Dutch Firms and the Emerging BRIC Countries:

Evidence from Firm Transaction Level Data

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The number of firms exporting to and importing from the BRIC countries is rapidly increasing between 2002 and 2008. Especially China and India stand out in this respect. This is different from trading partners with more stable markets, like the US. Most firms trading with the BRIC countries do not survive on these foreign markets for consecutive years. This is not different from other countries of origin and destination, but entry rates are higher, so more firms survive in the markets of the BRIC countries in the end. These surviving firms will become important traders after a few years. In particular for exports to Brazil, Russia and India, new exporters dominate the trade performance of incumbents after five years. On average approximately 2.4% of all firms in the sample enter into exporting to China in a year. Regression analysis shows that the probability starting to export to China is much higher for firms with (import) experience at the Chinese market or the market in the Chinese region. The size of the firm and its export dynamics are also determinants which increase the probability to enter the Chinese market. These determinants do not differ between China and the US, although the magnitudes differ.

Key words: BRIC countries, starting to export decisions, intensive versus extensive trade growth

Jel codes: F10, D22, F13

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1. Introduction[1]

With the rise of the BRIC countries also the imports from and the exports to these countries grow fast. Some literature has studied the consequences of this rise in trade, but nearly no papers have focused on the determinants at the micro level. Some of the scarce examples are some chapters in Feenstra and Wei (2010). The detailed data on international trade at the firm level open, however, possibilities for studying international trade behaviour of firms. It allows decomposing the changes in trade at the firm level by interpreting the transaction data as the result of various distinct firm decisions, the so-called 'trade margins'. The main trade margins are: the decision to engage in international trade, the destination(s) choice and the export product(s) choice. Creusen et al. (2011) use these detailed firm-level trade data to decompose these margins of Dutch exports. This paper focuses on some of the most dynamic markets for the Netherlands in this decade: the BRIC countries. China is now of one the most important export countries in the world and also the third largest exporter to the Netherlands for example. But not only the exports of these countries increase, the substantial rise of purchasing power in the BRIC countries magnifies their market size of these countries and their attractiveness as export destinations for Dutch firms.

Using a dataset of international transactions by firm, provided by Statistics Netherlands, we have constructed a detailed overview of the specifics of international trade with the BRIC countries. We have various reasons to think that it is interesting to focus on these countries. Different from many other trading partners, the trade relations are more dynamic and markets are developing. This could have consequences for the number of firms exporting or importing, the number of products and sales. Economic development of these countries creates new opportunities, from which we expect that the number of trading firms will increase as well as the number of products. Because of an increasing market size we could expect that export relations do not fail quickly. These markets are also new and destined. The countries are not only physically far away from the Netherlands, but also their cultures are different from the European culture and their institutions and the quality of these institutions differ from those in the Netherlands and other European countries. These differences could create a lot of

[1] This paper provides more background material to chapter 4 of Groot et al. (2011) The data are from the International Transactions data base from Statistics Netherlands (CBS). Section 2 provides more details. We thank CBS for providing these data. The authors are fully responsible for the calculations and presentation of the results.

uncertainty in trading with these countries. Smeets et al. (2008) conclude that differences in culture and a low institutional quality raise the market entry costs for exporters, for example.

We provide information on the number of firms trading, their position within a market, the size of trade per firm in terms of number of trade partners, products and average trade value, concentration of trade and entry and exit into trading with foreign markets. We find differences between the markets of the BRIC countries themselves, as well as both remarkable differences and similarities between trade with the BRIC countries on the one hand, and the US on the other hand. Throughout the whole paper, we will benchmark our findings on trade with the BRIC countries with data concerning trade with the US.

Section 2 describes the data base and some general descriptive statistics of the firms. Section 3 focuses on the trade relations of the Dutch firms with the BRIC countries: the average value of trade, the number of product and countries, and market entry and exit decisions. Section 4 presents the most important export and import sectors for the Netherlands with respect to the BRIC countries. Section 5 discusses in more detail the firm specific determinants of entering the Chinese export market based on regression analysis and Section 6 concludes.

2. The data and some stylized facts

First we present some general characteristics of the database. Then we turn some general descriptive statistics. This includes number of firms trading internationally, with any country, the size of trade in terms of average import and export value, average number of trade partners (i.e. countries traded with) and products.[2] We find that two-way traders, firms that both import and export goods, are more numerous, have larger import and export values, trade with a greater number of countries and in a larger number of products than firms that only import or export goods. Moreover, exporters are relatively small with the lowest average export value and average number of export products. Exports here only entail exports of goods produced in the Netherlands; re-exports have been excluded from the analysis.

[2] Throughout the whole document, products are defined on the 5 digit level as specified in the Combined Nomenclature.

2.1. The international trans-action-level data

The international transaction-level data (IH) provide detailed information on countries, type of products, transaction value and the volume in physical units, and the share of the export value that is related to re-exports. These data stem from two sources. The first is the customs data for non-EU trade relations. The second is an extensive survey across Dutch firms on their international export and import transactions with EU countries. The reason is that intra-EU trade is not recorded at the customs office since 1992. Statistic Netherlands surveys only firms with total exports (or imports) above a threshold in order to lower the administrative burden of smaller firms.[3] The data of the customs and surveyed firms provide information on the export destinations, their re-export share and the origin of their imports by product (at the 5- or 8-digit level). For the non surveyed firms, the dataset only includes the value of total exports and imports from the Dutch tax authorities. Each transaction is identified by the encrypted VAT-number, and is related to an actual Dutch exporter or importer.[4] Aggregating transactions by unique firm country and product combinations yields about 2 million observations per year for the period 2002-2008.

For this analysis we have focus on direct exports and imports and have eliminated data on re-exports. Moreover we have deleted all observations without trade values or whose country code or product code was missing. For the latter two missing values, these are mainly due to imputations by the CBS and will most likely not bias any descriptive statistics or estimates.

2.2. Number of firms and size of trade flows

Table 1 lists the number of Dutch firms involved in international trade by export or import status. A firm's trade status is determined by the aggregate trade flows of the firm. For example, if a firm records no export transaction, but records positive import transactions, the firm is labelled as an importer. Note that we do not use the terms importer and importing firms interchangeably; where an importer is a firm that only imports, importing firms are firms that import, but could also export. In this case we label them as two-way traders.

With an average annual growth rate of 1%, the total number of firms involved in international trade has slowly grown over the years. Both the number of importers and the number of two-way traders have increased, whereas the number of exporters has slightly

[3] Until 2005 the threshold of total firm exports was 225.000 euro. In 2006 and 2007 it was 400.000 euro.

[4] Statistics Netherlands identifies individual and actual exporters (importers) with an account number (IH-relation number) that may correspond with one or more VAT-numbers. This identifier gives no clue about the legal and organizational status of the trading firm.

fallen. As a consequence, the composition to trade status has tilted a little in favour of importers. Just over half of all Dutch firms involved in international trade are two-way traders. This composition of firms to trade status is very similar to the composition for Belgian firms, as reported by Muûls and Pisu (2007).

Table 1:Number of firms involved in international trade by trade status and year

		Trade status			
Year		Exporter	Importer	Two-way trader	Total
2002	Number of firms	2,311	7,189	9,964	19,464
	Share in total number of Dutch firms trading internationally	*11.9%*	*36.9%*	*51.2%*	*100%*
2008	Number of firms	2,244	7,951	10,420	20,615
	Share in total number of Dutch firms trading internationally	*10.9 %*	*38.6 %*	*50.6 %*	*100%*
Average annual growth rate		-0.5%	1.7%	0.7%	1.0%

Table 2 concludes that two-way traders are also larger than exporters and importers. In 2002, their average import value was almost €9.5 million, while is was almost €7.5 million for importers. Also, two-way traders exported on average €8.8 million, more than 4 times the average export value of exporters.

From 2002 to 2008, two-way traders have witnessed an impressive rise in their average import and export values. The average annual growth rate was nearly 7% for average export value and 10% for average import value. Also the average export value of exporters has grown rapidly by 10% per year on average. The average import value of importers has slowly fallen, on average 1% per year.

Overall, compared to Table 1, we see a stronger rise in per firm export value for both two-way traders and exporters than in the number of firms involved in trade. This observation also holds for the average import value of two-way traders. This indicates that overall exports, as well as imports by two-way traders, have mainly grown along the so-called intensive margin.[5]

[5] The intensive margin refers to the size of trade per firm, as opposed to the extensive margin, which refers to the number of firms involved in trade.

Table 2:Average size of trade by trade status year

		Trade status		
Year	In million euro	Exporter	Importer	Two-way trader
2002	Average import value		7.44	9.50
	Average export value	2.15		8.77
2008	Average import value		7.07	17.09
	Average export value	3.86		13.04
Average annual growth rate	Average import value		-0.8%	10.3%
	Average export value	10.0%		6.8%

Combining the number of firms and average import and export value per firm gives us the aggregate size of trade, displayed in Table 3. Note that, as compared to national accounts data (Statline) and taking into account the total re-export value that has not been reported here, approximately 1/3 of total trade value is missing in the dataset at hand.[6] The table shows once again that two-way traders are responsible for the larger part of trade, that is in particular the case for exports.

Table 3: Shares in total import/export value

		Trade status		
Year		Exporters	Importers	Two-way trader
2002	Import value		36.1%	63.9%
	Export value	5.3%		94.7%
2008	Import value		24.0%	76.0%
	Export value	5.8%		94.2%

2.3. The number of trading partners and products

Most exporters (55%) exported to only one or two countries in 2008.[7] For importers, the share of firms importing from only one or two countries was 46% and for two-way traders these shares were respectively 31% and 21%. Table 4 shows that the average exporting firm exports to more countries than the average importing firm imports from. In 2008 an exporting firm exported goods to nearly 10 countries, whereas an importing firm imported goods from nearly 7 countries on average.

Two-way traders have on average more import and more export partners than respectively importers and exporters. For both exporters and two-way traders, the average number of export partners has increased from 2002 to 2008. As to the average number of import partners, only two-way trades have managed to increase this from 7 to 8. The finding that the average number of import partners is lower than the average number of export

[6] This is known for earlier analyses with this dataset, see Creusen et al. (2011) and Statistics Netherlands (2009).

[7] A complete relative distribution of large Dutch firms by the number of export markets served in 2007 can be found in Smeets et al. (2008). This distribution pattern is very similar to the one for Belgian firms reported by Muûls and Pisu (2007) and for US firms reported by Bernard et al. (2009).

partners is common in the existing literature: Manova and Zhang (2009) have found similar results for Chinese firms, Bernard et al. (2009) for US firms.

Table 4: Average number of import and export partners by trade status

	Trade status		
Year	Importer	Two-way trader	Overall
2002	4.3	7.4	6.1
2008	4.3	8.3	6.6
	Exporter	Two-way trader	Overall
2002	3.8	9.4	8.4
2008	4.5	11.1	9.9

Two-way traders not only trade with more countries, they also import and export a greater number of products than importers and exporters do. Table 5 shows that importers import 16 products on average, whereas two-way traders import 245 products in 2008. As to the number of products exported, these figures are 4 for exporters and 10 for two-way traders. Overall, the average importing firms imports more than twice the number of products compared to the average exporting firm exports. Again this finding is common in the literature. Manova and Zhang (2009) have found that for Chinese firms the mean number of import products is almost twice the mean number of export products and that two-way traders both import and export more products than one-way traders in 2005. For US firms the difference is smaller, yet Bernard et al. (2009) report that the average importer imports more products than the average exporter exports in 2002.

Moreover, most exporters (59%) exported only one or two products to the world market in 2008. For importers, the share of firms importing only one or two distinct products was 349% and for two-way traders these shares were respectively 35% and 17%.

Table 5: Mean number of import and export products by trade status

	Trade status		
Year	Importer	Two-way trader	Overall
2002	14.3	21.1	18.3
2008	15.5	23.5	20.1
	Exporter	Two-way trader	Overall
2002	4.0	8.5	7.6
2008	3.9	9.7	8.7

Before we focus on the behaviour of Dutch firms at markets in the BRIC countries it is important to note that firms doing business with the BRIC countries are no average trading firms. From Smeets et al. (2008) we know that only the most productive and largest firms export to more destined markets. We do not have data on the size and productivity of firms to confirm this result for the BRIC countries. We do however have data on exports and imports

of these firms. The analysis with respect to the number of export destinations and products is repeated for Dutch firms which trade with at least one of the BRIC countries or the US. Tables 6 and 7 present the results and conclude that the average number of import and/or export partners is larger for firms also importing and/or exporting to one of these countries. This is not surprising. For Dutch exporters these markets are far away and are often only served by larger firms with serve on average more exports markets. Most of the trading firms serving only one or two markets concentrate on nearby markets in the EU. With respect to the average number of import partners, this also holds for firms importing from these countries. In 2008 a firm importing from Russia imports on average from 18 countries. Firms exporting to India also export to 28 other destinations. Firms importing goods from or exporting goods to the US are expected to have 10 import partners or 20 export partners. Similar conclusions hold for the number of exported and imported products.

Table 6: Average number of countries imported from by importing firm

	if importing from				
Year	Brazil	Russia	India	China	US
2002	15.6	16.8	13.7	11.0	9.1
2008	16.6	18.1	13.9	10.3	10.1

Table 7:Average number of export destinations by exporting firm

	if exporting to				
Year	Brazil	Russia	India	China	US
2002	34.6	26.8	30.9	28.1	18.1
2008	33.7	26.6	29.4	25.4	20.0

2.4. A note on Hong Kong and China

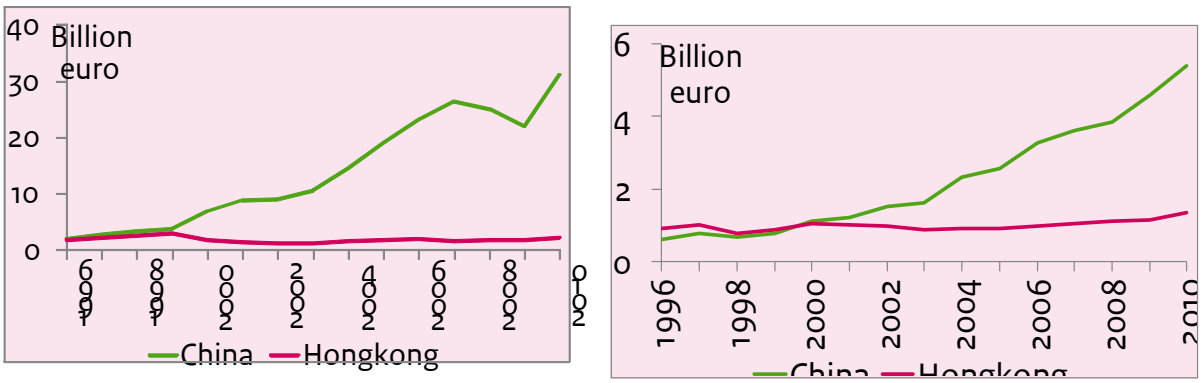
Hong Kong is the largest of China's two special administrative regions (the other one being Macau). With a 2008 per capita GDP of almost $33,000,[8] the World Bank regards Hong Kong as a high-income country. In international statistics, Hong Kong is generally measured separately from China. However, Hong Kong was also an important trading location for China. It connected China to the world trade and vice versa. The question whether we should combine the trade data for China and Hong Kong.

Figure 1 shows the total value of goods imports from and exports to China and Hong Kong. The charts show that exports to China only overtook those to Hong Kong as of 2000, but the difference increase rapidly. In 2008, total export value to China was 4 times as high as total export value to Hong Kong. The total import value to China was 14 times the value to

[8] Source: World Development Indicators, World Bank

Hong Kong. Even if a half of the imports to Hong Kong are re-exported to China or half of the exports from Hong Kong come from China the role of Hong Kong in China's trade is much more limited than ten years ago. Moreover, the value of export and imports of Hong Kong remain stable over the years.

Figure 1: The value of goods imports (left panel) and goods exports (right panel), 1996 - 2010



source: CBS Statline

Based on firm-level trade data, we have found that 2012 Dutch firms imported goods from Hong Kong and 969 exported goods to Hong Kong in 2008. All in all, 2639 Dutch firms trade with Hong Kong, of which more than half do not trade with China. In the same year, as reported in Table 8 later on, approximately 7000 Dutch firms traded with China. The number of Dutch firms trading with Hong Kong has hardly increased in the period 2002-2008; the average annual growth rate is only 1.5% over the period 2002-2008. This is a stark difference to the 8% average annual growth rate of Dutch firms trading with China. These firms were mostly importing firms. In 2008, importing firms imported on average approximately €680,000, exporting firms exported on average approximately €282,000. Comparing these values to Table 9, we notice that they are lower than those for any of the BRIC or US. Also, for Hong Kong, these values have fallen over the period 2002-2008, whereas they have risen for the BRIC and US.

All in all, we cannot conclude that the overall figures for Hong Kong are similar to China, neither to another high-income country such as the US and in terms of economic development, Hong Kong is far ahead of China. we have decided to deal with them as separate countries. Hong Kong forms not a part of the BRIC countries and its role in China's trade is becoming far less important than ten or twenty years ago.

3. Dutch firms trading with the BRIC countries

In this section, we take a closer look at firms trading with the BRIC countries. We have included figures for firms trading with the US to serve as a benchmark. We present findings on the number of firms trading with these countries, entry and exit, and trade by sector. This allows us to make a more extensive decomposition of the trade growth with this countries and the firm-level structure of international trade with the BRIC countries.

3.1. Number of firms and size of trade flows by status and year

Table 8 lists the number of importers, exporters and two-way traders and their share in the total number of firms trading by country. This definition by country slightly alters the notion of a two-way trader as defined in section 3. For example, a two-way trader with China is a firm that both imports from and exports to China. Hence, a firm importing from China and exporting to India is a two-way trader at the world market, an importer for China, and an exporter for India. Of all companies trading with China, 76% is an importer, 14% is an exporter, and 10% is a two-way trader. Comparing these figures with those of the other BRIC countries and the US, we find that the share of firms only importing goods is relatively high for China, whereas it is low for Russia. Russia, on the other hand, attracts relatively many firms that only export.

Most striking in Table 8 are the average annual growth rates of the number of firms trading of the BRIC as compared to the US. Where for the US, the numbers of importers, exporters and two-way traders are fairly stable, we find high growth rates for the BRIC countries. Especially for China, the number of importers and two-way traders has rapidly increased, with average annual growth rates over 8%.

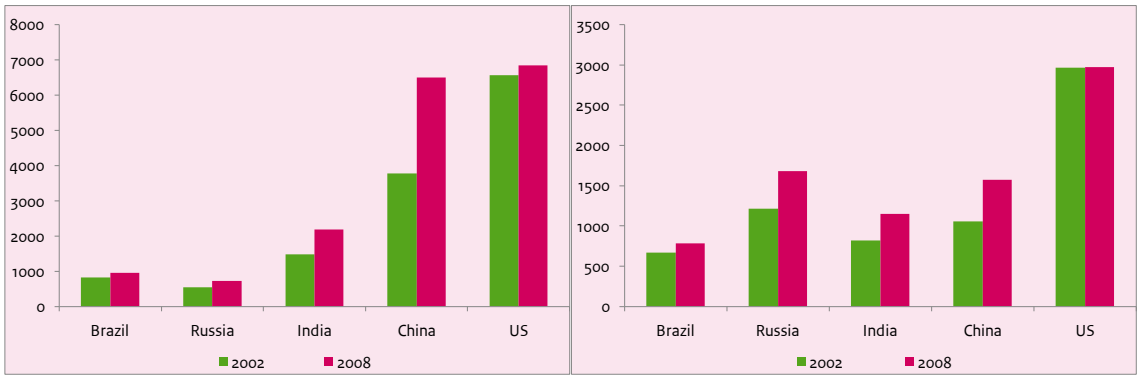
Table 8: Number of importers, exporters and two-way traders by market

Importers and share in total number of firms importing from and/or exporting to that market						
Year		Brazil	Russia	India	China	US
2002	number of firms	654	386	1,258	3,333	4,503
	share of total number of firms trading with that country	*49.0%*	*24.1%*	*60.7%*	*75.9%*	*60.3%*
2008	number of firms	800	477	1,767	5,456	4,713
	share of total number of firms trading with that country	*49.9%*	*22.1%*	*60.6%*	*77.6%*	*61.3%*
Average annual growth rate		3.4%	3.6%	5.8%	8.6%	0.8%
Exporters and share in total number of firms importing from and/or exporting to that market						
Year		Brazil	Russia	India	China	US
2002	number of firms	532	1,060	593	612	910
	share of total number of firms trading with that country	*39.9%*	*66.2%*	*28.6%*	*13.9%*	*12.2%*
2008	number of firms	631	1,429	726	527	851
	share of total number of firms trading with that country	*39.4%*	*66.3%*	*24.9%*	*7.5%*	*11.1%*
Average annual growth rate		2.9%	5.1%	3.4%	-2.5%	-1.1%
Two-way traders and share in total number of firms importing from and/or exporting to that market						
Year		Brazil	Russia	India	China	US
2002	number of firms	149	156	223	445	2,058
	share of total number of firms trading with that country	*11.2%*	*9.7%*	*10.8%*	*10.1%*	*27.5%*
2008	number of firms	172	250	423	1,049	2,123
	share of total number of firms trading with that country	*10.7%*	*11.6%*	*14.5%*	*14.9%*	*27.6%*
Average annual growth rate		2.4%	8.2%	11.3%	15.4%	0.5%

Figures 2a and 2b present the number of firms importing from or exporting to a country and their share in the total number of Dutch firms importing or exporting on the world market. The figure on the left shows that 22% of importing Dutch firms imported goods from China in 2002. In 2008, this share has increased to 35%. For exporters these shares were much lower: 9% and 12% respectively. Of all five countries, the lowest number of firms import goods from Russia. For exports, this is Brazil. For both importers and exporters, the United States is the most popular source/destination country with shares of respectively 37% and 24% of Dutch importers and exporters importing from/exporting to that market. These findings are in line with those for US firms. Bernard et al. (2009) have found that the share of US firms trading with lower-income countries is much lower than those trading with higher-income countries. Similarly for Belgian firms, Muûls and Pisu (2007) find that both 31% of importing and exporting firms trade with the US.

Even though the US is still 'on top of the list', the number of firms trading with the other countries is rapidly increasing, whereas the number of firms importing from and exporting to the US has hardly grown.

Figure 2: Numbers of firms importing from (left panel) or exporting to (right panel) to a country



Source: own calculations based on firm-level international transaction data of Statistics Netherlands.

As previously found in Table 2, the average export value is higher for two-way traders than for exporters. Table 9 confirms this for the BRIC countries. For average import value, only two-way traders in China and the US import more than importers. Both average import and export value are lowest for India, and highest for the US and Russia. Especially the high average import values for Russia are striking. Overall, average values are growing rapidly, yet in some cases, hardly any intensive margin growth, and sometimes even decline has been realized. The most explosive growth is accounted for by two-way traders from Russia: over the period 2002-2008, their average import value rose by 633% and their average export value by 75%. Moreover, for all countries, the export value growth rate is higher for exporters than for two-way traders.

Table 9: Average importing and exporting value by status and market

Average import value per firm						
year	In million euro	Brazil	Russia	India	China	US
2002	Importers	2.29	5.52	0.40	1.70	1.60
	Two-way traders	0.53	2.13	0.77	2.57	3.20
2008	Importers	3.37	15.10	0.90	2.05	1.71
	Two-way traders	3.75	15.60	0.59	2.89	5.76
Average annual	Importers	6.7%	18.3%	14.6%	3.2%	1.0%
growth rate	Two-way traders	38.7%	39.4%	-4.3%	2.0%	10.3%
Average export value per firm						
year	In million euro	Brazil	Russia	India	China	US
2002	Exporters	0.31	0.55	0.23	0.48	0.41
	Two-way traders	0.87	1.22	0.39	0.86	1.96
2008	Exporters	0.45	0.97	0.38	0.88	0.62
	Two-way traders	0.82	2.13	0.53	0.85	2.89
Average annual	Exporters	6.1%	9.9%	9.1%	10.6%	7.2%
growth rate	Two-way traders	-1.1%	9.8%	5.3%	-0.3%	6.7%

Groot et al. (2011) show that also the total import and export value with the BRIC countries have grown in importance over time. In particular, Russia and China show a remarkable rise in the share of total value imported from these countries.

Table 10 highlights the importance of two-way traders in trade with the BRIC countries. For all countries, the two-way traders' share in total import or export value is larger than their respective shares in the numbers of firms. Comparing countries among each other, one can see that, compared to the US, two-way traders attract a relatively large share of total import value of the BRIC countries. For the export value, the picture is the opposite; two-way traders seem to be less important in trade with the BRIC than in trade with the US. Moreover, for all countries two-way traders have become relatively more important over the years, except Brazil in exports.

Table 10: Share in total market import and export value by status and market

Share in total import value						
Year		Brazil	Russia	India	China	US
2002	Importers	95.0%	86.5%	74.4%	83.1%	52.3%
	Two-way traders	5.0%	13.5%	25.6%	16.9%	47.7%
2008	Importers	80.7%	64.9%	86.4%	78.7%	39.7%
	Two-way traders	19.3%	35.1%	13.6%	21.3%	60.3%
Share in total export value						
Year		Brazil	Russia	India	China	US
2002	Exporters	56.0%	75.4%	60.9%	43.6%	8.4%
	Two-way traders	44.0%	24.6%	39.1%	56.4%	91.6%
2008	Exporters	66.6%	72.2%	55.4%	34.4%	7.9%
	Two-way traders	33.4%	27.8%	44.6%	65.6%	92.1%

3.2. Concentration of trade value

Total trade value is not evenly distributed across firms. Tables 11 and 12 show concentration in terms of import and export value and 2008. Columns denote the top % of firms in terms of import/export value: for example, 0-2.5 refers to the largest 2.5% of importers/exporters and 10-25 refers to the firms between the 75th and 90th percentile. This categorization shows that, for all countries, a relatively small number of firms account for the bulk of trade. Comparing imports and exports, this distribution is most concentrated for imports. In the literature, the high degree of concentration of trade in a limited number of firms is regarded a stylized fact,[9] yet only explored for exports as such, as opposed to a country in particular. The pattern of Dutch trade to specific countries is hence not regarded as unusual.

[9] See Muûls and Pisu (2007), WTO (2008), Bernard et al. (2009), Manova and Zhang (2009)

Of all countries, the US seems the most concentrated in terms of Dutch exports and imports. This suggests that along the development path, concentrations for the BRIC are likely to increase. For imports, Russia shows an extremely high concentration. This is most likely due to the large share of oil and gas in the total import package from Russia.[10]

Table 11: Distribution of total import value; 2008

Imports; 2008	Top … % of firms in terms of import value					
	50-100	25-50	10-25	5-10	2.5-5	0-2.5
Brazil	0.2%	1.3%	5.3%	6.8%	9.7%	76.7%
Russia	0.003%	0.08%	0.8%	1.4%	2.4%	95.2%
India	0.5%	3.0%	9.4%	8.8%	9.1%	69.1%
China	0.4%	3.4%	11.0%	10.6%	11.0%	63.6%
US	0.1%	0.8%	3.2%	4.2%	5.2%	86.5%

Table 12: Distribution of total export value; 2008

Exports; 2008	Top … % of firms in terms of export value					
	50-100	25-50	10-25	5-10	2.5-5	0-2.5
Brazil	0.8%	4.0%	11.9%	13.2%	12.7%	57.4%
Russia	1.1%	4.8%	12.8%	13.1%	14.0%	54.2%
India	0.8%	3.6%	11.1%	13.7%	16.4%	54.3%
China	0.5%	2.8%	9.2%	11.2%	13.1%	63.3%
US	0.2%	1.3%	5.2%	6.1%	6.9%	80.1%

3.3. Entry and exit in import and export markets

As we have concluded from Table 8, the number of firms trading with the BRIC countries is rapidly increasing. This implies that every year, new firms start trading with (one of) these countries. This section takes a closer look at the pattern of market entry, as well as exit, for both Dutch firms at import and export markets.

Table 13 displays the 2008 entry and exit rates for firms importing from one of the BRIC countries or the US. Both entry and exit rates are highest for Russia, and lowest for the US. Clearly, the dynamics in the firms importing from the BRIC is higher than for the US: relatively more firms enter, and more firms exit. China seems to be an exception. Its entry and exit rates correspond to those of the US. In terms of total imports China is also already an established source country, while this is less the case for the other BRIC countries. Moreover, countries with high entry rates generally seem to have high exit rates.

[10] For all countries, and for both import and export value, the concentration of trade value has increased over 2002-2008 (but this is not shown in the tables).

Table 13: Entry into and exit from importing in 2008, as % of firms in 2007

	Entry (no imports in 2007, positive in 2008)	Exit (positive imports in 2007, no in 2008)
Brazil	31.2%	37.6%
Russia	49.5%	49.5%
India	30.9%	28.3%
China	21.2%	19.6%
US	19.2%	20.9%

The correlation between entry and exit rates is for a large part due to the low survival rate after entry: across all countries, on average half of the importers only import goods for one year. This can be seen in Figure 3, which displays the survival rates for the 2003 and 2005 cohort of firms entering an import market. The graphs indicate that low survival rates might be (part of) the cause of Russia's high exit rate. Only 38% of firms starting to import from this country in 2003, continued this importing relationship in 2004. Of the same cohort, only 9% imported goods all through 2008. All in all this shows that, especially for Russia, many firms terminate their import activities form that country within a few years. Of all source countries, firms starting to import from China perform best with 60% continuing in 2004 and 33% by 2008. Comparing the survival rates with those of the 2005 cohort shows that, except for China, rates have declined across all countries.

Figure 3: Survival rates at import markets in 2003 (solid) and 2005 (dashed)

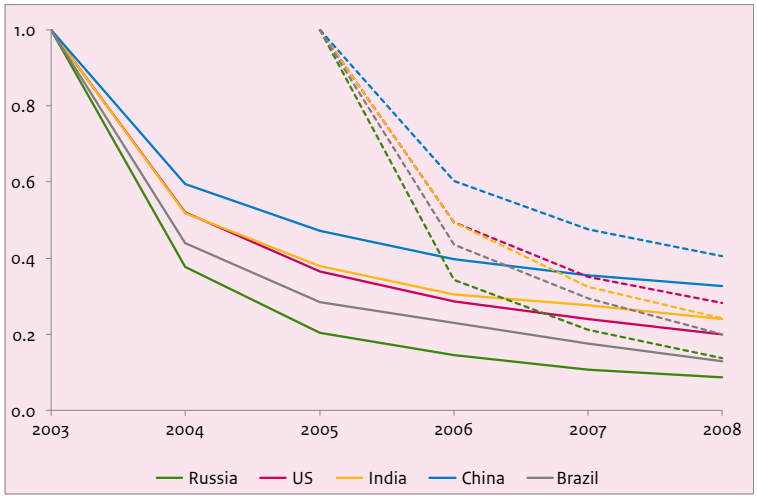


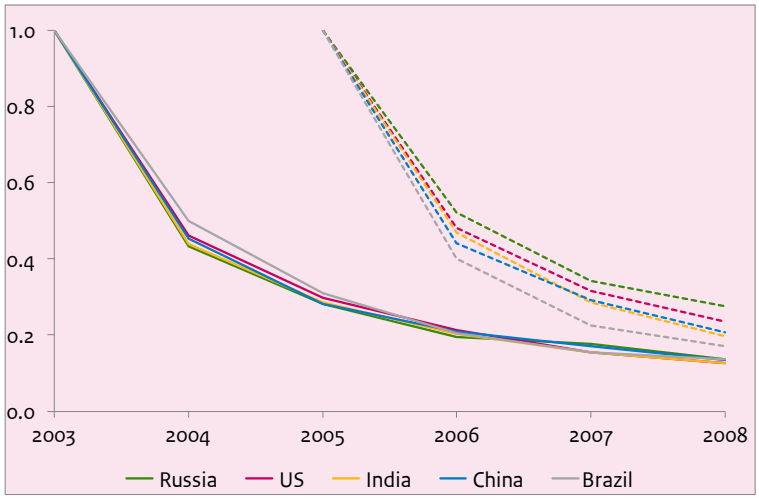
Table 14 lists the entry and export rates for exporting firms in 2008. An interesting difference to Table 13 is that differences in entry and exit rates between countries are smaller for exporting firms than for importing firms. Brazil had the highest entry rate into exporting, whereas China has the highest exit rate. Again, as for importing, entry and exit rates are lowest for the US.

Table 14: Entry into and exit from exporting in 2008, as % of firms in 2007

	Entry (no exports in 2007, positive in 2008)	Exit (positive exports in 2007, no in 2008)
Brazil	53.0%	32.1%
Russia	38.2%	30.2%
India	43.9%	31.5%
China	42.6%	34.6%
US	35.7%	27.9%

As to the survival rate, again, the countries are remarkably similar. Figure 4 shows that, for all countries, 43% to 46% of firms starting to export to one of the countries in 2003 continued to do so in 2004. 13 to 14% made it all the way to 2008. As to the 2005 cohort, Russia and the US have managed to increase their survival rate, whereas Brazil, India and China have maintained similar rates. Compared to importing firms, firms that have recently started exporting to one of these countries are less likely to survive. The survival rates we have found are not uncommon in the literature, Cadot et al. (2011) report similar rates for firms exporting in general.

Figure 4: Survival rates at export markets in 2003 (solid) and 2005 (dashed)



3.4. The origin of trade value growth

Contrary to what the high entry and exit rates might indicate, entry and exit have only little influence total import and export value growth with the BRIC and the US in the year of entry. Table 15 displays the average import and export value of entering and exiting firms as a share of the average incumbent firms' trade value at that market. The table must be read as follows: a firm which did not import from Russia in 2002, but did record imports in 2003, imports in 2003 on average only 2% of the 2003 import value of the incumbent firm importing goods from Russia both in 2002 and 2003. As for exiters; a firm which imports goods from Russia in

2002, but not anymore in 2003, imported in 2002 on average 7% of the 2002 import value of the incumbent firm importing goods from Russia in 2002 and continues his imports in 2003. Hence, Table 15 concludes that the import/export value of the average firm entering or exiting the import/export market with a particular country is never more than a third of the size of the incumbent firm in that market. Across all countries and averaged over 2003-2007, Creusen and Lejour (2011) found that on average, continuers export almost three times as much as starters or stoppers. Moreover, firms entering into importing or exporting have grown in relative size, except for the Russian market and the Indian export market. Also, for exports, the export value of firms who have just entered into exporting to one of the BRIC markets is clearly higher than firms who have just started exporting to the US.

Table 15: Average trade value of entering firms

Average import value of firms entering or exiting as share of staying firms' import value						
Year		Brazil	Russia	India	China	US
2002-2003	Entry	5.1%	2.0%	19.0%	2.6%	8.2%
	Exit	4.8%	7.2%	13.3%	8.3%	13.0%
2007-2008	Entry	23.3%	18.4%	11.3%	8.9%	15.0%
	Exit	5.7%	11.8%	23.8%	21.4%	9.3%
Average export value of firms entering or exiting as share of staying firms' export value						
Year		Brazil	Russia	India	China	US
2002-2003	Entry	18.0%	12.3%	24.4%	12.5%	7.0%
	Exit	20.5%	15.3%	33.3%	18.0%	6.8%
2007-2008	Entry	20.9%	11.2%	20.8%	19.3%	9.7%
	Exit	20.8%	10.3%	18.3%	21.2%	24.5%

In addition, Figure 5 show China's decomposition of total import and export value growth into who accounted for it. The contribution of firms entering the Chinese market to growth is defined as the average 2003 export value to China of firms who started exporting to China in 2003, multiplied by the number of firms who started exporting to the China in 2003. The contribution of exiting firms is the average Chinese export value of the exiting Dutch firms in 2002, times the number of firms exiting in 2003. The contribution of incumbent firms is the average additional export value of firms who exported to China both in 2002 and 2003, multiplied by the number of incumbent firms. For both imports and exports these graphs clearly shows that from one year to another primarily the incumbent firms account for total trade value growth.

Figure 5: Decomposition of Dutch export (left) and import (right) growth to and from China

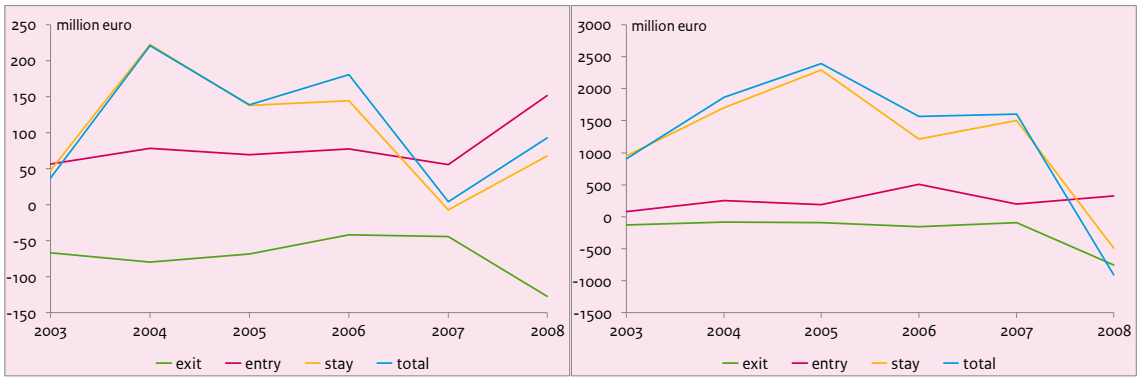


Figure 5 and Table 15 above might lead one to conclude that entry does not make a large difference. This conclusion is incorrect. While average imports or exports of the entering firm are relatively small as compared to the staying firm, and hence their aggregate contribution is small in the year of entry, the size of their operations tend to grow rapidly. Table 16 presents the average import and export value growth rates of firms who have imported and/or exported for all years in our sample, as well as firms that have started importing and/or exporting in 2003, and have continued there operations until 2008. The growth rates clearly show that, for both importing and exporting firms, entrants have grow at least twice as fast as incumbents. The relative gap between the growth rates of entrants and incumbents is largest in India. For this country we even see that for both importing and exporting firms, the entrant has exceeded the incumbent in size of operations in 2008. For the other three countries, the average size of entrants as a share of the average incumbents' size ranges from 2% (Russian importers) to 54% (Russian exporters).

Table 16: Trade value growth rates of 02-03 entrants versus incumbents[11]

Average annual import value growth rates of 02-08 importing firms versus 03-08 importing firms					
year	Brazil	Russia	India	China	US
02-08	10.0%	28.9%	4.9%	11.0%	10.9%
03-08	24.6%	52.7%	38.3%	52.1%	33.9%
Average annual export value growth rates of 02-08 exporting firms versus 03-08 exporting firms					
year	Brazil	Russia	India	China	US
02-08	7.6%	13.4%	10.3%	13.7%	11.9%
03-08	40.2%	38.9%	37.3%	29.7%	32.5%

[11] Note that in case we would have computed the average annual growth rate of all 02-03 entrants instead of those that survive all years until 2008, this growth rate would have been higher. This is because the 2003 average import and export value of entrants that do not survive until 2008 is lower (generally less than half, except for firms importing goods from Russia) than that of firms that do survive until 2008. This implies that firms with relatively low import or export values in the year of entry (in this case, 2003), are less likely to survive until 2008.

Next to import and export value growth rates, we can also take a look at the share of 2008 import and export value accounted for by firms importing/ exporting in all years from 2002-2008. In case entry would be absent, this share would be 100%. The more firms enter, the faster they grow (and the more firms exit), the smaller this share will become. Table 17 lists these share of total import and export value in the countries under consideration of the firms that have imported from or exported to these countries for the full period of our dataset. The table, again, shows that the US is a relatively stable market, while for India more than half of the import and export value is accounted for by firms who have, at some point between 2002 and 2008, started importing goods from or exporting goods to India. Hence, for the US, incumbents are relatively more important as is also the case for incumbents firms importing from Russia and China.

Table 17: Trade value accounted for by all-year importing/exporting firms[12]

Share of 2008 import value accounted for by firms importing in all years from 2002-2008					
year	Brazil	Russia	India	China	US
2008	56.9%	71.9%	36.5%	72.6%	78.8%
Share of 2008 export value accounted for by firms exporting in all years from 2002-2008					
year	Brazil	Russia	India	China	US
2008	47.8%	43.0%	39.6%	55.5%	75.3%

Overall, we conclude that even though entry and exit rates are high and entering firms, who manage to survive until 2008, grow faster than incumbents, the small number of them cause incumbents to dominate after all. Moreover, the pattern of entry and exit described in this section is consistent with the export dynamics for Columbian firms as reported by Eaton et al. (2007).

3.5. Trade in the product dimension

From Table 5 we have already noticed that a firm importing goods imports on average 20 distinct products in 2008, whereas an exporting firm exports on average 9 distinct products. Here we will take a look at our specific markets, and compute the average number of import products from and export products to a specific country. These results are listed in Table 18. In 2008, on average, a firm importing goods from China imports 9 different products (5 digit level). For exporting firms this is 2. The average number of products exported has been quite stable over the years. The number of distinct products imported has shown an upward trend

[12] Do note, with this table, that these same firms did not accounted for the full import or export value in 2002, as many firms who imported and/or exported goods from (one of) these countries in 2002, have ceased this activity between 2003 and 2008.

over the period 2002-2008. Interestingly, the average number of import and export products for Dutch firms importing goods from/ exporting goods to China closely resembles those of firms trading with the US: the average importer imports approximately 3 times as many products as the average exporter exports. For Brazil, Russia and India, the average numbers of products imported are closer to the average number of products exported. Also, for Brazil and Russia, the average importer imports less products than the average exporter exports.

Table 18: Mean number of import and export products per firm

Mean # of import products per importing firm					
year	Brazil	Russia	India	China	US
2002	2.29	2.29	3.88	7.49	8.52
2008	2.34	2.34	4.05	9.23	9.10
Mean # of export products per exporting firm					
year	Brazil	Russia	India	China	US
2002	2.72	3.50	2.54	2.62	3.10
2008	2.45	3.64	2.35	2.55	3.05

For China, we take a closer look at the Dutch firms importing goods from and exporting goods to this country. Table 19 categorizes the firms importing goods from China by the number of products imported and lists number of firms in each category as the share in the total number of firms importing goods from China. In 2002 nearly 37% of all importing firms only imported one product. By 2008, this share has fallen to 30%. The shares of firms importing 5 or more products have risen. In both years, only 1% of all firms imported more than 100 different products. Overall, there is a clear shift to (relatively) more multi-product importers. This shift can also be witnessed in terms of share in total import value. Total import value is quite concentrated in multi-product importers, yet it is unclear whether this concentration has increased or decreased over time.

Table 19: Share of total number of firms and import value by number of products imported; China

Share of total number of firms by number of products imported							
Number of products imported	1	2	3	4	5	6-10	>10
2002	36.5%	15.3%	8.9%	6.4%	4.7%	10.7%	17.5%
2008	30.0%	14.5%	8.9%	6.4%	5.0%	13.5%	21.7%
Share of total import value by # of products imported							
2002	2.7%	2.4%	3.1%	4.3%	4.5%	15.5%	67.4%
2008	2.4%	2.2%	1.8%	2.3%	2.4%	10.6%	78.2%

Similar to Table 19, Table 20 categorizes the firms exporting goods to China by the number of products exported and lists number of firms in each category as the share in the total number of firms exporting goods to China. In 2002 60% of all exporting firms only exported one product. In 2008 this share has fallen to 55%. The shares of firms exporting 3 or more

products have risen (except for firms exporting more than 50 products to China). Overall, there seems to be a mild shift to (relatively) more multi-product exporters. This shift is not so much visible in terms of share in total export value. Total export value is quite concentrated in multi-product exporters and this concentration seems to have reduced rather than increased: in 2002 2% of firms with more than ten export products exported 24% of total export value to China and in 2008 2% of these firms) exported 21% of total export value. Concentration patterns where a small number of multi-product exporters account for the larger share of trade value are a general feature in the literature.[13]

Table 20: Share of total number of firms and export value by number of products exported; China

Share of total number of firms by number of products exported							
Number of products exported	1	2	3	4	5	6-10	>10
2002	59.8%	19.6%	8.4%	3.5%	2.5%	4.4%	1.8%
2008	54.7%	19.4%	10.0%	4.6%	3.9%	5.1%	2.3%
Share of total export value by number of products exported							
2002	13.9%	19.9%	9.5%	10.1%	3.8%	18.7%	24.1%
2008	16.5%	8.9%	22.5%	14.2%	6.7%	10.2%	20.9%

4. The most important import and export sectors for Dutch firms

Our aggregate import and export values are not evenly spread across products or sectors but rather concentrated in a limited number of sectors. There are several reasons to this, some of them related to comparative advantages in the production of certain goods, others related to country-specific tastes and demands. Here, we will take look at the ten most important sectors[14] with respect to both total import and export value in our trade relationships with the BRIC and the US. We will report on which sectors are important, the sectors' shares in total import or export value, shares of firms active in these sectors and growth rates. We find that a limited number of sectors generally account for the bulk of trade. Moreover, the most important import and export sectors often coincide, both within, as well as between countries.[15]

[13] See Bernard et al. (2009) for US exporters and Manova and Zhang (2009) for Chinese exporters.

[14] Sectors are defined on the 2 digit level as specified in the Combined Nomenclature, this is a classification according to types of products, comparable to the harmonized system.

[15] In the tables presented in this section, information has sometimes been omitted and replaced by an 'x'. This is for confidentiality reasons: as the number of firms active in that particular sector is low, revealing such information would potentially reveal information specific to the firm.

4.1. Brazil

For Brazil, the 10 most important import and export sectors cover respectively 81% and 77% of total import and export value to Brazil. Only the organic chemicals sector (sector 29) belongs to the most important import and export sectors. Comparing the most important sectors for Brazil to those of other countries one sees that for example for China, only 1 import sector (again, organic chemicals) and 6 export sectors overlap.

Table 21 lists the 10 largest sectors for imports from Brazil. The individual sectors account for 4% to17% of total export value from Brazil, indicating a low concentration as compared to the other BRIC countries and the US. Within the particular sectors imports from Brazil have become more important in 8 of the 10 sectors between 2002 and 2008. The two sectors for which imports from Brazil have declined in importance, oil seeds and oleaginous fruits (sector 12[16]) and preparations of vegetables, fruit, nuts or other parts of plants (sector 20) are also the sectors where total import value has grown at a slower rate that aggregate import value from Brazil.

Table 21: Top 10 sectors for imports from Brazil

Sector, 2 digit level											
Year/sector	10	12	16	20	22	23	26	27	29	80	All
Average annual import value growth	234.4%	-3.4%	22.4%	4.0%	78.2%	18.8%	49.9%	59.9%	27.9%	13.7%	9.8%
% of total import value (2008) (sum: 81.3%)	4.3%	9.6%	4.0%	11.4%	4.7%	16.7%	14.5%	5.1%	5.4%	5.4%	100%
% of firms importing goods from Brazil active in this market											
2002	x	1.7%	2.2%	7.6%	x	1.5%	x	0.9%	2.5%	4.7%	100%
2008	x	2.1%	1.8%	6.1%	x	2.0%	x	0.7%	2.1%	5.6%	100%
% of worldwide import value in these sectors from Brazil											
2002	0.0%	33.8%	7.7%	15.8%	0.4%	17.5%	12.1%	0.1%	0.8%	6.1%	1.0%
2008	5.0%	13.5%	16.8%	11.7%	7.4%	24.5%	31.6%	0.4%	2.0%	6.7%	1.5%

Table 22 lists similar information for the most important export sectors. Here we find that for only 3 out of the 10 sectors, Brazil has grown in importance as a destination market. This indicates that exports in these sectors to other countries have grown more rapidly than for Brazil. For exports to Brazil, sector 84 (nuclear reactors, boilers, machinery and mechanical appliances) is the most important one in terms of value. This is also the sector where most Dutch firms exporting to Brazil are active in.

[16] Annex 1 lists all sector names and codes at the two digit level.

Table 22: Top 10 sectors for exports to Brazil

Sector, 2 digit level											
# exporters in top 10 export sectors											
Year/sector	28	29	30	31	39	48	54	84	85	90	All
Average annual export value growth	26.3%	4.7%	2.0%	21.4%	6.5%	15.3%	7.5%	11.9%	-10.6%	2.0%	3.2%
% of total export value (2008) (sum:77.2%)	9.5%	14.2%	6.0%	7.3%	9.1%	3.3%	2.8%	15.5%	4.3%	5.2%	100%
% of firms exporting goods to Brazil active in this market											
2002	1.6%	4.6%	1.9%	x	7.5%	2.9%	x	17.4%	6.1%	7.6%	100%
2008	1.7%	3.9%	1.1%	x	8.2%	2.9%	x	23.8%	9.4%	5.5%	100%
% of worldwide export value in these sectors to Brazil											
2002	1.8%	0.4%	1.9%	0.2%	0.8%	0.1%	0.3%	0.5%	0.9%	0.8%	0.3%
2008	2.5%	0.2%	1.2%	0.4%	0.7%	0.1%	0.2%	0.6%	0.5%	0.8%	0.4%

4.2. Russia

Due to the high concentration of imports from Russia in especially oil and gas, the 10 largest sectors for imports from Russia include many relatively small sectors wherein few Dutch firms are active. As reporting on the specifics of those sectors would potentially reveal specific information about the companies active in those sectors, only some general information will be reported. For Russia, the 10 largest import sectors cover 99% of total import value. Of this value 91% is accounted for by sector 27 (which includes oil and gas). Of all BRIC countries, this is by far the highest concentration we have found for both import and export markets. Compared to India and China (later on), we see a greater dispersion in import value growth rates in the ten largest sectors as well as sectors decreasing in size. With respect to the share of imports from Russia in total Dutch import value in these 10 sectors, we see an average share of nearly 8%, which is most in line with the Chinese figures. Most of these shares have grown from 2002 to 2008.

The ten largest sectors for exports to Russia are reported in Table 23: they cover 77% of total export value from the Netherlands to Russia and the most important sector in terms of value, nuclear reactors, boilers, machinery and mechanical appliances (sector 84), accounts for 'only' 23% of total export value. For Russia, none of the sectors that are in the 10 largest import sectors are also in the 10 largest export sectors. Only one of the largest sector for imports from Russia is also in the list for China (3 for India), for Dutch export sectors these are 6 sectors (5 for India). When looking at the Russian share in Dutch worldwide export value, one finds growth in all sectors. For 8 sectors, the average annual growth rate of export value in these sectors is higher than that of total export value to Russia.

Table 23: The 10 most important sectors for exports to Russia

Sector, 2 digit level											
Year/sector	20	30	38	39	40	60	70	84	85	87	All
Average annual export value growth	6.3%	36.1%	22.9%	26.9%	18.9%	20.0%	18.2%	20.3%	32.6%	15.9%	16.3%
% of total export value (2008) (sum: 77.2%)	3.2%	5.6%	6.1%	6.5%	3.3%	8.2%	4.6%	23.4%	5.1%	11.1%	100%
% of firms exporting goods to Russia active in this market											
2002	4.4%	1.6%	6.4%	12.0%	4.9%	5.6%	5.0%	26.1%	8.6%	10.6%	100%
2008	2.1%	1.1%	4.6%	13.3%	3.7%	6.9%	6.6%	31.6%	10.8%	9.2%	100%
% of worldwide export value in these sectors to Russia											
2002	1.0%	0.5%	2.1%	0.4%	0.7%	1.4%	1.3%	2.2%	0.5%	1.5%	0.8%
2008	1.0%	2.0%	4.5%	1.2%	1.4%	3.0%	2.4%	4.1%	2.6%	3.0%	1.3%

4.3. India

In India, the 10 most important markets cover approximately 69 to77% of the total import or export value for Dutch firms. Four sectors (29, 72, 84 and 85[17]) that are among the 10 largest sectors for imports from India, are also among the 10 largest sectors with respect to exports to India. Half of the 10 most important sectors for imports from India are also among the 10 most important sectors for imports from China. For exports, these are 8 sectors.

Table 24 lists the information concerning the 10 largest sectors for imports from India. As compared to China, total import value in India is less concentrated in the 10 largest sectors, even though one single sector, mineral fuels, oils and products of their distillation (sector 27), accounts for 33% of total import value from this country and has experienced an average annual growth rate of 80% over the period 2002 to 2008. With respect to total import value, we see shares ranging from 0.3% for sector 84 (nuclear reactors, boilers, machinery and mechanical appliances) to 4% for sector 61 (Articles of apparel and clothing accessories, knitted or crocheted), which is low as compared to China. Only half of the 10 largest import sectors have grown faster with respect to total import value than the total import package.

[17] These are respectively organic chemicals; iron and steel; nuclear reactors, boilers, machinery and mechanical appliances; and electrical machinery and equipment.

Table 24: The 10 most important sectors for imports from India

Sector, 2 digit level											
Year/sector	27	29	40	61	62	72	80	84	85	87	All
Average annual import value growth	79.4%	16.0%	24.7%	7.1%	5.1%	59.6%	10.9%	39.1%	-2.2%	8.4%	18.3%
% of total import value (2008) (sum: 68,9%)	32.7%	3.9%	2.5%	4.6%	3.7%	4.6%	3.5%	4.2%	5.1%	4.0%	100%
% of firms importing goods from India active in this market											
2002	x	6.2%	4.1%	10.4%	12.3%	1.1%	2.8%	13.2%	8.6%	2.2%	100%
2008	x	5.6%	5.2%	10.5%	11.1%	2.0%	2.7%	18.4%	12.1%	3.1%	100%
% of worldwide import value in these sectors from India											
2002	0.1%	0.6%	0.4%	3.4%	2.3%	0.2%	2.6%	0.0%	0.5%	0.4%	0.5%
2008	1.4%	0.8%	1.1%	4.0%	2.9%	1.1%	2.5%	0.3%	0.4%	0.6%	0.8%

Table 25 lists the information concerning the 10 largest sectors for exports to India. When looking at the Indian share in Dutch worldwide export value, one finds a similar picture as for China: some shares have grown but others have not. In 2008, these shares ranged from 0.2% for sector 39 (plastics) to 7% for sector 47 (wood pulp and other fibrous cellulosic materials). For only 4 sectors, the average annual growth rate of export value in the 10 largest sectors is higher than that of total export value to India.

Table 25: The 10 most important sectors for exports to India

Sector, 2 digit level											
Year/sector	29	30	38	39	47	48	72	84	85	90	All
Average annual export value growth	2.8%	18.4%	14.5%	24.0%	22.0%	11.0%	10.8%	20.0%	33.1%	1.1%	14.6%
% of total export value (2008) (sum: 77.4%)	11.9%	5.3%	8.5%	9.7%	3.5%	4.6%	3.6%	19.7%	6.5%	4.1%	100%
% of firms exporting goods to India active in this market											
2002	7.6%	1.8%	8.1%	10.9%	1.3%	5.4%	2.9%	33.3%	12.5%	11.5%	100%
2008	4.9%	1.3%	5.7%	10.3%	1.7%	4.3%	2.5%	38.7%	14.2%	10.2%	100%
% of worldwide export value in these sectors to India											
2002	0.9%	0.3%	1.2%	0.2%	7.2%	0.5%	0.4%	0.5%	0.2%	0.8%	0.2%
2008	0.7%	0.5%	1.6%	0.5%	7.3%	1.0%	0.4%	0.9%	0.9%	0.7%	0.3%

4.4. China

As noted previously, there are more Dutch firms importing goods from China than exporting goods to China. For both imports and exports, 8 of the 10 largest important sectors in 2008, were already among the largest 10 in 2002. The 10 largest sectors cover, both in imports and exports 74 to 78% of the total import or export value. Four sectors (29, 39, 84 and 85[18]) that

[18] These are respectively organic chemicals; plastics; nuclear reactors, boilers, machinery and mechanical appliances; and electrical machinery and equipment. The complete list of sectors corresponding to codes mentioned in this section can be found in appendix 1.

are among the 10 largest for imports from China, are also among the 10 largest with respect to exports to China.

Table 26 shows that 3% t0 46% of total worldwide import value in these sectors is sourced from China in 2008. These shares have shown impressive growth since 2002. The average annual growth rate of import value in the ten largest sectors is higher than that of total import value from China, except for 2 sectors: plastics (39) and nuclear reactors, boilers, machinery and mechanical appliances (84).

Table 26: The 10 most important sectors for imports from China

	Sector, CN 2 digit level										
Year/sector	29	39	61	62	64	73	84	85	94	95	All
Average annual import value growth	24.9%	9.1%	21.6%	13.5%	15.2%	28.8%	8.5%	13.2%	19.8%	23.3%	13.1%
% of total import value (2008) (sum: 77.5%)	2.1%	1.9%	3.5%	4.3%	2.3%	2.6%	25.1%	26.5%	3.2%	6.0%	100%
% of firms importing goods from China active in this market											
2002	3.3%	21.7%	9.6%	10.3%	4.9%	15.4%	24.6%	24.3%	10.7%	11.8%	100%
2008	4.7%	33.6%	12.0%	12.6%	6.7%	26.3%	41.3%	38.3%	15.4%	13.2%	100%
% of worldwide import value in these sectors from China											
2002	1.6%	3.5%	9.5%	12.8%	12.5%	3.7%	8.8%	8.8%	8.0%	30.0%	4.6%
2008	3.4%	4.2%	23.7%	25.5%	21.7%	8.4%	12.5%	16.5%	19.1%	46.3%	6.1%

Similar information for the most important Dutch export sectors to China can be found in Table 27. Where for all 10 most important import sectors, China has grown in importance, this is not generally the case for the 10 most important export sectors. For only 7 out of 10 sectors, China has grown in importance, and for only 2 China accounts for more than 2.5% of Dutch export value in that sector. Especially for wood pulp and other fibrous cellulosic materials (sector 47). China is an important destination, accounting for 56% of total Dutch export value. For 6 sectors, the average annual growth rate of export value in the 10 most important sectors is higher than that of total export value to China, for 4 it is lower and for 1 this growth rate is negative.

Table 27: The 10 most important sectors for exports to China

	Sector, 2 digit level										
Year/sector	29	30	38	39	40	47	74	84	85	90	All
Average annual export value growth	-1.1%	13.6%	5.5%	18.5%	53.6%	44.4%	47.2%	6.0%	5.1%	16.6%	12.2%
% of total export value (2008) (sum: 74.2%)	5.2%	3.0%	3.0%	12.2%	3.6%	10.1%	8.1%	17.7%	6.8%	4.5%	100%
% of firms exporting goods to China active in this market											
2002	6.3%	1.5%	5.6%	13.4%	2.4%	1.7%	1.9%	30.7%	12.1%	8.5%	100%
2008	4.3%	1.0%	5.7%	12.9%	3.5%	1.1%	1.5%	36.9%	16.4%	9.6%	100%
% of worldwide export value in these sectors to China											
2002	1.3%	0.6%	1.8%	0.9%	0.1%	20.1%	3.9%	2.5%	1.8%	0.9%	0.7%
2008	0.9%	0.7%	1.6%	1.5%	1.1%	56.0%	23.7%	2.2%	2.4%	2.2%	0.9%

4.5. US

In the US, the 10 largest sectors cover, both in imports and exports 84 to 88% of the total import or export value. The concentration of ten sectors in Dutch-US trade is more intense than for the other BRIC countries, apart from Dutch imports from Russia. For the 10 largest sectors for imports from the US, listed in Table 28, there is overlap with 4 sectors in China and India, and 3 in Russia. For exports those are respectively 6, 7 and 4 sectors. Of the largest sectors for imports from the US, 8 sectors are also largest for Dutch exports to the US.

For these 10 sectors Dutch firms import 2.6% to 32.9% of total import value in these sectors from the US. These shares are quite similar to those of Russia and China. Only six of the sectors have grown faster with respect to total import value than the total import package, 2 have shrunk.

Table 28: The 10 most important sectors for imports from the US

	Sector, 2 digit level										
Year/sector	12	27	28	29	30	38	39	84	85	90	All
Average annual import value growth	5.4%	33.0%	25.6%	-0.3%	27.0%	21.2%	9.3%	-9.7%	9.8%	1.5%	6.6%
% of total import value (2008) (sum: 88.1%)	2.0%	5.5%	2.6%	5.9%	26.3%	4.5%	3.0%	10.4%	16.3%	11.5%	100%
% of firms importing goods from the US active in this market											
2002	1.8%	2.1%	3.0%	5.0%	3.0%	8.1%	22.5%	50.4%	38.8%	25.8%	100%
2008	1.5%	2.4%	3.1%	4.8%	3.7%	8.4%	24.0%	50.5%	39.4%	26.8%	100%
% of worldwide import value in these sectors from the US											
2002	25.9%	1.3%	9.5%	24.1%	23.0%	17.8%	7.7%	15.6%	9.3%	31.3%	9.3%
2008	17.4%	2.6%	21.8%	13.5%	32.0%	30.9%	9.3%	7.4%	14.5%	32.9%	8.7%

As for exports, looking at the US share in Dutch worldwide export value, one finds shares to have grown in half of the sectors. For 4 sectors, the average annual growth rate of export

value is higher than that of total export value to the US, 3 sectors have witnessed a decline. Overall, exports to the US are relatively most important for sector 22, which includes beverages, spirits and vinegar.

Table 29: The 10 most important sectors for exports to the US

Sector, 2 digit level											
Year/sector	22	27	28	29	30	39	72	84	85	90	All
Average annual export value growth	80.9%	34.2%	29.7%	-3.2%	22.2%	5.7%	6.9%	5.8%	-4.1%	-3.2%	7.1%
% of total export value (2008) (sum:84.0%)	6.9%	26.0%	8.0%	4.0%	8.7%	2.3%	4.6%	13.6%	4.4%	5.5%	100%
% of firms exporting goods to the US active in this market											
2002	0.6%	1.3%	1.5%	3.2%	2.2%	12.2%	1.4%	40.4%	16.0%	13.4%	100%
2008	0.6%	1.3%	1.6%	3.2%	2.1%	13.1%	1.2%	44.8%	17.7%	13.6%	100%
% of worldwide export value in these sectors to the US											
2002	2.4%	2.5%	9.3%	5.6%	5.5%	1.6%	8.4%	9.5%	9.8%	17.5%	4.9%
2008	28.9%	5.5%	25.4%	3.3%	10.8%	1.4%	6.0%	8.2%	7.7%	13.2%	4.5%

5. The determinants of entering the Chinese market

5.1. Introduction

In this section, we aim to identify the key characteristics of firms starting to export their goods to China. In the literature, similar estimations modelling the export decisions of firms can be found, yet none of them focuses on a specific destination market, such as China. The research closest to this is Creusen and Lejour (2011) which analyses the export market entry decisions of Dutch firms and their subsequent growth or market exit. They use the same dataset as employed in this paper, yet extended the data base with survey data on financial statistics, production statistics and the general firm register. Following Albornoz et al. (2010) they model the probability that a firm decides to export to a new destination. Here, entry is recorded when a firm which has not exported to a country in year t-1, does export in t and t+1. As to market entry, they find that entry probability rises when the firm started to export (to other markets) in period t-1 and with the GDP of the destination country. The probability of entry into exporting to a specific destination falls with distance to the nearest export market, distance to the Netherlands and import tariffs.

Using the same dataset, Smeets et al. (2008) look into the characteristics of Dutch exporters in 2006 and 2007. Their main results are that the more productive firms are the ones that export, and that common costs and poor institutions are the main impediments to trade. Moreover, GDP and cultural proximity are positively and significantly correlated whereas higher tariffs and greater distance reduce the probability of exporting. Their results are thus

consistent with those of Bernard and Jensen (2004), who examined the factors that influence the probability of exporting for a US firm. They find also that plant variables, such as indicators of past success, labour quality, ownership structure, and product introductions can explain a large fraction of the probability that a plant exports.

Other papers involving similar datasets have looked at indicators such as survival rates in exporting of new exporters (Cadot et al., 2011) and the relation between destination market insecurity and export entry probability (Crozet, Koenig and Rebeyrol, 2008).

5.2. Data and descriptive statistics

We use the International Trade (IH) dataset, as described in section 2. The dataset includes a total of 29,224 distinct firms trading internationally. Naturally, not every firm is recorded in every year, and recorded firms either export goods, import goods or both.

As we are exploring market entry to China, we ignore observations of firms who exported to China the prior year as well as firms that export to China in all years. Here, we have defined entry into exporting to China as recording zero export value to China in year t-1, and a strictly positive export value in year t.[19] We also use the log of market value, which is equal to the total export value to China, of all firms in the sample, for all sectors a firm exports in. This variable is meant to represent the size of the potential market in China.[20] After these modifications, we end up with a slightly unbalanced panel: 159,121 observations which correspond to 28,947 distinct firms that are on average are present for 5.5 years in the panel out of the potential 7 years

Table 30 shows that on average 2.3% of all firms enter into exporting to China in a given year. The table clearly shows that the entry rate has been rising over time.

Table 30: Number of firms in data set and starting to export to China between 2002 and 2008

year	Number of firms in the extended and adjusted dataset	Number of firms entering into exporting to China	Share in total # of firms in the extended dataset that year
2002	22,689		
2003	22,640	451	2.0%
2004	22,742	478	2.1%
2005	22,813	532	2.3%
2006	22,986	531	2.3%
2007	22,926	573	2.5%
2008	22,325	622	2.8%

[19] As we will be using the natural log of a firm's export value in our specifications, and the dataset also includes firms who do not export goods (in some year), we set the natural log of 0 equal to 0. With only one observation with an export value below 1, this modification will not affect our estimation results.

[20] For this variable we identified only 4 observations facing a market value of less than 1 euro (and hence a log of market value below 0).

5.3. Model specification

We aim to estimate a simple model determining the key characteristics of firms starting to export to China. Because of the low share of firms entering each year, too much information would be lost were we to use a fixed effects logit specification. For this reason, we will use a random effects probit specification. Letting *i* be the individual firm and t be the year of potential entry we have constructed the following latent variable model

$$Entry_{ti}^{*} = \alpha_i + \lambda_t + \beta_1 exp_{i,t-1} + \beta_2 region_{i,t-1} + \beta_3 reexp_{i,t-1} + \beta_4 imp_{i,t-1} + \beta_5 \log(expval_{i,t-1}) + \beta_7 newexp_{i,t-1} + \beta_8 newmarket_{i,t-1} + \beta_8 \log(marketsize_{i,t-1}) + \varepsilon_{it}$$

and

$$Entry_{it} = \begin{cases} 0 & if \quad Entry_{it}^{*} \leq 0 \\ 1 & if \quad Entry_{it}^{*} > 0 \end{cases}$$

Our dependent variable, $Entry_{it}$ is a dummy equal to 1 in case firm *i* enters the Chinese market in year *t*. $Exp_{i,t-1}$ is a dummy equal to 1 if firm *i* was a exporter in year *t-1*. The basic idea is that a (Dutch) firm with export experience is more likely to enter the Chinese market than a firm without export experience. $region_{i,t-1}$, $reexp_{i,t-1}$ and $imp_{i,t-1}$ are dummies equal to 1 if firm *i* exported to an other country in the Chinese region,[21] exported goods to China from other countries (re-exports) and imported from China in year *t-1*, respectively. All these dummies indicate whether the firm has already experience with the Chinese market or neighbouring markets. Experience could reduce the entry costs to the Chinese market. For all coefficients we expect a positive value. The $log(val\_exp_{i,t-1})$ is the natural logarithm of the total export value of a firm in year *t-1* to all export destinations. The total export value of a firm indicates the size of the firm. We know from other papers, amongst others Kox and Rojas Romagosa, (2010) for the Netherlands that large export values are positively related to the size of the firm (measured in employment size e.g.) and productivity. Smeets et al. (2008) find that larger firms or more likely to enter destined markets in terms of physical and cultural distance. $Newexp_{i,t-1}$ is a dummy equal to 1 if firm *i* exported in year *t-1*, but not in year *t-2*. This follows the ideas of Albornoz et al. (2010) that new exporters are more likely to enter new markets than incumbent exporters. However, Creusen and Lejour (2011) find that exporting firms follow a stepping stone strategy entering new markets. They start with more nearby and familiar export markets before starting to export outside Europe. Although in general new

[21] The specific countries included in this dummy can be found in appendix 2

exporters are more inclined to enter new markets, in case of China and other destined markets we expect a negative relation. $Newmarket_{i,t-1}$ is a dummy equal to 1 in case firm i started exporting to a new destination in year *t-1*. This is also derived implicitly from Albornoz et al. A more dynamic firm measured by entering new markets is also more likely to enter China. Finally, $log(marketsize_{i,t-1})$ refers to the log of potential market size for firm *i* in year *t-1* where market size for firm *i* is defined as the total export value to China in sectors this firm is active in. For example, if a firm only sells in the 'food' sector, its market size will be the total value of Dutch food exports to China. Moreover, α_i is a firm-specific fixed effect, λ_t are a set of year dummies and ε_{it} is a $N(0,\sigma^2_\varepsilon)$ distributed error term.

Table 31 lists the mean values for the explanatory variables just listed, averaged over the years. It clearly shows that for all variables, except for $newexporter_{t-1}$, the mean value is higher is the firm enters into exporting to China than if it does not. Moreover, differences seem rather large: for almost all variables, the mean value for entering firms is more than 2 times as large as the mean under no entry. Hence, Table 31 already gives a first insight about potential signs of parameter coefficients in the model.

Table 31: Summary statistics for market entry in China

Mean values	No entry ($China\_entry_t=0$)	Entry ($China\_entry_t=1$)
$reexp_{i,t-1}$	0.0123	0.1305
$imp_{i,t-1}$	0.1862	0.4782
$newexp_{i,t-1}$	0.0794	0.0629
$newmarket_{i,t-1}$	0.3434	0.8004
$exp_{i,t-1}$	0.4649	0.8889
$logexp_{i,t-1}$	5.8147	12.1130
$logexp_{i,t-1}$ (if export $value_{t-1}$>0)	12.5095	13.6265
$region\_exp_{i,t-1}$	0.0808	0.5309
$logmarketsize_{i,t-1}$	8.0386	16.4377
$logmarketsize_{i,t-1}$ (if market $size_{-1}$>0)	17.3265	18.4982

5.4. Results

Table 32 below lists our estimation results. Instead of the coefficients, it reports the average marginal effects in % terms, hence the average marginal effect of an explanatory variable times 100. This average is defined as the average of the marginal effect of the coefficient across individuals. In appendix 3, the coefficients of the model itself are presented. The year dummies are not reported, but are highly significant.

The 'Marketsize China Region' specification seems to perform best, with all coefficients being highly significant and with the expected signs. The results indicate that a

firm's probability of entering into exporting to China significantly increases if the year prior to (potential) entry it exports goods to countries in the Chinese region; re-exports goods to China; imports goods from China; has expanded to new export markets; faces a large potential market size; and has a large export value. Its probability decreases if the firm is a recent export starter. For example, on average, the probability of entry increases by 3.72% if the firm exported goods to countries that are geographically and/or culturally relatively close to China. Experience with re-exports to China has the largest impact on the probability of exporting goods, produced in the Netherlands to China. This is not surprising, these firms know already the Chinese market. Quite often these firms are wholesale companies. For them it makes nearly no differences exporting goods made in the Netherlands or made in other countries.[22]

Table 32: Determinants of the firm entry decision to China

Average marginal effects (in %)	Market size China region	Market size non EU	Market size LLM	Market size Asia	Top10 China region
region_exp$_{i,t-1}$	3.72***				3.75***
nonEU_exp$_{t-1}$		1.99***			
LLM_exp$_{t-1}$			1.96***		
Asia_exp$_{t-1}$				3.48***	
reexp$_{i,t-1}$	5.25***	5.51***	5.58***	5.30***	5.36***
imp$_{i,t-1}$	1.35***	1.37***	1.41***	1.40***	1.36***
logexp$_{i,t-1}$	0.112***	0.163***	0.110***	0.112***	0.121***
newexp$_{i,t-1}$	-0.550***	-0.541***	-0.625***	-0.535***	-0.579***
newmarket$_{i,t-1}$	0.703***	0.529***	0.783***	0.659***	0.711***
logmarketsize$_{i,t-1}$	0.193***	0.189***	0.218***	0.190***	
top10$_{t-1}$					0.858***
exp$_{i,t-1}$	-6.96***	-13.0***	-8.94***	-6.83***	-0.866***
Observations	*113792*	*113792*	*113792*	*113792*	*113792*
Number of firms/groups	*27473*	*27473*	*27473*	*27473*	*27473*
Av. obs per group (max 5)	*4.1*	*4.1*	*4.1*	*4.1*	*4.1*
Log likelihood	*-10064.494*	*-10258.077*	*-10331.071*	*-10069.724*	*-10067.928*

[22] Note we have no information whether goods have been produced by the same Dutch firm which exports the goods.

Regarding the value for *exp*, the dummy indicating whether the firm exported goods the prior year or not, the results seem to indicate that the entry probability decreases when firms exports the year prior to entry. This could be due to the preference of firm to access nearby markets first, which is not China for Dutch firms as discussed before. Moreover, one must take into account that as soon as the export dummy equals 1, (log) export value and (log) market size is positive as well.

Considering the fact that on average approximately 2.4% of all firms in the sample enter into exporting to China, the marginal effects, especially those for *reexp*, *region* and *imp*, are large, pointing to the importance of experience with familiar markets.

In order to check for some possible correlations, we have performed robustness analyses concerning the region dummy and the log of potential market size. For the region dummy, we have re-estimated the model using 3 different regional dummy variables of whether a firm has experience in exporting to distant countries. These dummies are *nonEU*, for whether a firm exported goods outside the EU, *LLM*, for whether a firm exported to lower and lower middle income countries, and *Asia*, which includes the countries in the region dummy, as well as other Asian countries. We find that the signs of the other coefficients, and most often their size as well, remain unchanged. Moreover, the effects are clearly stronger for the China region and Asia dummies, indicating that what matters most is experience with exporting to Asia, rather than the weaker notion of experience outside the EU, or experience with lower or lower middle income countries. Table 33 lists the mean values for the alternative explanatory variables.

Using *top10*, a dummy indicating whether a firm exports goods in a sector that was one of the 10 most important export sectors of the Netherlands to China in terms of value in 2002, we find that it is a solid replacement for *logmarketsize*. Using this dummy, the average marginal effect of all other explanatory variables slightly increases, except for *newexporter*.

Table 33: Summary statistics of alternative variables

Mean values	No entry ($China\_entry_{i,t}=0$)	Entry ($China\_entry_{i,t}=1$)
$nonEU\_exp_{t-1}$	0.2554	0.7960
$top10_{t-1}$	0.2899	0.7496
LLM_exp_{t-1}	0.0898	0.4550
$Asia\_exp_{t-1}$	0.0945	0.5704
$China\_region\_exp_{t-1}$	0.0808	0.5309

Overall, the robustness tests for *region* show that explanatory power is reduced, yet results only mildly affected, when we employ *nonEU*, *LLM* or *Asia* instead of *region*. The

same holds for using a dummy for the top 10 export sectors as of 2002 except for the log of potential market size to indicate whether the firm's export package is high in demand in China.

5.5. US estimation

Knowing what firm characteristics might determine market entry into China is valuable, but a more interesting question might be as to what extent these characteristics are different from firms starting into exporting to US. Therefore, this section repeats the estimation for Dutch firms entering into exporting to the US. Prior to the analysis, we have 'cleaned' the dataset in a similar fashion as for the estimation into entering into exporting to China. We have omitted all firms that recorded a positive export value to the US in all years, as well as observations where the firm exported to the US the prior year. As a consequence, we are left with an unbalanced panel including 148,874 observations, corresponding to 28,169 distinct firms that are each export on average for 5.3 years out of a potential 7 years. On average 4.2% of all firms in dataset enter into exporting to the US in a given year.

The model specification is exactly in line with the model specification for explaining entry into exporting to China. Definitions of the dependent variables are analogous to those for the specification for entry into exporting to China and the list of countries belonging to the US region can again be found in appendix 2. Table 34 lists the summary statistics concerning the explanatory variables. It again clearly shows that for all variables, except for $newexporter_{t-1}$, the mean value is higher is the firm enters into exporting to US than if it does not. Again, we have adopted a random effects probit specification.

Table 34: Summary statistics for market entry in US

Mean values	No entry ($US\_entry_{i,t}=0$)	Entry ($US\_entry_{i,t}=1$)
$reexp_{i,t-1}$	0.0237	0.1877
$imp_{i,t-1}$	0.2062	0.5993
$newexp_{i,t-1}$	0.0785	0.0856
$newmarket_{i,t-1}$	0.3009	0.6852
$exp_{i,t-1}$	0.4203	0.7837
$logexp_{i,t-1}$	5.2261	10.1241
$logexp_{i,t-1}$ (if export $value_{t-1}>0$)	12.3745	12.8723
$region\_exp_{i,t-1}$	0.0148	0.1173
$logmarketsize_{i,t-1}$	7.8788	15.3745
$logmarketsize_{i,t-1}$ (if market $size_{-1}>0$)	18.7850	19.6312

Table 35: Determinants of the firm entry decision to US

Average marginal effects (in %)	Market size US region	Market size non EU	Market size HHM	Top 10, US region	Top 10, nonEU	Top 10, HHM
region_exp$_{i,t-1}$	5.76***			5.97***		
nonEU_exp$_{t-1}$		2.85***			2.96***	
HHM_exp$_{t-1}$			2.88***			2.99***
reexp$_{i,t-1}$	7.83***	7.73***	7.75***	7.96***	7.84***	7.85***
imp$_{i,t-1}$	3.95***	3.83***	3.85***	4.08***	3.93***	3.95***
logexp$_{i,t-1}$	0.112***	0.160***	0.140***	0.125***	0.172***	0.152***
newexp$_{i,t-1}$	-1.05***	-0.769***	-0.775***	-1.14***	-0.844***	-0.849***
newmarket$_{i,t-1}$	1.94***	1.25***	1.31***	2.04***	1.31***	1.38***
logmarketsize$_{i,t-1}$	0.337***	0.279***	0.280***			
top10$_{t-1}$				0.862***	0.697***	0.713***
exp$_{i,t-1}$	-10.1***	-10.6***	-9.67***	-0.290	-1.81***	-1.32***
Observations	*106063*	*106063*	*106063*	*106063*	*106063*	*106063*
Number of firms	*26603*	*26603*	*26603*	*26603*	*26603*	*26603*
Av. obs per group (max 5)	*4*	*4*	*4*	*4*	*4*	*4*
Log likelihood	*-14544.429*	*-14485.981*	*-14479.538*	*-14574.61*	*-14506.754*	*-14499.77*

Table 35 present the estimation results. All coefficients are significant at the 1% level and have the expected sign. Generally spoken the coefficients are larger for entering the US market than the Chinese markets. This can be expected from these marginal effects because the entry probability is 4.2 % for the US and only 2.4% for China. When corrected for the share of firms entering into exporting to the US each year, the size of effects are virtually the same. This indicates that China might be just as 'any other country' as export destination considered from firm determinants. Experience with a familiar market seem to be one of the most important determinants whether it is reexports, exports to a nearby country or imports.

6. Conclusions

In the last three decades, the share of the BRIC countries (Brazil, Russia, India and China) in global GDP has grown rapidly to 24% to date (measured in Purchasing Power Parities). Dutch trade with the BRIC countries has grown substantially over these decades, although at

different rates. Also, trade balances with the four countries developed differently, but they all turned into a substantial and increasing trade deficit for the Netherlands. The BRIC countries already have a share of 14 percent in Dutch imports, although the share is exports is only 4%.

Dutch firms trading with these countries are on average larger and more productive than the average exporting and importing firm. The former firms export on average to 30 countries while most exporting firms only have one or two foreign destinations. The importing firms source their products from at least ten countries.

The number of firms exporting to and importing from the BRIC countries is rapidly increasing between 2002 and 2008. Especially China and India stand out in this respect. This is different from trading partners with more stable markets, like the US. Moreover, an increasing share of trade with BRIC countries is conducted by Dutch two-way traders, although the share of two-way traders in the value of imports and exports is still much lower than for trade with developed countries. Most firms trading with the BRIC countries do not survive on these foreign markets for consecutive years. This is not different from other countries of origin and destination, but entry rates are higher, so more firms survive in the markets of the BRIC countries in the end. These surviving firms will become important traders after a few years. In particular for exports to Brazil, Russia and India, new exporters dominate the trade performance of incumbents after five years.

On average Dutch firms only export two or three products to one of the BRIC countries, this is not different to the US, but for imports it is different. Importing firms source two products from Brazil and Russia and about nine products from China in 2008. The last number is comparable to the number of imported products from the US by an average Dutch firm.

Imports and exports are not evenly spread across products or sectors but rather concentrated in a limited number of sectors. We find that a limited number of sectors generally account for the bulk of trade. The ten most important sectors in exports and imports account for more than 70 percent of all exports to a BRIC country or imports from a BRIC country. The most extreme are Dutch imports from Russia: 90 percent is oil and gas. Moreover, the most important import and export sectors often coincide, both within, as well as between countries.

On average approximately 2.4% of all firms in the sample enter into exporting to China in a year. Experience with the Chinese market by re-exporting or importing or export experience with markets in the Chinese region are important determinants for market entry. The size of

the firm measured by total export value and its export dynamics measured by entry to other markets are also determinants which increase the probability to enter the Chinese market. Besides, the size of the export market is important. These determinants are not different for China than for the US, although the magnitude differs.

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Appendices

6.1. Appendix 1; 2 digit product codes

2 digit product codes	
10	Cereals
12	Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal plants; straw and fodder
16	Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates
20	Preparations of vegetables, fruit, nuts or other parts of plants
22	Beverages, spirits and vinegar
23	Residues and waste from the food industries; prepared animal fodder
26	Ores, slag and ash
27	Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes
28	Inorganic chemicals; organic or inorganic compounds of precious materials, of rare-earth metals, of radioactive elements or of isotopes
29	Organic chemicals
30	Pharmaceutical products
31	Fertilisers
38	Miscellaneous chemical products
39	Plastics and articles thereof
40	Rubber and articles thereof
47	Pulp of wood or of other fibrous cellulosic material; recovered (waste and scrap) paper or paperboard
48	Paper and paperboard; articles of paper pulp, of paper or of paperboard
54	Man-made filaments; strip and the like of man-made textile materials
60	Knitted or crocheted fabrics
61	Articles of apparel and clothing accessories, knitted or crocheted
62	Articles of apparel and clothing accessories, not knitted or crocheted
64	Footwear, gaiters and the like; parts of such articles
70	Glass and glassware
72	Iron and steel
73	Articles of iron or steel
74	Copper and articles thereof
80	Tin and articles thereof
84	Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof
85	Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles
87	Vehicles other than railway or tramway rolling stock, and parts and accessories thereof
90	Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instruments and apparatus; parts and accessories thereof
94	Furniture; bedding, mattresses, mattress supports, cushions and similar stuffed furnishings; lamps and lighting fittings, not elsewhere specified or included; illuminated signs, illuminated nameplates and the like; prefabricated buildings
95	Toys, games and sports requisites; parts and accessories thereof

6.2. Appendix 2; country groups

China_region countries

Bhutan	Korea ,Dem Rep.	Myanmar
Brunei	Korea, Rep.	Nepal
Cambodia	LaoPDR	Philippines
Hong Kong	Macau	Singapore
Indonesia	Malaysia	Thailand
Japan	Mongolia	Vietnam

Asia countries

Afghanistan	India	Macau	Philippines
Bangladesh	Indonesia	Malaysia	Singapore
Bhutan	Japan	Mongolia	Sri Lanka
Brunei	Korea ,Dem Rep.	Myanmar	Thailand
Cambodia	Korea, Rep.	Nepal	Vietnam
Hong Kong	Lao PDR	Pakistan	

LLM countries

Afghanistan	Congo, Dem. Rep	Haiti	Maldives	Paraguay	Timor Leste
Angola	Congo, Rep.	Honduras	Mali	Philippines	Togo
Armenia	Côte d'Ivoire	India	Marshall Islands	Rwanda	Tonga
Bangladesh	Djibouti	Indonesia	Mauritania	Samoa	Tunisia
Belize	Ecuador	Iraq	Micronesia, Fed. Sts.	São Tomé and Principe	Turkmenistan
Benin	Egypt, Arab Rep.	Jordan	Moldova	Senegal	Tuvalu
Bhutan	El Salvador	Kenya	Mongolia	Sierra Leone	Uganda
Bolivia	Eritrea	Kiribati	Morocco	Solomon Islands	Ukraine
Burkina Faso	Ethiopia	Korea, Dem Rep.	Mozambique	Somalia	Uzbekistan
Burundi	Gambia, The	Kosovo	Myanmar	Sri Lanka	Vanuatu
Cambodia	Georgia	Kyrgyz Republic	Nepal	Sudan	Vietnam
Cameroon	Ghana	Lao PDR	Nicaragua	Swaziland	West Bank and Gaza
Cape Verde	Guatemala	Lesotho	Niger	Syrian Arab Republic	Yemen, Rep.
Central African Rep.	Guinea	Liberia	Nigeria	Tajikistan	Zambia
Chad	Guinea Bisau	Madagascar	Pakistan	Tanzania	Zimbabwe
Comoros	Guyana	Malawi	Papua New Guinea	Thailand	

HHM countries

All countries except countries in the LLM_countries list and the EU countries as well as Norway, Switzerland, Iceland and Liechtenstein.

Non EU countries

All countries except countries the EU countries as well as Norway, Switzerland, Iceland and Liechtenstein.

US_region countries

Canada	Mexico

6.3. Appendix 3: Model coefficients, entry into exporting to China

The table below lists the coeffients for the core specification and alternative specifications. Note that due to the probit specifications, these coefficients only indicate the sign of the effect. For the size of the effect, the calculation of average marginal effects or marginal effect at average is required.

Table 36: Determinants of the firm entry decision to China

COEFFICIENTS	MARKETSIZE CHINA REGION	MARKETSIZE nonEU	MARKETSIZE LLM	MARKETSIZE ASIA	TOP10 CHINA REGION
$region\_exp_{i,t-1}$	0.814***				0.818***
$nonEU\_exp_{t-1}$		0.748***			
LLM_exp_{t-1}			0.545***		
$Asia\_exp_{t-1}$				0.798***	
$reexp_{i,t-1}$	0.873***	0.927***	0.930***	0.874***	0.883***
$imp_{i,t-1}$	0.398***	0.430***	0.441***	0.407***	0.399***
$logexp_{i,t-1}$	0.0369***	0.0574***	0.0391***	0.0365***	0.0399***
$newexp_{i,t-1}$	-0.209***	-0.222***	-0.266***	-0.200***	-0.221***
$newmarket_{i,t-1}$	0.249***	0.201***	0.307***	0.230***	0.251***
$logmarketsize_{i,t-1}$	0.0636***	0.0664***	0.0772***	0.0620***	
$top10_{t-1}$					0.296***
$exp_{i,t-1}$	-1.127***	-1.641***	-1.311***	-1.111***	-0.246***
Observations	*113792*	*113792*	*113792*	*113792*	*113792*
Number of groups	*27473*	*27473*	*27473*	*27473*	*27473*
Av. obs per group (max 5)	*4.1*	*4.1*	*4.1*	*4.1*	*4.1*
Log likelihood	*-10064.494*	*-10258.077*	*-10331.071*	*-10069.724*	*-10067.928*

6.4. Appendix 4: Model coefficients, entry into exporting to the US

The table below lists the coeffients for the core specification and alternative specifications for the US estimation. Note that due to the probit specifications, these coefficients only indicate the sign of the effect. For the size of the effect, the calculation of average marginal effects or marginal effect at average is required.

Table 37: Determinants of the firm entry decision to US

COEFFICIENTS	MARKETSIZE, US region	MARKETSIZE, nonEU	MARKETSIZE, HHM	TOP 10, US region	TOP 10, nonEU	TOP 10, HHM
region_exp$_{i,t-1}$	0.704***			0.719***		
nonEU_exp$_{t-1}$		0.518***			0.534***	
HHM_exp$_{t-1}$			0.505***			0.521***
reexp$_{i,t-1}$	0.866***	0.861***	0.859***	0.873***	0.867***	0.864***
imp$_{i,t-1}$	0.670***	0.653***	0.652***	0.686***	0.665***	0.664***
logexp$_{i,t-1}$	0.0228***	0.0322***	0.0280***	0.0254***	0.0347***	0.0304***
newexp$_{i,t-1}$	-0.245***	-0.172***	-0.172***	-0.270***	-0.190***	-0.190***
newmarket$_{i,t-1}$	0.391***	0.255***	0.266***	0.412***	0.266***	0.278***
logmarketsize$_{i,t-1}$	0.0683***	0.0562***	0.0561***			
top10$_{t-1}$				0.172***	0.139***	0.141***
exp$_{i,t-1}$	-1.205***	-1.260***	-1.179***	-0.0575	-0.323***	-0.242***
Observations	106063	106063	106063	106063	106063	106063
Number of groups	*26603*	*26603*	*26603*	*26603*	*26603*	*26603*
Av. obs per group (max 5)	*4*	*4*	*4*	*4*	*4*	*4*
Log likelihood	*-14544.429*	*-14485.981*	*-14479.538*	*-14574.61*	*-14506.754*	*-14499.77*