Can Belgian firms cope with the Chinese dragon and the Asian tigers? The export performance of multi-product firms on foreign markets

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Can Belgian Firms cope with the Chinese Dragon and the Asian Tigers?

The Export Performance of Multi-product Firms on Foreign Markets

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ABSTRACT

Exporting firms are affected in many ways by competition on foreign markets. This paper focuses on the impact of Asian competition on the bilateral export performance of Belgian firms, controlling for firm-level as well as destination-market characteristics. Export performance is measured in several ways, including the export intensity, the variety and quality of trade as well as the export intensity growth. Export performance appears to differ substantially across firms, across sectors and across destination markets. Our overall results indicate that both the export intensity and variety of Belgian firms' exports are reduced by Asian competition. Especially the competitive pressure caused by mainland China and Hong Kong is strong. The competitive pressure is intense in labour-intensive sectors but also felt in a wide range of activities with a higher value added. Belgian exporters cope with foreign competition by following a variety-expansion or a quality-upgrading strategy.

1. INTRODUCTION

In the global trade environment of today, Belgian exporting companies face both threats and opportunities. Access to export markets provides opportunities for successful exporters, in particular for Belgian companies who are restricted by the limited size of their home market. On the other hand, companies face the continuous pressure of intense competition both on their home market and their main export markets. Empirical evidence suggests that Belgian exporters are gradually losing ground in their main export markets (see e.g., Abraham and Van Hove (2008)). This is not so surprising given the success of export-oriented Asian economies. The emergence of Asian economies causes quite some gloom and doom. Press statements of political and business leaders, TV-documentaries and trade unions warn against the rise of the Chinese Dragon (mainland China) and the Asian Tigers (Hong Kong, Taiwan, Singapore and Korea). The fear reigns that the industrial structure of European economies will be irreversibly damaged by relentless Asian competition. In Belgium, pessimism is deeply rooted. Since many of these Asian firms are strong performers and active exporters in manufacturing sectors in which also the Belgian economy has a large stake, pessimists fear that Belgian firms will be particularly vulnerable. The collapse of export markets after the recent financial crisis and the gradual erosion of Belgian market shares fuels this pessimism.

Gloom and doom is never a trustworthy guide to economic policy and corporate strategy. A deep understanding of what is going on is a crucial step in designing an appropriate response. This paper aims at contributing to this understanding by studying the behavior of Belgian exporting firms on foreign markets. We do this using a unique data set that includes for all Belgian manufacturing firms the bilateral export flows of all products to all export destinations for the 1998-2006 period. This huge data set allows us to assess in-depth the impact on export intensity, export variety and export quality of firm characteristics, the role of variables related to the country of export destination and the degree of Asian competition in export markets.

This paper is structured as follows. First we relate our work to the existing literature. Subsequently, we discuss in Section 3 our data set as well as the definition of some concepts. We also provide some stylized facts on export variety and export quality of Belgian exporting firms. In Section 4 we present the regression methodology. Section 5 gives an overview of the main regression results. Section 6 concludes.

2. RELATION TO THE EXISTING LITERATURE

To fully understand the impact of Asian competition on Belgian export performance we analyze (i) the characteristics and (ii) the export strategies of Belgian firms (iii) the characteristics of the markets of destination of the exports and (iv) the competitive pressure of Asian competitors and (v) the characteristics of the products and sectors involved.

The role of firm characteristics is emphasized in the rapidly growing literature on firm heterogeneity in international trade based on the influential work by Melitz (2003), Bernard et al. (2003) and Eaton et al. (2004). This heterogeneity in firm characteristics explains part of the export performance of companies. Although the direction of causality is not always straightforward, a positive relationship between on the one hand plant size, plant age, foreign ownership and on the other hand exports is generally found (for an overview see Bernard and Jensen (2004)). Likewise firms with higher productivity are more likely to enter export markets (see Wagner (2007) for an overview, Bernard and Wagner (1997) for Germany, Roberts and Tybout (1997) for Colombia, Clerides et al. (1998) for Colombia, Mexico and Morocco, Bernard and Jensen (1999) for the U.S., Abraham et al. (2010) for China) .

For Belgium, the role of firm-specific characteristics on export behaviour is documented by Muûls and Pisu (2007) and Pisu (2008). It is part of a growing literature on the impact of trade flows on the Belgian economy using firm-level data (e.g., Abraham, Konings and Vanormelingen (2009)).

Companies can follow several export strategies. They can sell more of a particular product in a foreign country, raising the export intensity of the firm in that market. Or they can sell a wider range of products in that country by engaging in product differentiation as emphasized in the literature on monopolistic competition and intra-industry trade. In this case the export variety of the firm in that market goes up. Another option is to broaden the geographic scope by exporting to a larger number of foreign markets. A final possibility is that companies adjust the quality of the products sold in foreign markets.

The characteristics of export markets matter as is well-known from the gravity approach in international trade. The GDP of the country of destination captures the impact of market size on export behaviour. GDP per capita is alternatively interpreted as measuring Heckscher-Ohlin-Samuelson trade based on comparative advantage and intra-industry trade between countries with similar income levels. Geographic distance, membership of trading blocks and border dummy variables reflect the fact that countries trade more intensively with neighbouring countries (see e.g., Anderson and van Wincoop (2003)). This is in line with a Melitz-type model where sunk costs of entering an export market is higher for countries that are further away or do not belong to the same trading block (e.g., Abraham and Van Hove (2005)). Recent research has shown that the gravity equation has theoretical underpinnings even with heterogeneous firms (Chaney (2008)).

The competitive pressure of Asian competitors will be felt more by Belgian firms when Belgian and Asian firms target the same export markets so that their export markets overlap. Likewise, a large or/and rising market share of Asian firms in a particular country is an indicator of growing competition for Belgian exporting firms.

Asian competition is likely to reduce sales of Belgian firms in export markets and hence reduce export intensity. Export variety will go down if Belgian firms narrow the range of products sold and focus on their "core competence", as Helpman et al. (2008) put it. Liu (2010) finds empirical support for such firm refocusing due to import competition. Alternatively, Belgian companies may counter foreign competition by a strategy of increasing export variety. This will be the case when they start targeting

differentiated products at specific consumer groups in foreign markets. Finally, firms may respond to Asian competition by raising product quality.

Research on the strategic response of exporting companies to Chinese competition is starting to emerge. Previous studies mostly focused on import competition as the channel through which foreign firm affect domestic producers and exporters. Schott (2008) shows that the average quality of American goods increased in a reaction to increasing Chinese competition. Also Fernandes and Paunov (2009) show that import competition from less advanced countries is responsible for product quality upgrading in Chile. Strategic responses may however also be the result of competitive forces in international markets. This is the perspective in this paper. Using sectoral data, Van Hove (2009) discusses the European response to Chinese competition in European export destination markets. Taking this analysis to the firm-product level is a major contribution to this literature.

The impact of Asian competition on Belgian export performance depends on product and sectoral characteristics. As an advanced industrialized economy, Belgium does not have a comparative advantage in lower-skilled-labour-intensive activities. Belgian companies will suffer greatly from low cost competition by China in those sectors. As shown by Schott (2008) the relative sophistication of Chinese exports is rapidly increasing so that Belgian exporters are experiencing Chinese competition in a growing range of products and sectors. Established Asian Tigers as Korea, Singapore and Taiwan have been present for several years already in products and sectors that belong to the core of Belgium's comparative advantage.

In our research, we use the export data for individual Belgian firms that is available at the National Bank of Belgium. We adopt a bilateral approach in the sense that we distinguish between export destinations rather than focusing on total trade flows. Furthermore we disaggregate trade flows to the sectoral, subsectoral and the product level. We measure export intensity, export variety and export quality. In sum, we use firm-level data to study corporate export performance for individual products, sectors and subsectors in individual export destinations.

Most studies focus on total trade flows only. However, there are good reasons to study the determinants of export behaviour from a bilateral trade perspective, i.e. making a distinction between the export destination markets. Eaton et al. (2004 and 2005) analyze French exporters and find substantial heterogeneity among exporters. Therefore, our work takes a bilateral approach with firm-level data for Belgian exporters.

An extensive international literature focuses both on the measurement and determinants of variety and quality of trade relying on very disaggregated (product-level) trade statistics. Variety is typically computed as the number of products, proxied by the number of detailed economic sectors a company is exporting in within a particular destination market. Quality is computed based on a comparison of unit-values ("prices") of exported goods relative to other (foreign) exporters in the same sector. Recent empirical evidence points to considerable heterogeneity in variety and quality patterns in international trade (e.g., Schott (2004), Hummels and Klenow (2005), Kaplinsky and Santos-Paulino (2005), Hallak (2005), Broda and Weinstein (2006), Van Hove (2010)). Both supply-side and demand-side factors are

found to matter for explaining this heterogeneity, including country size, income levels, factor intensities and innovation.

Optimally, indicators of quality and variety should be calculated from firm-level data. Until now this has been hardly done. Notable exceptions include Bernard et al. (2006) who show that product-switching within companies causes a reallocation to more productive business activities. In this paper we compute variety and quality based on firm-level export and product data. Especially as to the measurement of quality we make a modest methodological contribution to the literature (see e.g., Hallak and Schott (2008)).

3. DESCRIPTION OF THE DATA SET, DEFINITION OF CONCEPTS AND SOME STYLIZED FACTS

Our dataset is rich in nature but cumbersome to tackle. We have export data for all Belgian firms that export manufacturing products[2]. Export data are available by product and by market of destination for the 1998-2006 period[3]. For each year, each company and each market destination, data are available for the number of products exported, the export values and the unit values (total value divided by quantity).

We make a distinction between three levels of disaggregation which we label as products, subsectors and sectors. Products are measured at the Common Nomenclature (CN) 8-digit classification, which is the most detailed level available. Subsectors are defined at the 4-digit level of the Harmonized System (HS). Sectors are defined as the sections of the Harmonized System[4]. In terms of our terminology, each sector consists of several subsectors. In each subsector firms export several products. Since the Harmonized System was revised from 2007 on, we limit our sample to 2006 to avoid a bias in our results[5].

These export data are merged with three other data sets: first, with firm characteristics, secondly with destination market characteristics and finally with indicators measuring Asian competition on the Belgian export markets. The firm-level characteristics are obtained from the Belgian annual account data. Destination market characteristics include GDP and GDP per capita (from IMF), the geographical

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[2] Although it may seem a detail, this definition is different from "Belgian manufacturing firms". Firms are selected based on their reported exported products, not based on their official activity code(s). For simplicity we call all firms included in the dataset manufacturing firms. Exports are defined as the transfer of property. Note also that thresholds are applied for the reporting of exports. Only firms reaching minimum export value levels have to report their export activities. Hence firms with a limited export value are not contained in the database.

[3] Before 1998 Belgian export data are aggregated with Luxembourg export data since both countries reported joint statistics within the BLEU. We opted for including 2006 in order to maximize the time dimension of the data, although there was a methodological change in the collection of the trade data in 2006. Our robustness tests deleting all 2006 observations indicated that the inclusion of 2006 does not alter the conclusions of our analysis.

[4] See Appendix 1 for the definition of the sections of the Harmonized System as well as for the abbreviated names we will use in this paper.

[5] The revision of 2002 is more limited and is unlikely to affect our results.

great-circle distance (in km) between Brussels and the export market's capital city and dummies respectively indicating a common border, EU15-membership and EU27-membership. Finally competition indicators are calculated based on bilateral and sectoral trade statistics UNCTAD (2010). All of this results in a data set of more than 7 million observations.

We define **_variety_** of Belgian exports as the number of products exported by Belgian firms to a particular market in a particular year. Hence an additional variety is measured as soon as a non-zero export flow is observed for the exports of a particular product to a particular destination during a particular year. We measure variety at the firm-level, the bilateral and the subsectoral level. A substantial part of the analysis will be based on the subsectoral level. By definition variety is the number of exported products. Hence one has to count this number at a particular aggregated level. We opt for using the subsectoral level since that allows us to relate variety to the existence and degree of Asian competition within the same subsector. This is in fact a very disaggregated approach that allows us to measure competition in a very precise way.

The measurement of variety at the firm-specific product level adds a new dimension to the meaning of variety in international trade. It provides interesting insights in the export strategy of Belgian firms. Figure 1 shows that export variety of Belgian manufacturing firms across all destinations and across all products, between 1998 and 2006. The total variety has increased from 674783 in 1998 till 936909 in 2005, followed by a small decline towards 871154 in 2006.

These total figures hide substantial heterogeneity across firms, across destination markets as well as across sectors. Table 1a shows important evidence regarding this firm heterogeneity. The table indicates the number of firms with a particular level of variety. First, many Belgian exporters appear to be single-variety firms, exporting one product to one destination. Nevertheless this number is substantially decreasing over time indicating that Belgian exporters are becoming multi-variety firms[6]. In particular the number of firms with a variety in the range of 20 to 500 is gradually expanding. Secondly, there is substantial variation in terms of variety across firms since the variety ranges from 1 till over 10000. Finally, the number of very-large-variety-firms is limited which may be due to a relatively low number of large multinational firms, the importance of small and medium enterprises and the small size of the Belgian economy.

Since a larger variety at the firm-level may be the result of either a larger number of exported different products or exports to a larger number of destination markets, a further distinction should be made between the bilateral and sectoral (as well as subsectoral) heterogeneity in the variety observed. Table 1b shows that export variety substantially varies across manufacturing sectors, but the sectoral pattern remains relatively stable over time. Export variety is largest in Machinery, Textiles, Chemicals, Base Metals and Plastics. Not surprisingly these are also the main sectors of the Belgian industry, as shown by Table 1d. The average export intensity, shown in Table 1c, also indicates large differences across manufacturing sectors.

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[6] Note that this does not necessarily mean that they also become multiproduct-firms since the variety increase may be solely due to an increase in the number of export markets.

Alternatively one can distinguish between destination markets. From such analysis (not reported) we learn that in spite of the large heterogeneity across destination markets some patterns can be detected. Variety appears to be highest when exports are directed to other European countries, as well as to large or rich countries. In particular bordering countries and countries relatively close to Belgium attract a high number of differentiated Belgian products.

We conclude this section of the paper with a discussion of the **quality** aspect of Belgian manufacturing exports. In previous product-level export studies quality is often measured based on the unit values of the export products. A similar approach can be applied to firm-level export data: a higher firm-level export unit value indicates a higher quality level. However, such approach has to take into account several issues. First, comparing export unit values across different products is impossible since product prices depend on the quantity units as well as on several product characteristics. A comparison over time for the same product is however useful. An increase in the unit values can be interpreted as quality upgrading (if the unit values go up) or quality downgrading (if the unit values go down). Secondly, similar to the case of variety, studying the determinants of product-level export quality is hard since there are no potential determinants available at such detailed level. Therefore it is more useful to aggregate product-level price information. Thirdly, the evolution in unit values may reflect not only quality changes, but also other thinks like competition, market power or pricing strategies. Therefore quality upgrading should be defined in a stricter way. Apart from a unit value increase we add the requirement that also the export volume has to increase between the two periods. Since one would normally expect that export quantities go down in case export prices go up, the combination of increasing export prices and increasing export volumes is more likely to reflect a situation of quality upgrading. Customers are prepared to pay a higher price if the quality of the product increases too.

For these reasons we calculate the *extent of quality upgrading* as follows:

$$\Delta QUA_{iljkt} = \left[\sum_{j \in l} \left(\frac{p_{iljkt}^{up} - p_{iljkt-1}^{up}}{p_{iljkt-1}^{up}} \right) \left(\frac{EX_{iljkt}}{\sum_{j' \in l} EX_{ilj'kt}} \right) \right] \frac{\sum_{j' \in l} EX_{iljkt}^{up}}{\sum_{j' \in l} EX_{ilj'kt}}$$

Where ΔQUA_{iljkt} denotes the quality upgrading by firm i of product j belonging to subsector l exported to market k in year t; where p_{iljkt}^{up} is the export unit value (export value divided by export quantity) of product j produced by firm i in subsector l and exported to market k in year t for which holds that both the export volumes and the export unit values increased between period t-1 and t; where EX_{iljkt} is the export value of any product j (belonging to sector l) by firm i to market k in year t; and where EX_{iljkt}^{up} is the export value of a product j (belonging to sector) l by firm i to market k in year t for which holds that both the export volume and the export unit value increased between period t-1 and period t.

This quality indicator is therefore a weighted average of percentage price increases where the share of the exports of product j in the total subsectoral exports are used as weights. Moreover the indicator is weighted a second time, namely by the share of the export value of all products in subsector j that

experience a quality increase in the total export value of subsector j. This second weighting is important since it takes into account the relative importance of quality upgrading in the entire subsector. This quality indicator is computed for each subsector (HS4-level) and each destination market. In order to reduce the impact of outliers we compare the average unit values and export values between the periods 1998-2001 and 2002-2006[7]. A higher value for this measure indicates a higher extent of quality upgrading.

4. THE SET-UP OF THE EMPIRICAL STRATEGY

In this section we present the regression model that explains export behavior of Belgian firms. Export performance is measured in different ways. One approach is to consider export intensity as measured by the total value of bilateral exports of the firm at the level of the product and the subsector. A second possibility is to explain export variety which is measured by the number of products sold outside Belgium, which we call the exported product variety. The third option is to emphasize product quality by using information on weighted averages of product-level unit values (total value divided by quantity – see above)[8].

The regression equations for export intensity, export variety and export quality use a similar set of regressors throughout the empirical analysis to improve the coherence of this paper. They relate to firm-specific characteristics, determinants of the export markets and the competitive pressure from Asian competitors.

Remember that as to terminology we distinguish between several levels of disaggregation. The entire manufacturing sector is split up into *sectors*. Each sector consists of a number of *subsectors (indexed by l)*. Within each subsector a number of *products (indexed by j)* are produced and exported.

The regression equation for **export intensity** can be written as follows:

$$[1] \qquad EXP_{ijkt} = \delta_0 + \delta_1 FIRMCHAR_{it} + \delta_2 DEST_{kt} + \delta_3 COMP_{lkt} + \mu_{ijkt}$$

where EXP_{ijkt} measures the total value of exports of product j by firm i to export destination k in year t. The variable $FIRMCHAR_{it}$ refers to a set of relevant firm characteristics for the exporting firm. $DEST_{kt}$ is a vector of variables related to geographic characteristics of the market of destination k. The $COMP_{lkt}$ variable captures the competitive pressure of Asian competition in destination market k,

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[7] The choice of these two periods is arbitrary. Nevertheless they can be regarded as the period before China's entry into the WTO and the period thereafter.
[8] A final and somewhat different approach is to model export probabilities. Our main interest lies in the impact of Asian competition on the position of Belgian exporting firms in foreign markets. For this purpose, the export probability approach is less appropriate.

measured at the level of subsector l to which firm i belongs. Within $COMP_{lkt}$ we make a distinction between China and each Asian Tiger (Hong Kong, Taiwan, Singapore and South Korea).

Additionally we also estimate an alternative model with a slightly different definition of the export intensity, namely as the value of exports at the level of the subsector (instead of product-level exports). This allows us to make the comparison with our results for variety and quality (see below). As such we estimate the following model:

$$[1'] \qquad EXP_{ilkt} = \delta_0 + \delta_1 FIRMCHAR_{it} + \delta_2 DEST_{kt} + \delta_3 COMP_{lkt} + \mu_{ijkt}$$

with EXP_{ilkt} the sum of exports to market k in year t of all products j that belong to manufacturing subsector l.

Similarly, for **export variety** we estimate equation (2) :

$$[2] \qquad VAR_{ilkt} = \beta_0 + \beta_1 FIRMCHAR_{it} + \beta_2 DEST_{kt} + \beta_3 COMP_{lkt} + \varepsilon_{ijt}$$

In this equation VAR_{ilkt} is defined as the number of products exported by firm i to destination k within subsector l.

As to export quality, we focus on **quality upgrading** rather than on quality levels, as discussed in the previous section. The extent of export quality upgrading of Belgian manufacturing firm i in destination market k active in subsector l, ΔQUA_{ilkt}, is explained by equation (3):

$$[3] \qquad \Delta QUA_{ilkt} = \lambda_0 + \lambda_1 FIRMCHAR_{it} + \lambda_2 DEST_{kt} + \lambda_3 \Delta COMP_{lkt} + \varepsilon_{ijt}$$

Hence we attempt to explain quality upgrading by firm-level characteristics, destination market characteristics and the change in Asian competition between 1998-2001 and 2002-2006.

A final approach is to look at the **growth of export intensity**. We estimate the following equation (4):

$$[4] \qquad \Delta EXP_{ijkt} = \delta_0 + \delta_1 FIRMCHAR_{it} + \delta_2 DEST_{kt} + \delta_3 \Delta COMP_{lkt} + \delta_4 \Delta VAR_{ilkt} + \delta_5 \Delta QUA_{ilkt} + \mu_{ijkt}$$

This equation captures the export growth performance of Belgian firms in their export markets. Export growth rates of Belgian firms are affected in each market and each product category by the growth of the market share of their Asian competitors as measured by $\Delta COMP_{lkt}$. Belgian firms can respond to this challenge by upgrading the quality of their products or by altering the number of varieties exported to the contested markets. That is why we include the ΔVAR_{ilkt} and ΔQUA_{ilkt} variables in the regression equation.

We consider a wide range of firm-specific characteristics in the regression. Size effects are captured by the number of full-time-equivalent employees. Capital and innovation intensity are respectively measured by machinery per worker and immaterial fixed assets per worker. The productivity of the company is taken into account by including value added per worker in the regression. Finally, the quality of labour (human capital intensity) in the company is approximated by labour remuneration variables.

The selection of market destination variables is based on the well-known gravity approach. We include GDP and GDP per capita of the destination country to which the Belgian firm is exporting. We add a distance variable, a dummy for countries that share a border with Belgium and dummy variables for EU15 (the "old" EU) and EU27 (the current EU) member countries[9].

The competition of various Asian countries is measured in two ways[10]. First, we follow a dummy variable approach where the dummy for a specific Asian country takes the value 1 when the country of destination of a Belgian exporter also imports products from the Asian country within the same manufacturing subsector (HS-4 level). This provides information on the extent to which Belgian firms are systematically exporting to markets where exporting firms of a specific Asian competitor are active. The alternative approach is to include in the regression equation the market share of a specific Asian country in the total imports of the country to which Belgian firms are exporting.

In each of these models we add firm-level fixed effects as well as sectoral fixed effects at the HS2-level[11]. All variables are expressed in logs except for the dummies and the variables expressed as percentages (e.g., market shares of Asian competitors).

5. RESULTS

We will subsequently discuss the estimation results for export intensity, export variety, export quality and the growth in export intensity.

The results for **export intensity at the product level** (equation 1) **and the subsectoral level** (equation 1') are reported in Tables 2 and 3 respectively. Firm-specific characteristics play a role in Belgian export intensity. This is most of all the case in equation (1) where we disaggregate to the product level. Like other studies in the literature we find that firm size and productivity matters. Companies with a higher number of employees export more. As do firms with a higher value added per worker. Note that the size effect does not diminish when the company gets bigger. When adding squared size to the regression analysis, the squared variable is not statistically significant (not reported)[12]. Furthermore, one obtains a

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[9] Note that the EU15 and EU27 dummies are defined as time-invariant.

[10] Note that, as argued by Mayer et al. (2010), the GDP of the export destination market reflects the overall degree of competition in the foreign market. Hence we control for the overall degree of competition while we study the specific impact of Asian competition.

[11] Disaggregating dummies to the level of the subsector is computationally not realistic.

[12] Note that we considered several alternative firm-level characteristics in the model specification, including firm age, R&D expenditures, goodwill, etc. For none of these alternative regressors we obtained significant results.

statistically significant positive sign for the remuneration per worker variable in the product equation. Assuming that wage levels reflect labor skills, this seems to indicate that Belgian companies, that use intensively skilled labor, are more successful in export markets.

Interestingly, several of the firm characteristics turn out not to be significant. A higher capital and innovation intensity does not lead to significantly higher exports. The lack of an innovation effect is in line with evidence of studies that find that Belgian industry is specialized in exports of products with a low to medium technological content. But it could also be the consequence of using immaterial fixed assets as an imperfect measure of innovation. The absence of any noticeable impact of capital intensity is more surprising because Belgian firms are known to have compensated high labor costs by adopting capital-intensive production methods. As far as the data tell us, this strategy of raising capital intensity does not pay off in a better export performance.

Disaggregation to the product level pays off in terms of the statistical significance of the firm characteristics. For instance, the impact of the human capital variable (remuneration per worker) explains export intensity at the product but not at the subsectoral level.

Turning to the geographic characteristics of the destination markets, our results confirm the usual findings of the gravity model. Again, the picture is the sharpest for the export intensity equation at the product level (regression 1). The GDP and GDP per capita variables carry the expected positive sign: Belgian firms export more to larger and richer countries. The regression coefficient on the distance variable is negative and highly significant. Remarkable is the strong positive impact of the border, EU15 and EU27 dummies on our export performance indicators. This reflects the geographic orientation of Belgian exports to EU markets. Of those variables the strongest impact comes from the border dummy. This does not come as a surprise since the Netherlands, Germany and France are the three main trading partners of Belgium.

In the export intensity equation at the subsectoral level (regression 1'), the GDP per capita variable has a negative sign, the EU15 dummy is no longer significant whereas the EU27 effect becomes even significantly negative. Those findings may seem surprising at first sight but should be seen in combination with the very positive and very significant border effects and the statistically negative distance effects. Clearly, Belgian exports are primarily targeted at neighbouring markets and not at more distant markets even if some of those more distant countries belong to the EU.

Asian competition matters for Belgian exporting firms in both the export intensity equations at the product and the subsectoral level. But the competitive pressure on Belgian firms varies across Asian trading partners. Belgian firms are facing competition from Chinese firms on their export markets. Looking at the positive coefficient on the dummy variable for China, Belgian firms are selling intensively in markets where competitors of China are active. Moreover the regression coefficients for the market share variables for China and Hong Kong are negative. Belgian firms export less to markets where competitors from Hong Kong and China have built up a higher market share. It is well known that Hong Kong acts as a hub for the exports for many Chinese companies so that the competitive threat from China may operate through export platforms from both Hong Kong and mainland China. Among the

Asian Tigers, Korea and Singapore appear to be the main competitors for Belgian exporters. Their export markets overlap with Belgian export destinations. The export value of Belgian firms is lower in markets where firms from those countries achieve a higher market share although the evidence is mixed depending on whether one considers the regression at the product or the subsectoral level. 13 By contrast, Taiwan appears to be less of a direct competitor for Belgian exports.

The results from the regression for export variety (equation 2) broadly confirm the message from the export intensity regressions. As to the firm-level characteristics, it appears that larger firms export a larger variety. The same holds for firms with a higher human capital intensity. Productivity, capital intensity and innovation intensity do not matter for explaining variety. All destination market characteristics have the expected signs and are significant. Hence exports are characterized by more variety if exports are directed to larger or richer countries, to neighbouring countries, EU-countries or countries not too far away. Analogous to the findings for the export intensity, Belgian export variety seems to be characterized by geographical circles. Export variety is highest for neighbouring countries and then for EU15 countries. It is however somewhat lower for other EU-countries apart from the EU15 countries and substantially lower for countries further away.

The results for Asian competitive pressure on export variety are quite pronounced. Belgian export firms systematically sell a higher variety of products in markets where firms of the Asian countries considered in this paper are selling. Confronted with a high market share firms from China, Hong Kong and Singapore Belgian companies focus on core competences by concentrating on a smaller range of products sold in their export markets. By contrast, they sell a larger variety of products in markets with a substantial market share of Taiwanese and Korean firms. In short, the response of Belgian exporters to Asian competition differs from country to country.

These results provide us with very interesting insights into the determinants of export intensity and export variety, and in particular as to the role of Asian competition of Belgian export destination markets. We can however extend the analysis by splitting up our data in order to study these determinants for specific regions as well as for specific manufacturing sectors. Given that different geographical regions as well as different sectors have particular characteristics, we expect that additional findings for regions and sectors may in some cases deviate from our overall findings.

In order to better capture the regional differences in export competition for Belgian firms we rerun the export intensity and export variety regressions for separate export regions[14]. We focus on the subsectoral level only. We distinguish between Europe, Russia and Far-Eastern Europe ("East"), Asia, North America, South America, Middle East and the Mediterranean countries ("Middle East"), and Oceania. The results are summarized in Appendix 2 and 3. Note that the results for Western Europe are very similar to the findings for the whole data set, and therefore they are not separately reported. This

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[13] The market share variable for Korea is statistically significant and negative in the export intensity equation at the sectoral level but not at the product level. The opposite is true for Singapore.

[14] Note that we use the same model, but without the dummies for border, EU15 and EU27, since the latter are only relevant within the European region.

similarity is not much of a surprise in view of the strong orientation of Belgian export firms towards European markets.

We focus in particular on the impact of Asian competition at the regional level. One consistent finding is the strong competitive pressure from Chinese competition on Belgian export intensity. Often firms from Hong Kong play a pivotal role in this process. Just like in European markets, a larger market share of firms from Hong Kong and China reduces the value of Belgian export sales in Asian countries. The same happens in Africa, which is known to experience a growing Chinese influence in recent years. In North America, the Middle East and Mediterranean countries, Oceania, Russia and Far- Eastern Europe, Belgian export sales are threatened by competition from Hong Kong based companies. Only in South America, we do not find evidence of a negative relation between Belgian export intensity and higher Chinese or Hong Kong market shares.

The impact of Chinese competition on Belgian export variety however differs across export regions. In Europe, Far-Eastern Europe and Russia Belgian firms focus on their core competence by selling fewer varieties confronted with a large market share of China and/or Hong Kong. By contrast, Belgian firms engage in product differentiation by selling more varieties in Asian and Middle Eastern and Mediterranean countries where firms from China have acquired a strong position. In Africa, South and North America there is no statistically significant relation between Chinese or Hong Kong market shares and Belgian export variety.

The picture for the Asian Tigers is quite diverse. Taiwanese and Belgian firms do not appear to compete head-on in European markets, but are competing in the North American market, in Oceania and in the Middle Eastern and Mediterranean countries. High Korean market shares reduces Belgian export variety in Asia and South America. Likewise, fewer Belgian varieties are sold in those North American and European markets where firms from Singapore established a large market share.

After this regional split-up, we turn to the analysis of sectoral differences. Again we study the same set of determinants for export intensity and export variety, using in both cases the regressions that were run at the subsectoral level. To get a feel of the main trends, we aggregate the subsectors to twenty-one manufacturing sectors. We keep however the subsectoral variation within each of these sectors since there appears to be substantial subsectoral variation. As Appendix 4 for export intensity and Appendix 5 for export variety show, the results for many sectors are statistically significant and highly so.

Broadly speaking, the main points of the paper are confirmed. Belgian firms are realizing more export sales and are exporting a broader range of products in markets and in (sub)sectors where Asian companies are competing. Competition from the Chinese Dragon (both China and Hong Kong) is fierce in many sectors while the picture for the Asian tigers varies across Asian countries and across sectors.

The heterogeneity across sectors leads to interesting additional insights. China started its remarkable surge by first specializing in labour-intensive products and gradually moving towards products with a higher value added. This comparative advantage view is reflected in Belgian export sales. Our findings point to substantial negative effects on Belgian export intensity caused by Chinese firms in sectors like Textiles, Footwear, Minerals, Base Metals and Transport Equipment. For other, more capital-intensive

and knowledge-driven sectors, like Chemicals, Plastic and Specific Machinery, Chinese competition reduces export intensity but the size as well as the statistical significance of the effect are substantially smaller. Finally, in some sectors, notably Foods & Beverages, Leather, Wood, Paper, Glass & Stone and Machinery, the Belgian export intensity is not suffering from higher Chinese market shares. In several of those sectors Belgian export performance has traditionally been strong. This may explain why they are able to resist Mainland Chinese competition in foreign markets. Note that at the sectoral level the competition effect caused by Hong Kong may differ from the Mainland China effect.

The results for the Asian Tigers vary across sectors reflecting differences in export and specialization patterns of the various Asian countries. Consequently some negative competition effects may be offset by positive effects. From a Belgian perspective, comparative and competitive advantage seems to play a role. In sectors like Food & Beverages, Chemicals, Plastics and Leather Belgian exporters are able to maintain their export position in spite of the competition from the Asian Tigers. In Wood, Paper, Glass & Stone and Machinery Belgian exporters face intense competition from some Asian Tigers.

The most interesting insight from the regressions of export variety is the fact that in several sectors Belgian exporters often sell a broader range of products when they face Asian competition in general and competition from Singapore and China in particular. Variety is not only higher in more capital-intensive and innovation-intensive sectors, like Chemicals, Plastic, Machinery and Specific Machinery, but also in more labour-intensive sectors, notably Leather, Glass & Stone, Textiles and Footwear. Product differentiation appears to be a strategy chosen by firms in many sectors regardless of their factor intensities. This is a topic we explore in more detail in the following paragraphs.

Turning to the regression for export quality upgrading (equation 3), the results are not so compelling (see Table 5). Although we use a very adequate indicator of quality, our model appears to be unable to reveal the determinants of the extent of export quality upgrading. We hardly obtain significant results. Moreover the overall explanatory power of the model is very low. Hence quality at the firm-level, taking into account the direction of trade as well as underlying subsectoral heterogeneity, is neither driven by destination market characteristics nor by the firm-level characteristics we take into account. Moreover it appears that quality is not affected by Asian competition in the export destination markets.

Despite the lack of significant estimates, this finding deserves further attention. Previous studies showed that the quality of trade, measured at detailed product levels but not based on firm-level data, is driven by destination market characteristics. By contrast, this paper's results indicate that this conclusion no longer holds if one takes into account both firm-level and product-level heterogeneity. Hence more research needs to be done to adequately model the quality strategies of exporting firms and in order to better understand the driving forces of quality of trade of multi-product firms. This is however beyond the purpose of this paper.

Turning to the specification of the growth rate of export intensity (equation 4) , we analyze the effects of a strategy of quality upgrading and of a strategy of growing product differentiation on the value of bilateral product-level exports by Belgian firms. We define the growth of export intensity as the percentage change between the average export intensity in the period 2002-2006 and the average

export intensity in the period 1998-2001. And we restrict the sample to the firms that upgraded the quality of their product between the two periods. In doing so, we study within a sample of firms-products-markets, that are characterized by quality upgrading between the two periods, whether the extent of quality upgrading or the extent of variety expansion or perhaps both causes a higher growth in the export intensity of a Belgian firm exporting within a particular subsector to a particular market.

From Table 6 we learn that the impact of the growth in export variety as well as of the growth in export quality on the growth in export intensity is significantly positive. Both a strategy of upgrading quality and one of increasing export variety allow Belgian firms to export more, even in markets where they are facing Asian competition or increasing Asian competition. As such both strategies compensate for the negative competition effects caused by the Chinese Dragon and the Asian Tigers. The effect of variety expansion is however larger and more significant than the effect of quality upgrading. Note finally that these Belgian firms' export intensity growth is highest in large and poorer countries and in more distant countries.

Finally, repeating the same analysis at the sectoral level – results are summarized in Appendix 6 - shows that variety expansion is a valuable strategy in almost all sectors. Quality expansion, however, is adequate in many manufacturing sectors, but not in labour-intensive sectors producing standardized goods like Leather, Textiles and Footwear. This may be because in these sectors export intensity is determined by cost competitiveness, rather than by quality.

6. CONCLUSION

In this paper, we use the export data for individual Belgian firms to assess the impact of Asian companies on Belgian export performance. We adopt a bilateral approach in the sense that we distinguish between export destinations rather than focusing on total trade flows. Furthermore we disaggregate trade flows to the sectoral, subsectoral and the product level. We measure export intensity, export variety and export quality. In sum, we use firm-level data to study corporate export performance for individual products, sectors and subsectors in individual export destinations. This approach leads to several results.

First, Belgian exporting firms are heterogeneous and the differences between companies matters for export performance. Many Belgian exporters are single-variety firms, exporting one product to one destination. Gradually more and more companies are becoming multi-variety firms but the number of exported varieties varies considerably across firms. The number of very-large-variety firms is limited.

The heterogeneity in firm characteristics affects the export intensity and export variety of Belgian companies. Larger, more productive and skill-intensive export more and sell more products in foreign markets. Surprisingly, capital intensity does not seem to affect export performance in our data set. Nor does innovation intensity but this may be due to poor measurement of innovation.

Overall, we do not find any evidence that firm characteristics or destination market characteristics determine the quality of products exported by Belgian manufacturing firms. Nor is there a convincing link between Belgian export quality and the degree of Asian competition. Further research is needed to identify the determinants of Belgian export quality.

A second main finding is that not all export markets are equal for Belgian exporters. Belgian companies have a strong focus on the bordering EU countries and rely on the main EU trading partners for a large share of their export sales. This is a well-known fact. Not so well known is that also the variety of products sold is much higher in the countries bordering or being close to Belgium. This export variety quickly levels off when the distance between Belgium and the export markets rises. Outside the EU, Belgian exports are directed towards countries with larger markets and higher income levels per capita.

A third result of this paper is that the impact of Asian competition on Belgian exporters is clearly felt but is not the same for all Asian competitors. Belgian firms are confronted with Asian competitors in their key export markets. Export markets of Belgian and Asian firms overlap. In effect, Belgian firms systematically realize more export value and sell a wide range of export products in markets where Asian competitors are selling. Considering that the most important export markets for Belgian firms are located in the EU, this implies that Belgian firms are not only facing Asian competition in distant markets but also in their extended home base.

The competitive pressure from Asian countries is not the same for the Chinese Dragon and the Asian Tigers. Chinese competition stems from firms based in (mainland) China and from companies operating from Hong Kong: the Chinese Dragon is double-headed. Belgian firms experience this Chinese pressure in virtually all regions of the world. A higher market share of Chinese and/or Hong Kong firms in a foreign market lowers export sales of Belgian firms in that market.

The effects on Belgian export performance from the Asian Tigers is globally less widespread. Based on the effects of market shares on Belgian export intensity, Korea is a serious competitor for Belgian exporters in European and Asian markets. Competition from Singapore leads Belgian firms in the European and North American market to focus on their core competence by decreasing the number of products exported. Taiwan appears to be less of an overall competitor for Belgian exports but makes its presence felt in selected regions like North America, Oceania and in the Middle Eastern and Mediterranean countries.

A fourth finding of this paper relates to sectoral differences. Belgian firms seem to cope well with Chinese and Asian competition in traditionally strong core sectors of Belgian manufacturing. These include both capital- and innovation-intensive industries like Chemicals and Plastic, but also more labour-intensive industries like Leather and Food & Beverages. The pressure of Chinese competition is felt intensively in labour-intensive sectors in which Belgium does not have a comparative advantage. But it is also felt in several sectors with higher value added that are not dependent on low labour costs. Furthermore, Belgian exporters often sell a broader range of products when they face Asian competition, in capital-intensive as well as in labour-intensive sectors. This indicates that product differentiation is a common strategy to deal with Asian competition in the world market.

Finally, this paper contributes to the discussion in Belgium about how to cope with the competition from the Chinese Dragon and the Asian Tigers. Exporting firms may opt for a variety expansion strategy as well as for a quality upgrading strategy. Both strategies are found to expand the sales of Belgian firms in foreign markets. Based on our regression analysis, a strategy of raising export variety appears to be more effective in stimulating export intensity than a strategy of quality upgrading. This result should however be treated with caution because it remains difficult to measure product quality appropriately even at the very disaggregated level adopted in this paper.

What are the prospects for Belgian exports in the year to come? Based on our results, product differentiation by broadening the range of products sold in a foreign market appears to be a feasible option in a wide range of manufacturing sectors. Given that total variety of Belgian exports is gradually growing over time and given that a larger number of Belgian exporters are becoming multi-product firms, the Belgian economy seems to move into this direction. There are reasons to believe that the scope for product differentiation is not yet exhausted. Belgian firms that currently export one or a few products should be able to broaden their export range in the immediately neighbouring countries whose market environment is familiar to the Belgian business community. For their part, established multi-product exporters could attempt to expand the number of export markets where they are selling a full range of products. The current focus of multi-product exporters on the bordering trading partners could be extended to include other EU member countries and even export markets further away.

Alternatively, firms may opt for a export strategy based on quality. With this strategy firms counter declining export sales by upgrading the quality of their products. Such a quality-oriented strategy appears to work in most manufacturing sectors and may boost the growth of Belgian export sales even in those markets where Asian companies are competing. Only in sectors mainly consisting of standardized products this strategy will most likely fail.

Finally, export growth can be achieved when the main disadvantage of the current geographic specialization of Belgian exports is overcome. The heavy focus on the main EU trading partners is a drawback in a world where the highest growth rates are achieved outside Europe. Belgian manufacturing exporters should be able to benefit more from the strong demand growth in the emerging markets based on a strategy of raising export quality and export variety. The example of countries like Germany and Switzerland proves that such a strategy can be very successful even in the face of intense Asian competition.

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Figure 1: Export Variety of Belgian manufacturing firms, 1998-2006
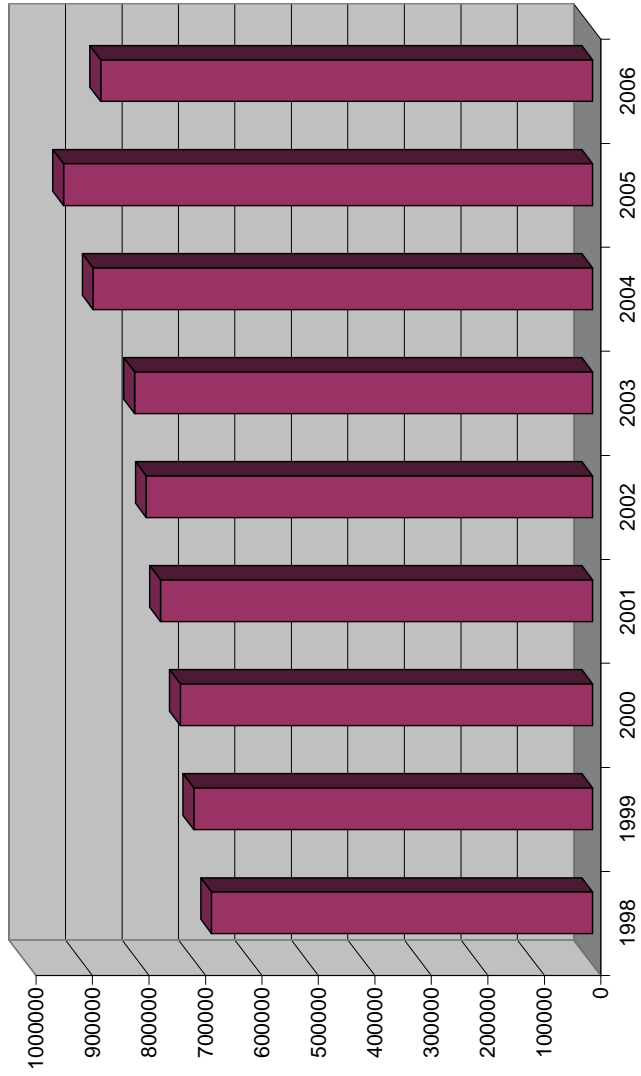
Table 1a: The number of firms by export variety, 1998-2006

Variety	Number of firms								
	1998	1999	2000	2001	2002	2003	2004	2005	2006
1	8026	3193	1920	1336	1053	812	711	607	491
2	3193	3099	3204	3148	3200	2886	2714	2698	2705
3	1920	1761	1977	1982	1810	1815	1727	1654	1555
4	1336	1250	1361	1428	1394	1240	1263	1099	1126
5	1053	1037	1015	1003	1012	976	949	924	782
6	812	796	843	905	836	808	704	727	622
7	711	664	671	731	716	670	634	651	530
8	607	595	597	616	588	589	576	511	445
9	491	494	524	517	497	447	471	478	376
10	464	470	501	473	500	481	430	404	333
11-20	2876	2832	2888	2990	2907	2870	2820	2737	2092
21-50	3008	3087	3126	3211	3176	3147	3158	3104	2330
51-100	1418	1398	1466	1550	1495	1565	1579	1622	1276
101-500	1148	1206	1277	1284	1317	1356	1410	1408	1266
501-1000	105	117	116	122	125	122	139	164	176
1001-10000	38	50	49	59	73	70	86	92	94
>10000	0	0	0	0	0	1	2	2	2

Table 1b: Total Export Variety per Harmonized System Sector, 1998-2006

HS Sector	1998	1999	2000	2001	2002	2003	2004	2005	2006
1 Animals	16291	16874	17532	18424	18170	18320	19154	18682	15955
2 Vegetables	24948	26744	25150	25722	26177	27057	28239	27898	22983
3 Fats & Oils	2725	2915	2874	2802	2938	2970	3179	3173	3085
4 Food & Beverages	31127	32315	33544	35079	36773	37445	39516	39149	35589
5 Minerals	5004	5270	5234	5526	5526	5632	5926	5968	5306
6 Chemicals	72406	75757	78081	81317	84072	85896	93243	98238	95191
7 Plastics	49079	52635	54345	50660	52783	54379	59121	64282	61474
8 Leather	908	944	981	1037	952	962	1023	1189	962
9 Wood	3778	4072	4248	4659	4895	5031	5317	5683	4700
10 Paper	25962	27198	27356	28129	29269	29671	32251	33223	30083
11 Textiles	73405	75041	79368	80890	82710	83229	89106	92531	83859
12 Footwear	5246	5194	5594	5931	6330	6901	8306	9291	8944
13 Glass & Stone	10687	11616	12194	13026	13623	13608	15244	16498	14131
14 Precious Items	5215	5394	5623	4840	3228	1385	1770	2119	1815
15 Base Metals	64042	67072	67663	71628	74581	77401	84389	92634	86672
16 Machinery	85103	90687	93575	93682	97177	100900	112155	122826	116913
17 Transport Equipment	28885	26496	29422	32064	32411	32431	31619	29814	29538
18 Specific Machinery	10232	11323	11357	12281	13178	13612	15417	16908	16849
19 Arms	284	254	297	253	249	257	240	252	224
20 Miscellaneous	19144	20828	22404	23868	24532	25240	27322	28971	25250
21 Art	828	912	1099	1042	1058	931	1008	1111	1077
TOTAL	535299	559541	577941	592860	610632	623258	673545	710440	660600

Table 1c: Average Export Intensity per Harmonized System Sector, 1998-2006

HS Sector	1998	1999	2000	2001	2002	2003	2004	2005	2006	Average 1998-2006
1 Animals	254519.5	222220.5	253974.8	261156.1	246379.6	234591.9	244582.8	254249.2	298004.2	252186.5
2 Vegetables	136253.3	128541.4	125683.4	132166.0	135132.3	139818.0	135900.8	146132.9	186735.4	140707.1
3 Fats & Oils	346584.4	288527.5	262882.6	289849.7	292429.7	296013.2	286558.6	281150.3	300271.7	293807.5
4 Food & Beverages	182099.6	171613.1	181798.7	189614.6	190157.4	198540.9	195782.8	205144.1	239121.6	194874.8
5 Minerals	309726.6	335535.3	480445.1	465215.3	336786.5	450457.3	563445.3	641314.1	849807.3	492525.9
6 Chemicals	264305.3	275321.9	310110.8	327182.0	446273.3	429859.0	435704.2	447699.3	491616.3	380896.9
7 Plastics	241783.9	241110.1	280136.3	290316.0	277917.4	271848.7	276837.5	291723.9	346280.0	279772.6
8 Leather	102844.8	88022.3	130218.2	113375.3	27660.9	29787.4	29780.8	21169.2	24933.2	63088.0
9 Wood	181742.5	174563.1	179112.6	183281.1	230293.9	227154.7	236199.9	221767.6	280574.4	212743.3
10 Paper	146843.0	151093.3	175603.1	164717.3	159186.9	154387.7	148290.3	141753.0	161176.6	155894.6
11 Textiles	111564.7	107067.1	110006.7	108841.5	107507.4	97758.6	90272.1	85934.8	97343.2	101810.7
12 Footwear	243081.5	261234.4	271500.2	304911.2	301641.2	230162.8	198760.1	204699.0	238423.7	250490.5
13 Glass & Stone	142451.0	126996.5	134156.7	128871.0	133117.0	131296.6	122444.2	117663.7	136463.1	130384.4
14 Precious Items	1693318.0	1997210.0	2338679.0	2389102.0	3781367.0	7243148.0	6338518.0	6048898.0	7084687.0	4323880.8
15 Base Metals	182751.5	165148.4	199814.3	181117.1	171709.1	171901.3	194215.5	197260.6	265575.6	192165.9
16 Machinery	159557.5	160828.3	189620.3	181514.1	169941.1	157361.7	148988.3	144747.8	155124.2	163075.9
17 Transport Equipment	618490.6	687200.3	501227.9	545278.9	553170.7	584271.4	659054.1	716635.3	755706.7	624559.5
18 Specific Machinery	95738.6	108741.1	118740.6	120776.4	113097.8	123754.3	118956.9	122916.2	129208.9	116881.2
19 Arms	707513.8	710460.5	597874.9	1153553.0	725235.7	605572.5	758432.1	640122.4	791196.4	743329.0
20 Miscellaneous	114581.6	107194.1	106749.6	102082.2	98829.3	96409.6	89290.9	83988.6	91710.4	98981.8
21 Art	68618.8	61265.1	64813.7	58542.4	51743.7	42839.4	62645.2	65555.3	58897.3	59435.7

Table 1d: Total Export Intensity per Harmonized System Sector, 1998-2006

HS Sector	1998	1999	2000	2001	2002	2003	2004	2005	2006	Average 1998-2006	Sum 1998-2006	Share in Total 1998-2006
1 Animals	4.15E+09	3.75E+09	4.45E+09	4.81E+09	4.48E+09	4.30E+09	4.68E+09	4.75E+09	4.75E+09	4.46E+09	4.01E+10	2.96
2 Vegetables	3.40E+09	3.44E+09	3.16E+09	3.40E+09	3.54E+09	3.78E+09	3.84E+09	4.08E+09	4.29E+09	3.66E+09	3.29E+10	2.43
3 Fats & Oils	9.44E+08	8.41E+08	7.56E+08	8.12E+08	8.59E+08	8.79E+08	9.11E+08	8.92E+08	9.26E+08	8.69E+08	7.82E+09	0.58
4 Food & Beverages	5.67E+09	5.55E+09	6.10E+09	6.65E+09	6.99E+09	7.43E+09	7.74E+09	8.03E+09	8.51E+09	6.96E+09	6.27E+10	4.63
5 Minerals	1.55E+09	1.77E+09	2.51E+09	2.57E+09	1.86E+09	2.54E+09	3.34E+09	3.83E+09	4.51E+09	2.72E+09	2.45E+10	1.81
6 Chemicals	1.91E+10	2.09E+10	2.42E+10	2.66E+10	3.75E+10	3.69E+10	4.06E+10	4.40E+10	4.68E+10	3.30E+10	2.97E+11	21.91
7 Plastics	1.19E+10	1.27E+10	1.52E+10	1.47E+10	1.47E+10	1.48E+10	1.64E+10	1.88E+10	2.13E+10	1.56E+10	1.41E+11	10.38
8 Leather	9.34E+07	8.31E+07	1.28E+08	1.18E+08	2.63E+07	2.87E+07	3.05E+07	2.52E+07	2.40E+07	6.19E+07	5.57E+08	0.04
9 Wood	6.87E+08	7.11E+08	7.61E+08	8.54E+08	1.13E+09	1.14E+09	1.26E+09	1.26E+09	1.32E+09	1.01E+09	9.12E+09	0.67
10 Paper	3.81E+09	4.11E+09	4.80E+09	4.63E+09	4.66E+09	4.58E+09	4.78E+09	4.71E+09	4.85E+09	4.55E+09	4.09E+10	3.02
11 Textiles	8.19E+09	8.03E+09	8.73E+09	8.80E+09	8.89E+09	8.14E+09	8.04E+09	7.95E+09	8.16E+09	8.33E+09	7.49E+10	5.54
12 Footwear	1.28E+09	1.36E+09	1.52E+09	1.81E+09	1.91E+09	1.59E+09	1.65E+09	1.90E+09	2.13E+09	1.68E+09	1.52E+10	1.12
13 Glass & Stone	1.52E+09	1.48E+09	1.64E+09	1.68E+09	1.81E+09	1.79E+09	1.87E+09	1.94E+09	1.93E+09	1.74E+09	1.57E+10	1.16
14 Precious Items	8.83E+09	1.08E+10	1.32E+10	1.16E+10	1.22E+10	1.00E+10	1.12E+10	1.28E+10	1.29E+10	1.15E+10	1.04E+11	7.65
15 Base Metals	1.17E+10	1.11E+10	1.35E+10	1.30E+10	1.28E+10	1.33E+10	1.64E+10	1.83E+10	2.30E+10	1.48E+10	1.33E+11	9.83
16 Machinery	1.36E+10	1.46E+10	1.77E+10	1.70E+10	1.65E+10	1.59E+10	1.67E+10	1.78E+10	1.81E+10	1.64E+10	1.48E+11	10.93
17 Transport Equipment	1.79E+10	1.82E+10	1.47E+10	1.75E+10	1.79E+10	1.89E+10	2.08E+10	2.14E+10	2.23E+10	1.88E+10	1.70E+11	12.53
18 Specific Machinery	9.80E+08	1.23E+09	1.35E+09	1.48E+09	1.49E+09	1.68E+09	1.83E+09	2.08E+09	2.18E+09	1.59E+09	1.43E+10	1.06
19 Arms	2.01E+08	1.80E+08	1.78E+08	2.92E+08	1.81E+08	1.56E+08	1.82E+08	1.61E+08	1.77E+08	1.90E+08	1.71E+09	0.13
20 Miscellaneous	2.19E+09	2.23E+09	2.39E+09	2.44E+09	2.42E+09	2.43E+09	2.44E+09	2.43E+09	2.32E+09	2.37E+09	2.13E+10	1.57
21 Art	5.68E+07	5.59E+07	7.12E+07	6.10E+07	5.47E+07	3.99E+07	6.31E+07	7.28E+07	6.34E+07	5.99E+07	5.39E+08	0.04
TOTAL	1.18E+11	1.23E+11	1.37E+11	1.41E+11	1.52E+11	1.50E+11	1.65E+11	1.77E+11	1.91E+11		1.35E+12	100

Table 2: Results for Export Intensity at the Product-level

	[1]			[2]			[3]			[4]		
	coef.	SE	t	coef.	SE	t	coef.	SE	t	coef.	SE	t
GDP	0.01	0.00	10.01 ***				-0.01	0.00	-7.43 ***	0.01	0.00	6.10 ***
GDP per capita	0.01	0.00	7.64 ***				0.01	0.00	14.32 ***	0.01	0.00	6.47 ***
Distance	-0.02	0.00	-18.68 ***				-0.01	0.00	-13.88 ***	-0.02	0.00	-12.92 ***
Border	0.03	0.00	12.20 ***				0.04	0.00	16.39 ***	0.02	0.00	4.33 ***
EU15	0.02	0.00	6.24 ***				0.02	0.00	5.89 ***	0.02	0.01	3.08 ***
EU27	0.01	0.00	4.88 ***				0.01	0.00	2.83 ***	0.00	0.00	0.88
Number of FTE employees				0.02	0.00	7.16 ***	0.02	0.00	6.93 ***	0.03	0.00	6.40 ***
Average remuneration				0.01	0.00	3.01 ***	0.00	0.00	-0.13	0.01	0.00	3.03 ***
Value added per worker				0.01	0.00	4.66 ***	0.01	0.00	5.06 ***	0.01	0.00	3.30 ***
Capital per worker				0.00	0.00	1.03						
Immaterial fixed assets per worker				0.00	0.00	0.91						
China active in sector and market							0.03	0.00	7.91 ***			
Korea active in sector and market							0.03	0.00	10.79 ***			
Taiwan active in sector and market							0.00	0.00	-1.32			
Singapore active in sector and market							0.04	0.00	13.79 ***			
Hong Kong active in sector and market							0.00	0.00	-0.31			
China's share in market's sectoral imports										-0.02	0.02	-0.85
Korea's share in market's sectoral imports										-0.09	0.04	-2.29 **
Taiwan's share in market's sectoral imports										0.01	0.04	0.23
Singapore's share in market's sectoral imports										0.19	0.04	4.76 ***
Hong Kong's share in market's sectoral imports										-0.19	0.05	-4.24 ***
Constant	0.21	0.02	13.93 ***	0.02	0.04	0.47	0.00	0.04	0.03	-0.03	0.06	-0.40
Sectoral Fixed Effects	yes			yes			yes			yes		
Firm Fixed Effects	yes			yes			yes			yes		
R^2	0.13			0.03			0.11			0.06		
F	349.01			18.89			151.91			104.24		

Note: Results based on a fixed-effects panel data estimation with robust standard errors and adjusted for clustering at the firm level; ***, **, * respectively denote statistical significance at 1 %, 5 % and 10 % level.

Table 3: Results for Export Intensity at the Subsectoral Level

	[1]			[2]			[3]			[4]		
	coef.	SE	t	coef.	SE	t	coef.	SE	t	coef.	SE	t
GDP	0.22	0.01	24.84 ***				0.21	0.01	15.86 ***	0.25	0.02	12.17 ***
GDP per capita	-0.05	0.01	-4.20 ***				-0.06	0.02	-3.16 ***	-0.09	0.02	-5.21 ***
Distance	-0.18	0.01	-17.99 ***				-0.18	0.02	-9.61 ***	-0.21	0.03	-7.80 ***
Border	0.39	0.03	12.88 ***				0.40	0.05	8.73 ***	0.40	0.05	7.46 ***
EU15	0.01	0.03	0.25				-0.02	0.05	-0.43	0.07	0.08	0.87
EU27	-0.39	0.03	-12.22 ***				-0.41	0.05	-8.27 ***	-0.52	0.08	-6.85 ***
Number of FTE employees				0.19	0.05	3.99 ***	0.20	0.05	4.16 ***	0.25	0.04	5.58 ***
Average remuneration				-0.09	0.05	-1.59	-0.14	0.05	-2.58 ***	-0.10	0.08	-1.35
Value added per worker				0.07	0.04	1.94 **	0.08	0.04	2.10 **	0.04	0.05	0.82
Capital per worker				0.00	0.02	-0.21	0.00	0.02	0.05	-0.01	0.02	-0.31
Immaterial fixed assets per worker				0.00	0.01	0.14	0.00	0.01	0.13	0.00	0.01	0.16
China active in sector and market							0.03	0.03	1.04			
Korea active in sector and market							0.15	0.02	6.70 ***			
Taiwan active in sector and market							-0.01	0.04	-0.18			
Singapore active in sector and market							0.09	0.03	3.39 **			
Hong Kong active in sector and market							-0.11	0.02	-5.00 **			
China's share in market's sectoral imports										-0.69	0.22	-3.16 ***
Korea's share in market's sectoral imports										0.52	0.48	1.07
Taiwan's share in market's sectoral imports										-1.07	0.42	-2.56 ***
Singapore's share in market's sectoral imports										0.32	0.41	0.79
Hong Kong's share in market's sectoral imports										-1.00	0.38	-2.65 ***
Constant	11.90	0.29	40.50 ***	10.47	1.11	9.48 ***	11.70	1.12	10.49 ***	12.53	1.46	8.60 ***
Sectoral Fixed Effects	yes			yes			yes			yes		
Firm Fixed Effects	yes			yes			yes			yes		
R²	0.10			0.07			0.11			0.11		
F	85.56			31.29			50.29			54.74		

*Note: Results based on a fixed-effects panel data estimation with robust standard errors and adjusted for clustering at the firm level; ***, **, * respectively denote statistical significance at 1 %, 5 % and 10 % level.*

Table 4: Results for Variety in Belgian Firm-level Exports (Subsectoral Level)

	[1] coef.	SE	t		[2] coef.	SE	t		[3] coef.	SE	t		[4] coef.	SE	t	
GDP	0.01	0.00	9.15	***					-0.01	0.00	-4.13	***	0.02	0.00	6.93	***
GDP per capita	0.02	0.00	7.79	***					0.03	0.00	9.03	***	0.01	0.00	4.03	***
Distance	-0.04	0.00	-17.45	***					-0.03	0.00	-9.50	***	-0.04	0.01	-8.19	***
Border	0.07	0.01	11.27	***					0.09	0.01	10.92	***	0.03	0.01	2.41	**
EU15	0.05	0.01	6.55	***					0.05	0.01	4.80	***	0.02	0.01	1.31	
EU27	0.04	0.01	6.05	***					0.03	0.01	3.69	***	0.05	0.02	3.33	***
Number of FTE employees					0.06	0.01	4.24	***	0.06	0.01	4.41	***	0.09	0.02	5.75	***
Average remuneration					0.03	0.01	2.73	***	0.01	0.01	1.19		0.04	0.01	2.52	**
Value added per worker					0.00	0.01	0.40		0.00	0.01	0.66		0.01	0.01	0.81	
Capital per worker					0.01	0.01	1.48		0.01	0.01	1.88	*	0.01	0.01	1.82	*
Immaterial fixed assets per worker					0.00	0.00	0.33		0.00	0.00	0.33		0.00	0.00	1.16	
China active in sector and market									0.05	0.01	5.18	***				
Korea active in sector and market									0.05	0.01	7.30	***				
Taiwan active in sector and market									0.02	0.01	2.06	**				
Singapore active in sector and market									0.09	0.01	10.83	***				
Hong Kong active in sector and market									0.02	0.01	3.18	***				
China's share in market's sectoral imports													-0.20	0.05	-3.75	***
Korea's share in market's sectoral imports													-0.42	0.12	-3.46	***
Taiwan's share in market's sectoral imports													0.29	0.11	2.60	***
Singapore's share in market's sectoral imports													0.15	0.10	1.43	
Hong Kong's share in market's sectoral imports													-0.34	0.10	-3.40	***
Constant	0.63	0.07	9.22	***	-0.21	0.18	-1.11		-0.19	0.19	-1.01		-0.67	0.27	-2.48	**
Sectoral Fixed Effects	yes				yes				yes				yes			
Firm Fixed Effects	yes				yes				yes				yes			
R²	0.10				0.09				0.12				0.12			
F	62.75				22.43				36.74				54.74			

Note: Results based on a fixed-effects panel data estimation with robust standard errors and adjusted for clustering at the firm level; ***, **, * respectively denote statistical significance at 1 %, 5 % and 10 % level.

Table 5: Results for Quality in Belgian Firm-level Exports (Subsectoral Level)

	[1]			[2]			[3]			[4]		
	coef.	SE	t	coef.	SE	t	coef.	SE	t	coef.	SE	t
GDP	-0.01	0.03	-0.37	-0.01	0.02	-0.31	0.08	0.07	1.10	-0.01	0.02	-0.67
GDP per capita	0.06	0.07	0.89	-0.03	0.01	-2.32 **	-0.02	0.02	-0.94	-0.02	0.01	-1.56
Distance	0.14	0.22	0.64	-0.11	0.11	-1.02	-0.13	0.13	-0.99	0.03	0.03	1.05
Border	0.25	0.24	1.04	0.18	0.15	1.20	0.13	0.10	1.26	0.14	0.10	1.44
EU15	0.14	0.19	0.75	0.01	0.13	0.09	-0.13	0.06	-2.03 **	-0.23	0.12	-1.99 **
EU27	-0.24	0.18	-1.28	-0.10	0.17	-0.59	0.00	0.08	0.00	0.13	0.10	1.27
Number of FTE employees				-0.38	0.38	-1.00	-0.23	0.40	-0.58	-0.56	0.52	-1.09
Average remuneration				-2.84	1.77	-1.61	-2.69	1.62	-1.66 *	-1.83	0.97	-1.90 *
Value added per worker				0.21	0.32	0.66	0.22	0.33	0.66	-0.30	0.33	-0.91
Capital per worker				0.14	0.42	0.32	0.14	0.43	0.32	0.23	0.21	1.12
Immaterial fixed assets per worker				0.17	0.19	0.93	0.17	0.19	0.92	-0.57	0.55	-1.04
China active in sector and market							-0.76	0.85	-0.90	0.08	0.17	0.46
Korea active in sector and market							-0.34	0.35	-0.96			
Taiwan active in sector and market							0.04	0.10	0.35			
Singapore active in sector and market							-0.06	0.10	-0.66			
Hong Kong active in sector and market							0.16	0.22	0.73			
Change in China's share in market's sectoral imports										0.02	0.02	0.89
Change in Korea's share in market's sectoral imports										-0.02	0.02	-0.94
Change in Taiwan's share in market's sectoral imports										-0.01	0.01	-0.77
Change in Singapore's share in market's sectoral imports										0.01	0.01	0.41
Change in Hong Kong's share in market's sectoral imports										-0.02	0.03	-0.84
Constant	-1.71	2.34	-0.73	24.93	12.56	1.98 **	22.09	10.48	2.11 **	27.53	13.72	2.01 **
Sectoral Fixed Effects	yes			yes			yes			yes		
Firm Fixed Effects	yes			yes			yes			yes		
R²	0.01			0.00			0.00			0.01		
F	2.39			0.69			335.33			9.41E+07		

Note: Results based on a fixed-effects panel data estimation with robust standard errors and adjusted for clustering at the firm level; ***, **, * respectively denote statistical significance at 1 %, 5 % and 10 % level.

Table 6: Results for Growth in the Export Intensity at the Subsectoral Level

	[1]			[2]			[3]			[4]			[5]		
	coef.	SE	t	coef.	SE	t	coef.	SE	t	coef.	SE	t	coef.	SE	t
Quality upgrading	0.00	0.00	2.83 ***	0.00	0.00	2.82 ***	0.00	0.00	7.89 ***	0.00	0.00	7.87 ***	0.00	0.00	9.99 ***
Variety expansion	1.25	0.03	44.07 ***	1.25	0.03	43.67 ***	1.16	0.05	23.11 ***	1.15	0.05	22.50 ***	1.13	0.05	23.59 ***
GDP				0.03	0.01	4.47 ***	0.02	0.01	2.36 **	0.04	0.01	4.70 ***	0.04	0.01	4.39 ***
GDP per capita				-0.02	0.01	-2.44 **	-0.02	0.01	-1.39	-0.02	0.01	-1.55	-0.04	0.01	-3.53 ***
Distance				0.00	0.01	0.56	0.02	0.01	2.00 **	0.02	0.01	1.62	0.04	0.01	2.69 ***
Border				-0.12	0.02	-5.70 ***	-0.07	0.03	-2.39 **	-0.08	0.03	-2.91 ***	-0.07	0.03	-2.07 **
EU15				0.02	0.03	0.73	0.06	0.03	1.98 **	0.05	0.03	1.52	0.06	0.05	1.25
EU27				0.09	0.02	4.85 ***	0.08	0.03	3.31 ***	0.09	0.03	3.61 ***	0.08	0.04	1.98 **
Number of FTE employees							0.72	0.17	4.27 ***	0.74	0.17	4.32 ***	0.76	0.21	3.62 ***
Average remuneration							2.38	0.36	6.61 ***	2.37	0.38	6.20 ***	2.77	0.69	4.03 ***
Value added per worker							0.21	0.10	2.19 **	0.41	0.12	3.41 ***	0.43	0.18	2.43 **
Capital per worker							-0.06	0.05	-1.31	-0.09	0.05	-1.91 *	-0.15	0.06	-2.33 **
Immaterial fixed assets per worker							-0.07	0.03	-2.67 ***	-0.07	0.03	-2.72 ***	-0.08	0.04	-2.36 **
China active in sector and market										-0.07	0.04	-1.67 *			
Korea active in sector and market										-0.06	0.03	-2.47 **			
Taiwan active in sector and market										0.04	0.03	1.45			
Singapore active in sector and market										-0.03	0.02	-1.29			
Hong Kong active in sector and market										-0.04	0.03	-1.58			
Change in China's share in market's sectoral imports													0.01	0.01	0.90
Change in Korea's share in market's sectoral imports													-0.01	0.01	-1.29
Change in Taiwan's share in market's sectoral imports													0.00	0.01	-0.67
Change in Singapore's share in market's sectoral imports													-0.01	0.00	-2.09 **
Change in Hong Kong's share in market's sectoral imports													0.01	0.01	0.99
Constant	0.68	0.36	1.91 *	0.66	0.37	1.77 *	-28.03	4.26	-6.57 ***	-27.61	4.44	-6.22 ***	-33.71	7.61	-4.43 ***
Sectoral Fixed Effects	yes			yes			yes			yes			yes		
Firm Fixed Effects	yes			yes			yes			yes			yes		
R²	0.12			0.12			0.12			0.13			0.13		
F	52.34			56.12			1.94E+09			64.57			2.00E+11		

Note: Results based on a fixed-effects panel data estimation with robust standard errors and adjusted for clustering at the firm level; ***, **, * respectively denote statistical significance at 1 %, 5 % and 10 % level.

Appendix 1: Sections of the Harmonized System (HS2002)

Harmonized System 2002 - SECTIONS	Short Section Name
SECTION I - LIVE ANIMALS; ANIMAL PRODUCTS	Animals
SECTION II - VEGETABLE PRODUCTS	Vegetables
SECTION III - ANIMAL OR VEGETABLE FATS AND OILS AND THEIR CLEAVAGE PRODUCTS; PREPARED EDIBLE FATS; ANIMAL OR VEGETABLE WAXES	Fats & Oils
SECTION IV - PREPARED FOODSTUFFS; BEVERAGES, SPIRITS AND VINEGAR; TOBACCO AND MANUFACTURED TOBACCO SUBSTITUTES	Food & Beverages
SECTION V - MINERAL PRODUCTS	Minerals
SECTION VI - PRODUCTS OF THE CHEMICAL OR ALLIED INDUSTRIES	Chemicals
SECTION VII - PLASTICS AND ARTICLES THEREOF; RUBBER AND ARTICLES THEREOF	Plastics
SECTION VIII - RAW HIDES AND SKINS, LEATHER, FURSKINS AND ARTICLES THEREOF; SADDLERY AND HARNESS; TRAVEL GOODS, HANDBAGS AND SIMILAR CONTAINERS;	Leather
SECTION IX - WOOD AND ARTICLES OF WOOD; WOOD CHARCOAL; CORK AND ARTICLES OF CORK; MANUFACTURES OF STRAW, OF ESPARTO OR OF OTHER PLAITING	Wood
SECTION X - PULP OF WOOD OR OF OTHER FIBROUS CELLULOSIC MATERIAL; RECOVERED (WASTE AND SCRAP) PAPER OR PAPERBOARD; PAPER AND PAPERBOARD	Paper
SECTION XI - TEXTILES AND TEXTILE ARTICLES	Textiles
SECTION XII - FOOTWEAR, HEADGEAR, UMBRELLAS, SUN UMBRELLAS, WALKING-STICKS, SEAT-STICKS, WHIPS, RIDING-CROPS AND PARTS THEREOF; PREPARED FEATHERS AND ARTICLES MADE THEREWITH; ARTIFICIAL FLOWERS; ARTICLES OF	Footwear
SECTION XIII - ARTICLES OF STONE, PLASTER, CEMENT, ASBESTOS, MICA OR SIMILAR MATERIALS; CERAMIC PRODUCTS; GLASS AND GLASSWARE	Glass & Stone
SECTION XIV - NATURAL OR CULTURED PEARLS, PRECIOUS OR SEMI-PRECIOUS STONES, PRECIOUS METALS, METALS CLAD WITH PRECIOUS METAL, AND ARTICLES	Precious Items
SECTION XV - BASE METALS AND ARTICLES OF BASE METAL	Base Metals
SECTION XVI - MACHINERY AND MECHANICAL APPLIANCES; ELECTRICAL EQUIPMENT; PARTS THEREOF; SOUND RECORDERS AND REPRODUCERS, TELEVISION IMAGE AND SOUND RECORDERS AND REPRODUCERS, AND PARTS AND ACCESSORIES OF SUCH	Machinery
SECTION XVII - VEHICLES, AIRCRAFT, VESSELS AND ASSOCIATED TRANSPORT	Transport Equipment
SECTION XVIII - OPTICAL, PHOTOGRAPHIC, CINEMATOGRAPHIC, MEASURING, CHECKING, PRECISION, MEDICAL OR SURGICAL INSTRUMENTS AND APPARATUS;	Specific Machinery
SECTION XIX - ARMS AND AMMUNITION; PARTS AND ACCESSORIES THEREOF	Arms
SECTION XX - MISCELLANEOUS MANUFACTURED ARTICLES	Miscellaneous
SECTION XXI - WORKS OF ART, COLLECTORS' PIECES AND ANTIQUES	Art

Appendix 2: Determinants of Export Intensity (Subsectoral level) by Region

	North America (a) coef.	North America (b) coef.	South America (a) coef.	South America (b) coef.	Asia (a) coef.	Asia (b) coef.	Africa (a) coef.	Africa (b) coef.	East (a) coef.	East (b) coef.	Middle-East (a) coef.	Middle-East (b) coef.	Oceania (a) coef.	Oceania (b) coef.
GDP	-1.40	0.27	0.33 ***	0.40 ***	0.16 ***	0.20 ***	0.24 ***	0.41 ***	0.45 ***	0.65 ***	0.31 ***	0.30 ***	0.53 ***	0.72 ***
GDP per capita	1.27	-0.70	0.03	-0.01	0.09 ***	-0.03	0.09 ***	0.02	-0.24 ***	-0.79 ***	0.00	0.04	-0.53 **	-0.94 ***
Distance	43.46	7.33	-0.09 ***	-0.06	-0.03	0.11	-0.10	-0.28	-0.02	-0.11	-0.16 ***	-0.08	1.69	3.25
Number of FTE employees	0.39 ***	0.36 ***	0.14	0.33 *	0.29 ***	0.34 ***	0.09	0.22 *	0.23 **	0.69 ***	0.12 **	0.11	0.40 ***	0.44 ***
Average remuneration	-0.03	-0.02	-0.08	-0.10	-0.02	0.00	-0.18 **	-0.14	0.12	0.49 **	-0.13 *	-0.10	0.08	0.06
Value added per worker	0.19 ***	0.16 ***	0.15 ***	0.09	0.07	0.14 **	0.08	0.02	0.04	-0.03	0.06	0.01	0.12 *	0.10
Capital per worker	0.02	0.02	0.03	0.03	0.04	0.04	0.01	-0.01	0.03	0.01	-0.01	-0.01	0.00	0.00
Immaterial fixed assets per worker	-0.01	-0.02	-0.02	0.02	-0.01	-0.02	-0.11 **	0.03	0.02	0.06	0.00	-0.01	-0.01	0.01
China active in sector and market	-0.82 ***		-0.02		-0.10 *		0.01		0.03		0.03		-0.17	
Korea active in sector and market	0.40 ***		-0.02		0.08 **		-0.03		0.06		0.12 ***		0.20 *	
Taiwan active in sector and market	0.13		0.00		0.15 **		0.12 ***		-0.06		-0.07 **		-0.07	
Singapore active in sector and market	0.01		-0.03		0.05		-0.01		-0.04		0.02		-0.12	
Hong Kong active in sector and market	0.07		-0.08 **		-0.08				-0.02		-0.05		-0.04	
China's share in market's sectoral imports		-0.05		0.00		-0.04 **		-0.07 **		0.01		-0.03		0.01
Korea's share in market's sectoral imports		-0.03		-0.04		-0.01		0.03		0.09		0.03		0.01
Taiwan's share in market's sectoral imports		-0.09 ***		0.01		0.03		-0.04		-0.01		-0.05 **		-0.06 **
Singapore's share in market's sectoral imports		0.01		-0.02		-0.04 **		0.00		-0.02		-0.02		-0.04
Hong Kong's share in market's sectoral imports		-0.08 ***		-0.01		-0.03 **		-0.03 **		-0.04 *		-0.02 *		-0.05 *
Constant	-370.24	-51.30	8.49 ***	3.29	8.00 ***	5.91 ***	11.36 ***	13.34 ***	6.92 ***	3.27	11.15 ***	9.28 ***	-11.33	-20.87
Sectoral Fixed Effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Firm Fixed Effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
R²	0.10	0.12	0.14	0.12	0.09	0.12	0.09	0.13	0.17	0.19	0.10	0.11	0.15	0.15

Note: Results based on a fixed-effects panel data estimation with robust standard errors and adjusted for clustering at the firm level; ***, **, * respectively denote statistical significance at 1 %, 5 % and 10 % level.

Appendix 3: Determinants of Export Variety (Subsectoral level) by Region

	North America		South America		Asia		Africa		East		Middle-East		Oceania	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
	coef.	coef.	coef.	coef.	coef.	coef.	coef.	coef.	coef.	coef.	coef.	coef.	coef.	coef.
GDP	0.03	0.16	0.03 ***	0.06 ***	0.01 ***	0.02 ***	0.03 ***	0.07 ***	0.05 ***	0.05 *	0.04 ***	0.05 ***	0.03	0.12 ***
GDP per capita	-0.07	-0.18	0.02 ***	0.01	0.02 ***	0.01	0.03 ***	0.03 **	0.01	0.02	0.01 **	0.04 ***	-0.02	-0.15 *
Distance	1.32	-1.81	0.00	0.03	-0.02	-0.11 **	-0.02	-0.14 **	0.05 ***	0.13 ***	-0.06 ***	-0.08 **	-0.19	0.73
Number of FTE employees	0.08 **	0.08 ***	0.03	0.04	0.04 **	0.04 *	0.03	0.04	0.06 ***	0.14 ***	0.04 **	0.04	0.08 **	0.11 ***
Average remuneration	0.00	0.00	0.04	0.08 *	0.03	0.00	-0.01	0.00	0.03	0.10	0.00	0.01	0.02	0.00
Value added per worker	0.01	0.01	0.00	-0.03	-0.01	0.00	0.02	0.04	0.01	-0.03	0.00	0.01	0.00	0.01
Capital per worker	0.01 *	0.01 *	0.02 **	0.03 **	0.00	0.01	0.00	0.02	0.02 **	0.04 *	0.01	0.03 **	0.02	0.03 *
Immaterial fixed assets per worker	-0.01	0.00	-0.01 *	-0.01	0.00	0.00	0.00	0.00	0.00	-0.01	0.00	0.00	-0.01	0.00
China active in sector and market	0.05		0.04 **		0.00		-0.04 **		0.01		0.01		0.03	
Korea active in sector and market	0.12 ***		0.00		0.04 ***		0.00		0.01		0.02		0.08 ***	
Taiwan active in sector and market	0.14 ***		0.02 *		0.02		0.00		0.05 **		-0.01		0.03	
Singapore active in sector and market	0.07 **		0.05 ***		0.02		0.06 ***		0.03		0.04 ***		0.03	
Hong Kong active in sector and market	0.09 ***		0.00		0.02		0.00		0.04 **		0.04 ***		0.04	
China's share in market's sectoral imports		0.00		0.02		0.01 **		0.00		0.01		0.01 *		0.02
Korea's share in market's sectoral imports		0.00		-0.02 *		-0.01 *		0.00		0.00		0.00		-0.01
Taiwan's share in market's sectoral imports		0.00		0.00		0.00		0.00		0.02		-0.01		0.00
Singapore's share in market's sectoral imports		0.02 ***		0.00		-0.01		0.00		0.00		-0.01		-0.01
Hong Kong's share in market's sectoral imports		-0.01		0.00		0.00		-0.01 *		-0.02 **		0.00		0.00
Constant	-11.74	15.72	-0.87 ***	-1.66 ***	-0.24	0.62	0.05	0.19	-1.34 ***	-2.63 ***	0.10	-0.38	0.70	-6.70
Sectoral Fixed Effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Firm Fixed Effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
R²	0.10	0.10	0.10	0.09	0.09	0.11	0.08	0.09	0.15	0.18	0.09	0.11	0.12	0.12

Note: Results based on a fixed-effects panel data estimation with robust standard errors and adjusted for clustering at the firm level; ***, **, * respectively denote statistical significance at 1 %, 5 % and 10 % level.

Appendix 4: Determinants of Export Intensity (Subsectoral level) by Sector

	Animals (1a)	Animals (1b)	Vegatables (2a)	Vegatables (2b)	Fats & Oils (3a)	Fats & Oils (3b)	Food & Beverages (4a)	Food & Beverages (4b)	Minerals (5a)	Minerals (5b)	Chemicals (6a)	Chemicals (6b)	Plastics (7a)	Plastics (7b)	Leather (8a)	Leather (8b)	Wood (9a)	Wood (9b)	Paper (10a)	Paper (10b)	Textiles (11a)	Textiles (11b)
GDP	0.24 ***	-0.05	0.11 ***	0.41 ***	0.20 ***	0.37 *	0.18 ***	0.40 ***	0.08 ***	0.35 ***	0.21 ***	0.28 ***	0.26 ***	0.28 ***	0.33 ***	0.37 ***	0.31 ***	0.31 ***	0.21 ***	0.28 ***	0.19 ***	0.36 ***
GDP per capita	-0.10 ***	0.40 *	-0.08 ***	-0.36 ***	-0.10 ***	-0.17	0.04 ***	0.12 ***	0.07 ***	-0.11 ***	-0.01 *	-0.05 ***	-0.01	-0.06 ***	0.09 ***	0.11 ***	0.00	-0.02	-0.04 ***	-0.05 ***	-0.11 ***	-0.17 ***
Distance	-0.43 ***	-0.19	-0.33 ***	-0.40 **	-0.10 ***	0.75	-0.20 ***	-0.97 ***	-0.27 ***	-0.16	-0.12 ***	-0.06 *	-0.06 ***	-0.40 ***	-0.09 **	-0.88 ***	-0.29 ***	-0.30 *	-0.18 ***	-0.08 **	-0.20 ***	-0.51 ***
Border	0.48 ***	1.20 ***	0.46 ***	-0.95 ***	0.32 ***	0.12	0.79 ***	0.64 ***	0.75 ***	-0.19	0.38 ***	0.36 ***	0.36 ***	0.43 ***	0.39 ***	0.21 ***	0.36 ***	0.27 *	0.52 ***	0.50 ***	0.56 ***	0.42 ***
EU15	0.68 ***	-0.30	0.73 ***	-1.02 ***	0.58 ***	0.51	0.30 ***	0.25	0.15 ***	0.57 **	-0.22 ***	-0.16 **	-0.21 ***	-0.15 ***	0.29 ***	0.51 ***	-0.16 ***	0.03	-0.36 ***	-0.35 ***	-0.12 ***	0.00
EU27	-0.73 ***	n.a.	-0.69 ***	n.a.	-0.17 **	n.a.	-0.70 ***	-1.54 ***	-0.01	-0.03	-0.31 ***	-0.33 ***	-0.12 ***	-0.23 ***	0.06	0.03	-0.23 ***	-1.38 ***	-0.50 ***	-0.60 ***	-0.27 ***	-0.35 ***
Number of FTE employees	0.33 ***	0.50	-0.69 ***	-0.09	0.40 ***	0.60	0.43 ***	0.43 ***	0.30 ***	0.91 ***	0.14 ***	0.23 ***	0.22 ***	0.29 ***	0.66 ***	0.65 ***	0.36 ***	0.34 ***	0.21 ***	0.14 ***	0.35 ***	0.50 ***
Average remuneration	0.09	0.00	0.06	-0.49 **	0.45 ***	-0.01	-0.13 ***	-0.64 ***	0.34 ***	-0.02	-0.05	0.18 **	-0.10 *	0.00	-0.41 ***	-0.44 ***	-0.08	-0.54 **	-0.23 ***	-0.30 ***	-0.08 *	0.13 ***
Value added per worker	0.18 ***	0.56 *	0.16 ***	0.41 ***	0.22 **	-0.19	0.31 ***	0.46 ***	0.01	0.08	0.13 ***	0.10 ***	0.00	0.01	0.28 ***	0.27 ***	0.23 ***	0.22 **	0.07 **	0.06 *	0.13 ***	0.14 ***
Capital per worker	0.10 ***	0.24 ***	0.01	0.01	0.08	0.02	0.02 *	0.00	0.04 *	-0.14 *	0.00	0.00	0.02 *	0.02	0.04 ***	0.00	0.03	0.08 *	0.02	0.01	0.03 ***	-0.03 ***
Immaterial fixed assets per worker	-0.02 **	-0.08	-0.01	0.02	0.09 ***	0.23 *	0.02 ***	-0.01	0.03 ***	-0.06 *	0.01 ***	0.00	-0.01 **	-0.01	0.04 ***	0.04 ***	-0.02	-0.02	0.00	-0.01	0.01 ***	0.02 ***
China active in sector and market	0.45 **		0.45 ***		0.77 ***		1.23 ***		-0.51 ***		-0.16 **		-0.09		-1.97 ***		-0.19		0.15		0.89 ***	
Korea active in sector and market	2.32 ***		0.00		-0.59		0.36 ***		1.07 ***		0.60 ***		-0.09		0.92 ***		-0.17		-0.42 ***		-0.46 ***	
Taiwan active in sector and market	-0.04		0.57 ***		1.36 ***		-1.28 ***		0.67 ***		0.55 ***		0.64 ***		1.42 ***		0.70 ***		-0.02		-1.26 ***	
Singapore active in sector and market	-1.44 ***		-0.66 ***		-1.15 ***		0.47 ***		2.18 ***		0.46 ***		0.25 ***		1.95 ***		-0.68 ***		0.57 ***		1.64 ***	
Hong Kong active in sector and market	-1.39 ***		-0.12		1.22 ***		-0.77 ***		-0.36 ***		0.05		0.31 ***								0.87 ***	
China's share in market's sectoral imports		0.34		0.10		-2.17 ***		0.36 ***		-0.39 ***		-0.06 **		-0.05 *		0.59 ***		0.30 **		0.19 ***		-0.78 ***
Korea's share in market's sectoral imports		0.40 **		-0.69 ***		-0.92 *		-0.02		-0.02		-0.02		0.10 ***		0.16 **		-0.27 ***		-0.08 **		-0.32 ***
Taiwan's share in market's sectoral imports		-0.94 ***		0.27 ***		0.25		0.40 ***		0.05		-0.03		0.00		-0.13		0.07		-0.41 ***		0.11 ***
Singapore's share in market's sectoral imports		-0.10		-0.01		0.98		-0.06 **		0.27 ***		-0.05 ***		0.06 ***		0.33 ***		-0.05		0.09 ***		0.13 ***
Hong Kong's share in market's sectoral imports		0.45 **		-0.34 ***		0.15		-0.09 ***		-0.22 ***		-0.11 ***		-0.01		0.07		-0.18 *		-0.05		0.51 ***
Constant	7.59 ***	-2.91	7.75 ***	13.09 ***	-0.55	-1.57	5.76 ***	13.37 ***	4.00 ***	5.49	7.64 ***	4.13 ***	8.10 ***	9.38 ***	3.81 ***	10.84 ***	5.28 ***	8.74 ***	9.36 ***	9.18 ***	8.49 ***	7.39 ***
Sectoral Fixed Effects	yes	no	yes	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
Firm Fixed Effects	no	yes	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
R²	0.09	0.18	0.07	0.09	0.09	0.24	0.09	0.08	0.18	0.46	0.07	0.05	0.06	0.07	0.19	0.23	0.09	0.08	0.05	0.06	0.08	0.09
F	244.93	19.23	336.40	22.02	57.59	4.12	802.61	150.20	409.32	133.35	1222.93	168.67	720.95	432.51	373.48	334.61	132.83	26.86	276.15	206.02	1342.39	702.96
# Observations	54891	1835	92466	4785	12976	351	180952	36073	40408	3708	352469	74964	224639	132101	33711	24510	31073	7191	108913	68568	322044	143654
Number of firms	702	96	997	411	393	70	1513	937	1308	340	3429	2199	4363	3744	1029	789	1770	1028	3405	2904	2907	1995

	Footwear (12a)	Footwear (12b)	Glass & Stone (13a)	Glass & Stone (13b)	Precious Items (14a)	Precious Items (14b)	Base Metals (15a)	Base Metals (15b)	Machinery (16a)	Machinery (16b)	Transport Equipment (17a)	Transport Equipment (17b)	Specific Machinery (18a)	Specific Machinery (18b)	Arms (19a)	Arms (19b)	Miscellaneous (20a)	Miscellaneous (20b)	Art (21a)	Art (21b)
GDP	0.23 ***	0.30 ***	0.31 ***	0.25 ***	0.13 ***	0.24 ***	0.26 ***	0.30 ***	0.26 ***	0.22 ***	0.28 ***	0.38 ***	0.22 ***	0.35 ***	0.42 ***	1.04 ***	0.13 ***	0.22 ***	0.35 ***	0.42 **
GDP per capita	-0.19 ***	-0.25 ***	0.00	0.03	-0.06 *	-0.15 *	-0.07 ***	-0.11 ***	-0.07 ***	-0.07 ***	0.08 ***	0.17 ***	-0.06 ***	-0.13 ***	-0.19 ***	-3.96	-0.08 ***	-0.07 ***	-0.47 ***	-0.27
Distance	-0.50 ***	0.32 ***	-0.36 ***	-0.21 ***	0.66 ***	-1.03 ***	-0.22 ***	-0.10 ***	-0.22 ***	-0.14 ***	-0.14 ***	0.03	-0.26 ***	-0.19 ***	0.28 ***	1.87	0.02	0.16 ***	-0.56 ***	-1.26 *
Border	0.50 ***	0.45 ***	0.22 ***	0.57 ***	0.38 **	0.72 ***	0.30 ***	0.20 ***	0.31 ***	0.46 ***	0.53 ***	0.61 ***	0.29 ***	0.12 ***	0.43 ***	-0.17	0.76 ***	0.81 ***	0.41	0.04
EU15	0.33 ***	0.57 ***	-0.19 ***	0.05	0.38 **	0.63 **	-0.05 **	0.00	0.09 ***	0.26 ***	0.63 ***	0.44 ***	0.13 ***	0.07	1.36 ***	0.92	0.10 ***	0.28 ***	-0.45	-2.12 ***
EU27	-0.76 ***	-0.62 ***	0.32 ***	-0.52 ***	-1.23 ***	-1.82 ***	-0.33 ***	-0.47 ***	-0.32 ***	-0.51 ***	0.11 ***	0.48 ***	-0.41 ***	-0.30 ***	-0.34 *	n.a.	-0.44 ***	-0.53 ***	-0.46	n.a.
Number of FTE employees	0.86 ***	1.11 ***	0.21 ***	0.31 ***	-0.07	-0.05	0.21 ***	0.23 ***	0.19 ***	0.23 ***	0.42 ***	0.60 ***	0.15 ***	0.20 ***	0.63	0.63	0.34 ***	0.39 ***	0.65 **	0.61
Average remuneration	0.63 ***	0.76 ***	-0.14 **	-0.16	-0.29	0.05	-0.17 ***	-0.20 ***	-0.20 ***	-0.21 ***	0.16 ***	0.27 ***	0.21 ***	0.22 ***	-1.22 *	-3.48	-0.19 ***	0.03	0.09	0.01
Value added per worker	-0.03	-0.02	0.16 ***	0.27 ***	0.08	0.04	0.14 ***	0.13 ***	-0.04 **	-0.05 ***	0.06 **	0.07 *	-0.02	0.02	-0.23	-1.11	0.08 ***	0.05 *	0.08	0.18
Capital per worker	-0.01	0.01	0.02	-0.01	0.02	-0.03	0.01	0.01	-0.03 ***	-0.02 *	0.02	0.02	0.04 ***	0.04 ***	0.09	2.07	0.04 ***	0.01	0.12	0.05
Immaterial fixed assets per worker	-0.02	0.00	-0.04 ***	-0.06 ***	-0.06 *	-0.06	-0.03 ***	-0.02 *	0.01 **	0.00	0.00	0.01	-0.01	0.00	-0.09	-1.42 ***	0.01 *	0.03 ***	-0.05 *	0.04
China active in sector and market	-1.96 ***		1.01 ***		-2.53 ***		0.15		-0.42 ***		-0.90 ***		-1.38 ***		2.71 ***		1.47 ***		0.56	
Korea active in sector and market	-1.28 ***		-0.70 ***		1.47 ***		0.52 ***		0.14 **		1.64 ***		0.42 ***		1.55 *		0.58 ***		-0.53	
Taiwan active in sector and market	-1.01 ***		-0.28 *		0.90 *		0.20 **		-0.33 ***		-0.13		-0.35 **		-0.40		-1.30 ***		-1.94 **	
Singapore active in sector and market	2.33 ***		0.34 ***		-0.05		-0.01		0.20 ***		-0.36 ***		0.41 ***		1.33		1.35 ***		1.62	
Hong Kong active in sector and market	0.77 ***		-0.26 **		1.14 **		-0.78 ***		0.01		-0.14		0.37 ***		-0.49		1.39 ***		-1.06	
China's share in market's sectoral imports		-2.44 ***		0.29 ***		-0.23		-0.10 ***		0.12 ***		-0.36 ***		-0.06 *		-0.86		0.16 ***		0.51
Korea's share in market's sectoral imports		0.12		-0.17 ***		0.39 ***		-0.21 ***		-0.03		-0.27 ***		-0.10 ***		-0.14		-0.52 ***		0.19
Taiwan's share in market's sectoral imports		-0.91 ***		0.02		0.18		0.19 ***		-0.13 ***		0.37 ***		-0.24 ***		-0.81		0.18 ***		0.32
Singapore's share in market's sectoral imports		0.29 ***		0.03		0.25 *		-0.05 **		0.07 ***		-0.22 ***		0.22 ***		-1.62		0.08 ***		-0.32
Hong Kong's share in market's sectoral imports		0.08		-0.26 ***		-0.46 **		-0.09 ***		-0.14 ***		0.06		-0.02		0.36		-0.41 ***		-0.21
Constant	2.95 ***	-5.33 ***	8.62 ***	5.35 ***	13.44 ***	14.66 ***	9.13 ***	8.06 ***	12.66 ***	11.88 ***	5.42 ***	-1.24	7.49 ***	5.46 ***	26.09 ***	72.08	7.45 ***	3.72 ***	10.99 ***	14.44
Sectoral Fixed Effects	no	no	yes	no	no	no	yes	no	yes	no	yes	no	yes	no	yes	no	yes	no	yes	no
Firm Fixed Effects	yes	yes	no	yes	yes	yes	no	yes	no	yes	no	yes	no	yes	no	yes	no	yes	no	yes
R²	0.10	0.14	0.12	0.09	0.07	0.13	0.05	0.04	0.04	0.05	0.17	0.25	0.05	0.06	0.22	0.90	0.10	0.12	0.15	0.12
F	146.47	106.02	428.30	89.36	21.18	20.81	664.65	246.64	1191.69	962.67	731.77	610.22	252.63	201.95	32.05	12.84	587.17	430.49	6.25	2.41
# Observations	28424	14384	65713	19195	6054	3287	259079	114383	582370	415336	78204	39578	100442	67347	2489	6	109477	68848	975	503
Number of firms	786	585	2001	1155	457	339	4196	3250	6722	5633	3533	1580	2843	2345	41	6	2909	2306	194	136

*Note: Results based on a fixed-effects panel data estimation with robust standard errors and adjusted for clustering at the firm level; ***, **, * respectively denote statistical significance at 1 %, 5 % and 10 % level.*

Appendix 5: Determinants of Export Variety (Subsectoral level) by Sector

	Animals		Vegetables		Fats & Oils		Food & Beverages		Minerals		Chemicals		Plastics		Leather		Wood		Paper		Textiles	
	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)	(4a)	(4b)	(5a)	(5b)	(6a)	(6b)	(7a)	(7b)	(8a)	(8b)	(9a)	(9b)	(10a)	(10b)	(11a)	(11b)
GDP	0.00 *	-0.16 ***	-0.05 ***	-0.03 *	0.00	0.04	-0.02 ***	0.05 ***	-0.03 ***	0.03 ***	-0.02 ***	0.02 ***	0.00 *	0.02 ***	0.01 ***	0.13 ***	0.01 ***	0.01 **	0.00	0.01 ***	-0.01 ***	0.06 ***
GDP per capita	0.07 ***	0.00	0.03 ***	-0.04	0.01 *	0.03	0.09 ***	-0.02 **	0.04 ***	-0.02 **	0.03 ***	0.00	0.03 ***	0.02 ***	0.11 ***	0.13 ***	0.03 ***	0.02 **	0.02 ***	0.01 ***	0.03 ***	-0.01 **
Distance	-0.07 ***	-0.05	-0.03 ***	0.01	-0.03 ***	0.12	-0.07 ***	-0.06 ***	-0.04 ***	0.03	0.00	-0.03 ***	-0.02 ***	-0.06 ***	0.09 ***	-0.56 ***	-0.04 ***	-0.01	-0.03 ***	0.00	-0.05	-0.19 ***
Border	0.29 ***	0.47 ***	0.13 ***	-0.18 ***	0.04 ***	-0.12	0.24 ***	0.12 ***	0.07 ***	-0.06	0.08 ***	0.10 ***	0.05 ***	-0.06 ***	0.12 ***	0.06 ***	0.04 ***	0.00	0.07 ***	0.05 ***	0.08 ***	-0.02 **
EU15	0.36 ***	0.78 ***	0.25 ***	0.13 **	0.06 ***	0.02	0.06 ***	0.22 ***	0.05 ***	0.06	0.07 ***	-0.01	-0.01 *	-0.02 ***	0.02	0.02	-0.04 ***	-0.04	-0.01 **	0.00	0.07 ***	0.07 ***
EU27	-0.07 ***	n.a.	0.08 ***	n.a.	0.07 ***	n.a.	0.02 *	-0.51 ***	0.11 ***	0.29 ***	0.03 ***	0.06 ***	0.05 ***	0.07 ***	0.33 ***	0.34 ***	0.03 ***	0.08 ***	0.01 **	-0.01	0.09 ***	0.16 ***
Number of FTE employees	0.02	0.24 **	-0.04 ***	-0.04	-0.04 *	0.31 **	-0.01	-0.01	-0.03 **	0.22 ***	0.00	0.02	0.07 ***	0.08 ***	0.30 ***	0.38 ***	0.06 ***	0.08 ***	0.07 ***	0.06 ***	0.15 ***	0.21 ***
Average remuneration	-0.05 *	0.25 *	0.02	0.04	0.00	0.14	0.01	-0.16 ***	0.06 ***	-0.02	-0.03 ***	-0.02	0.02 **	0.03 ***	0.06 **	0.06 *	-0.01	-0.07 **	0.00	-0.02	0.03 ***	0.05 ***
Value added per worker	0.01	-0.01	-0.01	0.01	-0.04 *	-0.03	-0.02 ***	0.04 ***	-0.05 ***	0.08 *	0.01 ***	0.01	0.02 ***	0.03 ***	0.03 ***	0.01	0.01	-0.01	0.02 ***	0.01	0.00	0.00
Capital per worker	0.01 **	0.02	0.00	0.02	0.01	0.04	0.01 **	0.00	0.01	-0.03	0.00 *	-0.01	0.02 ***	0.03 ***	-0.02 ***	-0.03 ***	0.00	0.00	0.01 ***	0.01 ***	0.01 ***	0.05 ***
Immaterial fixed assets per worker	-0.01	-0.03	-0.01 ***	-0.02 **	-0.01	-0.04	0.00	-0.01 ***	0.01 ***	-0.02 ***	0.00	-0.01 ***	0.02 ***	0.01 ***	0.02 ***	0.03 ***	0.00	0.00	0.01 ***	0.00	0.01 ***	0.01 ***
China active in sector and market	-0.02		0.36 ***		0.08		0.62 ***		-0.07 **		0.06 ***		0.04		0.31 ***		-0.02		0.18 ***		0.25 ***	
Korea active in sector and market	0.87 ***		0.07 *		0.31 ***		-0.21 ***		0.42 ***		0.27 ***		0.00		-1.39 ***		-0.02		0.11 ***		-0.07 ***	
Taiwan active in sector and market	0.29 ***		0.49 ***		0.23 ***		-0.27 ***		0.26 ***		0.31 ***		0.20 ***		0.75 ***		0.03		-0.25 ***		-0.48 ***	
Singapore active in sector and market	-0.33 ***		-0.23 ***		0.04		-0.15 ***		0.82 ***		0.20 ***		0.04 ***		1.04 ***		0.22 ***		-0.11 ***		0.53 ***	
Hong Kong active in sector and market	-0.73 ***		-0.03		0.28 ***		-0.29 ***		-0.06 *		-0.07 ***		0.08 ***		0.72 ***		-0.24 ***		0.19 ***		0.27 ***	
China's share in market's sectoral imports		-0.05		-0.05		-0.42 ***		0.26 ***		-0.13 ***		0.04 ***		0.01 **		0.30 ***		0.03 *		0.05 ***		-0.13 ***
Korea's share in market's sectoral imports		0.16 ***		-0.16 ***		-0.18		-0.05 ***		-0.05 ***		-0.03 ***		0.06 ***		0.02		-0.02		0.03 ***		-0.24 ***
Taiwan's share in market's sectoral imports		-0.07		0.00		0.06		0.00		0.02		0.02 ***		-0.06 ***		0.42 ***		-0.04 ***		-0.03 ***		0.15 ***
Singapore's share in market's sectoral imports		0.08		0.00		-0.15		-0.10 ***		0.08 ***		0.02 ***		0.01 ***		0.11 ***		-0.02		-0.01 ***		0.13 ***
Hong Kong's share in market's sectoral imports		-0.03		-0.08 ***		0.21 *		-0.13 ***		-0.05 **		-0.06 ***		-0.03 ***		0.06 ***		0.03 ***		-0.07 ***		0.10 ***
Constant	0.80 ***	-1.93	0.79 ***	0.28	0.77 *	-4.02	0.63 ***	2.24 ***	0.38 *	-1.36	0.29 ***	0.58 ***	-0.84 ***	-0.67 ***	-3.77 ***	1.08 ***	-0.19	0.15	-0.31 ***	-0.15	-0.31 ***	0.29 *
Sectoral Fixed Effects	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
Firm Fixed Effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
R²	0.12	0.28	0.09	0.13	0.11	0.20	0.10	0.09	0.22	0.49	0.08	0.05	0.06	0.05	0.18	0.21	0.04	0.03	0.04	0.03	0.08	0.08
F	360.22	33.32	446.42	31.28	73.08	3.35	972.93	174.63	523.51	150.39	1460.75	197.39	688.60	338.24	350.15	296.77	64.26	9.88	183.61	110.80	1235.21	597.30
# Observations	54891	1835	92466	4785	12976	351	180952	36073	40408	3708	352469	74964	224639	132101	33711	24510	31073	7191	108913	68568	322044	143654
Number of firms	702	96	997	411	393	70	1513	937	1308	340	3429	2199	4363	3744	1029	789	1770	1028	3405	2904	2907	1995

	Footwear		Glass & Stone		Precious Items		Base Metals		Machinery		Transport Equipment		Specific Machinery		Arms		Miscellaneous		Art	
	(12a)	(12b)	(13a)	(13b)	(14a)	(14b)	(15a)	(15b)	(16a)	(16b)	(17a)	(17b)	(18a)	(18b)	(19a)	(19b)	(20a)	(20b)	(21a)	(21b)
GDP	0.02 ***	0.05 ***	0.01 ***	0.04 ***	0.00	0.00	-0.01 ***	0.02 ***	0.01 ***	0.01 ***	-0.02 ***	0.01 ***	0.01	0.04 ***	0.01	-0.06	-0.02 ***	0.02 ***	0.00	-0.01
GDP per capita	0.04 ***	0.06 ***	0.01 ***	0.02 ***	0.00	-0.02 *	0.02 ***	0.02 ***	0.03 ***	0.03 ***	0.06 ***	0.09 ***	0.03 ***	0.01 ***	0.03 *	-0.45	0.06 ***	0.03 ***	0.01	0.04
Distance	-0.10 ***	0.15 ***	-0.05 ***	0.02	0.01	-0.03	-0.02 ***	-0.10 ***	-0.02 ***	-0.02 ***	-0.06 ***	0.15 ***	-0.06 ***	-0.04 ***	0.01	0.63 ***	0.06 ***	-0.10 ***	0.01	-0.03
Border	0.00	0.00	0.00	0.09 ***	0.10 ***	0.06 **	0.07 ***	-0.03 ***	0.07 ***	0.05 ***	0.09 ***	0.06 ***	0.04 ***	-0.05 ***	0.01	1.47 ***	0.12 ***	0.03 ***	0.01	0.02
EU15	-0.02	-0.13 ***	0.02 *	0.00	0.04	0.09 *	0.04 ***	-0.02 **	0.04 ***	0.06 ***	0.14 ***	0.13 ***	0.01 *	0.00	0.15 ***	-0.06	0.03 ***	0.02 *	-0.14 ***	-0.04
EU27	0.20 ***	0.38 ***	0.11 ***	0.04	-0.12 ***	-0.32 ***	0.06 ***	0.13 ***	0.04 ***	0.02 ***	0.09 ***	0.18 ***	0.04 ***	0.06 ***	0.01	n.a.	0.05 ***	0.00	0.09 **	n.a.
Number of FTE employees	0.20 ***	0.28 ***	0.06 ***	0.09 ***	-0.03	0.00	0.08 ***	0.13 ***	0.08 ***	0.08 ***	0.05 ***	0.05 ***	0.06 ***	0.05 ***	-0.09	-0.70 ***	0.10 ***	0.17 ***	0.01	-0.01
Average remuneration	0.32 ***	0.38 ***	0.09 ***	-0.04	0.08 *	0.00	0.00	0.09 ***	0.03 ***	0.02 ***	0.02	0.01	-0.01	-0.02 **	0.01	4.37 ***	-0.06 ***	-0.01	-0.02	0.00
Value added per worker	-0.04 ***	0.00	0.04 ***	0.05 ***	-0.01	-0.01	0.00	0.06 ***	0.00	-0.01 *	0.00	0.02	-0.01	-0.02 *	-0.02	-2.45 ***	0.03 ***	0.03 ***	-0.01	-0.03
Capital per worker	0.01	0.00	-0.01	-0.01	0.00	0.00	0.00 ***	0.03 ***	0.02 ***	0.02 ***	0.02 ***	0.03 ***	0.02 ***	0.02 ***	0.00	-0.45 ***	0.01 ***	0.01 **	-0.01	0.00
Immaterial fixed assets per worker	-0.01 ***	-0.01 *	0.00	0.00	-0.01	-0.02 **	0.00 ***	0.01 ***	0.00 ***	0.00	0.01 ***	0.01 ***	0.00 ***	0.00 **	0.01	-0.18 ***	0.01 ***	0.01 ***	0.01	0.01
China active in sector and market	-0.95 ***		0.04		-0.19 ***		0.15 ***		0.22 ***		-0.06		-0.25 ***		0.70 ***		0.57 ***		0.08	
Korea active in sector and market	-0.23 ***		-0.14 ***		0.33 ***		0.07 ***		-0.05 ***		0.43 ***		0.11 ***		0.06		0.34 ***		0.02	
Taiwan active in sector and market	-0.25 **		0.22 ***		0.28 ***		0.17 ***		-0.11 ***		0.53 ***		-0.20 ***		0.30 *		-0.80 ***		0.01	
Singapore active in sector and market	0.67 ***		0.06 *		-0.13 **		0.17 ***		0.00		-0.08 **		0.10 ***		0.36 *		0.53 ***		0.03	
Hong Kong active in sector and market	0.44 ***		0.03		0.10		-0.22 ***		0.12 ***		0.23 ***		0.10 ***		-0.46 ***		0.58 ***		-0.01	
China's share in market's sectoral imports		-0.92 ***		0.12 ***		0.00		-0.01		0.08 ***		-0.03 *		0.04 ***		-1.19 ***		0.08 ***		0.03
Korea's share in market's sectoral imports		-0.09 ***		-0.07 ***		0.06 ***		0.00		-0.08 ***		-0.11 ***		-0.05 ***		0.03		-0.07 ***		0.01
Taiwan's share in market's sectoral imports		-0.07 *		-0.03 **		-0.06 **		0.26 ***		-0.01		0.12 ***		-0.02 **		0.47 ***		0.23 ***		0.01
Singapore's share in market's sectoral imports		0.04 **		0.03 ***		-0.05 **		0.03 ***		0.07 ***		-0.16 ***		0.06 ***		0.46 ***		0.01		0.03
Hong Kong's share in market's sectoral imports		0.07 ***		-0.09 ***		-0.02		-0.14 ***		-0.06 ***		-0.03 **		-0.03 ***		-0.28		-0.13 ***		-0.06
Constant	-2.92 ***	-6.57 ***	-1.17 ***	-1.07 ***	-0.37	0.89 *	-0.37 ***	-1.44 ***	-0.65 ***	-0.30 ***	-0.80 ***	-2.30 ***	-0.45 ***	-0.31 *	0.54	-10.84	-0.85 ***	-0.01	0.22	0.30
Sectoral Fixed Effects	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
Firm Fixed Effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
R²	0.07	0.12	0.05	0.06	0.05	0.06	0.05	0.09	0.04	0.04	0.11	0.15	0.05	0.04	0.16	0.98	0.09	0.06	0.05	0.05
F	94.39	0.06	174.47	59.06	14.82	8.78	611.81	537.86	1200.41	813.22	561.48	311.32	224.12	114.99	21.85	76.95	480.52	194.35	1.84	0.83
# Observations	28424	14384	65713	19195	6054	3287	259079	114383	582370	415336	78204	39578	100442	67347	2489	55	109477	68848	975	503
Number of firms	786	585	2001	1155	457	339	4196	3250	6722	5633	3533	1580	2843	2345	41	6	2909	2306	194	136

*Note: Results based on a fixed-effects panel data estimation with robust standard errors and adjusted for clustering at the firm level; ***, **, * respectively denote statistical significance at 1 %, 5 % and 10 % level.*

Appendix 6: Variety Expansion and Quality Upgrading as Determinants of the Growth in Export Intensity: Evidence by Sector

Based on a regression with Dummies indicating whether Asian competitors are active

	Animals	Vegetables	Fats & Oils	Food & Beverages	Minerals	Chemicals
Quality upgrading	1.71	0.63	53.73 **	0.22 ***	-0.04	0.00 ***
Variety expansion	0.87 *	1.13 ***	1.23	0.84 ***	3.10 *	0.82 ***
	Plastics	Leather	Wood	Paper	Textiles	
Quality upgrading	0.00 ***	-0.64	0.24 **	0.00 ***	0.00	
Variety expansion	1.01 ***	n.a.	2.11 **	1.29 ***	1.13 ***	
	Footwear	Glass & Stone	Precious Items	Base Metals	Machinery	
Quality upgrading	0.07	0.01	-0.02	0.00 ***	0.00 ***	
Variety expansion	1.15 ***	1.01 ***	0.30	1.04 ***	1.19 ***	
	Transport Equipment Specific Machinery	Arms	Miscellaneous	Art		
Quality upgrading	0.01	n.a.	0.07 ***	n.a.		
Variety expansion	1.47 ***	n.a.	1.05 ***	n.a.		

Based on a regression with the Change in the Asian competitors' share in sectoral imports

	Animals	Vegetables	Fats & Oils	Food & Beverages	Minerals	Chemicals
Quality upgrading	0.62 ***	0.00 ***	0.16	0.16 ***	0.06 **	0.00 ***
Variety expansion	1.38 ***	1.13 ***	0.61 ***	0.93 ***	0.94 ***	0.89 ***
	Plastics	Leather	Wood	Paper	Textiles	
Quality upgrading	0.00 ***	0.18	0.17 ***	0.00 ***	0.00 *	
Variety expansion	1.03 ***	1.32	1.31 ***	1.23 ***	1.13 ***	
	Footwear	Glass & Stone	Precious Items	Base Metals	Machinery	
Quality upgrading	0.02	0.01 ***	0.00	0.00 ***	0.00 ***	
Variety expansion	1.17 ***	1.08 ***	-0.91	1.12 ***	1.27 ***	
	Transport Equipment Specific Machinery	Arms	Miscellaneous	Art		
Quality upgrading	0.06 ***	1.01	0.06 ***	n.a.		
Variety expansion	1.38 ***	0.10	1.04 ***	n.a.		

Note: Results based on a fixed-effects panel data estimation with robust standard errors and adjusted for clustering at the firm level; ***, **, * respectively denote statistical significance at 1 %, 5 % and 10 % level.

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