

# A closer look at BRIC traders

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**Economic growth is predominantly concentrated in the developing countries. China, India, Brazil and Russia are rapidly gaining economic power. Their current and future growth opens up a huge potential for the trade and investment relations of Dutch firms. This chapter provides an overview of trade relations with the BRIC countries, and illustrates factors that may contribute or hamper trade with these fast-growing economies. It turns out that trade with BRIC is often carried out by large and medium-sized enterprises. BRIC traders are also characterised by higher productivity, foreign ownership and two-way trade.**

## 2.1 Introduction

BRIC countries are increasingly important for the Dutch economy. The term BRIC is an acronym for the economies of Brazil, Russia, India and China, and it is used as a symbol of the shift in global economic power towards developing fast-growing countries.<sup>1)</sup> Approximately 16 percent of Dutch imports originate from the BRIC countries. These imports are an important source for re-exports. Although exports to the BRICs are still at a modest level, the fast growth in the BRIC countries and the slow growth in Europe make it likely that the BRIC countries will become a more important market for exporting firms in years to come. This makes it relevant to gain insight in the enterprise characteristic of firms that are actively trading with the BRIC countries and to determine which factors or firm characteristics are crucial for success on the BRIC markets.

Previous editions of the Internationalisation Monitor (CBS 2009, 2010, 2011) have shown that Dutch traders are larger firms than non-traders, that they pay higher wages, are more productive, and spend more on research and development. This is in line with current literature (Bernard and Jensen, 1997; Wagner, 2005). However, there is heterogeneity within trading firms. Two-way traders, who import as well as export, are more productive and pay higher wages than exporters or importers alone. Also, foreign owned enterprises are more productive than Dutch owned firms. The most recent research shows that the choice of destination markets is influenced by firm characteristics. Firms that *mainly* import from China/BRIC countries are on average the smallest, paying the lowest salaries (CBS, 2011).

What are the other enterprise characteristics of BRIC traders? Which firm characteristics determine trade relations with BRIC? This chapter will fill the knowledge gap on

<sup>1)</sup> The term BRIC was first used in a Goldman Sachs report from 2003 which speculated that by 2050 these four economies would be wealthier than most of the current major economic powers.

the characteristics of firms active in BRIC markets. In section 2.3 we briefly describe BRIC trade and BRIC traders. In order to see which firm characteristics determine BRIC market presence, we will analyse the success and failure factors of firms that export to or import from the BRIC countries in section 2.4. Section 2.5 concludes with a brief summary.

## 2.2 Data and methodology

In order to investigate the characteristics of firms trading with the BRIC markets, the employer-employee dataset (LEED) for 2010 was linked to the International Trade in Goods Statistics database at the micro level, using the unique enterprise identifier as key variable. The dataset contains 200,671 firms, of whom 104,070 exporters and 165,337 importers. Of these, 68,736 enterprises could be characterised as two-way traders, who export as well as import. The share of high/low paid employees per enterprise was taken from the employer-employee database. Enterprise characteristics such as size and economic activity were added to the dataset, both of which are standard information from the General Business Register. International trade status per enterprise was obtained from the International Trade Department. Locus of control, i.e. the nationality of the ultimate controlling institutional unit (UCI) was obtained from the FATS statistics, and R&D from the community innovation survey (CIS). Labour productivity was constructed by dividing the value added (SBS data) by the number of employees. Following the methodology used in chapter 7 of the Internationalisation Monitor 2011, the dataset was extended with types of product traded according to their factor intensity (Van Marrewijk, 2002). Five main groups of products are distinguished at the 3-digit SITC level, namely primary products, natural resource intensive products, unskilled labour intensive products, technology intensive products and human-capital intensive products.

The next section presents a number of descriptive tables to provide insight in the size, value, and composition of Dutch trade flows from and to the BRIC countries and show characteristics of firms trading with BRIC. We will run several regression models in order to investigate the success and failure factors of traders with the BRIC countries. Within this analysis, we will cluster several sorts of firm heterogeneity. Aside from BRIC exporters and BRIC importers as a total group we will also analyse firms that are active in the individual BRIC countries. Additionally we will analyse the effect of different levels of BRIC orientation. Some firms export almost exclusively to the BRIC countries while others export only a fraction. We expect to see different effects/characteristics.

## 2.3 Descriptive statistics

### Dutch imports from the BRIC countries

Table 2.3.1 summarises the trade between the Netherlands and the BRIC countries. BRIC products form an important part of Dutch imports. Their value is 42 billion euro<sup>2)</sup>, almost 16 percent of total Dutch imports. Most of these products come from China. Table 2.3.1 shows that more than 25 thousand firms in the Netherlands imported from the BRIC countries in 2010. Almost 90 percent of them imported from China, which represents approximately 60 percent of the total BRIC import value.

#### 2.3.1 Importance of trade with the BRICs for Dutch firms (2010)

	Total		BRIC		Brazil		Russia		India		China	
	imports	exports	imports	exports	imports	exports	imports	exports	imports	exports	imports	exports
<b>Firms</b>												
Total	165,337	104,070	25,405	6,613	2,018	1,543	1,361	3,295	5,400	2,304	22,474	3,558
% Total			15.4	6.6	1.2	1.5	0.8	3.2	3.3	2.2	13.6	3.4
% BRIC					7.9	23.3	5.4	49.8	21.3	34.8	88.5	53.8
Group 1 (>0%–25%)			12,990	5,538	1,482	1,482	1,202	2,915	4,219	2,163	11,935	3,131
Group 2 (>25%–50%)			2,903	469	193	32	49	152	339	68	2,501	176
Group 3 (>50%–<75%)			2,186	178	70	12	18	64	203	28	1,927	62
Group 4 (75%–<100%)			3,040	179	71	9	30	50	238	18	2,615	91
Group 5 (100%)			4,286	249	202	8	62	114	401	27	3,496	98
<b>Value</b>												
euro (bln)	274.0	278.6	42.2	10.0	4.0	1.4	11.0	3.3	3.0	1.1	24.0	4.0
% Total			15.4	3.6	1.4	0.5	4.1	1.2	1.1	0.4	8.8	1.5
% BRIC					9.3	14.3	26.8	33.2	7.0	12.0	56.9	40.7
<b>Average value (mln €)</b>												
Total	1.7	2.7	1.7	1.5	1.9	0.9	8.3	1.0	0.5	0.5	1.1	1.1
Group 1 (>0%–25%)			0.7	1.3	1.2	0.9	3.6	0.9	0.6	0.5	0.4	0.9
Group 2 (>25%–50%)			5.7	2.6	7.6	3.1	138.1	2.7	1.0	0.9	2.3	2.1
Group 3 (>50%–<75%)			2.5	3.6	1.4	0.6	3.1	1.6	0.5	0.2	2.5	5.3
Group 4 (75%–<100%)			3.3	4.0	8.4	0.5	3.2	3.2	0.5	0.8	3.4	5.5
Group 5 (100%)			0.1	0.3	0.1	0.1	0.2	0.5	0.1	0.1	0.1	0.1
<b>BRIC activity (%)</b>												
No BRIC	84.6	93.6										
1 BRIC country	12.6	4.1	81.9	63.7	38.5	19.9	26.7	50.1	31.1	28.3	80.0	45.1
2 BRIC countries	2.2	1.2	14.1	18.9	23.6	21.5	30.1	20.8	51.8	26.2	15.5	24.6
3 BRIC countries	0.5	0.6	3.2	9.2	27.5	23.7	27.8	12.8	13.2	22.1	3.6	15.1
All the BRICs	0.1	0.5	0.8	8.2	10.4	34.9	15.4	16.4	3.9	23.4	0.9	15.1

<sup>2)</sup> The numbers from the dataset differ from the official Statline numbers due to the fact that not all official trade flows could be linked to a firm located in the Netherlands. Some trade flows are linked-mismatches, others are from foreigners without an establishment in the Netherlands. See chapter 10 for further information on the matching of trade flows to enterprises.

About 80 percent of the importers in our sample are active in China only. Importers from the other three BRIC countries tend to be active in multiple BRIC countries. The different groups indicated in the table represent the share of BRIC trade or of the individual BRIC countries in the total trade for every BRIC trader. It explains the importance of BRIC trade for the individual firms. To be more precise, importers in group 1 import between 1 en 25 percent of their total imports from the BRIC countries. As table 2.3.1 shows, for more than half of the firms that import from the BRIC countries, the BRIC imports are just a fraction (>0–25 percent) of the firm’s total imports. The much smaller group of importers in group 2 import between 25 and 50 percent of their total imports from the BRIC countries. For almost 30 percent of all BRIC importers the BRIC imports make up more than 75 percent of their total imports. This is most common for importers trading with China. Because most BRIC importers are exclusively active in China, this affects the total BRIC import numbers.

The average import value of BRIC importers does not differ from that of importers in general. There are, however, substantial differences between the BRIC traders. Traders with India, for example, trade a smaller average value per firm than the other BRIC traders. The trade value of firms importing from India is very different from that of Russian import traders who have the highest average trade value per firm. One explanation is that Dutch-Russian trade is concentrated on raw material transactions due to Russia’s resource richness. These are products that are usually traded in bulk and as such provide a high average trade value per firm. Firms that are fully specialised in BRIC imports have the lowest average value per firm.

### 2.3.2 Products traded between the Netherlands and the BRICs (in percentages of total value, 2010)

	BRIC		Brazil		Russia		India		China	
	imports	exports	imports	exports	imports	exports	imports	exports	imports	exports
Primary products	38.2	33.7	83.6	30.0	93.1	32.5	49.0	27.0	3.8	38.0
Natural resource intensive products	3.0	1.2	2.7	4.5	5.5	0.6	2.0	1.0	1.9	0.6
Unskilled labour intensive products	13.5	2.3	0.9	2.3	0.1	3.4	17.0	1.9	21.4	1.5
Technology-intensive products	35.3	53.2	10.7	54.8	0.8	49.9	19.8	57.1	57.3	54.3
Human-capital intensive products	10.1	9.5	2.1	8.4	0.4	13.6	12.3	13.0	15.7	5.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 2.3.2 shows which types of products are traded between the Netherlands and the BRIC countries. The Netherlands imports quite different products from each BRIC country. Imports from India are relatively diverse in that all types of products play a substantial role, except for natural resource intensive products. Imports from Brazil and Russia concentrate on primary products. Imports from China focus more on technology intensive products

(almost 60 percent), although unskilled labour intensive and human-capital intensive products also play a substantial part.

Table 2.3.3 shows to what extent firms are specialised in the different type of products they trade. It reveals that many import firms are specialised in technology-intensive products. This picture is relatively consistent for all countries except Brazil. Here imports are dominated by primary products. The reason why fewer firms that import from Russia are highly specialised in primary products, even though most imports are primary products, is because these firms trade in bulk. A reasonable share of firms that import from India and China are also specialised in unskilled labour intensive and human-capital intensive products.

### 2.3.3 Product specialization by firms in trade with the BRICs (percentages of firms)

	BRIC		Brazil		Russia		India		China	
	importers	exporters	importers	exporters	importers	exporters	importers	exporters	importers	exporters
<b>Share primary products in BRIC</b>										
0	88.9	79.1	48.8	78.0	82.1	73.8	85.3	82.1	92.9	82.2
>0%–25%	3.0	3.7	1.7	6.2	2.4	4.1	3.9	3.8	2.3	2.7
>25%–75%	0.8	1.2	1.6	1.3	1.5	0.8	1.1	3.2	0.6	3.1
>75%–100%	7.3	15.9	47.9	14.5	14.0	21.3	9.7	11.0	4.2	11.9
<b>Share natural resource intensive products in BRIC</b>										
0	87.7	94.3	91.3	95.0	92.4	95.0	89.1	94.9	88.3	95.2
>0%–25%	7.9	3.7	1.5	2.9	1.2	3.2	5.3	2.5	7.7	2.5
>25%–75%	1.5	0.6	1.0	0.6	1.4	0.6	1.4	0.7	1.5	0.4
>75%–100%	2.9	1.5	6.1	1.5	5.0	1.2	4.1	1.9	2.5	1.8
<b>Share unskilled labour intensive products in BRIC</b>										
0	57.3	83.1	89.6	90.0	86.3	82.4	62.1	89.5	56.1	85.6
>0%–25%	12.9	6.7	2.7	3.8	3.2	6.8	4.6	3.2	13.3	5.1
>25%–75%	8.2	1.8	0.7	1.3	1.9	1.8	4.6	1.6	8.7	1.1
>75%–100%	21.6	8.4	6.9	4.9	8.7	9.1	28.7	5.6	21.9	8.2
<b>Share technology-intensive products in BRIC</b>										
0	40.8	38.0	68.5	28.6	51.5	46.6	59.3	29.1	37.3	32.3
>0%–25%	14.9	8.4	5.4	8.1	3.2	8.3	7.4	6.3	15.3	7.6
>25%–75%	10.0	6.6	2.8	9.9	4.5	6.1	4.9	6.9	10.3	5.3
>75%–100%	34.2	47.0	23.3	53.3	40.9	39.0	28.5	57.8	37.1	54.8
<b>Share human-capital intensive products in BRIC</b>										
0	53.1	61.9	76.7	66.4	64.1	59.7	62.3	70.3	52.7	68.0
>0%–25%	19.4	13.7	9.3	10.8	6.8	13.0	11.7	10.5	19.9	12.7
>25%–75%	9.8	5.6	3.1	8.3	4.6	5.8	7.3	3.7	9.7	3.4
>75%–100%	17.7	18.9	10.9	14.5	24.5	21.5	18.6	15.5	17.7	15.8



Table 2.3.4 shows BRIC trade by sector. The wholesale and retail trade sector dominate BRIC imports, with more than half of the BRIC importers and almost 40 percent of the total BRIC import value. Also many BRIC imports enter the Netherlands via transport and storage enterprises. This is not surprising, because a large part of the imports from China is destined for re-exports. There are, however, considerable differences between the BRIC countries. For example, for importers from Russia, the total import value of the manufacturing sector is more than double the value of the wholesale and retail trade sector. The manufacturing sector imports just about half of the total Russian import value. Transportation and storage, on the other hand, is quite important for the imports from China and India. While only 3 to 4 percent of these firms are active in this sector, their import value is around 40 percent of the total import value from these countries.

### 2.3.4 Traders and trade value by sector (in percentages, 2010)

	Total		BRIC		Brazil		Russia		India		China	
	firms	value	firms	value	firms	value	firms	value	firms	value	firms	value
<b>Import</b>												
A Agriculture, forestry and fishing	4.2	0.5	0.8	0.1	1.8	0.2	0.3	0.0	0.9	0.2	0.7	0.2
B Mining and quarrying	0.1	0.9	0.1	0.2	0.4	0.0	0.7	0.1	0.4	2.6	0.1	0.1
C Manufacturing	11.4	27.9	15.5	23.3	21.1	37.9	28.9	51.6	21.0	14.9	15.5	8.6
D Electricity and gas supply	0.1	2.0	0.2	2.3	0.1	0.0	0.4	8.4	0.2	0.0	0.2	0.0
E Water supply and waste management	0.2	0.2	0.2	0.0	0.2	0.1	0.1	0.0	0.2	0.0	0.1	0.0
F Construction	6.2	0.5	1.9	0.1	1.2	0.0	1.2	0.0	1.1	0.0	2.0	0.1
G Wholesale and retail trade	46.5	46.6	55.3	37.3	54.0	38.0	36.7	23.1	54.5	34.3	54.8	44.2
H Transportation and storage	2.5	15.7	3.1	30.1	6.9	15.4	7.7	16.0	4.0	45.5	3.0	37.2
I Accommodation and food serving	2.2	0.1	0.6	0.1	0.2	0.0	0.4	0.0	0.3	0.2	0.6	0.1
J–U Services&other sectors	26.6	5.8	22.4	6.5	13.8	8.3	23.4	0.6	17.7	2.3	23.0	9.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
<b>Export</b>												
A Agriculture, forestry and fishing	5.1	1.2	2.0	1.0	3.0	0.7	2.2	1.5	1.3	0.5	1.8	0.9
B Mining and quarrying	0.1	2.3	0.4	0.6	1.0	3.1	0.5	0.3	0.7	0.3	0.4	0.1
C Manufacturing	14.1	37.3	32.1	48.2	44.4	48.5	31.1	40.9	40.4	50.1	37.8	53.4
D Electricity and gas supply	0.1	4.5	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
E Water supply and waste management	0.3	0.3	0.4	0.3	0.2	0.1	0.1	0.0	0.6	1.1	0.4	0.4
F Construction	3.9	0.2	1.8	0.3	1.2	0.2	0.9	0.4	1.4	0.3	1.9	0.3
G Wholesale and retail trade	39.1	41.9	45.8	37.0	31.6	24.5	49.9	48.3	36.1	35.0	38.4	32.8
H Transportation and storage	4.5	6.6	4.2	9.0	4.0	20.6	4.4	4.8	4.8	7.3	4.6	8.9
I Accommodation and food serving	0.3	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.0
J–U Services&other sectors	32.5	5.8	13.2	3.4	14.4	2.3	10.8	3.8	14.8	5.5	14.6	3.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

## Dutch exports to the BRIC countries

Dutch exports to the BRIC countries are at much more modest scale than Dutch imports. Only 4 percent of Dutch exports (10 billion euro) found its way into the BRIC countries in 2010. Dutch exports mostly focus on the European market. The most important BRIC destination markets are China and Russia. Two thirds of the export value to the BRIC market is realised in the Chinese and Russian markets. The average export value per firm for BRIC exporters is considerable lower than for the total group of exporters. Firms that export to India have compared to the other three BRIC countries again the lowest average export value per firm. Firms that are fully specialised in exports to the BRIC countries, however, have an even lower average value per firm.

For most firms (84 percent) exporting to the BRIC countries forms only a fraction of their total exports. This share is higher than for BRIC imports. Barely 7 percent of the BRIC traders export more than 75 percent of their total exports to the BRIC countries. It is interesting to see that although half of the exporters to China and India are active in only one BRIC country, Brazil exporters are often active in multiple BRIC countries. Roughly 35 percent of the firms that export to Brazil are even active in all the other three BRIC countries as well.

The types of products exported to the individual BRIC countries are far more similar than those imported. All BRIC countries export mostly technology-intensive products, but primary products also play an important role, followed by human-capital intensive products. As with imports, most firms that export to the BRIC countries (Brazil included) are specialised in technology-intensive products. A less substantial but still relatively important share of the firms is specialised in primary and human-capital intensive products, especially firms that export to Russia.

The sector breakdown shows that BRIC exporters are mainly found in the wholesale and retail trade and in manufacturing. Almost half of the BRIC exporters are active in wholesale and retail. They account for more than a third of total BRIC exports. This is in line with research by Bernard et al. (2010) who indicate that when trade barriers are high firms, export indirectly through domestic wholesalers. Over a third of the BRIC exporters are active in manufacturing. They account for almost half of total BRIC exports. The transportation and storage sector is relatively important for the exports to Brazil. Few firms export a high share to Brazil. Even though only 4 percent of the firms that export to Brazil are active in transportation and storage, it generates over a fifth of the total export value to Brazil.

## Comparing BRIC traders to the average trader

Smeets et al. (2010) noted that distance and market size are important factors determining the Dutch trade pattern. They also pointed out that market entry costs also play a prominent role: “low levels of institutional and regulatory quality, corruption and cultural dissimilarity are important barriers for entering export markets”. It is therefore not surprising that table 2.3.5 shows that BRIC traders are different from the average trader. A larger share of BRIC traders are under foreign control than the total group of traders. Though still higher, this is less strong for importers from India and China. Foreign investors are better equipped to deal with trading barriers because they are already more productive firms (Fortanier and Moons, 2011). The same can be said of firm size. Traders with the BRIC countries are more often large or medium size firms than the total group of traders. Additionally they are more often two-way traders and invest more often in R&D. This is stronger for BRIC exporters and importers from Russia and Brazil than for importers from China and India. To see to what extent the BRIC trade itself and the degree of specialisation in the BRIC trade are associated with differences in firm size, wages, productivity and R&D expenditure, we estimated several regressions which are presented in the next paragraph.

### 2.3.5 Enterprise characteristics of BRIC traders in comparison (2010)

	Total		BRIC		Brazil		Russia		India		China	
	importers	exporters	importers	exporters	importers	exporters	importers	exporters	importers	exporters	importers	exporters
<b>Foreign control (%)</b>	4.2	5.7	11.4	22.7	21.3	36.4	32.2	26.3	16.1	30.9	11.6	26.2
<b>2-way-trader (%)</b>	41.6	66.0	69.1	95.2	83.6	98.0	90.6	94.1	82.3	97.4	69.2	97.5
<b>R&amp;D (%)</b>	0.8	1.2	2.9	8.5	8.2	16.3	10.9	10.2	5.2	12.5	3.0	10.9
<b>Size</b>												
small	94.9	93.4	85.5	68.8	67.0	50.5	58.1	64.4	74.6	57.8	85.2	61.2
medium	4.0	5.2	10.6	23.8	19.9	33.6	25.1	26.6	17.3	30.1	10.7	28.2
large	1.2	1.3	3.9	7.4	13.1	15.9	16.8	9.0	8.1	12.1	4.1	10.5

## 2.4 Regression results

### Firm size

In our first regression model, we analysed the relationship between BRIC trade and firm size in terms of log employees, while controlling for wages (share of high-paid workers), productivity and enterprise effects such as trading status, locus of control, type of product and economic activity. Although all firm effects are included in the model, only the coefficients of BRIC trade are reported in table 2.4.1. The first and fourth columns in table 2.4.1 show there is a positive and highly significant relation between firm size and trade with BRIC countries, both for imports and for exports. However, because China dominates the firm's import data, it is best to look at the four countries separately as well.

We ran the same regression again, but now for traders of the four BRIC countries individually. Columns 2 and 5 in table 2.4.1 show that there is a positive relation again between trade with all BRIC countries and firm size. Importers from Brazil employ 50 percent more people than firms with the same characteristics that do not import from Brazil. This is a considerable difference. For Brazil the effect of size is larger than for the other three BRIC countries, indicating that importers from Brazil in particular have more personnel. Nevertheless, the effect for the other three BRIC countries is also considerable. The positive effect is the smallest for exporters to Russia, i.e. they employ relatively fewer people than importers from Russia and traders with the other three countries. They are followed by traders with China.

Because we also want to see if there is a difference between the BRIC traders that predominantly trade with the BRIC countries and those for whom the BRIC trade forms only a small part of their total exports, the third regression adds the different BRIC groups as defined in table 2.3.1. The third column shows that the results for firms that mainly import from the BRIC countries differ from the total group. We now observe a negative relation with firm size. A higher degree of specialisation in BRIC imports is associated with smaller firm size in terms of employees. As such, the impact is largest for firms that import for 100 percent from the BRIC. These results support the conclusion that was drawn in the Internationalisation Monitor 2011 (IM2011) that enterprises that *mainly* import from China/BRIC countries are on average the smallest enterprises. Column 6 in table 2.4.1 shows that there is also a negative relation for firms with 100 percent BRIC exports, however it is not significant.

### 2.4.1 Relation of BRIC trade to firm size

	Importers		Exporters			
Log Employees OLS regression						
(Constant)	4.012*** (44.3)	4.120*** (46.1)	4.065*** (45.0)	4.007*** (32.3)	4.125*** (33.6)	4.030*** (32.5)
BRIC	0.360*** (14.9)			0.339*** (11.8)		
Brazil		0.509*** (10.2)			0.293*** (5.7)	
Russia		0.333*** (6.3)			0.163*** (4.3)	
India		0.374*** (10.9)			0.266*** (6.0)	
China		0.232*** (9.2)			0.249*** (6.6)	
BRIC Group 1			0.462*** (17.8)			0.356*** (11.9)
BRIC Group 2			0.313** (5.8)			0.232** (2.5)
BRIC Group 3			0.225*** (3.4)			0.31* (2.0)
BRIC Group 4			-0.133*** (-2.0)			0.132 (0.7)
BRIC Group 5			-0.44*** (-4.7)			-0.127 (-0.5)
F-value	193.3***	186.8***	159.3***	144.1***	132.6***	110.7***
N	12,029	12,029	12,029	8,514	8,514	8,514
R <sup>2</sup>	0.173	0.199	0.184	0.181	0.2	0.181

\*\*\* p < 0.01; \*\* p < 0.05; \* p < 0.1.

Included in the model but not shown in the table: wages, productivity, R&D, trading status, locus of control, type of product and economic activity.

### Wages

We next analysed the relationship between BRIC trade and the share of high-paid jobs in an enterprise. Columns 1 and 4 in table 2.4.2 show a positive relation. However, only the results for exporters are significant. Columns 2 and 5 show that there is a negative relation between the share of high-paid jobs and firms that import from China and India. Table 2.3.4 already showed that importers from these two countries are mostly firms in wholesale, retail, transport and storage. Many of these imports, such as apparel and electronics, are destined for re-exports, so it is not surprising that these firms have a lower share of high-paid jobs than other firms. There is a positive relation between the share of high-paid jobs and firms that import from Brazil and Russia and firms that export to all four BRIC countries. However from the latter, only the relation between exporters to Brazil and India is significant. Columns 3 and 6 look again at the different BRIC trader groups.

There seems to be a significant negative relation between the share of high-paid jobs and firms that import between 25 and 75 percent of their trade from the BRIC countries. For the BRIC exporters only the group that exports exclusively to the BRIC countries has a negative relation with the share of high paid-jobs. This effect is not significant however.

## 2.4.2 Relation of BRIC trade to wages

	Importers		Exporters			
Share high-paid OLS regression						
(Constant)	-0.099*** (-7.1)	-0.095*** (-6.8)	-0.099*** (-7.1)	-0.064*** (-3.3)	-0.051*** (-2.6)	-0.063*** (-3.2)
BRIC	0.001 (0.3)			0.031*** (6.8)		
Brazil		0.059*** (7.3)			0.052*** (6.4)	
Russia		0.033*** (3.9)			0.009 (1.5)	
India		-0.012** (-2.2)			0.024*** (3.4)	
China		-0.007* (-1.7)			0.005 (0.9)	
BRIC Group 1			0.006 (1.4)			0.031*** (6.5)
BRIC Group 2			-0.024*** (-2.8)			0.02 (1.4)
BRIC Group 3			-0.023** (-2.1)			0.073*** (2.9)
BRIC Group 4			-0.002 (-0.2)			0.061** (2.1)
BRIC Group 5			0.014 (0.9)			-0.024 (-0.6)
F-value	323.2***	269.4***	248.5***	225.5***	189***	172.9***
N	12,029	12,029	12,029	8,514	8,514	8,514
R <sup>2</sup>	0.259	0.264	0.26	0.256	0.262	0.257

\*\*\* p < 0.01; \*\* p < 0.05; \* p < 0.1.

Included in the model but not shown in the table: firm size, productivity, R&D, trading status, locus of control, type of product and economic activity.

## Productivity

After looking at firm size and the share of high-paid workers, we now ask whether the productivity of a trader is also related with the presence of and degree of specialisation in BRIC trade. We expect that BRIC traders are more productive, because only the most productive firms can explore these far away markets and deal with barriers posed by foreign laws, institutions and cultures (Smeets et al., 2010). Table 2.4.3 shows the same

regressions as in tables 2.4.1 and 2.4.2, only now we take productivity as the dependent variable. Columns 1 and 4 from table 2.4.3 show that BRIC traders are more productive than non-BRIC traders. The coefficient and the intercept of BRIC exporters are larger than for BRIC importers. BRIC exporters are thus more productive than BRIC importers. In columns 2 and 5 the results for the firms that trade with single BRIC countries are presented. Russian importers are the most productive. Firms that import from Russia are 13 percent more productive than firms with the same characteristics that do not import from Russia. Firms that import from China are the least productive of the importers from the four BRIC countries. The latter is nevertheless not significant. The degree of specialisation in imports from BRIC has a negative relation with productivity. Complete import specialisation seems to be negatively related with productivity, while no specialisation is associated with higher productivity. For exporters, the same relation with productivity is found only for rather non-specialised traders.

### 2.4.3 Relation BRIC trade to productivity

	Importers		Exporters			
Log Labour productivity OLS regression						
(Constant)	3.896*** (115.7)	3.905*** (116.2)	3.904*** (115.4)	3.927*** (74.0)	3.944*** (74.4)	3.929*** (73.8)
BRIC	0.037*** (2.8)			0.088*** (5.5)		
Brazil		0.083*** (3.1)			0.073** (2.6)	
Russia		0.13*** (4.5)			0.034* (1.7)	
India		0.078*** (4.1)			0.044* (1.8)	
China		0.007 (0.5)			0.087*** (4.2)	
BRIC Group 1			0.043*** (3.0)			0.09*** (5.5)
BRIC Group 2			0.052* (1.8)			0.093* (1.8)
BRIC Group 3			0.037 (1.0)			0.067 (0.8)
BRIC Group 4			0.028 (0.8)			-0.014 (-0.1)
BRIC Group 5			-0.101** (-2.0)			0.04 (0.3)
F-value	190.3***	161.4***	148.5***	122.7***	103.8***	95.5***
N	12,029	12,029	12,029	8,514	8,514	8,514
R <sup>2</sup>	0.182	0.186	0.182	0.168	0.172	0.168

\*\*\* p < 0.01; \*\* p < 0.05; \* p < 0.1.

Included in the model but not shown in the table: wages, firm size, R&D, trading status, locus of control, type of product and economic activity.

## R&D activity

We also want to analyse the relation between BRIC trade and R&D activity. We therefore ran a logistic regression where the odds of conducting R&D are defined as the ratio of the probability of being an R&D firm over not being an R&D firm. Columns 1 and 4 in table 2.4.4 show a positive relation between being an R&D active firm and being a BRIC trader. Column 5 shows the same relation for the individual countries, except for exporters to India. We see a negative relation between being an exporter to India and being an R&D firm. The relation is not significant though. The same is true for groups 4 and 5 of the BRIC traders.

### 2.4.4 Relation of BRIC trade to R&D activity

	Importers		Exporters			
The odds of R&D activity						
Logistic regression						
Constant	0.016***	0.018***	0.017***	0.007***	0.009***	0.008***
BRIC	1.369*** (+)			1.809*** (+)		
Brazil		1.34** (+)			1.474*** (+)	
Russia		1.197 (+)			1.497*** (+)	
India		1.111 (+)			0.915 (-)	
China		1.22** (+)			1.302** (+)	
BRIC Group 1			1.416*** (+)			1.904*** (+)
BRIC Group 2			1.41** (+)			1.104 (+)
BRIC Group 3			1.001 (+)			0.663 (-)
BRIC Group 4			0.963 (-)			0.92 (-)
BRIC Group 5			0.738 (-)			0.738 (-)
N	12,029	12,029	12,029	8,514	8,514	8,514

\*\*\* p < 0.01; \*\* p < 0.05; \* p < 0.1.

Included in the model but not shown in the table: wages, firm size, productivity, trading status, locus of control, type of product and economic activity.



### Likelihood of BRIC trade

Finally, after running several separate regressions that measured the relation of BRIC trade with firm performance (employment, wages, R&D and productivity), we now want to reverse the analysis and gauge the impact of firm performance on the likelihood of BRIC imports/exports. We therefore ran a regression for each separate country, including all firm characteristics, to see what firm characteristics have the largest impact on the probability of becoming a BRIC trader. *Share A* in table 2.4.5 stands for the share of primary products traded in total BRIC trade. *Share B* stands for the share of natural resource intensive products, *C* for unskilled labour intensive products, *D* for technology-intensive products and *E* for human-capital intensive products.

Table 2.4.5 concurs with the first couple of regressions concluding that the firms with a higher productivity are more likely to become BRIC traders. Also firm size matters. All else being equal, the probability that medium and large firms are BRIC traders is higher than for small firms. Equally, firms that pay medium or high wages are more likely to become BRIC traders than firms that pay low wages. The exceptions are importers from China and India. The type of product traded with these countries is likely to play an important role in this.

Unlike the first regressions, table 2.4.5 also looks at the type of trader and products traded and the economic activity. Two-way traders, foreign owned firms and R&D firms are more likely to become BRIC traders. BRIC traders are relatively often active in manufacturing, trade and transport and less often active in the services sectors. With respect to the types of products traded, table 2.4.5 supports that traders in primary products are more likely to trade with Brazil and Russia than firms trading other types of products. Importers that trade unskilled-labour intensive product are more likely to import from India and China.

## 2.4.5 Impact of firm characteristics on probability of being a BRIC trader

	Brazil		Russia		India		China	
	importers	exporters	importers	exporters	importers	exporters	importers	exporters
Logistic regression								
Constant	0.004***	0.001***	0.002***	0.026***	0.008***	0.005***	0.087***	0.008***
Log Labour productivity	1.277*** (+)	1.338*** (+)	1.369*** (+)	1.211*** (+)	1.25*** (+)	1.291*** (+)	1.082*** (+)	1.332*** (+)
Medium (1)	2.063*** (+)	2.015*** (+)	1.97*** (+)	1.768*** (+)	1.741*** (+)	1.866*** (+)	1.421*** (+)	1.878*** (+)
Large (1)	5.378*** (+)	3.359*** (+)	4.305*** (+)	2.133*** (+)	3.537*** (+)	2.723*** (+)	2.756*** (+)	2.803*** (+)
Share low-paid (2)	0.783 (-)	0.11*** (-)	0.462 (-)	0.418** (-)	1.666* (+)	0.049*** (-)	1.815*** (+)	0.206*** (-)
Share high-paid (2)	3.618*** (+)	4.375*** (+)	2.308*** (+)	1.945*** (+)	1.025 (+)	2.386*** (+)	1.022 (+)	1.708*** (+)
2-way-trader (3)	4.139*** (+)	4.205*** (+)	2.879*** (+)	1.399* (+)	3.885*** (+)	2.527*** (+)	2.227*** (+)	2.536*** (+)
Foreign control (4)	1.041 (+)	1.404*** (+)	1.624*** (+)	1.35*** (+)	1.053 (+)	1.261*** (+)	1.175*** (+)	1.106 (+)
R&D (5)	1.528*** (+)	1.943*** (+)	1.44*** (+)	1.868*** (+)	1.367*** (+)	1.508*** (+)	1.36*** (+)	1.697*** (+)
Manuf&Prod. of goods (6)	1.636*** (+)	2.532*** (+)	1.448*** (+)	1.868*** (+)	1.406*** (+)	1.877*** (+)	0.91 (-)	1.828*** (+)
Trade&Transport (6)	1.985*** (+)	1.575*** (+)	1.295* (+)	1.786*** (+)	1.665*** (+)	1.201 (+)	1.327*** (+)	1.356*** (+)
ShareB (7)	0.996** (-)	0.993** (-)	0.996 (-)	0.991*** (-)	1 (+)	0.998 (-)	1.007*** (+)	0.997 (-)
ShareC (7)	0.984*** (-)	0.997 (-)	0.992*** (-)	0.999 (-)	1.009*** (+)	1.002 (+)	1.015*** (+)	1.003*** (+)
ShareD (7)	0.989*** (-)	1.004*** (+)	1 (-)	0.999* (-)	1.002** (+)	1.008*** (+)	1.01*** (+)	1.008*** (+)
ShareE (7)	0.982*** (-)	0.998 (-)	1 (-)	0.996*** (-)	0.999 (-)	1 (-)	1.007*** (+)	1 (-)
N	12,029	8,514	12,029	8,514	12,029	8,514	12,029	8,514

\*\*\* p < 0.01; \*\* p < 0.05; \* p < 0.1.

Reference group 1: Small. Reference group 2: share medium-paid. Reference group 3: one-way-trader. Reference group 4: Dutch control. Reference group 5: No R&D. Reference group 6: Services and other sectors. Reference group 7: Share A.

## 2.5 Conclusions

This chapter analysed the role of BRIC trade in total trade and characteristics of BRIC traders. The differences between trade and traders with the individual BRIC countries are larger for imports than for exports. Primary products form an important trade product specifically for Brazil and Russia, while unskilled labour-intensive products are imported more from China and India. Technology-intensive products are most frequently exported to all the BRIC countries, followed by primary products.

Because BRIC exports form a small fraction of total exports, much attention in the public debate is currently being paid to how the share of Dutch exports to the BRIC countries can be increased. BRIC traders in general are often medium or large sized firms. Large firms play especially a major role in the trade with Brazil. Small firms presumably face too many trade barriers that are difficult for them to overcome. The probability that medium and large firms are BRIC traders is thus higher than for small firms. BRIC traders are additionally often found among the more productive firms. Firms with a higher productivity are therefore more likely to become BRIC traders. This is in line with previous research, which shows that the more productive firms are more likely to overcome trade barriers than less productive firms. This relation is stronger for BRIC exporters than for BRIC importers. Also firms that pay medium or high wages are more likely to become BRIC traders than firms that pay low wages. The exceptions are importers from China and India. The type of product traded with these countries is likely to play an important role in this. Other characteristics that are positively associated with BRIC traders are: being a two-way trader, a foreign owned firm and an R&D firm. The story is different though, for firms that are highly specialised in trade with BRIC. Firms that are fully specialised in BRIC trade have the lowest average value per firm. Additionally, they are smaller and less productive than other firms.