52	0.51	0.36
Exporting retailers	1264	53440	4.29	0.64	0,20
Indirect exporters	24276	32522	4.54	0.43	0
Non-exporters	41374	8653	2.88	0.60	0
Total	82963	27810	4.16	0.48	0.11

Source: Based on data sets processed at Statistics Estonia.

Table 11 also shows the productivity (defined as value added per employee) of the different enterprise types. The results provide direct evidence for the productivity-sorting hypothesis discussed earlier. Looking across enterprise categories, the highest labor productivity levels are recorded among direct exporters (including wholesalers). Indirect exporters are substantially less productive, but still far ahead of the non-exporters. This represents a more comprehensive and conclusive set of evidence for productivity sorting than what has been found in earlier data analyses. Earlier studies have either used surveys where firms report indirect export activities or tried to infer patterns from industry data and information on direct exporters: here the conclusions are drawn directly from data on firm-level transactions.

The columns on average length of value chains and position in value chains also provide interesting information on the differences between (direct and indirect) exporters and non-exporters. On average, direct and indirect exporters appear remarkably similar in these dimensions, and they are located further away from end consumers than both trade intermediaries and non-exporters. In other words, many of them participate in international (if not global) value chains, supplying intermediate inputs for further processing in downstream firms. This probably explain one of the somewhat surprising findings in Unt et al. (2018): while many other contributions to the literature have suggested that productivity tends to be higher closer to end customers, this is not the case for Estonia. On the contrary, labor productivity is robustly higher for firms further away from end

consumers and closer to resources/raw materials. This result is driven by the heavy weight of exporting firms in Estonia – exporters are both more productive and further away from final consumers than other types of firms. The firms categorized as non-exporters are closer to the final customer (as seen by the value of x) and operate in value chains that are much shorter (and probably also less complex) than those of the other firm categories.

Table 12 includes the same data categories, but with a higher cut-off level for direct and indirect exporters: now, a firm is included in one of the exporter categories only if direct or indirect exports account for at least 10% of total output. This more restrictive exporter definition changes the distribution of firms across categories, signaling that relatively many firms have marginal participation in export activities. Using this higher cut-off, the export participation rate falls by about half. Now, 12% of firms are in the direct exporter categories; adding indirect exporters raises the share of exporters to 25%. The conclusions regarding productivity sorting do not change. The most productive firms are still the direct exporters, indirect exports are significantly less productive, and non-exporters make up the least productive enterprise category.

Table 12 Direct exporters, indirect exporters, trade intermediaries, and non-exporters in Estonia 2017 (10% cut-off for exporter categories)

Firm Type	Number of firms	VA per employee	VCL: value chain length	x: position in value chain	Direct export share
Direct exporters	7813	74563	4,70	0,38	0,60
Exporting wholesalers	1773	67103	5,63	0,48	0,59
Exporting retailers	472	50789	4,68	0,53	0,50
Indirect exporters	10756	30908	5,18	0,37	0
Non-exporters	62149	20100	3,65	0,54	0
Total	82963	27810	4,16	0,48	0,11

Source: Based on data sets processed at Statistics Estonia.

The tables do not report any information on the export shares of indirect exporters. The reason is that individual products cannot always be traced through the value chain. For

example, wholesalers operate both on the domestic and the international market. They can acquire the same type of goods from several different domestic suppliers, and they can also import the same product varieties. These may then be sold both to domestic customers and exported to foreign customers: when the wholesaler has several suppliers of the same products and sells these to multiple markets, it is not possible to determine the exact destination for the products acquired from any individual domestic supplier. In more detailed analysis of the current data set, it will be possible to examine to what extent wholesalers sell the same goods in the home market and abroad; this information, in turn, can be used to estimate what share of domestically acquired goods are actually exported.

6.3 Further research questions

The brief description of direct and indirect exporters provided in the previous paragraphs is only a first look at some dimensions of a data set that will allow more comprehensive analysis of firm dynamics and internationalization in Estonia. The Estonian VAT transaction data base provides unique opportunities to explore research questions that have only been studied in small samples and case studies in other countries. As a small open economy, Estonia shares many features with other small European countries, not least Sweden, and analysis based on Estonia may provide more direct answers to various research questions than what is possible with the currently available register data sets in Sweden. Plans for further collaboration with Estonian researchers include detailed analysis of the characteristics of different kinds of indirect exports, e.g. exports via wholesalers versus exports of intermediate inputs embedded in the direct export of other firms. Moreover, as transaction data become available for additional years, it will be important to explore the learning dimensions of indirect exports. Does the productivity of indirect exporters increase faster than that of non-exporters? Are there differences in productivity growth between different types of indirect exporters? Does indirect export lead to direct export over time, or are non-exporters equally likely to become new direct exporters? Additional questions will undoubtedly emerge as more researchers make use of the new analytical dimension afforded by these data.

7 Conclusions

It has been argued that wholesalers have been the dominant international participants in most long-distance trade relationships from ancient Phoenicia and Greece until the first quarter of the 20th century. Wholesalers and other trade intermediaries were instrumental in connecting nations in early medieval Europe, managed trade between Europe and its colonies in the Americas and Africa from the 16th century and monopolized the bilateral trade between European countries and East Asia in the 17th and 18th centuries. In the second half of the 20th century, Japan's general trading companies, the "sogo shosha", facilitated the country's export miracle, and accounted for more than half of Japanese exports in some years.

Wholesalers are still important actors in the global economy. Today, they facilitate international trade not only by their extensive networks, their expertise on foreign markets, and their ability to manage complex transactions with counterparts in distant countries. Wholesale firms also contribute by upgrading goods and may act as guarantors for product quality. They fill a role as an intermediary agent that is especially valuable for SMEs that otherwise would find it difficult, or even impossible, to reach foreign markets with their products.

The importance of the wholesale sector for the Swedish economy becomes clear by looking at import and export statistics. The wholesale sector accounts for approximately 25 percent of all Swedish manufacturing imports and 10 percent of manufacturing exports. Behind these numbers stands about 30 000 wholesale firms generating approximately 150 000 jobs, making the wholesale sector an even larger employer than the restaurant sector. Yet, despite their central role in international exchange there are several aspects of their operations that are relatively unexplored.

In this study entitled we have studied the role of wholesale firm in the Swedish economy not only in terms of export volumes steaming from wholesale firms. Focus here is on the role of wholesale firms as a supporter of exports for firms that have difficulties in exporting by their own. We have also looked at the competitive relation between direct exporting manufacturing firms and wholesale firms as well as wholesale firms as a door opener for distant and difficult markets.

Results from the analysis of supports the claim that wholesale firms support exports from firms that are not strong enough for direct exports by themselves, positioning indirect

exporters in an intermediate productivity level. This result is further strengthened by data from Estonia where we by using unique VAT register data are able follow all domestic transactions. From for the Estonian data we found a similar productivity hierarchy as for Sweden, positioning indirect exporting firms between fully local firms and direct exporters.

We also note that the observation of wholesale firms supports indirect exports also suggests that Sweden (as well as most other countries) is much more exposed to and dependent on international markets than what the number of direct exporters suggests. In Estonian data we found that the numbers of internationalized firms more than doubles when indirect exporters are included. Few firms are insulated from the developments in international markets.

A second characteristic of wholesale firms found is that they export a larger variety of goods than direct exporters. On average a wholesale firm exports 35 types of goods to a given market, whereas the corresponding number for direct exporters is five products. Given this large scope it is motivated to analyze happens with the foreign sales of direct exporters when wholesale firms enter the same export market. The results from the analysis give no indications that wholesale firms engage in head-to-head competition with direct exporters. Instead of reducing direct exports, the results suggest that the entrance of wholesale firms leads to increased direct exports, which indicates that wholesale firms can act as a door opener for other firm's (direct) exports. Here, however, at finer levels of fixed effects, the significant positive volume effect does not carry through, though we never found any negative effects of wholesale exports on direct exports.

A final characteristic of wholesale firms is their ability to solve the contract problem. The contract problem involves handling a series of tasks spanning from knowledge about rules and regulations, tax and financial rules, customs procedures, rules of origin etc., suggesting that wholesale firms may be of special importance for markets with weak institutions.

Using a series of proxies for institutional quality of the destination market, the results suggest that the importance of wholesale exports grows larger as the institutional quality of the destination market diminishes. In addition, this effect seems to increase with geographical distance. Hence, wholesale firms are of especially high importance for exports to distant and difficult markets.

Finally, the comparative advantage of wholesalers is typically not found in products but rather in markets. The producers typically know more about their products than

wholesalers do, and when this information is crucial for contracting and sales, wholesalers may not be able to perform better than the producers themselves. However, wholesalers may be able to reach better results than small producers when the costs of adaptation to local conditions and commercial practices weigh more heavily than product-specific knowledge. In line with this line of reasoning the results suggest that wholesalers generally play a limited role in raw materials and standardized industrial inputs where economies of scale are important and producers tend to be so large that they can carry the costs of establishing their own direct export operations.

8 References

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9 Appendix

9.1 Regressions by distance

Table A1 Linear distance segments

Dependent variable. Wholesale firms share of industry exports. FE-estimation

	$\ln(\text{distance}) < 7$ (1100 km)	$\ln(\text{distance}) 7-9$ 1100-8100 km	$\ln(\text{distance}) > 9$ +8100 km
$\ln(\text{distance})$	-0.0310 (0.0092)**	0.0581 (0.0024)***	-0.0926 (0.0109)***
<i>Full set of control variables</i>	yes	yes	yes

Note: Robust standard errors clustered by industry-country within parenthesis (.).

ACF-adjusted Levin-Petrin TFP. Control variables included: $\ln(\text{distance})$, $\ln(y)$, $\ln(\text{GDP})$, period dummies.