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Go Wide or Go Deep: Margins of New Trade Flows

Katharina Erhardt*and Apoorva Gupta†

August 2024

Abstract

This paper aims to understand the pathways by which exporters become entities that sell multiple goods to multiple customers. To understand firms' export strategies, we analyse new trade flows – new seller-buyer-product combinations – of individual exporters. Our first finding highlights that these new trade flows are an important margin for firms of all size classes, accounting for approximately 62% of their overall trade flows. Classifying new trade flows into going-wide (introducing new products) and going-deep (reaching new buyers for existing products), we find that the dominant margin of export expansion depends on the size and life-cycle stage of exporters; smaller firms rely relatively more on going-wide and large firms more on going-deep. We also demonstrate that selling new products is different from selling existing products: Firms target new products to a single, often new, buyer. To rationalize these facts, we propose a conceptual framework where firms allocate scarce sales personnel between selling existing products to more buyers and matching with new buyers for introducing new products. We empirically test and confirm the model's key predictions. In particular, we use the 2015 Swiss exchange rate shock and show that going-deep is more pronounced as an export strategy when a firm's effective market size is relatively larger. The findings suggest varying scope and size for firms born in different phases of globalisation.

Keywords: Export strategies, product introduction, customer accumulation, buyer-seller relationships, multi-product firms

JEL-codes: F10, F14, L25, O31

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1 Introduction

We know surprisingly little about the exporting strategies of individual firms. While it is a well-established fact that more productive firms sell a greater number of products to a larger number of customers in international markets (Bernard et al., 2007), the pathways by which these firms achieve such expansion remains unclear. Specifically, we do not know how firms choose, at each point in time, between intensifying their efforts to sell more of their existing products to new customers around the world (a strategy we call 'going-deep') versus introducing additional products in international markets (a strategy we call 'going-wide').[1]

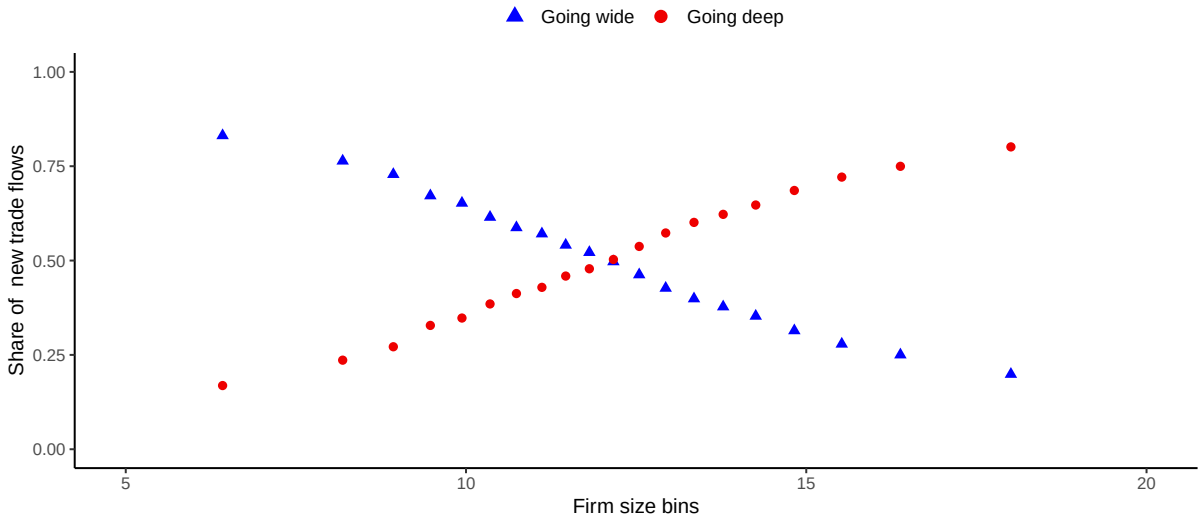
Relying on Swiss transaction-level customs data from 2012 to 2017, which includes information on the identity of individual buyers in foreign markets, we aggregate all individual export transactions at the exporter-buyer-product-year level, an object that we refer to as *trade flows*.[2] In order to analyse firms' export strategies, we define *new trade flows* as trade flows that entail a new buyer and/or a new product or a new combination of an existing buyer and an existing product for an exporter. To understand the composition of new trade flows, we define two margins: going-wide refers to new trade flows of a firm on account of widening the products sold abroad, and going-deep to those that are created on account of a firm deepening the customer base for existing products. Analysing new trade flows and their composition allows us to understand where exporters, at each point in time, choose to direct their sales and thereby offers an understanding of the choices exporters make to expand in foreign markets.

Our analysis reveals two striking novel findings. First, new trade flows account for a significant share of total trade flows across all exporter size classes. For the smallest 5% of exporters, 87% of annual trade flows are new, while for the largest 5%, this figure is approximately 57%. Thus, trade flows of an exporter are in constant flux and firms' export strategies at any given point in time importantly affect the overall export flows. To fully comprehend the dynamics of exporting, it is essential to analyse the composition of these new trade flows. Our second key finding is that the composition varies significantly based on firm size and life-cycle stage. To illustrate this, we present a bin-scatter plot of the going-wide and the going-deep margin along 20 firm size bins in Figure 1. The predominant export expansion strategy of smaller exporters is going-wide (adding new products) accounting for 83% of their new trade flows. Larger exporters, on the other hand, focus

[1] An important literature examines firms' decisions to become exporters and to consequently increase their export sales through either acquiring additional customers or destinations (see Das et al., 2007; Fitzgerald et al., 2023; Arkolakis, 2010; Albornoz et al., 2012 or adding new products (see Albornoz et al., 2023). None of these papers investigate the two strategies of export expansion in one framework.

[2] We focus on multi-product, multi-buyer exporters.

Figure 1: Going-wide versus Going-deep



Notes: The figure shows a bin-scatter plot with annual firm export value on the x-axis, and composition of new trade flows on the y-axis. A new trade flow is a firm - HS8 product - buyer combination observed in year t but not in t - 1. The blue line shows the share of new trade flows on account of selling new products, and the red shows the share of new trade flows on account of reaching new buyers for existing products by a firm in a given year.

on going-deep (acquiring new customers) which accounts for 80% of their new trade flows. These findings, robust to several sensitivity checks, suggest a previously unexplored trade-off between different export strategies over the expansion path of a firm, and offers new insights on how the scale and scope of exporters develops.

There are at least two reasons for our limited understanding of this trade-off. First, in most models of international trade – both static and dynamic ones – the optimal scale and scope of a firm is determined by its productivity and exogenous demand conditions (Melitz, 2003; Das et al., 2007; Alessandria et al., 2021). Following a positive (negative) productivity or demand shock, a firm increases (decreases) its jobs. These responses are typically instant, such that firms immediately reach their optimal scale and scope. In some models, these responses are sluggish (Eaton et al., 2021), but in no model, a trade-off between 'going-deep' and 'going-wide' arises. Only when supply-side factors such as adjustment costs or labour market frictions hinder firms from optimally adjusting their (employment) size, a trade-off between export strategies arises. Vast empirical evidence suggests that adjustment costs are indeed a major factor in constraining firm size; a fact that gives rise to a trade-off between firms' growth strategies (Decker et al., 2020). A second reason for our limited understanding of the trade-off between going-deep and going-wide is that most empirical studies on firm export behaviour do not observe or exploit trade flows at the product-buyer level, but focus on either of the two margins, or analyse more aggregate data like

the product-country margin.

Acknowledging that there exists a trade-off between going-wide and going-deep, which varies by a firm's development stage, has significant implications in terms of the impact of trade liberalisation for firms at different points of their expansion path. However, to fully understand these implications, we must first explore the mechanism driving this trade-off.

To this end, we further scrutinize our data and investigate how firms sell new products in export markets. Interestingly, we find that 83% of new trade flows that are devoted to going-wide involve the sale of a new product to only *one* buyer in the year of introduction. Within the smallest 5% of exporting firms, this share stands at 89%, but even among the largest 5% exporters the share remains at 76%. Moreover, in roughly half of all trade flows devoted to going-wide, the new product is sold to a *single* buyer who is also a *new* buyer for the firm. This finding suggests that for firms of all size classes, new products are specifically directed towards a buyer, presumably to match the need of that buyer and, hence, that the introduction of new products, for firms of all size classes, is the outcome of a unique buyer-seller matching process that differs fundamentally from the process of accumulating buyers for existing products.

In the context of an economic model, we can think of firms selling their existing products by maximizing profits based on the known demand schedule for these products. In contrast, selling a new product requires first identifying the latent demand schedule of the new product. This process can be viewed as a matching process, wherein a firm needs to invest in meeting an appropriate buyer or a core buyer, and jointly evaluate if the technology of the seller can be embedded in a product that meets the needs of that core buyer.

We incorporate these findings in a simple conceptual framework in which sales personnel within a firm is in fixed supply. Sales personnel can either sell existing products to more buyers (going-deep) or match with core buyers to introduce new products (going-wide). We model the process of accumulating customers for existing products in the spirit of Arkolakis (2010) with decreasing returns to investing sales personnel in finding new customers. The process of finding a core buyer for a new product is modelled as the outcome of a Poisson process, where the probability of a successful match per employed sales personnel is constant. Thus, while going-deep becomes more profitable with the size of the market or the number of products a firm offers, the returns to employ sales personnel in going-wide is constant. We derive an analytical solution for the allocation of sales personnel between going-deep and going-wide and establish three testable predictions.

Consistent with the patterns we observe in the data, the model predicts that firms at a later stage of

their expansion path allocate a larger share of their new trade flows to going-deep. Two additional testable predictions arise from this framework. First, firms that sell more buyer-specific products allocate a smaller share of their sales personnel to going-deep. Second, as market size increases, the returns to going-deep also increase, leading firms to allocate a larger share of their sales personnel to this strategy.

We proceed by testing all three theoretical predictions. First, by relying on within-firm variation in size, we confirm that firms devote a larger share of their new trade flows to going-deep as they grow. Second, using a measure of relationship-specificity of products provided by Nunn (2007), we find supporting evidence for the prediction that firms that sell more (buyer)-relationship-specific products devote a smaller share of their new trade flows to going-deep. Third, by exploiting an unanticipated and sizable exchange-rate appreciation of the Swiss franc in 2015, we confirm that going-deep is more pronounced as an exporting strategy when firms' effective market size is relatively larger. We measure the effective market size impact of the appreciation at firm-level by using the ratio of their imports to exports in the years prior to the shock. This measure captures the pass-through of the exchange-rate shock on firms' position in foreign output markets (their export market size). A placebo test confirms that the relationship between our measure of exposure to the shock and its effect on the share of new trade flows devoted to go-deep is not a spurious correlation, but only emerges after the exchange rate shock.

Taken together, our empirical findings suggest that the striking difference in firms' export strategies can be rationalized in a conceptual framework in which firms face supply-side constraints and the process of selling existing versus new products is different. Our results have important policy implications and suggest that under increased globalization, firms will develop substantially different scope and scale. Specifically, firms born in a more globalized world and with access to a larger market will go deeper already at the beginning of their development process, and have a smaller product portfolio. This may have potentially important implications for gains from trade, as firms may not fully internalise the resulting reduction in the variety of available products.

Related literature: Our paper is related to various strands of the literature. In particular, by investigating the interdependencies between customer accumulation and optimal product scope of multi-product firms, it links two previously independent strands of research.

First, the process of customer accumulation and sequential market access is an important focus of recent research on firm dynamics in foreign markets (Alessandria et al., 2021). Models on customer base accumulation formalise the role of advertising and pricing strategies employed by firms to reach new customers (Arkolakis, 2010; Fitzgerald et al., 2023; Gourio and Rudanko, 2014; Beaumont and

Lenoir, 2019; Argente et al., 2021; Piveteau, 2021). Given the focus on growth through customer accumulation, most of this work assumes firms to have a single product or a constant product basket. We borrow insights from these models and extend a model of customer accumulation to include the introduction of new products. This extension is guided by our empirical evidence that suggests that the process of creation of buyer-seller relationships is different based on whether a firm is selling a new versus an old product.

Second, in the domain of multi-product firms, a growing literature investigates the optimal product scope of heterogeneous firms (Eckel and Neary, 2010; Dhingra, 2013; Flach and Irlacher, 2018). In these models, exporters take a decision regarding the number of products they want to produce, and creation of a new product is equivalent to firms incurring a fixed cost. Cannibalization effects reduce the incentives to introduce additional products. With a focus on determining the optimal product scope of firms, there is no constraint that introduces a trade-off in these models between product scope expansion and customer accumulation for existing products. Nocke and Yeaple (2014) introduce a supply-side constraint in terms of organizational capital that determines the trade-off firms face between offering many products and lowering marginal production costs.

Within the multi-product firm literature, learning models can account for slow product scope expansion over a firm's life-cycle (Albornoz et al., 2023; Berman et al., 2019; Timoshenko, 2015; Sheveleva and Krishna, 2017; Esteve-Pérez, 2021; Albornoz et al., 2012). Albornoz et al. (2023), which investigates how firms sequentially export multiple products to multiple countries, is most closely related to this paper. They find that young exporters, if they continue exporting, initially sell additional products in their first export market. These empirical facts are consistent with our conceptual framework, where firms face a trade-off between different exporting strategies based on their stage of development. In contrast, Albornoz et al. (2023) conceptualize their findings in a model of learning about export markets, where the relative fixed costs of adding products versus adding countries rationalizes the path dependency observed in the data. Additionally, on account of having information on buyer identity, we document and rationalise novel facts that selling existing products to new customers – an exporting margin that is subsumed in their intensive margin within countries – is conceptually different from introducing new products.

Finally, we contribute to the management and innovation literature that argues that products are rarely developed in a void, but suggests a collaborative or interactive development process where new products are conceived in dialogue with a user or a buyer (Bhaskarabhatla, 2016; Von Hippel, 1998). Literature on supply chains too recognises that a substantial part of product development results from interactions within buyers and suppliers (Roy et al., 2004). There is evidence to suggest

that involving suppliers in new product development reduces costs and time to market, and improve quality (Ragatz et al., 1997; Zhao et al., 2014). Our finding that a new product is, more often than not, specifically directed towards a buyer for firms of all size classes, is in line with these ideas. This interactive approach seems to be the dominant way of introducing new products in international markets, and offers a new lens to study multi-product firms.

The rest of the paper is structured as follows. Section 2 describes the data and presents the stylised facts. Section 3 outlines the model we use to rationalise the stylised facts. Section 4 tests key theoretical predictions of the model, and Section 6 concludes.

2 Data and Stylised Facts

The analysis in this paper relies on Swiss transaction-level customs data from 2012 to 2017. Similar to customs data from several other countries, the data provides information on the quantity, value, and date of exports of Swiss firms for each Harmonised-System 8 digit (HS8) product. In addition, the Swiss data provides information on the buying entity, which is typically a firm. This unique detail allows us to decompose the export flows of a Swiss firm into its individual buyers and the products they purchase, allowing for a novel perspective on exporting strategies.

Using data from Switzerland is particularly suitable for this study on export strategies because Switzerland is a small, open economy. Switzerland is strongly integrated in European markets through numerous bilateral agreements with the European Union and through its favourable geographic position bordering major European economies. Therefore, customs data capture a significant portion of the overall sales activities of Swiss firms and even relatively small firms are active in international trade. In addition, as Switzerland is not a member of the European Union, all customs transactions are recorded, and we observe the universe of trade flows irrespective of transaction value or firm size.

To jointly study the buyer and product margins of Swiss exporters, we first aggregate the transaction-level data at an annual level, and define a *trade flow* as the movement of exports from firm f in year t of a HS8 product p to a buyer firm b. In other words, a trade flow refers to a $ftbp$ combination. Note that every buyer, across destination countries, has a unique buyer ID, thus subsuming the destination country within the buyer ID.[3] We use data for all HS8 codes, except Gold, Oil and Miscellaneous manufacturing articles.

[3]Egger and Erhardt (2016) describe the algorithm used to harmonise the names of sellers and buyers in the data for the purpose of aggregating transactions over a year.

Table 1: Summary statistics

	Mean	Min	25th	Median	75th	Max
Export Value (in Mio CHF)	11.6	0	0	0.2	1.2	36,119.5
No. of products	17	1	3	7	17	1,019
No. of buyers	45	1	3	8	27	9,467
No. of trade flows	113	1	5	13	47	50,489

Note: The table provides summary statistics for 12333 Swiss exporters from 2012 to 2017. *No. of products* refers to the count of unique HS8 products exported by a firm in a given year, *no. of buyers* refers to the unique number of buyers a firm exports to in a given year, and *No. of trade flows* refers to the count of product-buyer combinations of an exporter in a given year.

Since the aim of this paper is to examine the exporting strategies of firms, without delving into the entry and exit decision from export markets, we restrict the sample to continuous exporters, and those that export more than one product or to more than one buyer over the duration of the sample. Further, we drop firms for which more than 75% of the trade flows have missing buyer information. The restricted sample we use accounts for 95.34% of the value of non-gold, non-oil exports captured by our data. This gives us 8.4 million trade flows over six years for 12,333 firms. Summary statistics in Table 1 show that the average firm in our data exports goods worth 11.6 million Swiss Francs (CHF) in a year, has 113 trade flows consisting of on average 17 HS8 products and 45 distinct buyers.[4] The median firm exports 7 HS8 products to 8 unique buyers, thus suggesting that the number of buyers a typical firm engages with is not substantially higher than the number of products.[5] The statistics illustrate that the firms in our sample are at varying points in their export expansion path. Nonetheless, by focusing on continuous multi-product multi-buyer exporters, even those in the left tail of the distribution are rather large in comparison to the overall population of firms and are important Swiss exporters.

A large literature in international trade is dedicated to describing the firm-level determinants of total export revenues generated, the number of products sold, or the count of customers reached by exporters as presented in Table 1. The focus of these papers is on the determinants of cross-sectional variation across exporters in the long run. In this paper, we want to ask a different question: what is the pathway along which firms become exporters of many products to many

[4]Similar to Bernard et al. (2018), who use Norwegian transaction-level customs data, Table A1 decomposes exports to a destination market into number of unique exporting firms, products and buyers, the density of trade, and average value of exports. We find very similar coefficients, confirming that our dataset is comparable to other transaction level customs datasets.

[5]Table A2 provides more detailed summary statistics for firms split into 20 equally sized bins.

customers. Since firms do not grow to their optimal size and scope in an instant – for instance, because they face supply-side constraints that slow down their growth – firms must choose how to allocate their resources across different export expansion strategies: adding more customers (going-deep) or adding new products (going-wide). The following sections aim to describe firms' export strategies and present novel stylized facts.

2.1 New trade flows

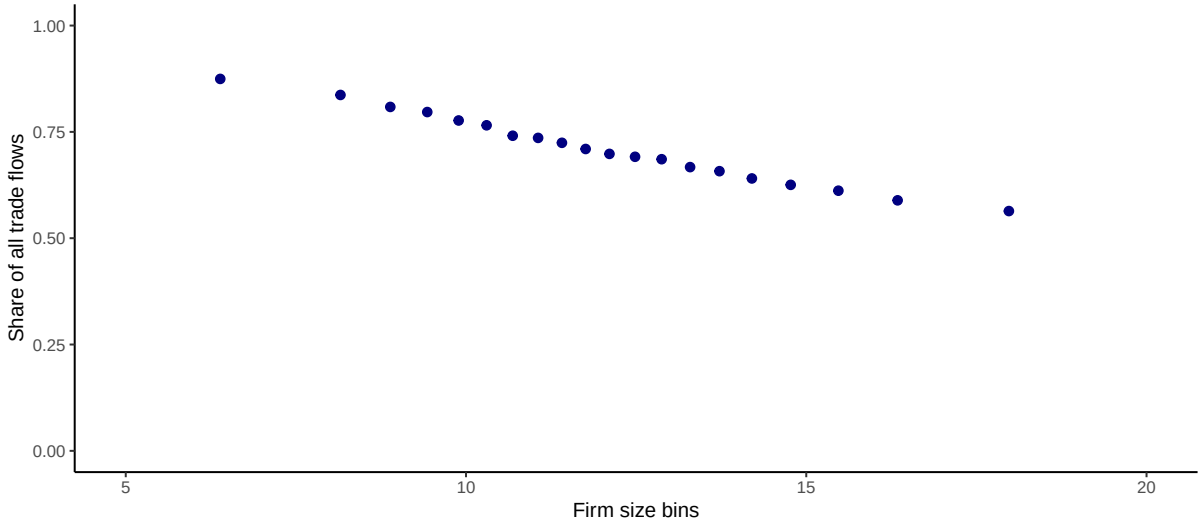
The granularity of our data allows us to identify and learn about the steps firms take from one year to the next on their export expansion path. To this end, we focus on *new trade flows* of exporters. We define a *new* trade flow as a trade flow that is not observed in a given year but observed in the following one. In other words, a new trade flow is an $ftbp$ combination that is not observed in t but observed in $t+1$. Using a one-year rolling criterion ensures a consistent and standardised measurement across all years, and alleviates concerns regarding seasonality in the export pattern of specific goods.[6] Perhaps surprisingly, we find that more than 62% of trade flows (approximately 4.5 million trade flows out of 7.3 million trade flows from 2013 to 2017) are defined as new trade flows. The high share of new trade flows highlights the importance of change in international trade, and emphasises the need to understand the composition of these newly created flows.

Fact 1: New trade flows are significant for firms of all size classes. To explore the relevance of new trade flows for firms at different stages of their export expansion path, we analyse the proportion of new trade flows in all trade flows for firms of different size classes. Figure 2 shows a bin-scatter plot with annual firm export values on the x-axis, and the share of new trade flows in all trade flows of those firms on the y-axis. The dots in the graph represent the mean value of the share of new trade flows in a given size bin.

The figure shows that new trade flows constitute an important share of total trade flows across all the size bins. For the smallest exporters, 87% of all trade flows seen in a given year are new, that is, they occur in $t+1$ but not in t. This share declines gradually as firms become larger, but even for the largest exporters, approximately 56.5% of all trade flows in a given year are new. Figure A1 shows the share of new trade flows defined over a three-year span. Here, a trade flow is considered new if it is not observed within a three-year window but occurs at least once in the subsequent three years. This definition accounts for variations in shipment frequency for different products and the

[6] By using the one-year criterion, a mere 8% of trade flows are identified as new more than once in the sample period. All results hold as we aggregate our data to two three-year windows, and define new trade flows as those that are not seen in the initial three years, but seen at least once in the subsequent three years.

Figure 2: New trade flows



Notes: The figure shows a bin-scatter plot with export value of a firm in year t on the x-axis, and the (mean value of the) share of *new trade flows* in total trade flows of a firm in a given year on the y-axis. A new trade flow is a firm - HS8 product - buyer combination observed in year $t+1$ but not in t.

varying regularity with which exporters may sell a given product to different buyers. Also, for this alternative measurement, we confirm the overall picture that new trade flows form an important part of total trade flows for firms of all size classes. Further, figure A2 shows the relevance of new trade flows in terms of generated export value. For smaller exporters, new trade flows account for approximately 88% of export sales in a given year. Although this share is decreasing in the size of firms, it accounts for a significant share of export sales of firms across the size distribution.

Thus, exporters, irrespective of size or maturity in international markets, constantly change the composition of their trade flows. From one year to the next, more than half of the trade flows of a firm are the result of them connecting with new buyers and/or exporting new products. Understanding the choice exporters make between these two options as they advance in the size distribution or as market conditions change, offers important novel insights into how firms become exporters of many products to many customers.[7]

Table 2: New trade flows and their composition

		Share of number of new trade flows	Share of value of new trade flows	
New Product	New Buyer	0.08	0.04	} Going wide
	Existing Buyer	0.11	0.06	
Existing Product	New Buyer	0.49	0.62	} Going deep
	Existing Buyer	0.32	0.28	

Note: *New product* refers to HS8 products that are sold by a firm in $t+1$ but not in t. *Existing product* refers to HS8 products sold by a firm in consecutive time periods. *New buyer* refers to buyers to whom a firm exports to in year $t+1$ but not in t. *Existing buyer* refers to buyers to whom a firm exports in consecutive time periods.

2.2 Composition of new trade flows

We disaggregate new trade flows of firms into two groups: going-wide versus going-deep. Going-wide refers to new trade flows that are created on account of a firm selling a new product, and going-deep refers to those that are on account of a firm selling its existing products to new buyers and buyers to whom the product was previously not sold to. We define a new product of a firm f as a HS8 product p that is not sold in year t but sold in $t+1$. Similarly, a new buyer for a firm f is a buyer b to whom the firm exports to in year $t+1$ but not in t. Thus, the type of newness of a trade flow, product or buyer, captures how exporters expand.

Table 2 shows the share of new trade flows on account of the two margins. Approximately one-fifth of *new* trade flows are due to firms selling new products or going-wide. Breaking down this margin further: 8% of new trade flows are such that a new product is sold to a new buyer, while 11% are such that new products being sold to an existing buyer of the firm. The remaining four-fifths of new trade flows are due to firms accumulating buyers for existing products, or going-deep. Specifically, 49% of new trade flows are due to firms selling their existing products to entirely new buyers. 32% of new trade flows are ones where firms sell their existing products to existing buyers that had not bought that product before.[8] In terms of value of exports, going-wide accounts for 10% of the value of new trade flows, and going-deep for the rest. With no guidance from existing work on the

[7]Figure A3 shows the share of trade flows that are dropped by a firm in a subsequent year, that is trade-flows that are observed in t but not in $t+1$. Similar to the creation of new trade flows, firms of all size classes also a drop a large share of their trade flows from one year to the next. This further highlights the constant churn in trade flows for all exporters. On average, the share of trade flows dropped is lower than the share added in a given firm size bin, suggesting that the exporters are growing.

[8]Note that we are focusing on new trade flows here, hence, the intensive margin, or trade flows where firms sell the same product to the same buyer in consecutive periods are not included here.

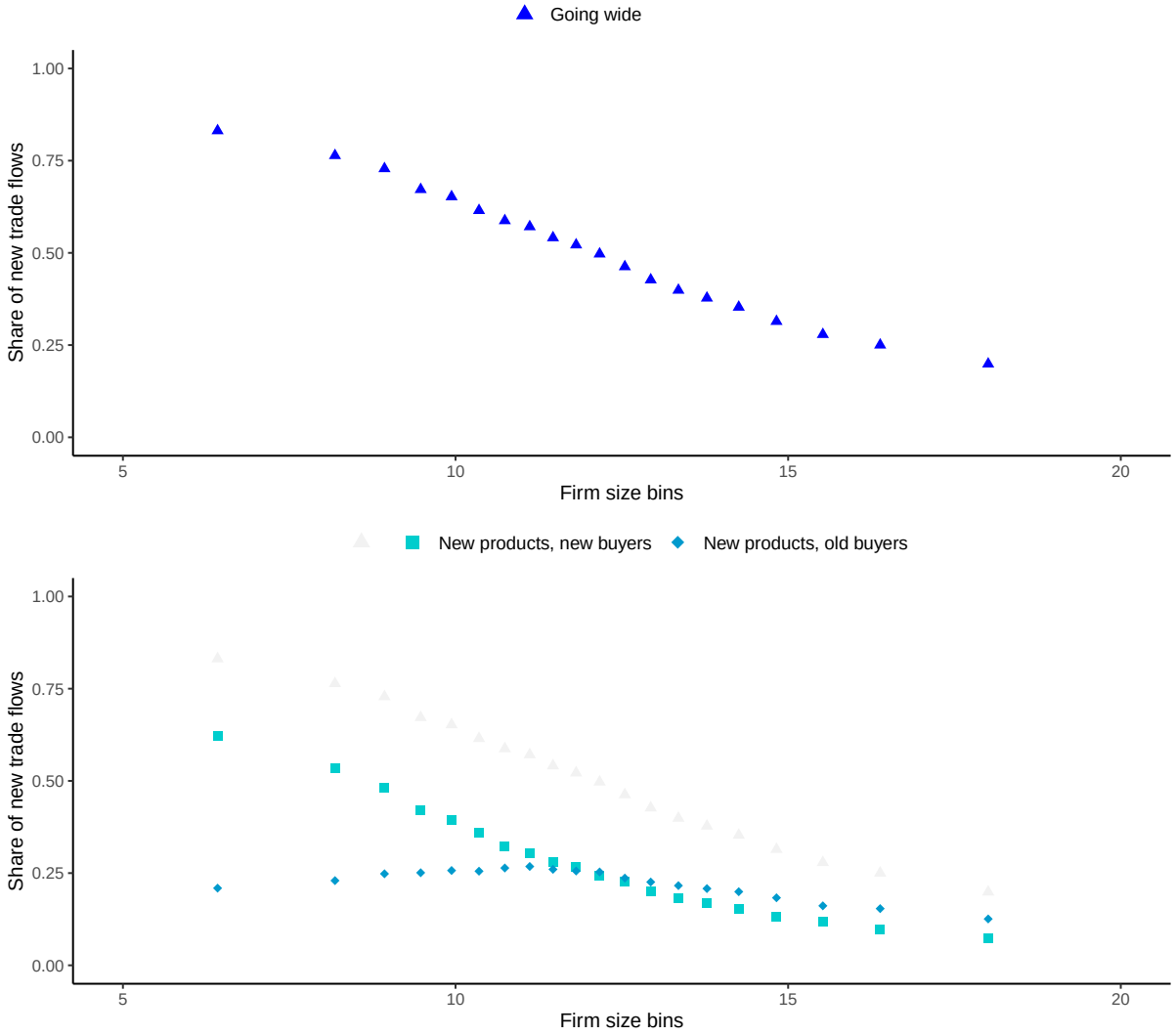
exporting strategies of firms at different stages of their export expansion, we study this in our data next.

Fact 2: Going-wide is the dominant margin of new trade flows for smaller exporters, while going-deep dominates for larger exporters. We first study the share of going-wide trade flows of firms in all their new trade flows for firms of different size classes. Figure 3 shows a bin-scatter plot for 20 bins with firm export value on the x-axis and the corresponding share of new trade flows that are generated on account of going-wide on the y-axis. The figure shows that, on average, 83% of the new trade flows of the smallest exporters are due to going-wide. For the first 10 firm size bins, going-wide accounts for more than 50% of all newly created trade flows, showing that it is the dominant margin of expansion for half our sample. The proportion of going-wide trade flows decreases substantially as firm size increases, and for the firms in the last bin, the share is as low as 20%. Note that this number is close to the share of going-wide trade flows in our data in Table 2 and underlines how strongly exporting is skewed towards large firms. For firms in the top one percentile of the size distribution, the share of going-wide trade flows further decreases to 17.4%.

The bottom panel of Figure 3 splits the going-wide trade flows into two groups. The squares correspond to those where a new product is sold to a buyer who is also new for the firm. The diamonds correspond to the ones where a new product is sold to an existing buyer of the firm. The figure shows that for the first 10 firm size bins, the former type of going-wide trade flows is the dominant margin of new trade flows. Close to 62% of new trade flows of the smallest 5% exporters are an outcome of the exporter selling a new product to a hitherto unknown buyer. Only 21% of new trade flows for the smallest 5% exporters are on account of them selling new products to their existing buyers. For larger exporters, however, the two types of going-wide trade flows account for roughly the same share of new trade flows. This finding sheds light on the importance of going-wide, especially with new buyers, for smaller exporters, where we emphasize that even smaller exporters in our sample are relatively large firms and persistent exporters. This finding is corroborated by the results of Albornoz et al. (2023) who find that young French exporters are more likely to expand by adding products instead of countries.

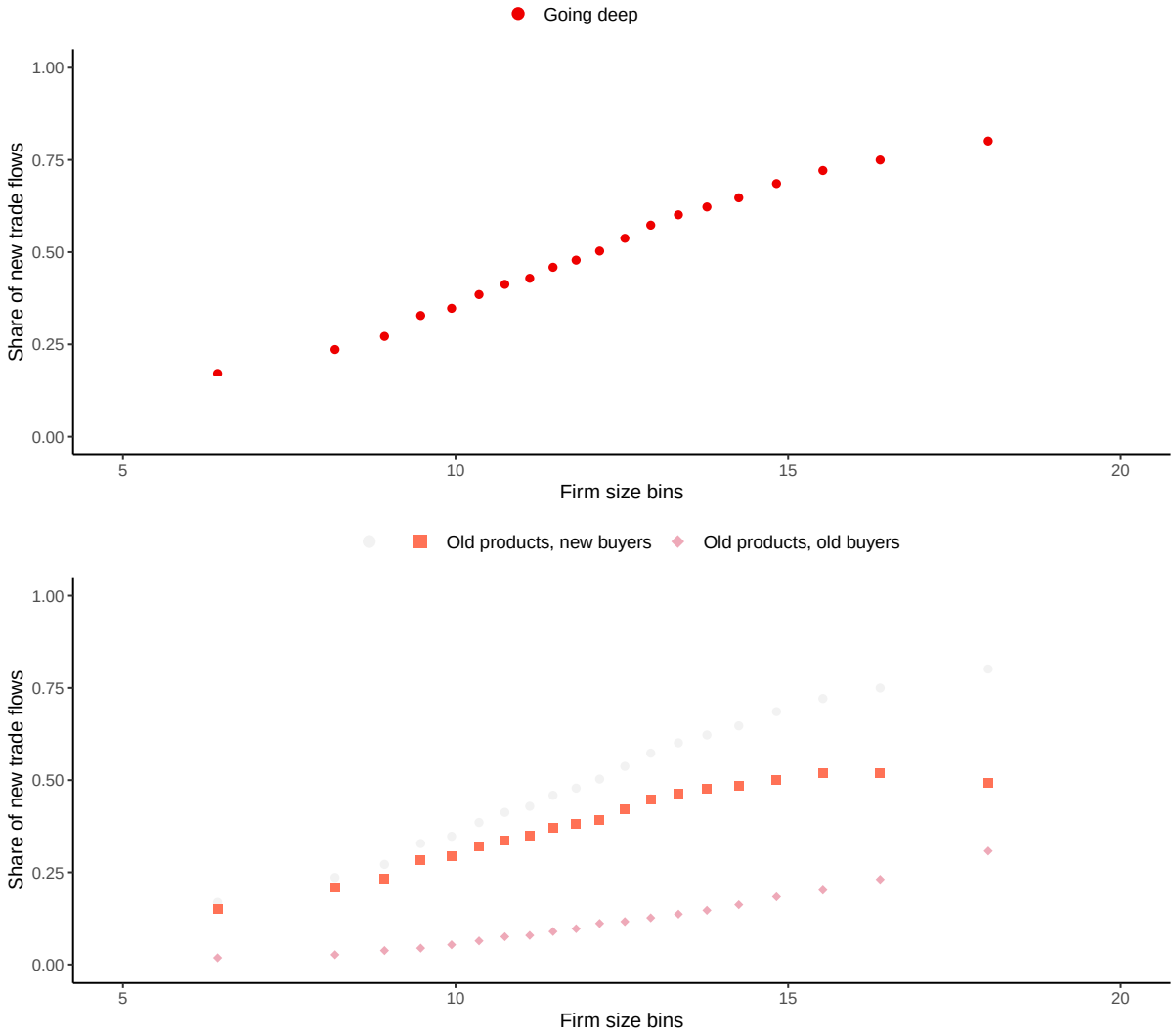
The mirror image of going-wide is the share of new trade flows created on account of exporters going-deep, that is, firms accumulating new buyers for their existing products. As seen in Figure 4, approximately 17% of new trade flows for the smallest firm size bin are due to going-deep, but for the largest firm size bin, the share is as high as 80%. The share of going-deep trade flows is even larger, approximately 82.6% for the average firm in the top one percentile of the size distribution.

Figure 3: Going-wide and its components



Notes: The figure shows a bin-scatter plot with annual firm export value on the x-axis, and the share of going-wide trade flows in new trade flows of a firm in a given year on the y-axis. Going-wide trade flows are defined as new trade flows on account of a firm selling a new product a) to a new buyer b) to an existing buyer of the firm.

Figure 4: Going-deep and its components



Notes: The figure shows a bin-scatter plot with annual firm export value on the x-axis, and the share of going-deep trade flows in new trade flows of a firm in a given year on the y-axis. Going-deep trade flows are defined as new trade flows on account of a firm selling one of its existing products (a) to a new buyer (b) to an existing buyer who previously bought another product from the firm.

The bottom panel of Figure 4 splits going-deep into two groups. Squares correspond to those flows where a firm reaches a new buyer for its existing products. Diamonds correspond to trade flows where the firm sells one of its existing products to a pre-existing buyer who had previously purchased another product of that firm. The figure shows that across firms of all size classes, the dominant margin of going-deep is firms accumulating *new* buyers for their existing products. It accounts for 15% of all new trade flows for firms in the smallest size bin, and for approximately 50% for those in the largest size bin. Finding buyers for an existing product from within the pre-existing buyer base forms a negligible share of the new trade flows of small firms, approximately 2%, and increases gradually along the firm size distribution. The results indicate that to expand sales of existing products, firms of all size classes rely heavily on searching for buyers outside its existing buyer base.

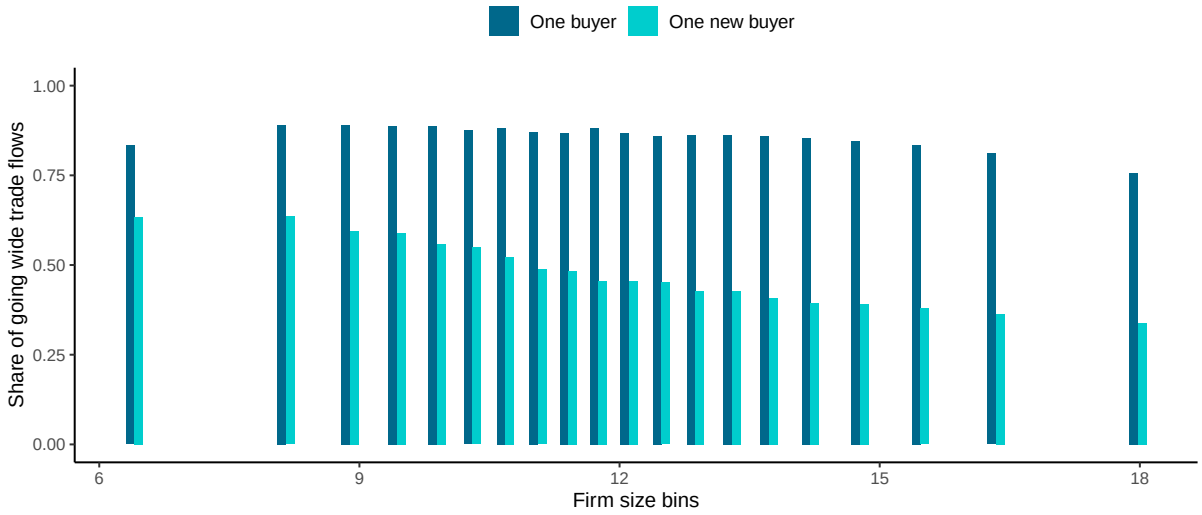
Figure 1, presented earlier in the introduction, juxtaposes the going-wide and going-deep margins in a single graph, illustrating the stark difference in composition of new trade flows across the firm size distribution.[9] This stylised finding is robust to defining new products and new buyers over a three-year span (see Figure A5) and defining the share of going-wide and going-deep trade flows in terms of value of exports (see Figure A6). Further, Figure A7 shows a bin-scatter plot for go-wide and go-deep trade flows for firms in different size bins conditional on the number of products a firm produces in a given year. The pattern remains similar, thus showing that the stylised finding is not a result of large firms exhausting the number of products they can introduce. Figure A8 divides new trade flows involving a new buyer into two groups: those where the new buyer is located in a new destination country and those where the new buyer is in a destination country where the exporter already has a presence. The graph illustrates the relative importance of entering new destination markets for introducing new products, particularly for small exporters.[10]

A further inspection of Figures 3 and 4 illustrates that the overall pattern is largely driven by two margins: The margin of selling new products to new buyers stands out for smaller firms, while the margin of selling old products to new buyers dominates for larger firms. While the latter margin is the focus of a rather large literature that explicitly models the accumulation of additional customers for existing products (see, e.g.,Arkolakis, 2010; Fitzgerald et al., 2023; Eaton et al., 2021), we know less about the process of selling new products, to both new and old customers. A natural question

[9]Note that Figures 3 and 4 illustrate the share of going-wide and going-deep among new trade flows, and not the absolute value of the respective types of new trade flows. In terms of absolute values, of course, the number of each type of new trade flows is increasing in firm size (see figure A4).

[10]Only 11.7% of the going-wide transactions are such that a firm exports a new product to a new country, and only 5.6% of the going-deep transactions are such that the firm exports an existing product to a new country.

Figure 5: New products sold to one (new) buyer



Notes: The x-axis uses the annual firm export value to split firms into 20 equally sized bins. Going-wide trade flows is the number of new trade flows on account of firms selling new products.

emerging from the trade-off we observe between going-deep and going-wide is whether the process of selling new products to customers might be distinct from selling existing products. In order to answer this question, we next investigate how firms sell new products to buyers.

2.3 Selling new products

Fact 3: New products are introduced with one (new) buyer. In a first step, we analyse the number of buyers a new product is sold to. The average number of buyers a new product is sold to in our sample is 1.58, and the median is 1. In fact, we find that 83.4% of new products introduced in our sample are introduced by a firm with exclusive sales to a sole buyer in the year of introduction. We study the likelihood of this phenomenon across the firm size distribution in Figure 5. The dark bars illustrate the share of new products that are sold to a single buyer, or equivalently the share of going-wide trade flows with one buyer for firms in a given firm size bin. For firms of all size classes, 82-89% of the new products are introduced with a single buyer, and even for the largest 5% firms, this share remains at 76%. Thus, irrespective of firm size, the selling of new products relies heavily on securing a single buyer initially.

In a second step, we explore the types of buyers that buy new products. We find that 42% of all going-wide trade flows are such that a new product is sold to only one *new* buyer in the year of introduction. The light bars in Figure 5 show 63% of new products introduced by the smallest 5% firms are sold to a single buyer who is also a new buyer for the firm. For the largest 5%

firms, the ratio is 34%. Hence, selling to a single new buyer is a distinctive feature of adding new products across firms of all size classes. Figure A9 shows that this finding is robust to defining new products using the HS2 classification, thereby considering only products from very distinct product categories as new products. To allay concerns that exports to non-firm entities could be driving our result, we use a restricted sample where we are able to match buyers in the Swiss customs data with firm names in Orbis from Bureau van Dijk. Also with this filter, we find that the relevance of new products being sold to a single buyer in the year of introduction is high along the firm size distribution (See Figure A10). Thus, the fact we uncover appears particularly relevant for firm-to-firm trade.

This finding suggests that a large share of new products of a firm are specifically directed towards one (new) buyer, presumably, to match the need of that particular buyer. This implies that the process of selling new products differs fundamentally from selling existing ones. While the latter is focused on attracting more buyers to the existing characteristics of a product, the former aims at satisfying a particular buyer-specific demand.

This insight diverges from the notion that a firm independently develops a new product and subsequently sells it to its existing buyer base and some new buyers. Essentially, we interpret this finding as one where firms own a certain technology that can be used in various functions, with these functions corresponding to different products that embed the technology of the firm. While firms know about their technology, they need expertise from potential buyers regarding the potential use cases for their technology across market niches. We refer to the latter process as locating the latent demand for a new product. Locating this demand requires the firm to first meet an appropriate buyer – we will refer to these buyers as core buyers – who bring some information or knowledge to the table that leads to the embedding of the firm's technology into a new product.

This perspective on selling new products is supported by a body of literature in organisation and innovation economics, which demonstrates that buyer-supplier relationships are crucial for firms to introduce new products (Bhaskarabhatla, 2016; Klepper and Thompson, 2006). One specific example studied in this literature is the laser industry. General-purpose technologies, such as lasers, are utilized in various sub-markets or market niches, necessitating investment in finding buyers to discover new applications and uses. In this context, it is plausible that core buyers are international customers. This is because different countries specialize in various industries with specific technological needs and exhibit diverse demand for final goods. This is in line with the finding that many of the new buyers that new products are introduced with are in new destination countries.

In order to provide some anecdotal evidence on the relevance of the outlined mechanism, consider the following excerpts from the websites of well-known firms that illustrate the underlying process we intend to elucidate.

> *We work with many sectors and platforms.* ***Our technology*** *drives some of the top equipment and* ***products*** *around the world.*
>
> Taiwan Semi-Conductor Manufacturing Company (TSMC)

> *We develop* ***completely new laser machines for customer-specific applications****. In collaboration with the customer, we first determine and test whether laser technology is suitable for the application.*
>
> MetaQuip

> *The company's optical products are used to manufacture microchips, research infectious diseases, manage the quality of electric vehicles and wind turbines, provide the best possible treatment in neurosurgery and eye surgery, and make award-winning films.*
>
> Carl Zeiss AG

The above examples elucidate how firms can use the technology they own to create products across several products and sectors. TSMC in particular is a foundry that uses its know-how to manufacture semi-conductor chips based on the design provided by a particular buyer. Similarly, MetaQuip designs new machines for new applications identified by a customer. Carl Zeiss uses its expertise in optics to make products for several industries including semiconductor industry, electromobility, clinics and ophthalmology, film and optics etc. While the quotes above are examples of capital goods and intermediate goods, the pattern identified above for introducing new products holds for all types of goods, as seen in Figure A11: The share of going-wide transactions that are sold to one buyer in the year of introduction is more than 80% for all three types of goods. This suggests that similarly to classic intermediate and capital goods, also final consumption goods are introduced through matching with a buyer – e.g., a wholesaler or a retailer – that helps firms to identify market niches and functions for their technology in the final goods market.

3 Model framework

We use the stylised facts shown above to develop a simple partial equilibrium model that provides a framework to illustrate the trade-off a firm f faces between introducing new products (going-

wide) versus accumulating new buyers for existing products (going-deep) in export markets. In our setting, this trade-off arises as firms cannot grow to their desired size in an instant due to supply side constraints. Indeed, empirical studies suggest that exporting firms grow slowly and gradually (Alessandria et al., 2021). One way to model this slow adjustment is to take into account labour market frictions as in Fajgelbaum (2019). We conceptualize this idea in a reduced-form way and assume that, in the short run, sales personnel within a firm is fixed. This constraint gives rise to the trade-off between going-wide and going-deep. In particular, we assume that each firm is endowed with a fixed number of sales personnel S_f. Without loss of generality, we normalize this to one ($S_f = 1$).

A large literature has investigated the role of firm-level heterogeneity in productivity for determining firm size and scope (Eckel and Neary, 2010; Dhingra, 2013). A salient result in that literature is that more productive firms are larger and offer more products. This is also an important feature in our data. However, we also observe that although larger firms have a more extensive product portfolio, an increasingly smaller share of their new trade flows are the result of introducing new products. We want to focus on the latter feature of the data by holding cross-sectional determinants of firm size and scope fixed and examining how firms that differ in terms of their stage in the export expansion path differ in their export strategies. Hence, we assume the marginal cost of production of each good, c, to be identical for all firms and products. The stage of a firm's expansion path is captured by the number of products a firm has already introduced, M_f^{Old}. We assume that firms are born with a fixed number of products, M_f^{Old}, that varies exogenously across firms.

Sales personnel can be employed to deepen the customer base for existing products (going-deep) or to find so-called core buyers to whom firms can target new products (going-wide). While firms know the demand for their existing products, finding core buyers corresponds to locating the latent demand for new products. In the following discussion, the terms customer and buyer are used interchangeably. Consistent with what we observe in trade data, we consider customers to be firms that source products as inputs.[11]

We focus on sellers' investment in accumulating more customers for their existing products in the spirit of Arkolakis (2010). We assume that each acquired customer's demand for the product follows a simple linear demand structure. With this framework, the quantity of each variety i sold to an

[11] Note that the vast majority of export transactions are indeed firm-to-firm trading relationships, even for final goods which are bought by retailers or wholesalers. In the case of retailers, the sourcing strategy of buyers corresponds to their optimal portfolio choice.

acquired customer C is a linear function of its price p and exogenous market parameters Γ:[12]

$$q_i^C = \Gamma - \frac{1}{\gamma} p_i, \tag{1}$$

where γ denotes the degree of product differentiation and determines the price sensitivity of customers. By assuming Γ to be exogenous, we simplify the framework and abstract away from cannibalization forces that have been the focus of much of the previous work on multi-product firms (Eckel and Neary, 2010; Dhingra, 2013; Flach and Irlacher, 2018). We do this in light of the empirical evidence that shows that new products are mostly sold to new buyers. Moreover, our empirical evidence is robust to considering very different products (i.e., 2-digit HS product categories) where cannibalization forces are less likely to operate. The framework can, however, be easily extended to incorporate these forces.[13]

Going-deep: The number of customers a seller reaches for a given product variety depends on the market share n_i that is 'conquered'. We model the functional form of sellers' investment in accumulating a customer base for existing varieties (going-deep) following Arkolakis (2010):

$$n(s_i) = 1 - \left[1 + \theta \frac{s_i}{\left(M_f^{Old}\right)^{\beta} L^{\alpha}} \right]^{-\frac{1}{\theta}}. \tag{2}$$

where the parameter θ governs the degree of decreasing returns to investing in going-deep and can be interpreted as a parameter capturing the buyer-specificity of the respective products. Since $\theta > 0$, n_i varies between 0 and 1. s_i denotes the share of sales personnel used for deepening the customer base of variety i. Hence, the total number of customers reached per existing product is $n(s_i)L$ where $L > 0$ denotes the size of the market. Following Arkolakis (2010), $\alpha \in (0, 1)$ denotes how the efficiency of deepening the customer base depends on the size of the market L.

[12] The demand structure chosen here determines the intensive margin *within* buyers – how much firms sell to a given buyer – which we take as identical across products, new or old. Choosing a linear demand here is without loss of generality and choosing an alternative demand, e.g., CES, would not yield different results.

[13] Taking the standard framework of this literature based on linear demand schedules, we can rewrite (1) such that $\Gamma = \frac{\alpha}{\gamma} - \frac{\eta}{\gamma} Q^C$, where α and η are related to the substitution of the differentiated variety to a numeraire input and Ω^* denotes the set of varieties available to the average customer. Market demand of an individual customer is then $Q^C = \int_{i \in \Omega^*} q_i^C di = \frac{\alpha \int_{i \in \Omega^*} n_i di}{\gamma + \eta \int_{i \in \Omega^*} n_i di} - \frac{\int_{i \in \Omega^*} p_i n_i di}{\gamma + \eta \int_{i \in \Omega^*} n_i di}$, with n_i denoting the probability that a particular variety reaches a customer. Assuming that adding customers is independent across firms and varieties, we denote the average number of varieties available to customers by $\bar{n}N = \int_{i \in \Omega^*} n_i di$ and N is the number of available varieties in Ω^*. Moreover, we denote the average price buyers pay for the varieties they consume by $\bar{p} = \frac{1}{\bar{n}N} \int_{i \in \Omega^*} p_i n_i di$. Now we can rewrite the demand of an individual customer C for variety i as $q_i^C = \frac{\alpha}{\gamma + \eta \bar{n} N} - \frac{1}{\gamma} p_i + \frac{\eta \bar{n} N}{\gamma(\gamma + \eta \bar{n} N)} \bar{p}$. Since each firm's investment in adding products will affect the number of available varieties, the optimal product scope in these models will take this cannibalization force into account. We abstract from this force in the main analysis.

Note that due to symmetry of products and decreasing returns to going-deep, in equilibrium, firms will optimally invest the same amount of sales personnel for each of their existing products, such that s_i can be denoted as s_f. $\beta \in (0,1)$ captures the extent to which the investment of going-deep in a specific product spills over to all products of the firm. If $\beta = 0$, investment in going-deep benefits all products, if $\beta = 1$ each sales person only increases sales for one particular variety.

We assume that each firm will always sell a given product to the core buyer of that product (the buyer with whom the product is introduced in the market) independent of the investment into going-deep, s_f. Hence, for each existing product, total market demand is a function of prices charged (the intensive margin per buyer) and the number of customers reached (the extensive buyer margin). As market demand for existing products is identical for all products we can denote the demand for any product of firm f by:

$$q_f = \left[1 + \left(1 - \left[1 + \theta \frac{s_f}{\left(M_f^{Old}\right)^{\beta} L^{\alpha}}\right]^{-\frac{1}{\theta}}\right) L\right] \left[\Gamma - \frac{1}{\gamma} p_f\right].$$

Going-wide: The second margin of growth for firms is the introduction of new products. While firms know the demand schedule of products that have already been introduced (1)[14], firms must anchor the latent demand in product space for new products. We build on the stylised fact that a new product is typically sold to a single new buyer to model the anchoring of latent demand as the process of finding a core buyer towards whom firms can target new products. Once a product has been developed for this core buyer, the product can be marketed to other customers according to equation (1).

We model this process of going-wide like a search for successful matches with an exogenous success rate conditional on the personnel invested. $1 - s_f$ denotes the share of sales personnel invested in going-wide or the time invested by sales personnel to find suitable matches. We assume the success rate to be independent of markets size as the time spent by a sales person with a potential buyer to understand if a match emerges is constant.[15] We model the number of successful matches (and, hence, product creations), M_f^{new} as the outcome of a Poisson process. The discrete random variable of successful product introduction, M_f^{new}, has a probability mass function given by:

$$f\left(k; \epsilon(1 - s_f)\right) = Pr(M_f^{new} = k) = \frac{\left(\epsilon(1 - s_f)\right)^k e^{-\left(\epsilon(1 - s_f)\right)}}{k!}, \tag{3}$$

[14]This assumption of perfect knowledge of the demand schedule can be relaxed to allow for random demand function parameters.

[15]We could allow for market size L to increase the likelihood of finding matches as long as we assume that going-wide scales less with market size than going-deep.

where $\epsilon > 0$ is an exogenous parameter related to the success rate of matches. Given a Poisson process, the expected number of successful matches and, hence, product introductions is a function of this parameter and the personnel invested in finding new matches:[16]

$$\mathbb{E}\left[M_f^{new}\right] = \epsilon(1 - s_f). \tag{4}$$

Solution: We assume that firms simultaneously choose the quantity sold to each acquired customer and the allocation of sales personnel between going-deep and going-wide. The optimal quantity sold to each customer, prices charged and profits per acquired customer for any product by a profit-maximizing firm are given by:

$$q_f^C = \frac{1}{2}\left(\Gamma - \frac{1}{\gamma}c\right) \quad \text{and} \quad p_f = \frac{1}{2}\left(\gamma\Gamma + c\right) \quad \text{and} \quad \mu_f = \frac{1}{2}\left(\gamma\Gamma - c\right). \tag{5}$$

Given this, the expected total profits of a firm as a function of the share of sales personnel invested in going-deep, s_f, are as follows:

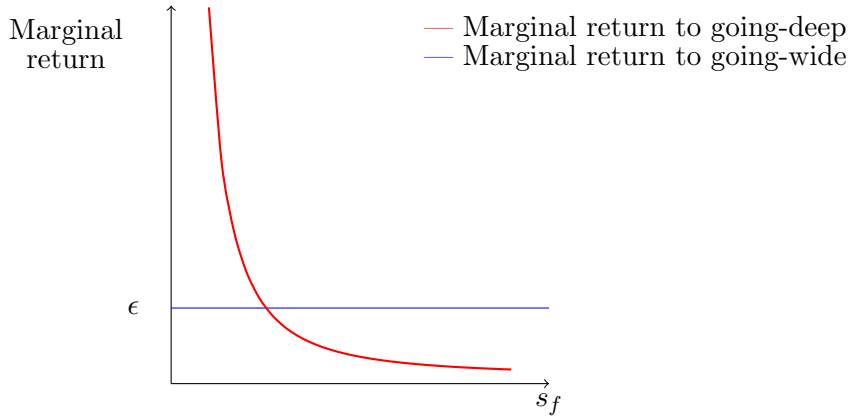
$$\mathbb{E}\left[\pi_f\right] = \frac{1}{4}\left(\gamma\Gamma - c\right)^2 \frac{1}{\gamma}\left(M_f^{Old}\left[1 + \left(1 - \left[1 + \theta\frac{s_f}{\left(M_f^{Old}\right)^{\beta} L^{\alpha}}\right]^{-\frac{1}{\theta}}\right) L\right] + \epsilon(1 - s_f)\right), \tag{6}$$

where the first component in the bracket corresponds to the expected profits of selling more of existing products (going-deep) and the second component corresponds to the expected profits of adding new products to the portfolio (going-wide).

The marginal return to going-deep is decreasing in s_f as it becomes progressively harder to reach additional customers for existing products. An additional sales person will reach fewer new customers compared to the previous sales person as the number of available buyers for a given product becomes saturated. This is illustrated by the red locus in Figure 6. In contrast, the marginal return to going-wide is constant since a fixed amount of sales personnel is needed to evaluate whether a successful match will emerge with a new core buyer. This is irrespective of the amount already invested in going-wide. The constant marginal return to going-wide is illustrated by the blue locus in Figure 6.

[16] The fact that selling new products is different from selling existing ones is related to the literature on exploitation versus exploration. We can think of the rate of successful matches with new core buyers, ϵ, as the likelihood of success of risky exploitation (Manso et al., 2023).

Figure 6: Optimal choice of s_f



Notes: s_f denotes the share of sales personnel allocated to going-deep, and $s_f \in (0, 1)$.

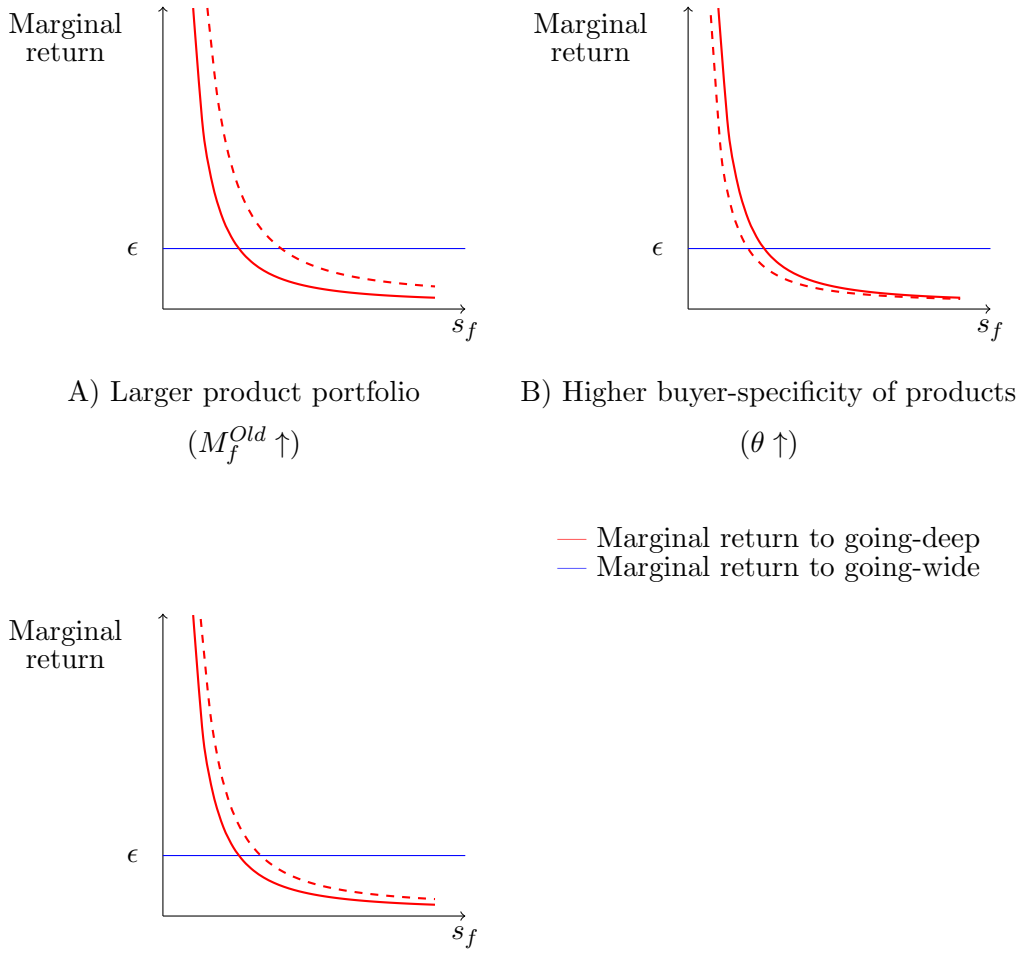
The optimal share of sales personnel invested in going-deep is given by the intersection of the two loci as long as the optimal share is below one. Analytically, the profit maximising choice of s_f is given by:

$$s_f = \min \left(\left[\epsilon^{-\frac{\theta}{1+\theta}} \left(M_f^{Old} \right)^{\frac{\theta(1-\beta)}{1+\theta}} (L)^{\frac{\theta(1-\alpha)}{1+\theta}} - 1 \right] \frac{\left(M_f^{Old} \right)^{\beta} L^{\alpha}}{\theta}, 1 \right) \tag{7}$$

3.1 Comparative statistics

The conceptual framework illustrates how firms face a trade-off between the two export strategies, given they cannot optimally adjust their employment size. The intensity of each strategy depends on specific parameters of the model.

Figure 7: Comparative statics: Optimal choice of going-deep for different parameter values



Notes: s_f denotes the share of sales personnel allocated to going-deep, and $s_f \in (0, 1)$. The dotted lines shows how the solution changes for an increase in parameter value.

Importantly, the framework explains a stylized fact documented in section 2: Firms that are at a later stage of their expansion path and that are larger, having already introduced several products, will allocate a smaller share of their personnel to broadening their product range and instead focus on deepening their existing offerings. This is depicted in Panel A of Figure 7. This shift is not due to an exhaustion of products that a firm can introduce, but rather because, constrained in their personnel growth, it becomes increasingly profitable for firms to invest in going-deep. As seen in Table A2, larger firms tend to introduce more products than smaller ones, indicating they are not limited in the number of products they can potentially introduce. It is due to scale effects that

these larger firms find it optimal to allocate their resources towards going-deep and acquire more customers for their existing products. In contrast, smaller firms allocate a larger share – and under certain model parameters, a dominant share– of their sales personnel to broadening their product scope instead of accumulating more buyers for their existing products. This strategy is driven by diminishing returns of going-deep: as it becomes progressively more difficult to reach additional customers for a given product, smaller firms have higher returns from going-wide than going-deep.

We derive two additional theoretical predictions from this framework. First, the model parameter θ governs the extent of decreasing returns from investing in going-deep. In firm-to-firm trade, underlying the observed trade-flows, θ can be understood as capturing the specificity of products to a particular buyer relationship. The more tailored a product is to a specific buyer, the harder it becomes to reach additional customers, making firms more likely to go wide as θ increases. This is illustrated in Panel B of Figure 7, where the schedule reflecting marginal returns to going-deep shifts to the left as θ increases.

Second, the framework predicts that the optimal export strategy depends on market size L. Investment in going-deep scales with market size, while going-wide does not. This reflects that creating a successful match with a potential core buyer requires the same amount of resources, regardless of the number of other potential buyers. Hence, the marginal return to going-wide is unaffected by market size. This is illustrated in Panel C of Figure 7, where an increase in market size shifts only the schedule of marginal returns to going-deep to the right.

4 Testing theoretical predictions

We use our data to test the predictions of the conceptual framework. Since we do not directly observe the share of sales personnel, s_f, allocated to going-deep in the data, we measure the intensity of going-deep as an export strategy in terms of the share of new trade flows created as a result of firms accumulating new customers for their existing products (as we did in Section 2).

In our conceptual framework, this share corresponds to

$$Deepshare_f = \frac{M_f^{Old}\left[1+\left(1-\left[1+\theta\frac{s_f}{\left(M_f^{Old}\right)^{\beta}L^{\alpha}}\right]^{-\frac{1}{\theta}}\right)L\right]}{\epsilon(1-s_f)+M_f^{Old}\left[1+\left(1-\left[1+\theta\frac{s_f}{\left(M_f^{Old}\right)^{\beta}L^{\alpha}}\right]^{-\frac{1}{\theta}}\right)L\right]}$$

and is monotonically increasing in s_f:

$$\frac{\partial Deepshare_f}{\partial s_f} > 0$$

Effect of firm size on s_f: Our conceptual framework predicts that firms at a later stage in their export expansion path will allocate a larger share of their new trade flows to going-deep. As shown in Fact 2, larger firms tend to focus on going-deep, which aligns with our prediction but could also be attributed to cross-sectional differences among firms. In this section, we directly test the predicted relationship between the stage in the expansion path and the share of going-deep trade flows by leveraging within-firm variation in size. The analysis is based on the following simple linear regression:

$$\text{Deep Share}_{ft} = \beta \log(\text{Size})_{ft} + \lambda_f + \lambda_t + \epsilon_{ft} \tag{8}$$

where Deep Share_{ft} is the share of new trade flows on account of going-deep for firm f at time t, where a new trade flow is a seller-buyer-product combination that is seen in $t+1$, but not in t. We capture firm size, Size_{ft}, in terms of the export value of a firm f in time t. Alternatively, we use the number of products and buyers of a firm to capture firm size.[17] λ_f are included to control for individual firm characteristics, ensuring that the relationship between Deep Share_{ft} and firm size is identified using variation in size within firms across the six-year panel. The latter controls for firm-specific heterogeneity that determines the long-run cross-sectional variation in export volume, e.g. productivity, that is known to be a major determinant of firms' overall export size. Additionally, λ_t accounts for potential macroeconomic shifts that could impact all firms uniformly. Standard errors are clustered at the firm level. A positive estimate for the coefficient β suggests that as the exports of a firm increase, the firm goes deep. In other words, as a firm matures along its export expansion path, a larger share of its new trade flows consists of accumulating new buyers for its existing products.

Table 3 shows the results. Columns (1), (2) and (3) use alternative measures of firm size while controlling for firm and year fixed effects. In all columns, the relationship between firm size and Deep Share is positive and statistically significant. The coefficient in Column (1) suggests that for a one percent increase in export value, the share of new trade flows created on account of going-deep is 3.5 percentage points. Note that the average value of the share of going-wide trade flows is 0.498.[18]

Columns (4)-(6) show results with minor modifications to the baseline specification. Column (4) defines Deep Share using the value of trade flows on account of going-deep in the total value of

[17] Note that export value, and number of buyers scales monotonically with the number of products a firm is born with (M_f^{Old}) in our model.

[18] Table A3 shows that the coefficient is similar for firms producing capital, consumption, and intermediate goods.

Table 3: Firms go deep as they grow

Dependent Variables:	Deep Share					
				(Value)	(3-year)	(HS2)
Model:	(1)	(2)	(3)	(4)	(5)	(6)
Log exports	0.0353***			0.0515***	0.0431***	0.0304***
	(0.0012)			(0.0011)	(0.0015)	(0.0015)
Log products		0.1300***				
		(0.0023)				
Log buyers			0.0980***			
			(0.0022)			
Fixed-effects						
Year	Yes	Yes	Yes	Yes	Yes	Yes
Firm	Yes	Yes	Yes		Yes	Yes
Industry				Yes		
Observations	59,949	59,949	59,949	12,266	59,949	58,308
R^2	0.68132	0.70010	0.69043	0.32013	0.60684	0.53814

Note: The dependent variable *DeepShare* is the share of new trade flows for a firm in a given year on account of going-deep (reaching new buyers for existing products) in Columns 1-3, and the value of going-deep trade flows as a share of the value of new trade flows in Column (4). *DeepShare* in Column (5) uses data aggregated over three years, from 2012-2014 and 2015-2017, and new trade flows are defined as trade flows observed in the latter time period, but not in the first. *DeepShare* in Column (6) defines a trade flow as a firm selling a HS2 product to a buyer in a given year, and correspondingly defines new trade flows. *Log exports* is the log of the annual value of exports of a given firm and *Log no. of products* is the log of the number of HS8 products sold by a firm in a given year. Standard errors are clustered at firm level. Signif. Codes: ***: 0.01, **: 0.05, *: 0.1

new trade flows. Column (5) defines Deep Share over a three-year window.[19]. Finally, we use a stricter definition of what constitutes a new product in Column (6). In the baseline, what we call a new product – a new HS8 code – could be very close to existing products, thus blurring the lines between whether the trade flow is indeed new and can be accorded to going-wide or rather going-deep with a slightly customized product. Hence, we check the robustness of our result to defining a new product as one that is a new HS2 code in Column (6). With this definition too, more than 40% of the trade flows in our sample are new. Columns (3)-(6) show that the result is robust to these alternate measurements of the share of going-deep trade flows.

While firm fixed effects absorb time-invariant components of firm productivity, we additionally check if our results hold in sub-samples of presumably more and less productive firms by distinguishing firms by size and multinational status in Table A4.[20] For the sub-sample of multinational and non- multinational firms in Columns (1) and (2), respectively, the coefficient is positive and statistically significant, and similar to the baseline. In Columns (3)-(6), we split firms into four quartiles based on the aggregate value of their export sales over the six years. The coefficient is positive and significant for all the size groups.

Next, we undertake a robustness check in which we exclude all new trade flows which drop out after one year. The result, presented in Column (1) Table A5, confirms our finding. In Column (2) of this table, we filter out firms with fewer than three products at the inception of the sample. As shown in Table A5, the coefficient remains positive and statistically significant in both cases.

Effect of θ on s_f: The second theoretical prediction of the conceptual framework suggests that firms with a product portfolio characterised by higher buyer-relationship-specificity will optimally choose an export strategy that focuses more on going-wide and less on going-deep. To measure the buyer-specificity of a firm's product portfolio, θ_f, we calculate the sales-weighted relationship-specificity of products sold by firms in 2012 following Nunn (2007). Nunn (2007) measures the relationship specificity of products based on the share of inputs used in production of a product that are differentiated – those that are neither bought and sold on an exchange nor reference priced –, as defined by Rauch (1999). We expect that firms with more relationship specific products have a higher θ and consequently devote a relatively smaller share of their new trade flows to going-deep.

We show the results in Table 4. Column (1) shows the relationship between θ and the share of going-

[19]With data from 2012-2018, for each firm we have information for Deep Share for only one year. Hence, we report the results with four-digit industry fixed effects only.

[20]We rely on a match of our data with Orbis from Bureau van Dijk to identify Swiss multinationals. In cases where we are unable to match a Swiss exporting firm with Orbis data, we drop it.

Table 4: Relationship between θ and Deep Share(s)

Dependent Variable:	Deep Share	
Model:	(1)	(2)
Buyer specificity	-0.0774***	-0.0449***
	(0.0191)	(0.0158)
Log exports		0.0550***
		(0.0007)
Fixed-effects		
Year	Yes	Yes
Industry	Yes	Yes
Observations	59,646	59,646
R^2	0.15402	0.31450

Note: The dependent variable *DeepShare* is the share of new trade flows on account of going-deep (reaching new buyers for existing products). *Buyer specificity* is the sales-weighted relationship-specificity of products sold by firms in 2012 using the classification of relationship specificity by (Nunn, 2007). *Log exports* is the log of the annual value of exports of a given firm. Standard errors are clustered at firm level. Signif. Codes: ***: 0.01, **: 0.05, *: 0.1

deep trade flows while controlling for four-digit firm-level industry fixed effects as well as for year fixed effects to account for macroeconomic variation. We find that firms selling more buyer-specific products allocate a smaller share of their new trade flows to go deep. That is, firms producing products where the search for new customers is subject to more intense decreasing returns focus their export strategy more on going-wide. Column (2) additionally controls for the log of exports of firm f in year t to account for concerns that smaller firms are more likely to produce more buyer-specific products. The results in column (2) confirm that the effect of buyer specificity is not driven by firm size.

Effect of market size L on s_f: The third theoretical prediction emerging from the conceptual framework relates to the effect of market size: going-deep becomes more profitable as an export strategy as the market size increases. In order to capture a plausible exogenous change in the (effective) market size firms face, we make use of a sudden and sizable exchange rate shock that occurred in Switzerland in 2015. On January 15 2015, the Swiss National Bank suddenly and unexpectedly decided to give up on a minimum exchange rate policy (1.2 CHF/EUR) of the Swiss franc relative to the Euro, a policy that had been in place since 2011. The Swiss exchange rate appreciation in 2015 occurred in an environment characterised by low exchange rate volatility and stable macroeconomic outlook, and came as a surprise to most market analysts and investors. This policy change caused a strong and persistent appreciation of the Swiss franc against other currencies as is illustrated in Figure A12. The Figure also illustrates that investors were not expecting a change in the exchange rate. This large exchange rate shock has been exploited in previous research work (see e.g., Auer et al., 2019; Bonadio et al., 2020).

The appreciation reduced the effective market size of all Swiss firms as their products became more expensive in their export destinations from one day to the next while production costs in Switzerland remained relatively stable. The appreciation was not only a nominal but a real shock to export prices because of rigidities in the domestic market that prevented domestic costs of production from adjusting to the new environment. However, the exchange rate shock did not affect all Swiss firms the same way because only part of production costs are rather rigid, in particular, costs of domestic labour and other domestically sourced inputs. Inputs used in production that stem from abroad, in contrast, became cheaper with the appreciation. Hence, the import intensity of firms prior to the appreciation governs the pass-through of the exchange rate shock on the effective market size of individual firms. This is in line with evidence by Amiti et al. (2014) who show that the exchange rate pass-through depends importantly on the importing intensity of firms. We exploit this firm-level variation in the effect of the exchange rate shock on effective market size to test the third

prediction of our conceptual framework.[21]

We estimate the exposure of each firm to the exchange rate shock's impact on their effective market size as follows:

$$Exposure_f = \sum_{t=2012}^{2014} \frac{Imports_{ft}}{Exports_{ft} + Imports_{ft}} \tag{9}$$

We use data from 2012 to 2014, the three years prior to the shock, to measure firms' import intensity. The measure captures firm exposure to a relatively larger market (L) after the exchange rate appreciation. The measure varies between 0 and 1, and the average value of exposure for firms in our data is 0.574. We test the effect of market size on firm export strategy using the firm-level variation in exposure to the exchange rate shock's impact on effective market size as follows:

$$\Delta\text{Deep Share}_{f(t-2014)} = \beta Exposure_{f,pre} + \lambda_j + [x'_{f,pre}\gamma] + \epsilon_f \tag{10}$$

where $t \in (2015, 2017)$. Hence, we estimate the change in export strategy within one year after the shock (short difference), and over a three-year horizon (long horizon). We control for four-digit industry fixed effects (λ_j), which accounts for factors such as changes in import competition at the industry level. We expect our coefficient of interest, β, to be positive: Firms that that face a relatively larger effective market size after the appreciation should allocate a larger share of their resources to going-deep after the shock compared to those that face a reduction in their relative market size. Standard errors are clustered at the four-digit industry level.

The results are presented in Table 5. Columns (1) and (2) examine the change in the share of going-deep trade flows over a one-year horizon, that is, from 2014 to 2015. To account for any potential correlation between firm size and *Exposure*, Column (2) controls for the value of exports of a firm in 2014. In Column (3), we extend the analysis to examine the change in the share of going-deep trade flows over a three-year horizon, from 2014 to 2017. Finally, Column (4) presents the results when Deep Share is defined in terms of export value, that is the value of going-deep trade flows in the total value of new trade flows. *Exposure* is positive and statistically significant across all specifications, indicating that a relatively larger effective market size is associated with a larger share of new trade flows devoted to going-deep, as predicted by the conceptual framework.

[21] Previous research by Flach and Irlacher (2018) has used an exchange rate shock in Brazil as a measure of a change in effective market size.

Table 5: Deep Share and market size (L)

Dependent Variables:	Change in Deep Share			
			(Long Difference)	(Value)
Model:	(1)	(2)	(3)	(4)
Exposure	0.0325***	0.0478***	0.0669***	0.0247**
	(0.0091)	(0.0107)	(0.0112)	(0.0119)
Log exports		0.0039***		
		(0.0013)		
Fixed-effects				
Industry	Yes	Yes	Yes	Yes
Observations	11,779	11,779	11,726	11,779
R^2	0.04646	0.04729	0.05545	0.04270

Note: The dependent variable ΔDeep Share$_{f(t-2014)}$ is the change in the share of new trade flows on account of going-deep (reaching new buyers for existing products) from 2014 to 2015 in Columns (1) and (2) and from 2014 to 2017 in Column (3). Column (4) uses the one-year change in the share of going-deep trade flows defined in terms of the value of the new trade flow instead of the count of trade flows. *Exposure* is the ratio of value of imports in total value of imports and exports of a firm between 2012 and 2014. *Log exports* is the log of the annual value of exports of a firm in 2014. Standard errors are clustered at four digit industry level. Signif. Codes: ***: 0.01, **: 0.05, *: 0.1

Table 6: Deep Share and L: Placebo test

Dependent Variables:	Change in Deep Share			
			(Value)	
Model:	(1)	(2)	(3)	(4)
Exposure	-0.0032		0.0055	
	(0.0104)		(0.0131)	
Exposure_{2013}		-0.0149		-0.0074
		(0.0095)		(0.0119)
Fixed-effects				
Industry	Yes	Yes	Yes	Yes
Observations	11,754	11,754	11,754	11,754
R^2	0.04751	0.04773	0.04850	0.04851

Note: The dependent variable $\Delta\text{Deep Share}_{f(2014-2013)}$ is the change in the share of new trade flows on account of going-deep (accumulating new buyers for existing products) from 2013 to 2014 in columns (1) and (2). Columns (3) and (4) uses the change in the share of going-deep trade flows from 2013 to 2014 defined in terms of the value of the new trade flow. *Exposure* is the ratio of imports in total exports plus imports of a firm between 2012 and 2014. *Log exports*$_{2013}$ is the log of the annual value of exports of a firm in 2013. *Exposure*$_{2013}$ is the ratio of imports in total exports plus imports of a firm in 2013. Standard errors are clustered at four digit industry level. Signif. Codes: ***: 0.01, **: 0.05, *: 0.1

To allay the concern that *Exposure* may be picking up some unobserved heterogeneity at the firm-level that is positively correlated with the dependent variable, we conduct a placebo test where we study how firms more exposed to a (relative) increase in market size due to the exchange rate shock in 2015 changed their export strategy in the years before the exchange rate appreciation. Results are reported in Table 6. Column (1) uses the measure of *Exposure* as calculated in equation 9, and studies its relationship with change in the share of going-deep trade flows prior to the exchange rate shock, that is from 2013 to 2014.[22] Column (2) redefines exposure for the pre-shock years by using imports and exports value of firms in 2013, hence, before the exchange rate shock appreciation. This allows us to have a comparable measure of increase in relative market size as in equation 9 but for the placebo years. Finally, Columns (3) and (4) show the result for change in the share of going-deep trade flows measured in terms of export value. Across all specification, we cannot see a relationship between firm-level import intensity and change in export strategy, suggesting that it is not the importing intensity per-se that affects firms' export strategies in the subsequent year. Import intensity captures the differential impact of the exchange rate shock in 2015 on the firms' effective market size. This in turn affects their export strategies in the following years as predicted by the conceptual framework.

5 Discussion

The stylized facts presented in this paper show that firms of different sizes vary in their export strategies. Smaller firms devote a larger share of their new trade flows to going-wide, while larger firms devote the majority of their new trade flows to going-deep. Together with the fact that new products are typically targeted to one (often new) buyer, this evidence suggests that selling new products is inherently different from selling existing products and which strategy is more profitable depends on the size and life-cycle stage of exporters.

We propose a simple conceptual framework in which selling new products is different from selling existing products, as selling new products requires matching with a core buyer first. Since firms cannot flexibly adjust their employment, they face a trade-off between accumulating new buyers for their existing products and introducing new ones. An important implication of the model is that the two exporting strategies differ in their scalability with respect to firm size and market size. This difference can explain the variation in export strategies across firm size classes observed in the data, as well as the change in export strategy observed after an exogenous change in market size.

[22] Note that due to data availability, we can calculate Deep Share only for the years 2013 and 2014, and can, hence, obtain ΔDeep Share$_{f,(2014-2013)}$ only over a short horizon.

The set-up of the conceptual framework is, on purpose, stylized. We could extend the framework to allow for spillovers from the existing customer base to the pool of potential core buyers, which aligns with the empirical observations that core buyers of larger firms are more often existing buyers (see Figure 5). One could also incorporate further motives that explain the difference in scalability of going-wide and going-deep.[23] For instance, the development of new products might become increasingly difficult because of technological constraints or span-of-control considerations (Caliendo et al., 2020). In Figure 6 this would correspond to an upward trend of the blue schedule corresponding to going-wide. Moreover, cannibalization could make introducing new products increasingly unattractive; this can be incorporated in our framework by taking into account the effect of an additional product on the demand for existing products.

These mechanisms, however, do not on their own take into account the empirical fact that selling new products is different from selling existing products and that product introductions are typically targeted towards a particular (often new) buyer. We explicitly model this novel fact: Instead of firms developing products in a void they need to match with a core buyer first. While a structural model would have to carefully consider all these additional aspects, we aim at capturing a conceptual mechanism that can explain the novel stylized facts presented. Accordingly, we resort to reduced-form empirical work supported by a simple conceptual framework in this paper.

The findings of the paper have very important implications, as they suggest that firms that are born at different levels of global market integration will choose different market expansion paths and have different scope and scale. In particular, firms that are born in a more globalized world and with access to a larger market will have a smaller product portfolio at a given size. This may have potentially important implications for gains from trade, as firms may not fully internalise the resulting reduction in the variety of available products.

6 Conclusion

This paper sheds light on the way firms become exporters of many products to many customers. To do so, we examine a novel margin of trade flows which we refer to as new trade flows – previously unseen seller-buyer-product combinations – of firms. First, we demonstrate that these new trade flows constitute an important share of trade flows for firms of all size classes. Next, we show that

[23] The difference in scalability between going-wide and going-deep is reminiscent of the literature that distinguishes between types of innovations, leading to different types of innovation for firms of varying sizes (Akcigit and Kerr, 2018). While this literature focuses on supply-side mechanisms, we highlight a demand-side perspective where selling new products is different from selling existing ones, consistent with our novel empirical evidence.

firms of different sizes differ in terms of their export strategy. Smaller firms concentrate their new trade flows on introducing new products (going-wide), while larger firms predominantly use their new trade flows to deepen their customer base for existing products (going-deep). Finally, we show that firms typically introduce new products with a single, often new, buyer. This suggests that selling new products is inherently different from selling existing ones.

We provide a simple conceptual framework that incorporates these insights and that can rationalise these facts: Firms face supply-side constraints that generate a trade-off between exporting strategies. Since adding new products requires a match with a core buyer first, it scales less with firm and market size compared to going-deep. Therefore, firms at different stages in their expansion path vary in terms of their exporting strategy. The model has three important testable predictions: First, as firms grow, they devote a larger share of their new trade flows to going-deep. Second, firms that offer more buyer-specific products will pursue export strategies that are rather focused on going-wide. Third, a larger output market makes going-deep relatively more profitable. We confirm all three of these predictions in the empirical section using detailed product-level information and an exogenous change in effective market size induced by an unexpected appreciation of the local currency.

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A Appendix: Additional tables

Table A1: Bernard et al. (2018) Decomposition, 2013 data

Dependent Variables:	log(Sellers)	log(Products)	log(Buyers)	log(Density)	log(Avg. exports)
Model:	(1)	(2)	(3)	(4)	(5)
Variables					
log(Exports)	0.5740***	0.5558***	0.6423***	-1.056***	0.2843***
	(0.0123)	(0.0112)	(0.0151)	(0.0236)	(0.0133)
Fit statistics					
Observations	240	240	240	240	240
R^2	0.90192	0.91169	0.88431	0.89386	0.65693

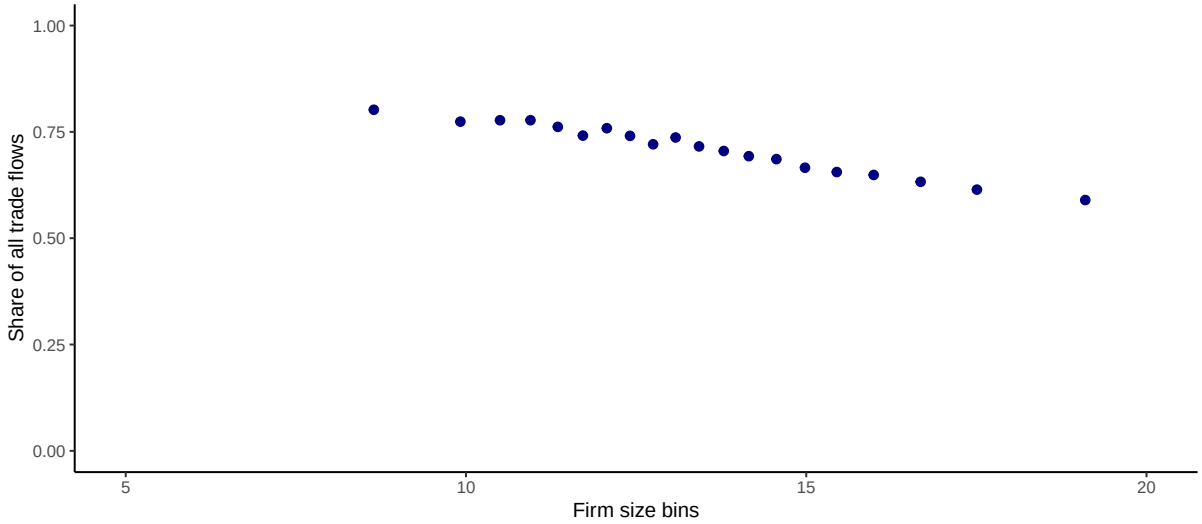
Note: *Sellers* is the number of unique exporters exporting to a country in 2013, *Products* is the number of HS8 products, *Buyers* is the number of buying entities, *Density* is the exporter-product-buyer combinations in the data as a ratio of possible combinations, and *Avg. exports* is the average value of exports per exporter-product-buyer combination. All dependent variables are in logs. Independent variable is the log of exports to a country. IID Standard errors are reported in parentheses. Signif. Codes: ***: 0.01, **: 0.05, *: 0.1

Table A2: Descriptive statistics by firm size bins

Firm size bins	Products	Buyers	Destinations	Trade flows	Export value	New pdts	New buyers
1	3.87	3.72	2.20	6.21	93164.61	3.20	3.04
2	3.97	4.03	2.43	5.69	33629.37	2.97	3.04
3	4.48	4.33	2.58	6.56	46887.87	3.26	3.13
4	4.99	5.23	2.94	7.70	50773.66	3.42	3.72
5	5.58	5.74	3.20	8.59	58869.36	3.75	4.00
6	6.39	6.85	3.53	10.47	87870.55	4.23	4.82
7	7.03	8.43	3.91	12.71	122398.08	4.42	5.92
8	8.23	9.77	4.50	17.40	206757.45	5.08	6.68
9	9.17	11.25	5.06	18.52	201215.36	5.54	7.59
10	10.22	12.64	5.46	20.47	221282.18	5.96	8.32
11	11.33	14.86	6.21	24.97	278888.63	6.50	9.70
12	12.76	18.55	7.15	30.73	394450.47	7.19	12.08
13	14.48	23.25	8.33	37.81	513494.92	7.99	14.88
14	15.78	28.36	9.67	46.66	756621.86	8.45	17.32
15	18.04	33.29	11.10	56.17	1199843.11	9.25	19.93
16	21.89	44.92	13.02	78.54	1835716.22	10.54	27.57
17	25.70	59.37	16.10	108.35	3045557.90	12.33	34.25
18	33.63	90.15	21.23	180.21	6150059.29	15.20	48.69
19	46.12	155.43	28.24	364.23	14191716.49	19.48	83.45
20	98.29	387.25	44.87	1309.49	209160402.54	36.66	196.59

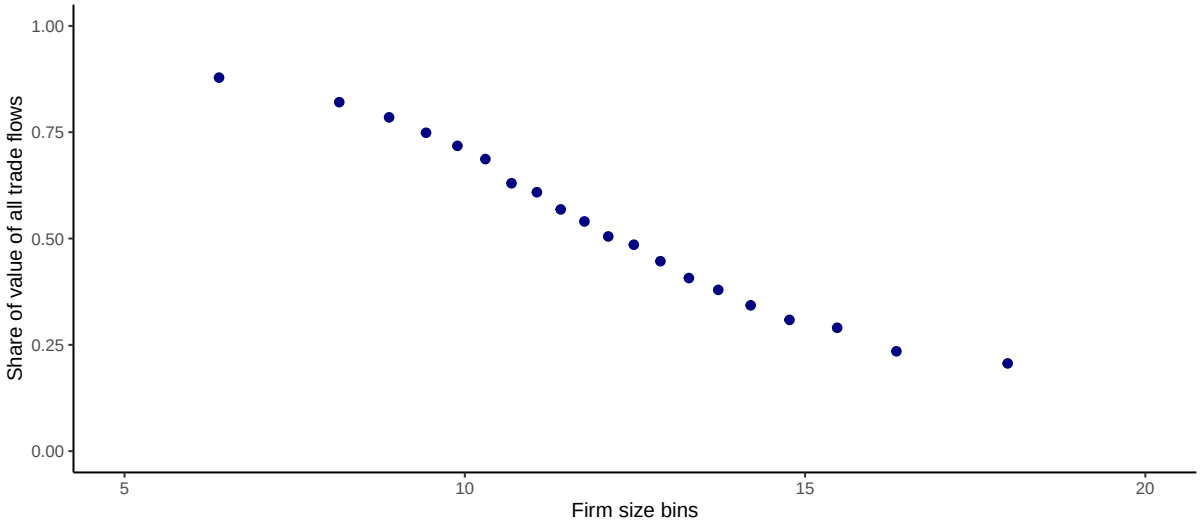
Note: Sellers are split into twenty equally sized bins using the export value in a given year. Column (2) shows the average number of HS8 Products sold by firms in the respective bin in a given year, Column (3) the average number of buyers, Column (4) the average number of destinations, Column (5) the average number of product-buyer combinations, Column (6) the average value of exports, and column (7) and (8), the average number of new HS8 products and buyers respectively.

Figure A1: New trade flows: Three-year window



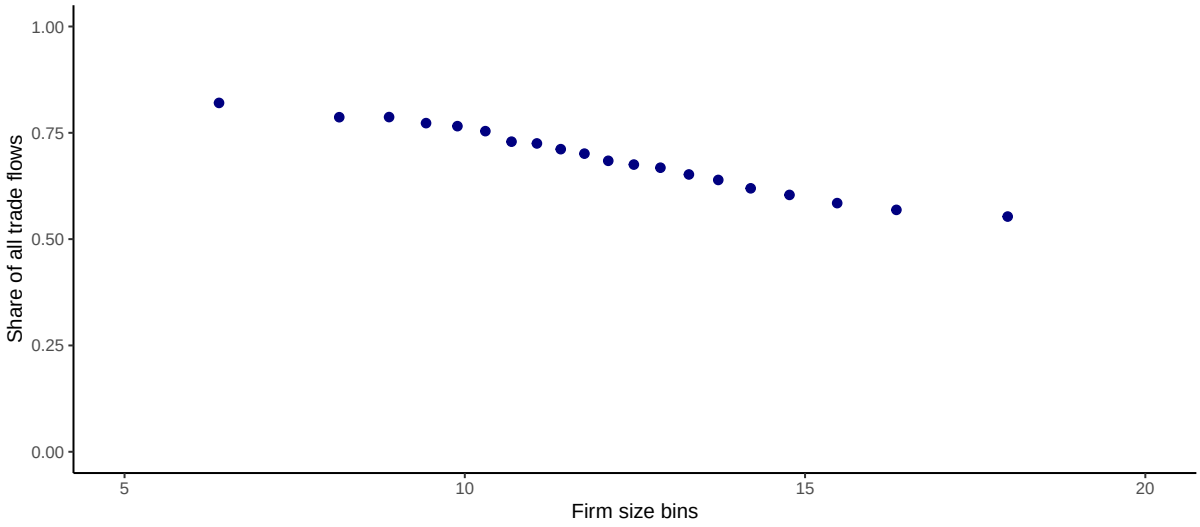
Notes: The data from 2012 to 2017 is aggregated two three-year windows, and new trade flows are defined as those firm - HS8 product - buyer combinations that are not seen in the initial three years, but seen atleast once in the subsequent three years. The figure shows a bin-scatter plot with firm export value in the former three year period on the x-axis, and the share of *new trade flows* in total trade flows on the y-axis.

Figure A2: New trade flows: By export value



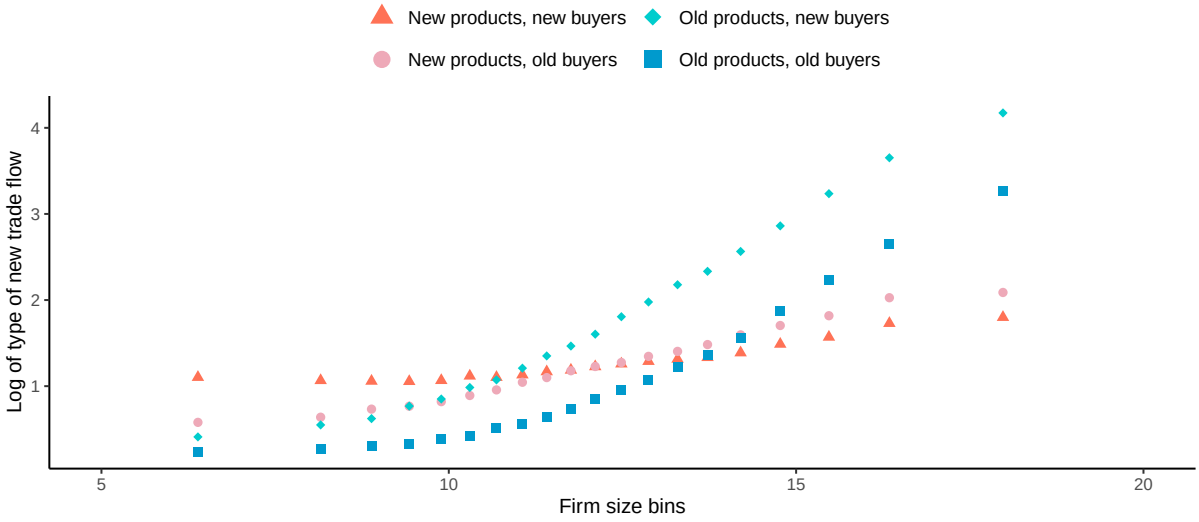
Notes: The figure shows a bin-scatter plot with annual firm export value on the x-axis, and the share of export value generated on account of *new trade flows* in total export value of a firm in a given year on the y-axis. A new trade flow is a firm - HS8 product - buyer combination observed in year $t+1$ but not in t.

Figure A3: Dropped trade flows



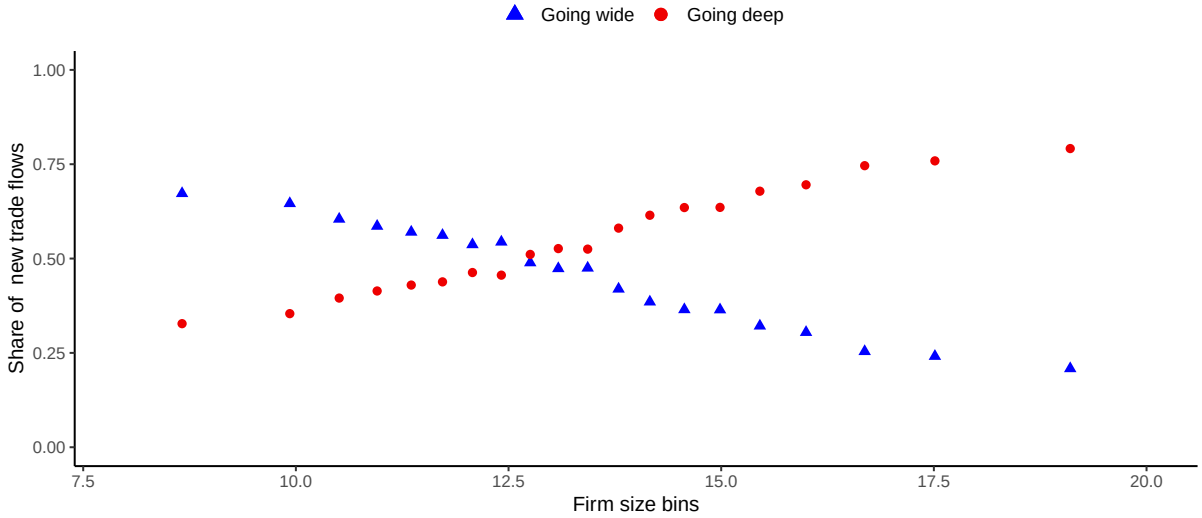
Notes: The figure shows a bin-scatter plot with annual firm export value on the x-axis, and the share of firm - HS8 product - buyer combination observed in year t but not in $t+1$.

Figure A4: Composition of new trade flows: Absolute number



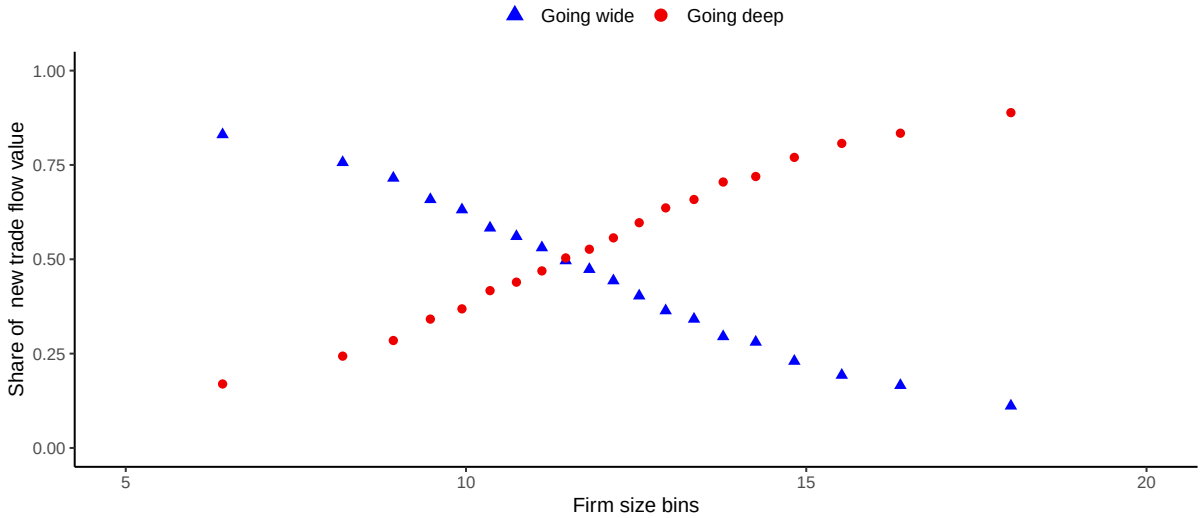
Notes: The figure shows a bin-scatter plot with annual firm export value on the x-axis, and the number of different types of new trade flows, that is firm - HS8 product - buyer combination observed in year $t+1$ but not in t

Figure A5: Composition of new trade flows: Three-year window



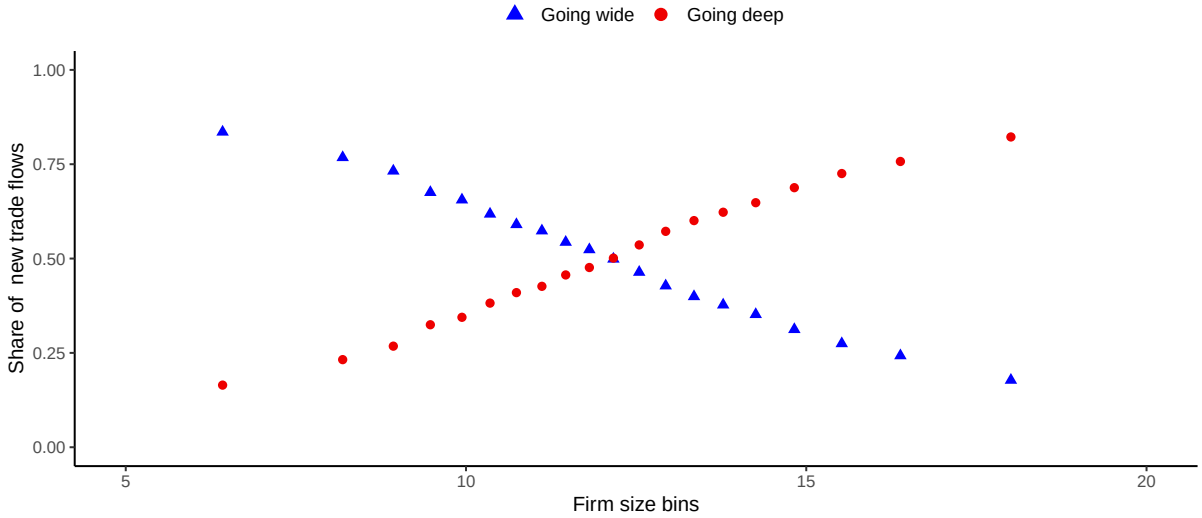
Notes: The figure shows a bin-scatter plot with firm export value aggregated over three years on the x-axis, and the share of different types of new trade flows. New trade flows, new products and new buyers here are defined as trade flows, products and buyers that are not seen in the initial three years (2012-2014), but seen atleast once in the subsequent three years (2015-2017), respectively.

Figure A6: Composition of new trade flows: By export value



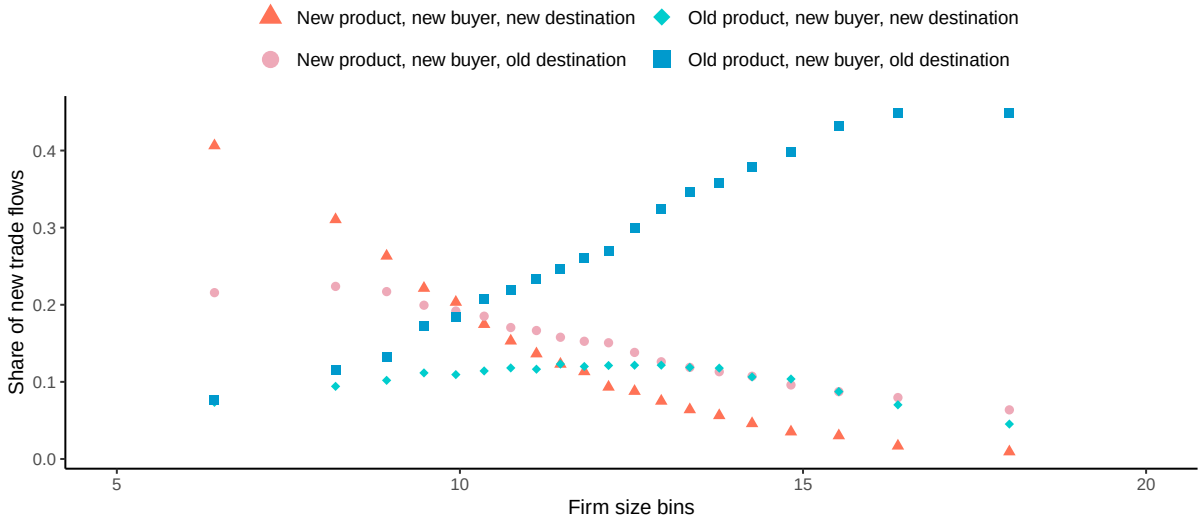
Notes: The figure shows a bin-scatter plot with annual firm export value on the x-axis, and the share of export value of going-deep and going-wide trade flows in the export value of new trade flows.

Figure A7: Composition of new trade flows: Conditional on number of products



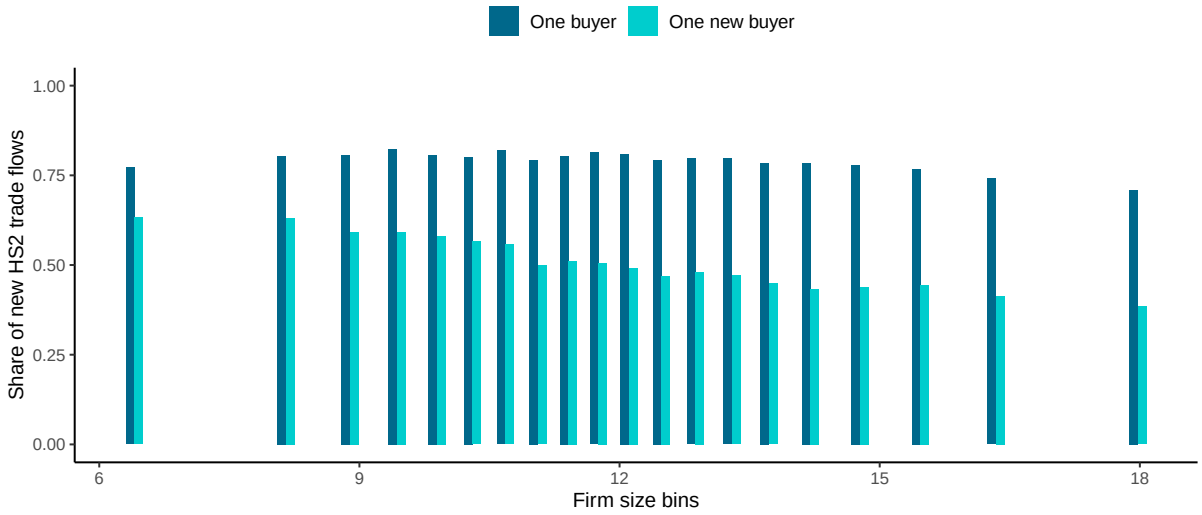
Notes: The figure shows a bin-scatter plot with annual firm export value on the x-axis, and the share of different types of new trade flows. The bin-scatter conditions on the number of HS8 products produced by firm f in year t.

Figure A8: Composition of new trade flows: Including new destination



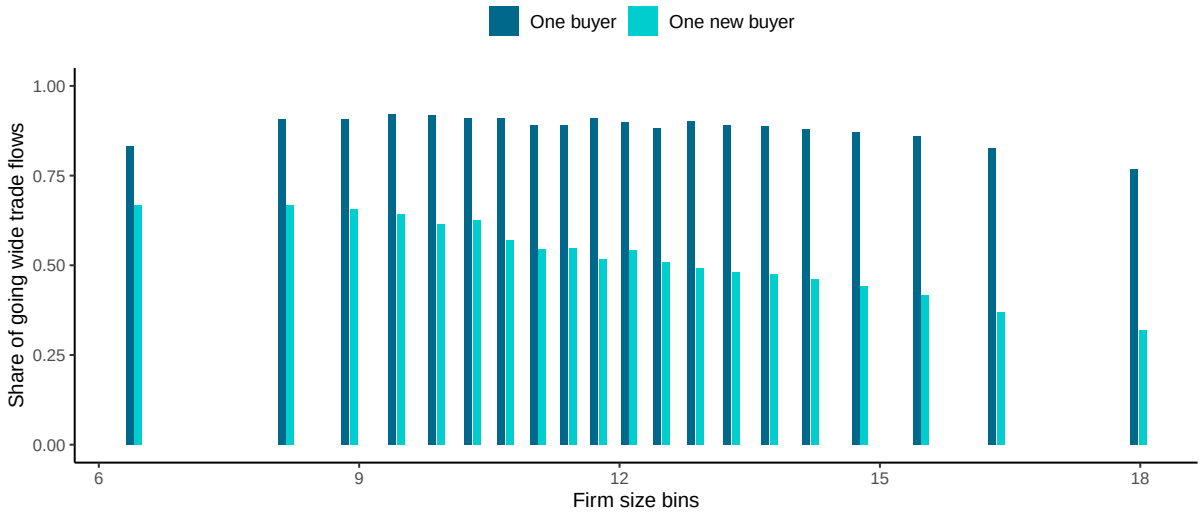
Notes: The figure shows a bin-scatter plot with annual firm export value on the x-axis, and the share of different types of new trade flows in all new trade flows, that is firm - HS8 product - buyer combination observed in year $t+1$ but not in t. New destination is a country that firm f exported to in time $t+1$ but not in t.

Figure A9: New **HS2** products sold to one (new) buyer



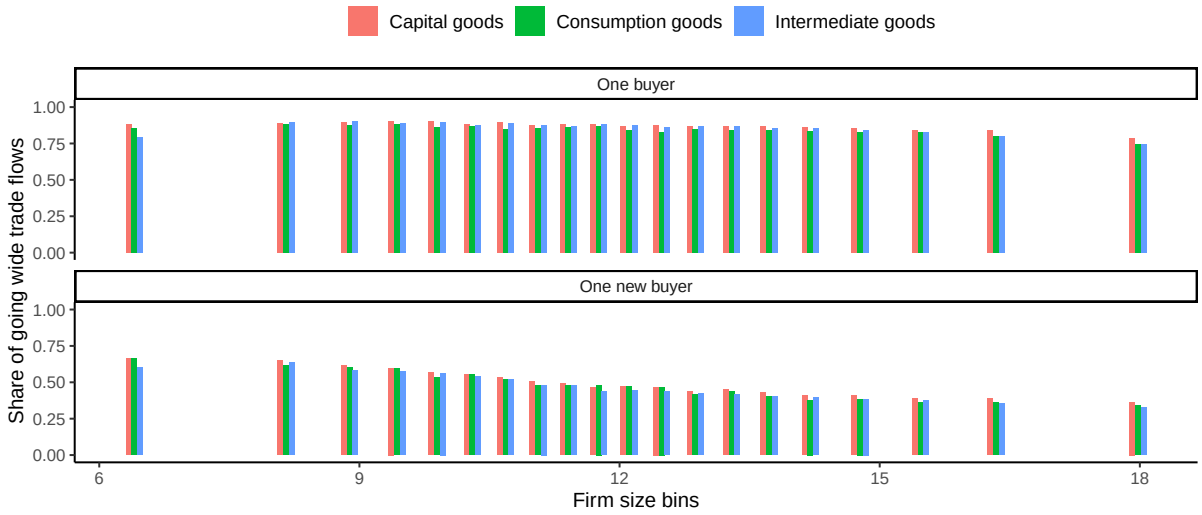
Note: The x-axis uses the annual firm export value to split firms into 20 equally sized bins. Going-wide trade flows is the number of new trade flows on account firms selling new HS2 products, that is HS2 products that are sold by a firm in $t+1$ but not in t.

Figure A10: New products sold to one (new) **firm**



Note: The x-axis uses the annual firm export value to split firms into 20 equally sized bins. Going-wide trade flows is the number of new trade flows on account firms selling new products. The graph uses a sub-sample of trade flows sold to buyers matched with firm names in Orbis from Bureau van Dijk. Note that the calculation of the number of buyers for a new product of a firm in a given year is done using the full sample.

Figure A11: New products sold to one (new) buyer: Type of good



Note: The x-axis uses the annual firm export value to split firms into 20 equally sized bins. Going-wide trade flows is the number of new trade flows on account firms selling new products. Firm-hs8 products are classified into capital, consumption and intermediate goods based on Broad Economic Categories (BEC).

Table A3: Composition of new trade flows: By type of good

Dependent Variable:	Deep Share		
BEC_2012	Capital goods	Consumption goods	Intermediate goods
Model:	(1)	(2)	(3)
Log exports	0.0373***	0.0330***	0.0349***
	(0.0022)	(0.0025)	(0.0017)
Fixed-effects			
Year	Yes	Yes	Yes
Firm	Yes	Yes	Yes
Observations	15,442	13,476	29,472
R^2	0.71235	0.67127	0.67237

Note: The dependent variable *DeepShare* is the share of new trade flows for a firm in a given year on account of going-deep (reaching new buyers for existing products). *Log exports* is the log of the annual value of exports of a given firm. Firms are split into Broad Economic Categories (BEC) based on their 2012 product mix. If over 50% of a firm's export value comes from one BEC category, it is classified accordingly. 98.5% firms are classified into one of the three categories. Standard errors are clustered at firm level. Signif. Codes: ***: 0.01, **: 0.05, *: 0.1

Table A4: Composition of new trade flows: Sub-samples

Dependent Variable:	Deep Share					
	Not-MNC	MNC	Size:Q1	Size:Q2	Size:Q3	Size:Q4
Model:	(1)	(2)	(3)	(4)	(5)	(6)
Log exports	0.0356***	0.0346***	0.0326***	0.0356***	0.0376***	0.0396***
	(0.0015)	(0.0020)	(0.0019)	(0.0023)	(0.0027)	(0.0028)
Fixed-effects						
Year	Yes	Yes	Yes	Yes	Yes	Yes
Firm	Yes	Yes	Yes	Yes	Yes	Yes
Observations	38,634	20,676	14,518	14,929	15,151	15,347
R^2	0.66445	0.73755	0.52463	0.58493	0.63909	0.70025

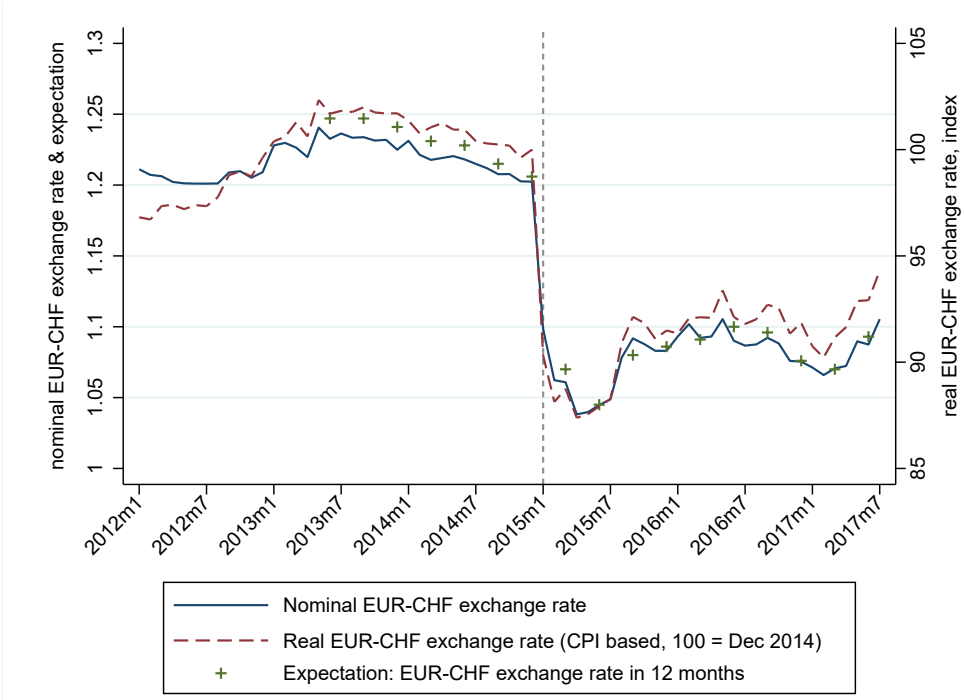
Note: The dependent variable *DeepShare* is the share of new trade flows for a firm in a given year on account of going-deep (reaching new buyers for existing products). *Log exports* is the log of the annual value of exports of a given firm. MNC is the sample of Swiss firms, matched with Orbis from Bureau van Dijk, that either have an international shareholder or an international subsidiary. Columns (3)-(6) use the aggregate value of firm exports sales over six years to split them into four quartiles. Standard errors are clustered at firm level. Signif. Codes: ***: 0.01, **: 0.05, *: 0.1

Table A5: Composition of new trade flows: Accounting for exit

Dependent Variable:	Deep Share	
	New trade flows that survive > 1 year	Firms with more than 3 products
Model:	(1)	(2)
Log exports	0.0469***	0.0377***
	(0.0028)	(0.0017)
Fixed-effects		
Year	Yes	Yes
Firm	Yes	Yes
Observations	38,253	37,986
R^2	0.63029	0.72156

Note: The dependent variable *DeepShare* is the share of new trade flows for a firm in a given year on account of going-deep (reaching new buyers for existing products). *Log exports* is the log of the annual value of exports of a given firm. Column (1) uses data for new trade flows that survive for more than one year, and Column (2) uses data for firms that have more than 3 HS-8 products in 2012. Standard errors are clustered at firm level. Signif. Codes: ***: 0.01, **: 0.05, *: 0.1

Figure A12: EUR-CHF exchange rate, 2012 to 2017



Sources: SNB, Deloitte CFO Survey Switzerland (www.deloitte.com/ch/cfosurvey). The EUR-CHF exchange rate is measured as the amount of Swiss francs needed to purchase one euro.

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