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Export Margins, Employment Skills and Financial Conditions: Stylized Facts from Greek Exporters

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1 INTRODUCTION

An extensive theoretical and empirical literature has shown that heterogeneity in trade has important implications for aggregate economic outcomes, like productivity and welfare. An important question that remains

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open involves the underlying linkages with various sources of heterogeneity on the margins of exporters, given by the numbers of products and destinations, and the value, price and quantity of exports at the firm level. In this short chapter, we use a newly developed dataset from Greek exporters, and we present a number of stylized facts that aim at addressing empirically the following questions: How are (i) the number of products exported per destination ('exporter scope at the destination') and the number of destinations per product to which a firm exports ('exporter scope of the product'), (ii) the value, quantity and price of exports, related at the firm level to the allocation between skilled and unskilled employment and wages, and the financial conditions proxied by cash flows and credit scores?

While it has already been established that exporters outperform non-exporters (they are larger, pay higher wages and are more productive), the association between the various margins of exporting with factor inputs goes beyond the traditional theories of international trade, in which unskilled-intensive production is carried out by combining labor, capital, and a technology. Several models, including those by Yeaple (2005), Verhoogen (2008), Arkolakis (2010), and Brambilla et al. (2012), have internalized some of the complexities of modern production processes in trade by assuming that the production of goods comprises the combination of marketing, distribution, foreign trade activities, and exporting services. These extra fixed and variable costs typically need to be paid up front due to long time lags between production and sales, whereas the realization of revenues is uncertain and typically involves more complex, riskier, and less enforceable contracts between the lender and the borrower. As a result, potential exporters must have enough liquidity at hand, and, not

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surprisingly, there is empirical evidence that financial constraints affect exporting decisions (see e.g. Bellone et al. 2010; Berman and Héricourt 2010; Chaney 2016; Feenstra et al. 2014; Greenaway et al. 2007; Manova 2013; Manova et al. 2015; Minetti and Zhu 2011; Muûls 2015).

Keeping these considerations in mind, in this chapter we attempt to provide an empirical assessment of the questions posed in the beginning of the chapter using a newly developed dataset on Greek exporting firms, described in more detail in Sect. 2. In Sect. 3, we present the three main empirical findings. First, the proportional allocation of skilled to unskilled labor and the wage skill premium are positively associated with the number of products sold at a given destination ('exporter scope at the destination'), but not with the number of destinations to which a product is exported ('exporter scope of the product'). Second, firms with higher export sales and quantities have lower-skilled to unskilled wage bill ratios, an effect that is driven by lower-skilled to unskilled employment ratios across firms rather than differences in the wage skill premia. Third, there is some evidence, albeit weak, that financial restrictions are adversely related to the 'exporter scope at the destination' and the 'exporter scope of the product', as well as revenues and quantities. The latter effect however should be interpreted with caution, as virtually all Greek exporters faced substantial financial restrictions in our sample year (2014). In the conclusion, we discuss what we consider to be the main implications of these findings for related theoretical and empirical work on Greek exporters.

2 DATA

Our focus lies on patterns of export sales of individual products and destinations across Greek firms. Given the questions at hand, we cover various margins of export activity at the firm level, given by the 'exporter scope at the destination', the 'exporter scope of the product', and sales and quantities per product at the destination. Export values and quantities are of special interest as they yield unit values (export prices). In this section, we briefly describe our data sources and provide some descriptive statistics for the data at hand.

2.1 Data Sources

We use a newly compiled dataset on Greek exporting firms that merges data from three main sources for 2014. Trade data at the firm–product–destination level are obtained from the Intrastat databank, and firm-level variables are obtained from the Annual Manufacturing Survey (AMS), both available via the Greek Statistical Agency (ELSTAT). Financial variables are obtained from the ICAP database, which collects balance sheet and financial information on Greek firms. Below we give a brief description of our main sources.

The Intrastat databank collects information and produces statistics on dispatches and arrivals of goods and replaced customs declarations as the source of trade statistics. In particular, the national authorities collect data on the identification number allocated to the party responsible for providing information, the reference period, the flow (arrival, dispatch), the value and quantity of the goods in net mass (weight excluding packaging), and the supplementary unit (liter, m², number of items, etc.) if relevant, and their destination. Firms whose annual trade amount is above a certain value are responsible for providing information, and this threshold value is redefined so that a minimum amount of data is collected for each trade flow. Each year, national authorities define their thresholds, set in such a way so as to collect data relating to at least 97% of all dispatches with approximately 4600 firms recorded as exporters for 2014. The classification of all reported exported goods (approximately 2500 products) follows the Standard International Trade Classification (SITC) system. Our dataset consists of manufacturing products in the following sectors: *chemicals* (Sector 5), *machinery and transport equipment* (Sector 7), *other manufactured goods* (Sectors 6 and 8). We calculate unit prices using our export revenue and quantity data as follows: firm f 's average export price for product p in destination d is given by the
$$price_{fpd} = \frac{revenue_{fpd}}{quantity_{fpd}}.$$

To obtain data on employment at the firm level, we use survey data from the AMS, which is carried out annually and contains data related to economic activity of medium-scale and large-scale manufacturing firms. The survey provides figures on labor force variables (number of employees and remuneration per type of worker).¹ The firm survey is collected at the

¹For a more detailed description of the external sector statistics and the Annual Industrial Survey, see Theofilakou and Stournaras (2013) and Tsakanikas and Vassiliadis (2013).

plant level, but export and financial information is recorded at the firm level. A key limitation of these data is therefore sample size in some regressions, with roughly 400 (manufacturing) firms in our cross-section for 2014 when employment data are considered.

We match the data on exports by ELSTAT with financial sheet data from database supplied by ICAP, which is the largest Greek firm that supplies business information. ICAP provides information on financial variables. In total, roughly 35,000 firms are included in the ICAP database. The ICAP database also contains credit scores for selected firms, which express firm-specific multivariate estimates of credit quality with respect to the probability of default and/or bankruptcy, thus controlling for insolvency, excessive and/or bad debts, overdue accounts, and other typical commercial risks in a single indicator.² Given that high cash flow is considered to be indicator of good financial health and low credit risk, it is also mirrored in a higher credit score. Both measures typically capture the access of firms to financial markets and indicate lower credit rationing. We therefore use them interchangeably as firm-level measures of credit rationing for Greek exporters.³

To avoid misreporting by some firms, we follow Feenstra et al. (2014), and we clean the sample for mismeasurement and for very small firms by checking that key financial variables, such as total assets and sales are not missing. We also confirm that total assets exceed liquid assets and fixed assets and that exports do not exceed total sales. Finally, we impose the restriction that export revenue should exceed €10,000 in total, €1000 for each destination, and €100 for each product-destination pair.

2.2 *Descriptive Statistics*

Table 3.1 reports some key statistics for our full sample of exporting firms. In the first column, we present for comparison purposes the statistics for the full coverage of exporters across all sectors, whereas in the second

²In the micro-exporting literature, Muùls (2015) uses a similar credit score to explore empirically its effects on firm sales and the numbers of products exported and destinations served. The author reports that a higher credit score is associated with higher growth rates in all the aforementioned margins.

³Notice that, as pointed out by Minetti and Zhu (2011), it is possible that, for instance, a firm that faces financial constraints hoards cash or suffers from credit rationing due to high existing debt.

column we report the same statistics for manufacturing firms.⁴ Approximately 2500 products are exported with the average number of products per firm amounting to 7.5 for all exporters and 7.2 for manufacturers, whereas the average number of destinations per firm is 7.3 and 8.1, respectively.⁵

In the theoretical literature of microexporting it is common to model firm heterogeneity along the dimension of productivity (Melitz 2003). One of the most robust predictions in these models is that higher-productivity firms will be larger in equilibrium. Motivated by this argument, in Table 3.2 we focus on how key firm characteristics relate to export size. To this end, we decompose exporters in ‘high exports’ and ‘low exports’ with the cutoff point given by the median of the distribution of export sales. As can be readily seen, the differences between all exporters (first and second columns) and manufacturing firms (third and fourth columns) are not qualitatively essential. Turning to manufacturing firms, for which employment data from AMS are available, we observe that larger exporters have, as expected, substantially higher total sales and gross profits, but of similar magnitude as percentage of their assets. Larger firms pay less for skilled relative to unskilled employment, as indicated by the wage bill ratios for the two groups, with the difference stemming from the relative number of employees rather than the skill premium through the wage rate. To assess their financial status of exporting firms, we also report their cash flows and credit rating from the ICAP database. In manufacturing, larger exporters have higher cash flows and higher credit rating, a finding that is consistent with the hypothesis that larger firms are less credit rationed.

In the next section, we attempt to explore in more detail the implications of these differences across the dimensions of the export margins.

3 EXPORT MARGINS AND FACTOR INPUTS

We begin the analysis of export margins by reporting in Table 3.3 some simple correlations between firm revenues, quantities, and prices, with the number of products and destinations per firm in the form of OLS

⁴In empirical specifications related to labor variables, only a subset of these firms (matched with AMS) are due to data availability.

⁵See Arkolakis and Muendler (2013) on the similarities of the Greek dataset with datasets that have been used in the related empirical literature.

regressions including. We stress that in Table 3.3 and in all subsequent tables, the estimated coefficients reflect correlations, rather than causal effects. Product fixed effects are included to control for systematic differences across goods in consumer appeal, comparative advantage, transportation costs, units of measure (kilos vs. units), and other product-specific characteristics. We also include destination fixed effects to account for destination-specific characteristics, such as consumer income, general demand conditions, transportation costs, as well as inflation and exchange rates.

Panel A of Table 3.3 reports the results on export revenues. Columns (1) and (2) show that higher revenues are correlated positively with quantities and negatively with prices, a finding that is consistent with similar correlations for the US (Gervais 2015). Columns (3) and (4) report that exporters with higher revenues sell less products to more destinations. The same patterns are confirmed in columns (5) and (6) of Panel A, where the numbers of products and destinations are used jointly with quantities and prices respectively as r.h.s. variables. Panels B and C report the corresponding regressions with the components of revenues, namely quantity and price as l.h.s. variables respectively, and show that the estimated relationships in revenues, reported in Panel A, are mainly driven by changes in quantities rather than prices. Specifically, Panel B confirms that higher quantities are associated with higher export revenues and, in addition, with lower prices. Also, higher quantities are associated with less products sold to more destinations. In columns (1) and (2) of Panel C, we establish that higher prices are associated with lower revenues and quantities, whereas columns (3) and (4) report that higher prices are associated with more products exported to a smaller number of destinations. However, in columns (5) and (6), which estimate the relationships jointly, we find that the correlations do not always retain their signs and significance. In short, we find that the correlations between the components of the export margins, given by the ‘exporter scope at the destination’ and the ‘exporter scope of the product’, revenues and quantities-prices, are sufficiently worthy of further investigation.

3.1 *Employment Skills*

Table 3.4 presents regressions that relate the numbers of products and destinations to the structure of employment at the firm level. All

employment variables are reported as ratios of skilled to unskilled labor. Column (1) in Panel A shows that the firms in which the aggregate wage bill for skilled relative to unskilled labor is higher export more products in each destination. In columns (2) and (3), the total wage costs are decomposed in the number of employees and the wage rate. We find that firms with relatively more skilled employees and higher wage skill premia export more products, a finding that is confirmed in column (4) in which the two variables are used jointly.⁶ In Panel B of Table 3.4, we perform the same exercise using the number of destinations for each product as an l.h.s. variable and find that it is not affected by the relative wage bill or its components. An important point to notice therefore from this evidence is that both the proportional allocation of skilled to unskilled labor and the skill premium are positively associated with the exporter scope at the destination, but not with the exporter scope of the product. We consider this set of facts to be the first main finding of this chapter.

We next turn into the analysis of export sales (Panel C of Table 3.4). Column (1) shows that firms with higher export sales have lower-skilled to unskilled wage bill ratios. When the wage bill variable is decomposed into employment and wages in columns (2) and (3), we find that firms with higher sales have lower-skilled to unskilled employment ratio, but no differences in their wage skill premia. This implies that the linkage with the aggregate wage bill stems from lower-skilled to unskilled employment, rather than lower skill premia. These individual effects persist, if we include both the employment ratio and the skill premium in a single specification in column (4). To shed some further light in these effects, in Panels D and E we use as dependent variables the quantity and price variables, respectively. The association of export sales with the wage bill ratio and its components is driven by its quantity component: all coefficients in Panel D have the same magnitude and statistical significance with those reported in Panel C. In contrast, when prices are used as the l.h.s. variable, the correlation evaporates (with the exception of a weak negative association with the skill premium). These correlations suggest that changes in quantities are the driving force of the negative association between revenues and the

⁶The wage rate for skilled and unskilled workers is calculated by dividing the wage bill to the number of employees. Denoting the wage bill, employment, and the wage rate by wb , n , and w respectively, we get that $\frac{w^s}{w^u} \cdot \left(\frac{wb^s}{n^s}\right) / \left(\frac{wb^u}{n^u}\right) = \left(\frac{wb^s}{wb^u}\right) \left(\frac{n^u}{n^s}\right)$, where s and u denote skilled and unskilled labor.

ratio of skilled to unskilled employment across exporting firms, and we consider them to be our second main finding.

3.2 *Financial Conditions*

The financial conditions of firms, through their cash flows and credit scores, are the main points of interest in this subsection. In columns (1) and (2) of Panels A and B in Table 3.5, we relate the ‘exporter scope at the destination’ and the ‘exporter scope of the product’ with these financial measures. Specifically, columns (1) in Panels A and B show that cash flow is positively associated with the ‘exporter scope of the product’, but not the ‘exporter scope at the destination’. In columns (2) in Panels A and B, we use as r.h.s. variable the lagged credit score of the firm (which is based on information available at the end of each year). We find that it is positively, but weakly, associated with the ‘exporter scope at the destination’, but not the ‘exporter scope of the product’.

In Panels C, D, and E of Table 3.5, we regress export revenues and their components on financial conditions. Column (2) in Panel C shows that firms with higher export sales have higher credit scores but their sales are not related to their cash flow in column (1). In turn, in Panel D we use quantities as l.h.s. variable. Again, cash flow is not significantly associated with the quantities exported, whereas the credit score in column (2) is weakly significant with a positive sign. When we look at prices (Panel E), we find that they both are not associated with cash flow and credit ratings. The evidence, albeit weak, that financial restrictions are adversely related to the ‘exporter scope at the destination’ and the ‘exporter scope of the product’, as well as revenues and quantities, is the third finding of the chapter.

4 SUGGESTIVE THEORIES ON THE ROLE OF QUALITY FOR GREEK EXPORTERS

What lies behind these correlations of export margins with employment skills and financial conditions? In this section, we set out to uncover some of the channels behind our results. Casual empiricism suggests that the quality channel is the most obvious candidate that explains this type of association. That is, the correlations could be largely explained by unobservable differences in the quality of inputs reflecting differences in

average input costs, which are in turn reflected in output quality (Kugler and Verhoogen 2012). In an empirical context, Manova and Zhang (2012) establish that Chinese export prices are higher in richer, larger, and more distant destinations and support the empirical relevance of trade models with endogenous product quality. Consistent with the quality interpretation, Atkin et al. (2015) point out that larger firms have greater costs primarily because they use higher-quality, more costly inputs, and Gervais (2015) finds that export demand is positively correlated with advertising expenditures, wage rates, and material costs. Indeed, some papers have highlighted the role of quality in models where consumers value quality, but quality is expensive to produce (Harrigan et al. 2015). Baldwin and Harrigan (2011) develop a heterogeneous firms trade model in which consumers appreciate quality. Higher quality is associated with higher marginal cost, which however is more than offset by the advantage of high quality.

There are various reasons why quality in exporting may demand relatively more skilled employment along with a higher skill premium. For instance, international marketing and commercialization, transportation and distribution, and advertising require expertise in international businesses, languages, foreign technologies, and the social idiosyncrasies of foreign markets. Verhoogen (2008) develops a model where exporting allows for quality upgrading and skill-intensive services, a channel that might be particularly relevant if it involves accessing high-income destinations with higher valuation for quality (Brambilla et al. 2012). In a related vein, exporting may require varying levels of skills due to ‘skilled-bias globalization’, in which international trade activities use skill-intensive resources (Matsuyama 2007).

Regarding financial conditions, how do our empirical findings relate to the margins of Greek exporters? The main issue that Greek exporting firms faced during the global financial crisis and, even more intensely, during the Greek crisis was the lack of access to credit, which particularly affected their expansion to new market. According to the European Central Bank (ECB 2017), while in the Eurozone the terms of financing have become more favorable over the last years, in Greece 23% of Greek SMEs declare that the lack of access to credit is the most acute problem faced. Not surprisingly, around 70% of Greek exporters are ranked between 1 and 4 on the 10-scale credit rating by ICAP.

In the exporting market, credit can be used to finance marketing, advertising, price-based promotions and create brand loyalty through artificial product differentiation, and hence affect the exporter scope at the

destination. In a related vein, Arkolakis (2010) has put forward the idea that marketing expenditures affect trade at the firm level, which is corroborated by the evidence reported in Atkin et al. (2015). This channel of credit constraints is particularly relevant for the exporter scope of the product, as exporters face extra costs due to information gathering, building distribution and sales systems, offering additional customer services and warranties, as well as adjusting products to local legislation and tastes. As pointed out by Arkolakis et al. (2019), the first exported item to a particular destination may face higher importer costs than a subsequent item, due to, for example, the financial cost and time required for both paperwork and border compliance, sanitary and phytosanitary as well as other technical regulations that can affect approval of a first export product differently from subsequent products, and price or quantity control measures with differential importance.

5 CONCLUSIONS

In this chapter, we have documented a number of facts about the margins of exports across Greek exporters. Although focused on a specific country, our results have the advantage that they are based on empirical regularities and do not require the strong assumptions of structural approaches. What are the implications of our findings for the heterogeneous firms literature and, more specifically, for Greek exporters? In relation to the existing literature on export margins, perhaps our most interesting finding is that other exporting margins, and not just export sales, are systematically related to employment skills and financial conditions. It will be important to investigate whether these patterns hold, or are more intense, in other destination characteristics like income, size, and distance. But assuming that these patterns prove to be general, they suggest that the theoretical literature should focus on models that can rationalize, or at least verify, consistent strong relationships between export margins and quality.

We believe that our findings point to several potentially fruitful directions for future work. However, caution is warranted in interpreting these correlations. It may be that quality is part of what is typically thought of as managerial ability, which may matter more for high-quality products, or the firms that face financial constraints have suffered from adverse world demand shocks. In short, there may be complicated interactions between quality, employment skills, and financial constraints. The correlations reported in the chapter suggest that export margins are sufficiently worthy of further investigation.

APPENDIX

Table 3.1 Greek exporters, exporting characteristics

	<i>All exporters</i>	<i>Manufacturers</i>
<i>Number of exporting firms</i>	4216	3159
<i>Value of exports</i>	5002	3942
<i>Number of products</i>	2460	1938
<i>Number of destinations</i>	186	182
<i>Average number of products per firm</i>	7.5	7.2
<i>Average number of destinations per firm</i>	7.3	8.1
<i>Average number of destinations per product</i>	4.1	3.7
<i>Number of observations</i>	79,076	60,607

Notes: Value of exports is reported in thousand Euros

Table 3.2 Greek exporters, firm characteristics

	<i>A. All exporters</i>		<i>B. Manufacturers</i>	
	<i>High exports</i>	<i>Low exports</i>	<i>High exports</i>	<i>Low exports</i>
<i>Total sales</i>	39,300	6336	29,200	5014
<i>Gross profits</i>	7540	1440	7638	1407
<i>Total assets</i>	51,444	7531	43,400	7410
<i>Fixed assets</i>	30,933	3005	25,342	3075
<i>Employment</i>	n.a.	n.a.	56	32
<i>Wage bill (skilled/unskilled)</i>	n.a.	n.a.	1.65	1.90
<i>Employment (skilled/unskilled)</i>	n.a.	n.a.	1.02	1.37
<i>Skill premium (wage rate)</i>	n.a.	n.a.	1.58	1.49
<i>Cash flow</i>	0.074	0.090	0.084	0.075
<i>Credit score</i>	4.0	3.4	4.0	3.4

Notes: *Total assets*, *fixed assets*, *gross profits*, and *operating costs* are reported in thousand Euros. *Cash flow* is calculated as profits net of tax expenditures plus depreciation and is normalized by *total assets*. Splitting in high and low exports is done at the median of the distribution

Table 3.3 Export performance and export margins

	(1)	(2)	(3)	(4)	(5)	(6)
<i>A. Dependent variable: Revenues</i>						
<i>Quantity</i>	0.711*** (104.83)				0.702*** (100.34)	
<i>Price</i>		-0.123*** (-5.40)				-0.083*** (-4.14)
<i># of products</i>			-0.219*** (-11.48)		-0.009 (-1.08)	-0.170*** (-10.94)
<i># of destinations</i>				0.581*** (20.55)	0.098*** (7.70)	0.552*** (21.27)
<i>R-sq</i>	0.810	0.261	0.268	0.306	0.811	0.315
<i>B. Dependent variable: Quantity</i>						
<i>Revenues</i>	1.046*** (127.44)				1.034*** (130.00)	
<i>Price</i>		-1.123*** (-49.42)				-1.083*** (-53.94)
<i># of products</i>			-0.289*** (-11.15)		-0.055*** (-4.95)	-0.170*** (-10.94)
<i># of destinations</i>				0.687*** (18.60)	0.079*** (4.82)	0.552*** (21.27)
<i>R-sq</i>	0.859	0.628	0.459	0.484	0.860	0.655
<i>C. Dependent variable: Price</i>						
<i>Revenues</i>	-0.046*** (-5.65)				-0.034*** (-4.24)	
<i>Quantity</i>		-0.289*** (-42.57)				-0.298*** (-42.67)
<i># of products</i>			0.069*** (5.68)		0.055*** (4.95)	-0.009 (-1.08)
<i># of destinations</i>				-0.106*** (-6.41)	-0.079*** (-4.82)	0.098*** (7.70)
<i>R-sq</i>	0.627	0.747	0.627	0.627	0.630	0.749

Notes: All variables are in logs. The regressions include a constant term, and *t* statistics (in parentheses) are based on robust standard errors clustered at product level (* denotes $p < 0.10$, ** denotes $p < 0.05$, *** denotes $p < 0.01$). *# of products* and *# of destinations* denote the 'exporter scope at the destination' and the 'exporter scope of the product' respectively (see text for definitions). All regressions include product and destination fixed effects. In all regressions the number of observations is 60,607 and the number of clusters (products) is 2264

Table 3.4 Export margins and labor variables (skilled/unskilled ratios)

	(1)	(2)	(3)	(4)
<i>A. Dependent variable: Number of products per destination</i>				
<i>Wage bill ratio</i>	0.299*** (6.82)			
<i>Employment ratio</i>		0.315*** (6.97)		0.309*** (6.94)
<i>Skill premium</i>			0.285*** (4.87)	0.238*** (4.18)
<i>N</i>	5745	5745	5745	5745
<i>R-sq</i>	0.345	0.336	0.231	0.346
<i>B. Dependent variable: Number of destinations per product</i>				
<i>Wage bill ratio</i>	-0.019 (-0.44)			
<i>Employment ratio</i>		-0.014 (-0.30)		-0.016 (-0.34)
<i>Skill premium</i>			-0.035 (-0.26)	-0.039 (-0.28)
<i>N</i>	5745	5745	5745	5745
<i>R-sq</i>	0.741	0.741	0.741	0.741
<i>C. Dependent variable: Revenues</i>				
<i>Wage bill ratio</i>	-0.325*** (-5.91)			
<i>Employment ratio</i>		-0.345*** (-6.11)		-0.352*** (-6.25)
<i>Skill premium</i>			-0.072 (-0.49)	-0.150 (-0.95)
<i>N</i>	5745	5745	5745	5745
<i>R-sq</i>	0.474	0.474	0.464	0.474
<i>D. Dependent variable: Quantity</i>				
<i>Wage bill ratio</i>	-0.317*** (-3.64)			
<i>Employment ratio</i>		-0.372*** (-4.23)		-0.371*** (-4.17)
<i>Skill premium</i>			0.124 (0.59)	0.042 (0.19)
<i>N</i>	5745	5745	5745	5745
<i>R-sq</i>	0.630	0.631	0.625	0.631
<i>E. Dependent variable: Price</i>				
<i>Wage bill ratio</i>	-0.008 (-0.14)			
<i>Employment ratio</i>		0.027 (0.44)		0.019 (0.32)
<i>Skill premium</i>			-0.196* (-1.85)	-0.191* (-1.78)
<i>N</i>	5745	5745	5745	5745
<i>R-sq</i>	0.789	0.789	0.789	0.790

Notes: All variables are in logs. The regressions include a constant term and *t* statistics are in parentheses (* denotes $p < 0.10$, ** denotes $p < 0.05$, *** denotes $p < 0.01$). All r.h.s. variables are expressed as ratios of skilled to unskilled labor. Regressions in Panel A include destination fixed effects, in Panel B product fixed effects, and in Panels C-E product and destination fixed effects. Standard errors in Panel A are clustered at destination level whereas in Panels B-E are clustered at product level

Table 3.5 Export margins and financial variables

	(1)	(2)
<i>A. Dependent variable: Number of products per destination</i>		
<i>Cash flow</i>	0.012 (0.24)	
<i>Credit score</i>		0.153* (1.82)
<i>N</i>	3432	5640
<i>R-sq</i>	0.314	0.227
<i>B. Dependent variable: Number of destinations per product</i>		
<i>Cash flow</i>	0.158** (2.14)	
<i>Credit score</i>		0.077 (0.87)
<i>N</i>	3432	5640
<i>R-sq</i>	0.814	0.753
<i>C. Dependent variable: Revenues</i>		
<i>Cash flow</i>	0.104 (1.05)	
<i>Credit score</i>		0.317** (2.24)
<i>N</i>	3432	5640
<i>R-sq</i>	0.522	0.466
<i>D. Dependent variable: Quantity</i>		
<i>Cash flow</i>	0.106 (0.77)	
<i>Credit score</i>		0.334* (1.73)
<i>N</i>	3432	5640
<i>R-sq</i>	0.652	0.620
<i>E. Dependent variable: Price</i>		
<i>Cash flow</i>	-0.003 (-0.03)	
<i>Credit score</i>		-0.017 (-0.17)
<i>N</i>	3432	5640
<i>R-sq</i>	0.819	0.789

Notes: All variables are in logs. The regressions include a constant term and *t* statistics are in parentheses (* denotes $p < 0.10$, ** denotes $p < 0.05$, *** denotes $p < 0.01$). Credit score is the 20,013 score. Regressions in Panel A include destination fixed effects, in Panel B product fixed effects, and in Panels C–E product and destination fixed effects. Standard errors in Panel A are clustered at destination level, whereas in Panels B–E they are clustered at product level

REFERENCES

- Atkin D., A. Chaudhry, S. Chaudry, A. K. Khandelwal and E. Verhoogen (2015). Mark-Up and Cost Dispersion Across Firms: Direct Evidence from Producer Surveys in Pakistan. *American Economic Review*, 105(5), 537–544.
- Arkolakis C. (2010). Market Penetration Costs and the New Consumers Margin in International Trade. *Journal of Political Economy*, 118(6), 1151–1199.
- Arkolakis C. and M.A. Muendler (2013). Exporters and Their Products: A Collection of Empirical Regularities. *CESifo Economic Studies*, 59(2), 223–248.
- Arkolakis C., S. Ganapati and M.A. Muendler (2019). The Extensive Margin of Exporting Products: A Firm-level Analysis. Working Paper.
- Baldwin R. and J. Harrigan (2011). Zeros, Quality, and Space: Trade Theory and Trade Evidence. *American Economic Journal: Microeconomics*, 3(2), 60–88.
- Bellone F., P. Musso, L. Nesta and S. Schiavo (2010). Financial Constraints and Firm Export Behaviour. *World Economy*, 33(3), 347–373.
- Berman N. and J. Héricourt (2010). Financial Factors and the Margins of Trade: Evidence from Cross-Country Firm-level Data. *Journal of Development Economics*, 93(2), 206–217.
- Brambilla I., D. Lederman, and G. Porto (2012). Exports, Export Destinations, and Skills. *American Economic Review*, 102(7), 3406–3438.
- Chaney T. (2016). Liquidity Constrained Exporters. *Journal of Economic Dynamics and Control*, 72, 141–154.
- ECB (2017). Survey on the Access to Finance of Enterprises in the Euro Area. Available online at: https://www.ecb.europa.eu/pub/pdf/other/ecb_accesstofinancesmallmediumsizedenterprises201711.en.pdf
- Feenstra R.C., Z. Li, and M. Yu (2014). Exports and Credit Constraints under Incomplete Information: Theory and Evidence from China. *Review of Economic and Statistics*, 96(4), 729–744.
- Gervais A. (2015). Product Quality and Firm Feterogeneity in International Trade. *Canadian Journal of Economics*, 48(3), 1152–1174.
- Greenaway D., A. Guariglia and R. Kneller (2007). Financial Factors and Exporting Decisions. *Journal of International Economics*, 73(2), 377–395.
- Harrigan J., X. Ma and V. Shlychkov (2015). Export prices of U.S. Firms. *Journal of International Economics*, 97(1), 100–111.
- Kugler M. and E. Verhoogen (2012). Prices, Plant Size, and Product Quality. *Review of Economic Studies*, 79(1), 307–339.
- Matsuyama K. (2007). Beyond Icebergs: Towards a Theory of Biased Globalization. *The Review of Economic Studies*, 74(1), 237–253.
- Manova K. (2013). Credit Constraints, Heterogeneous Firms and International Trade. *Review of Economic Studies*, 80(2), 711–744.
- Manova K. and Z. Zhang (2012). Export Prices Across Firms and Destinations. *Quarterly Journal of Economics*, 127(1), 379–436.

- Manova K., S. Wei and Z. Zhang (2015). Firm Exports and Multinational Activity under Credit Constraints. *Review of Economics and Statistics*, forthcoming.
- Melitz M.J. (2003). The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity. *Econometrica*, 71(6), 1695–1725.
- Minetti R. and S. C. Zhu (2011). Credit Constraints and Firm Export: Microeconomic Evidence from Italy. *Journal of International Economics*, 83(2), 109–125.
- Muûls M. (2015). Exporters, Importers and Credit Constraints. *Journal of International Economics*, 95(2), 333–343.
- Theofilakou N.K. and Y. Stournaras (2013). An analysis of Greek External Sector Statistics and Their Application in Academic Research and Economic Policy Making. *Journal of Economic and Social Measurement*, 38(1), 41–56.
- Tsakanikas A. and M. Vassiliadis (2013). A Methodological Review of the Greek Annual Industrial Survey. *Journal of Economic and Social Measurement*, 38(1), 57–77.
- Verhoogen E.A. (2008). Trade, Quality Upgrading, and Wage Inequality in the Mexican Manufacturing Sector. *Quarterly Journal of Economics*, 123(2), 489–530.
- Yeaple S.R. (2005). A Simple Model of Firm Heterogeneity, International Trade, and Wages. *Journal of International Economics*, 65(1), 1–20.