

**The rise of the BRIC countries and  
its impact on the Dutch economy**

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CPB Background document

On request by the Ministry of Economic Affairs, Agriculture and  
Innovation

2011, November 21

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## Executive summary

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). They contributed substantially to global economic growth already before the financial crisis and even more so since 2008. Because of their high expected growth rates and large population size, the BRIC countries in general and China in particular will have a major impact on the global economy during the coming decades.

A small open economy like the Netherlands is particularly likely to be affected by developments in the global economy. We find that the high growth rates of the BRIC countries enhance Dutch trade. Measured by imports, the BRIC countries have become more important than the US for the Netherlands, although this is not (yet) the case for exports. Nearly 100 thousand jobs and 1.7 percent of value added can be associated with Dutch trade with the BRIC countries in 2009. This is a gross effect, the net effect is much smaller, because people would be employed in others sectors of the economy without trade with the BRIC countries. Moreover, China's comparative advantage is rapidly changing and moving towards high-tech goods as is evident from the technology and skill content of its export package.

The dynamics of the world economy shift to these countries and this process would be conducive to economic growth if the Netherlands would be more closely connected to the manufacturing production centres in the world. Although Dutch exports to these countries increase, experience so far has revealed that acquiring sustained access to the BRIC countries is difficult. Differences in culture and regulations limit effective market entry and the opportunities to benefit from these dynamics.

### **The rise of the BRIC countries in the world economy**

The impact of the BRIC countries on the world economy is evident from the figures. Their 45% share in the global labour force illustrates the enormous potential of the BRIC countries. If growth continues at the current pace, China will become the largest economy of the world within two decades, although GDP per capita still remains substantially below that of Europe and the US. It will take more than a few decades before these countries can be expected to be at par with Europe or the US. The economic structure of the BRIC countries is characteristic for less developed countries with a large share of people employed in agriculture and only a small share in services. Their share in world trade and investment is smaller than their share in GDP.

The BRIC countries are, however, expected to develop further in the next decades. If the growth rates that have been observed since the 1980s remain stable over the next 15 years, China and India will increase their combined share in global output to over 40 percent. The ongoing shift of production activities will continue to move to Asia as a consequence of comparative advantages. This process which started with relocations to Japan and later to China is likely to continue in the direction of countries like India, Malaysia, Vietnam and Indonesia. In view of its rich and successful history, the potential of China to regain its strong position as an economic and innovative power is manifest, notwithstanding the huge uncertainties regarding social and political tensions, economic imbalances and environmental quality. It is expected that growth rates will fall to lower levels somewhere during the coming decade, although economic performance has continued to be strong throughout the recent years of worldwide economic crisis. Characteristic for China so far is the exceptionally high savings rate. Increased awareness of its prosperity, a reduced role of the central government and a rapidly changing age composition of its population is expected to result in reduced savings rates in the years to come. This will alleviate global imbalances, but will also put an upward pressure on global interest rates. From a long-run historical perspective, one can safely conclude that China and India are reclaiming their former important role in the world economy which they had until around 1800.

The future growth potential of the BRIC countries and also the ease of trading and engaging in foreign direct investments strongly depend on the institutional quality of these countries. According to indicators of the Worldbank, the quality of governance in the Netherlands is among the highest in the world. Brazil has a score just above the median. The quality of governance in India is somewhat below the median and China and Russia have a relatively low average quality of governance. This suggests that substantial institutional reforms in these countries are still needed if they want to fully exploit their growth potential.

### **Dutch trade relations with the BRIC countries are developing**

Dutch trade with the BRIC countries has grown substantially over the past decade, 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 versus 8 percent for the US in 2010. The BRIC countries are not yet as important for Dutch exports as the US (export share of 4 percent for the BRIC countries versus 5 percent for the US), but this is expected to change. Compared to 1990, trade with the BRIC countries has increased substantially, while the export and import shares to and from the US have remained fairly constant. In particular China's exports have become increasingly important during recent years. It is currently the second exporter worldwide and the Dutch import share of Chinese products is among the

three highest of the EU-15 countries. Dutch exports to the BRIC countries are limited when measured as a share in total trade, not only compared to imports, but also compared to other EU-15 countries. However, a part of our exports goes indirectly to the BRIC countries via other European countries, mainly through Germany. Accounting for these indirect exports improves the Dutch position somewhat compared to other EU-15 countries.

The overlap in comparative advantages between the BRIC countries and the Netherlands is limited, as measured by the revealed comparative advantages for about hundred product groups, also including services. The overlap is largest with Brazil, mainly due to specialization of both countries in agricultural products, and smallest with China. The product groups in which both the Netherlands and China have a revealed comparative advantage are traded worldwide which could indicate more competition for Dutch exporters of these goods. Examples are office machines and telecommunications and sound recording apparatus. However, it is important to assess the dynamic character of the Chinese economy. China's comparative advantage is rapidly changing and moving towards high-tech goods as seen from the technology and skill content of its exports. Although part of this content comes from imported intermediates, it clearly reflects the changing production structure in China. This trend was already visible five years ago, but has accelerated substantially and reflects a rapidly increasing Chinese competitiveness of high-end goods.

Using international transaction data of firms between 2002 and 2008 we find that the number of firms exporting to and importing from the BRIC countries is rapidly increasing. Especially China and India stand out in this respect. This is different from trading partners with more stable markets, like the US. However, most firms trading with the BRIC countries do not survive in these markets. This also occurs with trade between other countries of origin and destination, but entry rates in the BRIC countries are higher, so more firms survive in these markets in the end. The surviving firms increase their exports or imports substantially and 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. This is different for the Chinese markets, where incumbent Dutch exporters dominate a substantial part of the exports.

### **Dutch FDI relations with the BRIC countries are developing**

Apart from trade, economic relations with the BRIC countries also intensify through foreign direct investment (FDI). The Netherlands has relatively large foreign direct investments in the BRIC countries, compared to other European countries. However, this is not the case the other way around. The amount of FDI from the BRIC countries in the Netherlands is very low. In 2009 the total FDI stock of the

BRIC countries was nearly two billion euro, of which most came from China. This is a modest amount compared to the FDI stock of 106 billion euros in the EU-15. A relatively large share of the Dutch firms with Chinese or Indian owners is active in knowledge-intensive distribution services, related to the Dutch position as gateway to Europe. FDI can be seen as an alternative for trade. The importance of Dutch investments relative to trade is largest in Brazil and smallest in China. This implies that cultural and institutional barriers might be relatively large for China.

### **The increasing economic implications for the Netherlands**

Through trade and FDI, the economic developments in the BRIC countries have macroeconomic effects on the Dutch economy. About 1.6 percent of Dutch employment and 1.7 percent of value added can be attributed to trade with the BRIC countries. This includes exports and Dutch re-exports which originate from the BRIC countries. The impact of the re-exports from the BRIC countries is modest; about 0.3 percent of employment and value added. In total nearly 100 thousand jobs are involved, of which about forty percent is attributable to China. Including the indirect exports through other countries to the BRIC countries, about 2 percent of value added is related to final demand in the BRIC countries. This means that about two percent of the Dutch economy is vulnerable to short term economic developments in the BRIC countries. The net benefit of trade with these countries is much smaller, because firms and employees would develop other activities. Benefits for the Dutch economy are realised mostly on the import side through, for example, lower prices. The price differences with the Netherlands are the largest for India and China, and very small for Brazil. However, the positive effects of lower import prices on inflation could have reached a turning point, in particular for Chinese imports. In 2006 we estimated one percent less inflation cumulated since 1990 due to increasing Chinese imports. Recently, the Renminbi has appreciated, while Chinese inflation has been relatively high. If these trends continue, the price advantage of China will decrease.

Trade could also affect labour markets by higher wage differentials or higher unemployment rates. Since 2002, hourly wages in the lowest and highest percentiles of the Dutch wage distribution have risen relative to the intermediate percentiles, but there has been no substantial increase in overall wage inequality. Moreover, there are strong indications that the modest increase in wage inequality in the past was mainly caused by skill-biased technological change.

### **Policy implications**

Experience so far has revealed that acquiring sustained access to the BRIC countries is difficult. Cultural and institutional barriers are an important impediment, especially when compared to trade with our main trading partners in Europe. This requires a fundamentally different way of approaching these

countries, in which support from governmental agencies could be an important ingredient. The government could support firms to meet their foreign counterparts in business and government. Moreover, although Brazil, China and India are members of the WTO, and probably Russia will follow soon, trade barriers with these countries remain high. Import tariffs are slashed down in particular when China entered the WTO, but other regulatory barriers are still in place. This is particularly important for services trade. The Netherlands has a relatively strong position in international transport and business services. But regulatory hurdles limit effective market entry. Unclear regulations and administrative bureaucracy also affect successful investment in these countries. Free trade agreements that include services trade and investment between the EU and these countries could help to lower these hurdles.

A multilateral agreement would be preferable, however. Then it would not be necessary to formulate rules of origin which guarantee that a minimum part of the product is produced in the home country. Such rules limit trade and could be incompatible with many export products from China which are only assembled there, while all intermediates come from other countries. Second, the WTO has a dispute settlement system, which disciplines the countries to conform to the trade rules.

A large part of the imports of the Netherlands from the BRIC countries is re-exported to mainly other European destinations and it seems reasonable to expect that these flows will increase substantially during the next decades. If the Netherlands aims to facilitate these flows, it has to develop infrastructure capacity to remain an attractive location for handling trade. The costs and negative external effects, such as pollution and congestion, have to be balanced against the net benefits of re-exports.

Apart from trade, outward and inward investment could strengthen the ties between the Netherlands and the fast-growing BRIC countries. Although the FDI stocks do not point to a significant establishment of firms from BRIC countries, the micro data on firm ownership show that the Netherlands appears to be an attractive location for these firms in Europe. This could be related to the large distribution and logistic sectors. However, firms and in particular headquarters become more footloose. Therefore it is important to monitor the quality of factors determining the establishments of internationally operating firms. Increasing trade and FDI will also affect jobs and wages. Unemployment is low in the Netherlands and wage inequality is modest in international perspective and only slightly increasing. Existing labour market policies that have been put in place in the past seem to be sufficient to deal with job losses associated with trade and off-shoring. However, specific

jobs and tasks can be more vulnerable and if these jobs and tasks can be identified in the future, it could be helpful to retrain these workers.

# 1 Introduction<sup>1</sup>

Since the end of the Cold War, the political and economic world landscape has undergone a tremendous transformation. Following several decades of relative stability, with economic dominance of the US and to a lesser extent Western Europe and Japan, we have seen dramatic transformations in the past two decades in the Soviet Union, China, Brazil and India. And to a somewhat lesser extent, we can also mention transformations in, for example, South Africa, Indonesia, and smaller countries in South-East Asia. This has resulted in a shift of economic and political power towards the developing countries in general and Asia in particular. While accounting for a minor share of the global economy in the 1980s, the share of the BRIC countries (Brazil, Russia, India and China)<sup>2</sup> in total GDP measured in Purchasing Power Parity (PPP) is now 24%. And already before the recent financial crisis, the fast growing BRIC countries accounted for a large share of global economic growth. While demand for consumer and investment goods rapidly declined in virtually the entire developed world in the crisis that started in 2008, the Chinese economy continued to grow at eight percent per year. As such, China can be considered as the engine of economic growth in the world that has somewhat alleviated the setback that the advanced world has experienced lately. It is, however, questionable, for how long China can continue to play this role. It faces potential overheating of its economy. Since the publication of the CPB study on China (Suyker and De Groot, 2006), the Chinese economy has continued to expand rapidly (by more than half in real terms). The risks associated with this rapid growth for Chinese economy that we noted five years ago - most notably inflationary pressure and a vulnerable banking system - have not yet resulted in a deceleration of growth but remain relevant today.

The impact of the BRIC countries on the world economy is evident from Figure 1.1. Their 45% share in the global labour force illustrates the enormous potential of the BRIC countries. If growth continues at the current pace, China will become the largest economy of the world within two decades. Figure 1.1 also illustrates that, for example, GDP per capita remains much lower than the average of the world (as the population share of the BRIC is higher than the GDP share). It will take more than a few decades before these countries can be expected to be at par with Europe or the US. On issues like patent applications – that may be important for long term growth – the BRIC countries even lag further

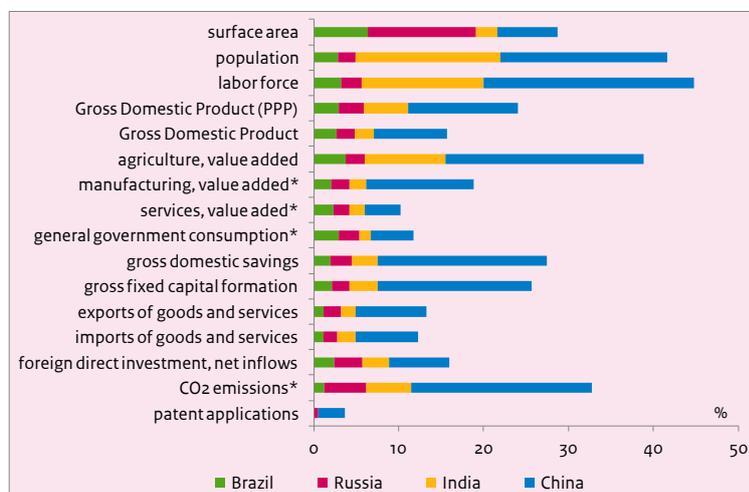
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<sup>1</sup> The authors thank the participants at meetings of the Ministry of Economic Affairs, Agriculture and Innovation and of CPB for their constructive comments. In particular we appreciate the detailed comments of Wim Suyker. We are grateful to Inge van den Bijgaart for her analysis of the firm-level data in Chapter 4 and to Jelte Haagsma for his assistance with the layout of the figures and tables.

<sup>2</sup> BRIC is an acronym for the four largest developing countries Brazil, Russia, India and China that was introduced by Goldman Sachs chairman Jim O'Neil in 2001. Goldman Sachs has taken these four countries together because they expect that all four countries will belong to the largest ten economies in the world in 2050.

behind the developed world. But even there, clear signs are visible of rapid developments at the technology front, especially in China.

**Figure 1.1. Key statistics – share of the BRIC countries in the world economy in 2009**



Source: World Development Indicators (Worldbank, 2011). Note: \* indicates that data are for the year 2007.

The economic structure of the BRIC countries is characteristic for less developed countries with a large share of people employed in agriculture and a relatively small share in services. Their degree of openness, measured by total trade and FDI is smaller than their share in GDP. Savings are substantially larger, most notably in China.

The economic developments of the BRIC countries raise many questions. Is economic growth of these countries sustainable and for how long will it continue? What is the impact on other countries in the world, and the Netherlands in particular? These questions cannot be answered easily. In this study, we focus on the direct impact of the BRIC countries on the Dutch economy. In slightly more than a decade, China has turned into the second largest importer of the Netherlands and the growth rates suggest that its share will increase further. The direct impact can be measured by following trends in international trade and Foreign Direct Investment (FDI) relations between the Netherlands and the BRIC countries over time. Especially for trade, we analyze the macroeconomic trends, sectoral developments and also trade at the firm level. With respect to FDI the data are more aggregated. Trade and FDI affect the whole Dutch economy. We measure the impact on employment, value added and prices.

In an earlier study, we already looked at the impact of the emergence of China (Suyker and De Groot, 2006) and India (Suyker et al., 2007) on the Dutch economy. Only five years ago, we found that the share of China in total Dutch trade had more than doubled between 2000 and 2005. The speed at which change is taking place and the changes within the production sector call for a new assessment. The

need for information is illustrated even further by the highly turbulent developments during the financial crisis, particularly in relation to trade. To provide a more general overview, we include Russia and Brazil in our analysis, while we occasionally present figures for a selection of other developing economies (see Annex A). Moreover, this analysis extends the previous studies by analyzing trade in goods and services and trade at the firm level, and by focusing more explicitly on foreign direct investments.

The remainder of this document is structured as follows. Chapter 2 presents the stylized facts of the BRIC countries and the Netherlands, followed by a characterization of the economic developments in the BRIC countries since the 1980s. We present a decomposition of their economic growth and assess the importance of these factors for future growth. Chapter 3 discusses the development of goods and services trade and FDI between the BRIC countries and the Netherlands. This section compares and analyzes developments across several dimensions: international trade of goods and services at the macro level and product group level and foreign direct investment. The strong exporting sectors of these countries are compared and also the technological and human capital content of their products. Chapter 4 analyses trade and foreign investment decisions of Dutch firms. The aim is to understand the development of trade and FDI at a deeper level and to spot possible barriers with respect to bilateral trade and investment. Chapter 5 focuses on the macroeconomic impact of the emerging BRIC countries. We assess the impact on employment, value added and the price level in the Netherlands. Chapter 6 will summarize and conclude. Furthermore, it will discuss the broader policy implications of the findings of the previous chapters.

## 2 The economic upswing of the BRIC countries

This chapter sets the stage for the subsequent analyses by presenting a series of stylized facts regarding the stage of development of the BRIC countries and their economic development in the course of history.

### 2.1 Stylized facts on stage of development

Table 2.1 presents some key statistics on the BRIC countries and compares those with the Netherlands. The first striking fact is the massive difference in geographical and population size. The area of Russia is 400 times that of the Netherlands, while even the smallest BRIC country – India – is almost 80 times larger. In terms of population, China is almost 80 times more populous than the Netherlands, while Russia has 9 times more inhabitants. Considering economic size, however, the differences are much smaller. China's GDP is 7 to 8 times larger than that of the Netherlands. The other BRIC economies are hardly twice as large as the Dutch economy. In terms of the value of international trade, China is about three times as large as the Netherlands, while the trade of India is about 1.5 times smaller. Another important notion that emerges from Table 2.1 is the large heterogeneity within the group of BRIC countries. The countries are in very different stages of economic development. While India is still relatively poor, Brazil and Russia can be considered middle income countries.

When we look at the share of household consumption, government consumption, investments, exports and imports in GDP, several interesting facts emerge. In China, gross savings are as high as 54 percent of GDP,<sup>3</sup> while gross investment is 48 percent of GDP (thus indicating a net outflow of capital). Even though this high investment has delivered a major contribution to China's success in achieving continuous economic growth, it may also have resulted in misguided investment and investments in assets with low returns. The Chinese economy is also relatively export oriented, with exports at 29 percent of GDP and imports at 25 percent. In India, gross savings (35% of GDP) and investments (36 percent of GDP) are more or less in balance. India is, however, running large trade deficits as imports are 25 percent of GDP while exports are only 18 percent. In Russia and Brazil (where gross investments are in fact lower than in the Netherlands in terms of GDP) both gross savings and investments are far lower than in China and India. Furthermore, Brazil is somewhat an outlier compared to the other BRIC

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<sup>3</sup> Yang et al. (2011) find that firms, households and government contributed to the high savings in the past decade. The causes are very diverse and include high economic growth, rising profits, provisions of social services and the demographic transition. According to Chamon et al. (2010) income uncertainty and pension reforms are the main reasons for higher household savings.

countries as its economy is relatively sheltered. In China, household consumption is a relatively small part of total expenditures, which is uncommon in market economies. When the share of consumption in GDP starts to increase in the future, this may result in a fast growing domestic market and therefore opportunities for Dutch exports (which are more focused on consumer goods compared to the exports of, for example, Germany).

**Table 2.1. Key statistics for the Netherlands and the BRIC countries**

	Brazil	Russia	India	China	the Netherlands
Surface (1000 sq. km, 2009)	8515	17098	3287	9597	42
Population (million, 2009)	194	142	1155	1331	16.7
Life expectancy at birth (years, 2009)	73	66	64	73	81
Mortality rate, under-5 (per 1,000, 2009)	21	12	66	19	4
Fertility rate (births per woman, 2009)	1.8	1.6	2.7	1.8	1.8
GDP (current dollars, billion, 2010)*	2088	1480	1729	5879	783
GDP per capita (dollars at PPPs, 2010)*	11273	15612	3408	7544	40973
Gini coefficient of incomes (latest av. year)	53.9	42.3	36.8	41.5	30.9
Poverty (consumption share of poorest 10%, latest av. year)	1.2	2.6	3.6	2.4	2.5
Agriculture, value added (% of GDP, 2009)	6	5	18	10	2
Industry, value added (% of GDP, 2009)	25	33	27	46	24
Services, value added (% of GDP, 2009)	69	62	55	43	74
Household consumption expenditure (% of GDP, 2009)	62	54	56	35	46
Government consumption expenditure (% of GDP, 2009)	22	20	12	13	29
Gross savings (% of GDP, 2009)	15	23	35	54	22
Gross fixed capital formation (% of GDP, 2009)	17	19	36	48	18
Exports of goods and services (% of GDP, 2009)	10	29	18	29	69
Imports of goods and services (% of GDP, 2009)	11	20	25	25	62
Dutch export share of goods and services (% , 2009)**	0.90	1.40	0.60	1.60	
Dutch import share of goods and services (% , 2009)**	1.80	3.10	0.90	7.00	
Dutch outgoing FDI share (% of stock, 2009)***	1.41	1.62	0.29	0.92	
Dutch incoming FDI share (% of stock, 2009)***	0.72	0.31	0.07	0.27	
Urbanisation (% of population, 2009)	86	73	30	44	82
Sanitation facilities (% of population with access, 2008)	80	87	31	55	100
Water availability (% of population with access, 2008)	97	96	88	89	100
Internet users (per 1,000 people, 2009)	392	421	53	288	900
Fixed line and mobile phone subscribers (per 1,000 people, 2009)	1110	1940	480	800	1720
Motor vehicles (per 1,000 people, 2008)	198	245	15	37	515
Energy use (kg of oil equivalent per capita, 2008)	1295	4838	545	1598	4845
CO-2 emission (x1000 kg per capita, 2007)	1.9	10.8	1.4	5.0	10.6
Quality of governance, in percentiles (2010)****	59	22	42	28	97
Ease of doing business, in percentiles (2010)****	31	33	27	57	84

Sources: World Development Indicators (Worldbank, 2011), \*IMF-IFS, \*\* OECD-ITCS database, \*\*\*Eurostat, \*\*\*\*Worldbank.

On other relevant dimensions of development, the differences are large as well. For example, the child mortality rate in India is five times that of Brazil. In Russia and Brazil, and even China, sanitation facilities are very common, whereas in India only 31 percent of households have access to such facilities. The largest differences are found for the per capita use of telephones, internet, and the number of motor vehicles. Here it becomes visible that Russia and Brazil are much further developed than China and especially India.

Differences in the stage of economic development do not only vary between the BRIC countries. The distribution of economic activities and income between households and regions within countries is also highly uneven when compared to advanced economies. Figure 2.1 shows the regional distribution of GDP relative to the average GDP in each individual country. In the Brazilian state of Sao Paulo, GDP per capita is more than three times as high as in the Amazon states. In China and India the differences between regions are somewhat smaller than in Brazil, even though both countries have a number of peripheral regions that lag far behind. The most unequal spatial distribution of GDP is found in Russia, where the Moscow area and a number of regions that are abundant in natural resources have a very high GDP per capita, while there are at the same time many regions with a GDP per capita less than half of the national average. The distribution of household consumption in Brazil is amongst the most unequal in the world.<sup>4</sup>

The distribution of wealth across households is not uniformly higher in the BRIC countries compared to the Netherlands. As shown in Table 2.1, Brazil has a Gini-coefficient of 53.9 with a share of only 1.2 percent of the poorest 10 percent of households in total household consumption. Russia and China have a higher Gini-coefficient than the Netherlands, which is mainly explained by the presence of a relatively large share of very rich households. The income share of the poorest 10 percent of households in these countries is comparable to the Netherlands. Interestingly, the income share of the poorest households in India is relatively large compared to even the Netherlands. In terms of income levels, the poorest in India are not poorer than those in the other BRIC countries. If we combine the consumption share of the poorest 10% in each country, the share of consumption in GDP and GDP per capita, we find that China has the highest level of poverty, with a monthly per capita consumption (for a person in a household at the 10th percentile) of 53 US\$ (PPP). For India this figure is 60, for Brazil 69, and for Russia 232 US\$.<sup>5</sup>

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<sup>4</sup> If we would present the same figure for Dutch provinces, all 12 provinces would be within or close to the middle category, with a GRP between 81 and 125 percent of the national average.

<sup>5</sup> It must be noted that these are back of the envelope calculations that are not entirely comparable, for example, because of differences in average household size.

The future growth potential of the BRIC countries and also the ease of trading and engaging in foreign direct investments strongly depend on the institutional quality of these countries. The institutional quality is often approximated by the average score on the Worldwide Governance Indicators from the Worldbank.<sup>6</sup> The Worldbank provides indicators for six types of governance: voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law, control of corruption (see Kaufmann et al., 2010). Table 2.1 shows the percentile of the average of these six indicators, which are based on 210 countries. The percentiles range from 0 for the country with the lowest level of governance to 100 for the country with the highest level of governance.<sup>7</sup> According to these indicators, the quality of governance in the Netherlands is among the highest in the world. Brazil comes second with a score above the median. The quality of governance in India is somewhat below the median, but particularly low for political stability and absence of violence. China has a relatively low average quality of governance, which is caused mainly by the low ranking for voice and accountability. Russia has the lowest quality of governance of the four countries.

Another indicator for the quality of institutions is the ease of doing business indicator.<sup>8</sup> This ranking is based on nine topics related to doing business. The percentiles for this indicator are based on 183 countries. Again, the Netherlands scores high compared to the BRIC countries, but not as high as for the governance indicators. China scores above the median, while the other BRIC countries all score around the 30th percentile. Interestingly, the ease of doing business index for Hong Kong is the second highest in the world, after Singapore.

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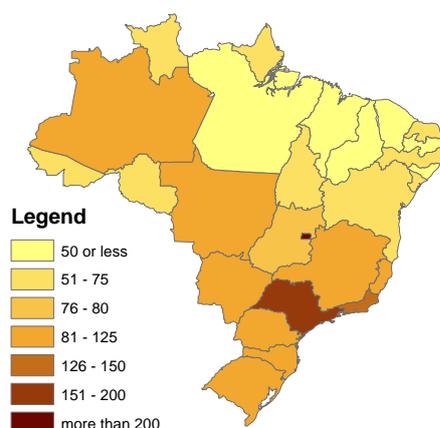
<sup>6</sup> Obtained from <http://info.worldbank.org/governance/wgi/index.asp>

<sup>7</sup> The percentile for country  $i$  is calculated as  $100 * (R_i - 1) / (N - 1)$ , where  $R_i$  is the rank score of the average of the indicators and  $N$  is the total number of countries in the sample.

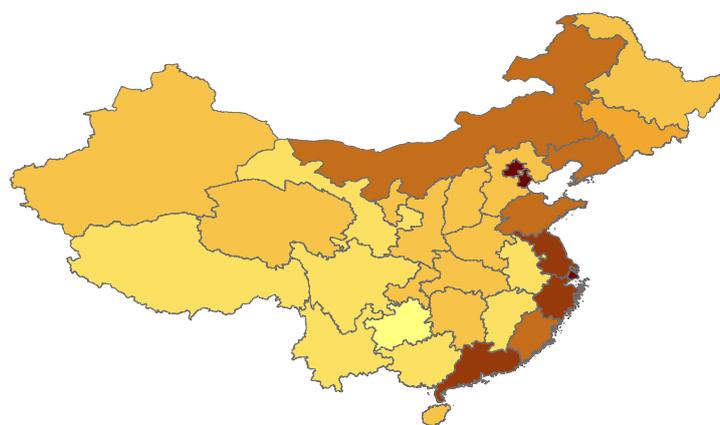
<sup>8</sup> Obtained from <http://www.doingbusiness.org>

Figure 2.1. Index (in %) of GRP per capita relative to national GDP, 2007

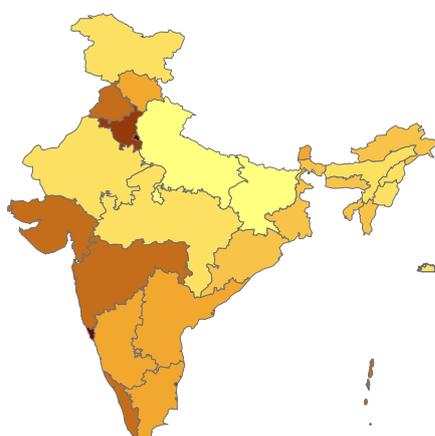
Brazil



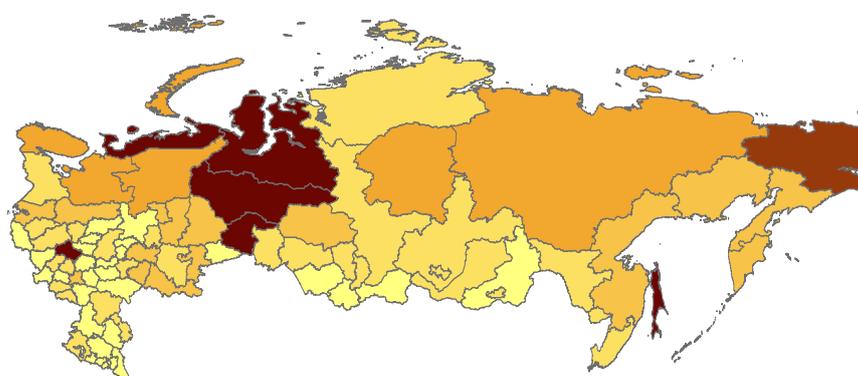
China



India



Russia



Sources: Brazil – GDP by State, 2007 (Regional Accounts 2007, Brazilian Institute of Geography and Statistics); China – quotient of GDP by province, 2007 (National Bureau of Statistics) and population, 2007 (NBS); India – Net State Domestic Product by State, 2006-2007 (Handbook on the Indian Economy, Reserve Bank of India, 2010); Russia – quotient of GRP by federal subject, 2007 (Federal State Statistics Service) and population, 2002 (all Russia Population Census, FSSS).

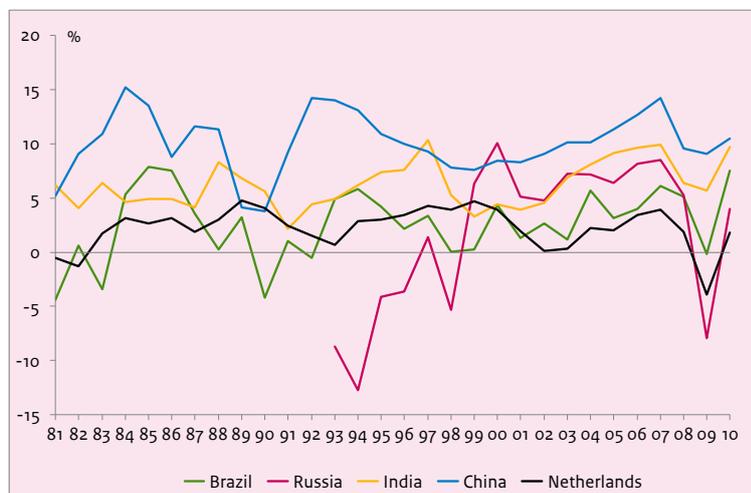
## 2.2 Growth dynamics

Although all four BRIC countries have experienced episodes of relatively high economic growth during the last decades, there are substantial differences in the characteristics of their respective growth processes (see also Box 1 for a long-run perspective on the position of China and India in the world economy). In both China and India, the start of economic acceleration was marked by policy reform around 1980. At that time, Brazil suffered from the consequences of disastrous economic policy, resulting in an episode of hyperinflation in the late 1980s. At that same time, Russia was still part of the Soviet Union which fell apart in 1991. As Figure 2.2 shows, China is by far the most important

contributor to the growing economic importance of the BRIC countries. Its annual GDP growth rates have been close to 10 percent in almost every single year since the early 1980s. India has also achieved uninterrupted growth, but it is revolving around a 6 percent yearly average. Brazil alternates periods of low economic growth with periods where growth peaks at about 5 percent. Russia has the shortest ‘take-off’ period of the four countries. In its early years between 1991 and 1998 it experienced a severe recession, with an average 5 percent annual decline of GDP, followed by a continuous period of growth until the country recently was hit severely by the financial crisis.

An intriguing question is whether and when the growth rates of emerging economies will decrease to ‘normal’ levels, as happened to countries such as Japan and South Korea after a few decades of catching up. Even though it is theoretically possible that per capita output of the BRIC countries will converge to the levels of advanced economies, this would require substantial improvements in institutions and human capital. Furthermore, growth in China strongly has been driven by investments, while consumer demand so far has developed relatively slow. Eichengreen et al. (2011) have predicted that economic growth in China will slow down with at least 2 percentage points at a GDP per capita of about US\$ 17,000 (PPP). This level of economic development is expected to be achieved by 2015.

**Figure 2.2. Annual volume GDP growth rates of the BRICs during ‘take-off’**



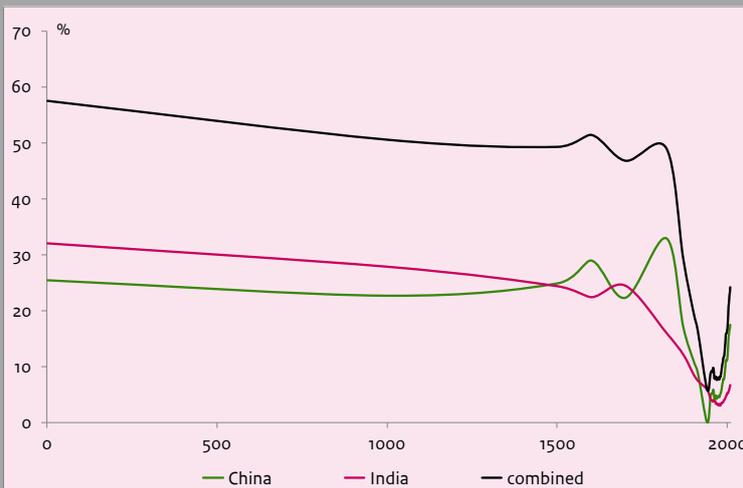
Source: IMF-IFS statistics database.

### Box 1. Back to normal?

In the last three decades, the economies of China and India in particular have experienced historically unique growth rates. With average annual growth rates of about 10 (China) or 6 (India) percent over the period 1980–2009, they massively outperformed advanced economies like the Netherlands with an average annual growth rate just above 2 percent. This has resulted in an impressive catching up and a substantial reduction in the gap between China and India on the one hand and the advanced world on the other hand. Both countries have become important players in the global economy in a relatively short time period. While their combined share in the global GDP (PPP adjusted) was only about 8 percent in 1980, it was more than 24 percent in 2008 (source: Maddison / GGDC database).

However, when we take a longer historical perspective, these developments should not come as a surprise. China and India have been important economic players in the world economy in the past. Two thousand years ago, Maddison estimated that China and India produced almost 60 percent of the total economic output of the world. Figure 2.3 shows the development of the share of China and India in global GDP (PPP adjusted) over the period 0 – 2008.

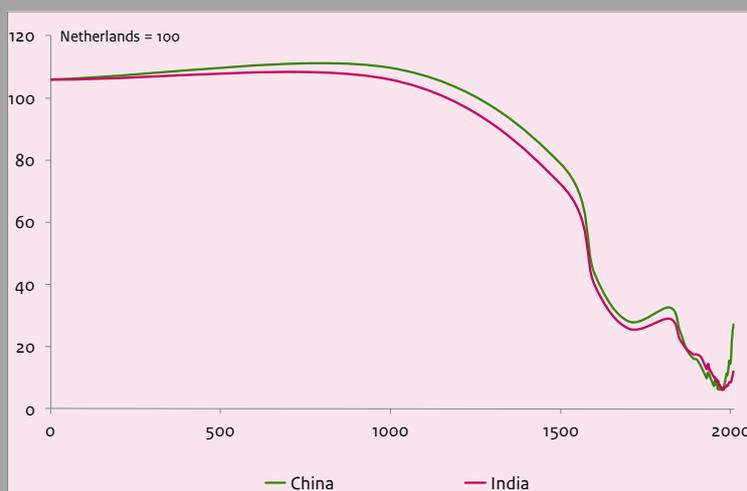
**Figure 2.3. Share of Chinese and Indian economy in global GDP (PPP adjusted)**



In the period 0 – 1000, there was hardly any economic development in the world economy. The share of China and India was very slowly declining, but stayed at around 50 percent. Between 1000 and 1820, worldwide growth was about 0.2 percent annually and mainly caused by population growth (cf. Maddison, 2001). Also during that period, China and India kept up with the global economy. After 1820, the global economy started to grow much faster, due to the industrial revolution in the western countries. China and India did not keep up with this transition, which caused their share in global GDP to quickly drop to just 6 percent in 1940.

The main reason for this drop is that the western world experienced high productivity growth which China and India did not experience. Both countries are catching up since around 1980, which can be seen from Figure 2.3. Figure 2.4 shows a comparable picture, but now comparing GDP per capita in China and India with that of the Netherlands (which is normalized at 100). The story is more or less the same, although here the decline sets in earlier at around the end of the Middle Ages reflecting the economic development in North-West Europe (and the Netherlands in particular) in the 16<sup>th</sup> – 19<sup>th</sup> century (see also De Vries, 1984, and De Vries and Van der Woude, 1995).

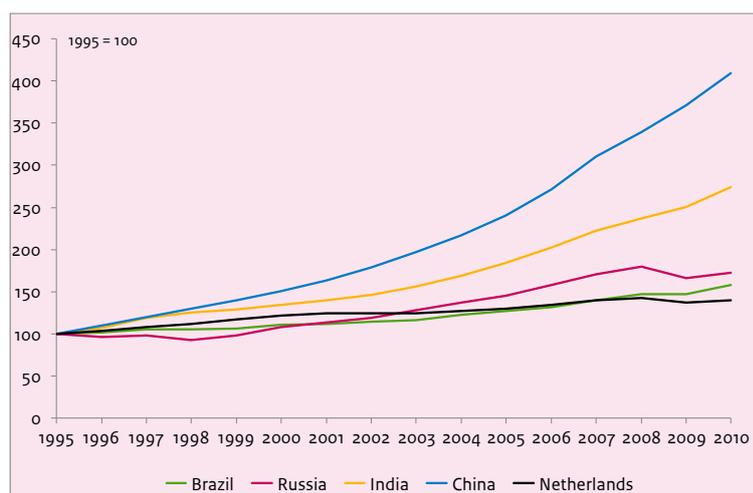
**Figure 2.4. GDP per capita (PPP adjusted) of China and India relative to the Netherlands (=100)**



Looking at the high growth rates since 1980, people often wonder how long China and India can keep up this pace. The historical perspective shows that these countries have a large potential due to their large population size. It is likely that that the recent growth rates are the result of a catch-up effect. Figure 2.4 shows that the gap in GDP per capita is still relatively large, however.

Figure 2.5 shows the indexed GDP volume of all four economies plus the Netherlands from 1995 onwards. Even though ‘take-off’ in China and India started already in the 1980s, all the BRIC countries experienced the fastest expansion after 1995. During this period, Chinese GDP more than quadrupled, while India’s GDP increased by almost three-fold. Brazil and Russia experienced much lower growth, only slightly higher than the GDP growth rates of the Netherlands.

**Figure 2.5. GDP volume (base year = 1995)**



Source: IMF-IFS statistics database.

Under the heading of growth accounting, there are various ways in which we can decompose the growth of countries in its various components. This section describes the results of standard growth accounting exercises and of a decomposition of GDP per capita into productivity, work intensity and participation.

Growth accounting is a method used to decompose income or GDP growth into different components. This enables us to assess the importance of different causes of growth. Table 2.2 shows the result of growth decompositions for the four BRIC countries during the 1980–2009 period.<sup>9</sup> The average annual percentage change in output (GDP) is decomposed in three components: employment (that is, the labour input in the production process), capital, and a residual term. The residual term, also known as total factor productivity, captures the effects of many different variables such as technological progress, the efficiency of workers, but also growth determinants such as climate and institutions. The change in output due to capital and total factor productivity add up to the change in output per worker.

<sup>9</sup> The growth decompositions in this box are made using the same methodology as in Bosworth and Collins (2007).

From Table 2.2 several interesting facts emerge. First, it shows that a part of output growth during the last three decades in all countries except Russia is due to a growing labour force. In China, however, output per worker has increased more than twice as fast (8.3 percent on average) than in India (4.0 percent), while output per worker increased by only 0.3 percent in Brazil. About half of the difference between China and India is explained by higher growth rates of the capital stock in China. This reflects the high savings rate in China. One of the big questions is whether these investments will be productive and deliver reasonable returns in the future. The other half is explained by higher factor productivity growth. In both China and India, the contribution of factor productivity is equal in the 1990–2000 and the 2000–2009 periods, while the contribution of capital has been accelerating during the last period. In Brazil, there has been almost no growth of output due to the use of capital or total factor productivity.

**Table 2.2. Determinants of growth in the BRIC countries 1980–2009**

Period	Output	Employment	Output per employee	Contribution of		
				Physical capital	Total factor productivity	
Average annual percentage changes						
1980-2009	Brazil	2.5	2.3	0.3	0.2	0.1
	China	10.0	1.6	8.3	3.6	4.6
	India	6.3	2.2	4.0	1.9	2.0
	Russia			<i>n.a.</i>		
1980-1990	Brazil	2.2	3.3	-1.1	0.4	-1.6
	China	9.3	2.8	6.3	2.7	3.5
	India	5.9	2.6	3.2	1.4	1.8
	Russia			<i>n.a.</i>		
1990-2000	Brazil	2.6	1.1	1.6	0.1	1.4
	China	10.4	1.1	9.2	3.9	5.2
	India	5.5	1.8	3.6	1.8	1.7
	Russia			<i>n.a.</i>		
2000-2009	Brazil	2.8	2.4	0.4	-0.1	0.6
	China	10.5	0.9	9.5	4.2	5.1
	India	7.6	2.3	5.2	2.6	2.6
	Russia	4.9	0.4	4.5	1.6	2.9

Source: own calculations based on IMF-IFS data.

Second, we can determine and decompose differences in GDP per capita. This is done in Table 2.3 in which we decompose the gap in GDP per capita with the US into a part that is attributable to lower productivity per hour worked, a part that is attributable to fewer hours worked per person, and a part attributed to lower participation (which can be the resultant of an aged or very young population, high

unemployment or voluntary non-participation). If we first look at the Netherlands, we see that the Netherlands was facing a gap of almost 40% with the US in 1950, which was fully explained by low productivity per hour worked (partly caused by the destruction of capital in the Second World War and partly by “technological backwardness”). Part of this productivity disadvantage was compensated by the fact that in 1950 participation and hours worked per person were high relative to the US. In 2010, the gap with the US has halved, productivity is still lagging behind, hours worked per person are very low (due to short working weeks and a high share of part-time jobs). Participation is high relative to the US (partly again a reflection of many part-time jobs and partly also as a reflection of a very low unemployment rate).

**Table 2.3. Decomposition of GDP per capita, gap with the US (in %)**

		GDP per capita	GDP per hour worked	Hours worked per worker	Participation
the Netherlands	1950	37.5	62.6	-14.8	-10.2
	1970	20.7	29.6	-4.0	-4.9
	1990	25.6	7.2	11.6	6.8
	2010	20.5	13.6	18.6	-11.6
Brazil	1950	82.5	84.4	-3.2	1.3
	1970	79.7	83.7	-8.5	4.5
	1990	78.8	81.6	-4.4	1.6
	2010	77.9	87.2	-4.3	-5.0
China	1950	96.4	<i>GDP per worker</i>		
	1970	96.0	101.7		-5.7
	1990	93.8	99.0		-5.2
	2010	75.9	89.2		-13.4
Russia	1950	<i>GDP per worker</i>			
	1970				
	1990	66.5	69.3		-3.0
	2010	71.1	74.6		-3.5
USSR	1950	70.3	77.9	-1.1	-6.5
	1970	62.9	72.1	-0.1	-9.2
	1990	70.3	69.6	0.5	0.2
	2010	74.6	75.4		-0.8
India	1950	93.5	<i>GDP per worker</i>		
	1970	94.2	87.8		6.4
	1990	94.4	85.6		8.8
	2010	89.0	83.4		5.6

Note: GDP per capita is the sum of productivity (GDP per hour worked), hours worked (per worker) and participation. For China, Russia and India we have no data on hours worked per person, so we have determined the contribution of GDP per person worked. Source: own calculations based on Total Economy Database (Conference Board).

For the BRIC countries, we see that in all cases, GDP per capita is far below that of the US. This gap is predominantly explained by a low productivity per worker. To the extent that information is available, this low productivity per worker is almost exclusively driven by low productivity per hour worked. The table also clearly reveals that China has succeeded best in closing the technology gap with the US. In Brazil, the gap has even increased (although partly compensated by a strong increase in participation relative to the US). This confirms the conclusions that were drawn on the basis of the growth-accounting exercise presented in Table 2.2.

Economic growth in both Brazil and India to some extent has been driven by population growth. Growth of GDP per capita in Brazil has been only 1.3 percent since its economic take-off in 1984, barely half the Dutch average annual per capita growth. Furthermore, the growth rates of Russia and Brazil are partially the result of the exploitation of abundant natural resources. The following sections will further elaborate on economic growth in the different BRIC countries during their episodes of accelerated economic growth.

### **2.3 Economic growth, take off and transition**

For China, India and Russia the transformation towards a market-based economy, deregulation and the 'opening-up' towards the global economy marked the start of economic acceleration. In China, a rather gradual reform process started in 1978 with the introduction of the 'opening-up' policy by its leader Deng Xiaoping. Policy changes are often 'tested' in smaller regions before being fully implemented. By western standards, China is still far off from a well-functioning market economy. Since 2005, under the leadership of president Hu Jintao and prime minister Wen Jiabao, the process of liberalization has been gradually continued. An interesting feature of the liberalization process in China is that, in contrast to Russia, it has occurred without a thorough attempt to democratization. Even though recent growth is increasingly driven by domestic demand, growth in the early years was led by an export-oriented policy, and later the inflow of foreign capital. In the latter, there is a large similarity with the earlier success of other Asian economies, like Japan, South Korea and Taiwan (see Young, 1994, 1995).

Even though the Indian economy started to accelerate in the early 1980s, substantial policy reform did not occur until a decade later. Rodrik and Subramanian (2005) attribute the growth during the first decade of India's 'take-off' to a change in the political approach towards private businesses. Before the 1980s, this could best be characterized as downright hostility, whereas in the early 1980s the economic environment abruptly changed towards business friendly. During the 1980s, the Indian economy

remained relatively closed, and economic growth was mainly driven by domestic factors. Drastic market-based economic reform started first in 1991. Many areas of economic activity were opened to private firms, while investment decisions in most industries did no longer require government approval. Up to the 1990s, banking was mostly restricted to government operated firms. Therefore, investment decisions were often politically rather than economically motivated. Furthermore, from the late 1990s onwards trade restrictions were gradually removed (even though trade remains more restrictive than in most OECD countries), and the integration of India into the world economy began. As was the case in China, this transformation resulted in the inflow of foreign capital.

In contrast to China and India, economic reform in Russia occurred in a 'big bang' fashion rather than gradual, following the collapse of the Soviet Union. Reforms started in 1987 under Michail Gorbatsjov, with the decision to allow firms to determine output levels based on demand. Furthermore, companies (although still being state-owned) became financially independent and were allowed to negotiate prices, such that the transfer of funds from profitable to unprofitable companies came to an end. Another reform was that foreign investment became legal. In 1991, in the first year of the presidency of Boris Yeltsin, Russia implemented what was known as the 'shock therapy' led by Jegor Gaidar which aimed at a rapid and radical transformation towards a market economy. The first effects of this policy were disastrous. A full economic collapse occurred, with GDP declining by about 50 percent between 1991 and 1995. The sudden removal of price controls resulted in an episode of hyperinflation. After a short period of recovery, the 1998 financial crisis resulted in a new recession and hyperinflation. After the financial crisis in 1998, the economy started to recover. Since then, economic growth has been continuously high, large sums of foreign direct investments have been attracted, and inflation has remained relatively low. The total stock of FDI originating from the EU invested in Russia has quadrupled in the five years between 2004 and 2009. GDP growth is spurred by high revenues from the availability of natural resources, especially oil and gas.

In the early 1980s, the Brazilian economy experienced a period of economic crisis that was the result of bad governance and a high dependency on foreign debt. As the government attempted to reduce indebtedness by reducing imports and economic growth and the introduction of an import substitution program, the economy entered a deep recession in 1981. In the mid 1980s this program resulted in a trade surplus, but at that time the domestic public debt had become problematic and a loose monetary policy had resulted in hyperinflation. While it took until the early 1990s before fiscal stabilization was achieved, early attempts to improve macroeconomic stability relied on a price freeze. While upon introduction in 1986 this was successful initially, supply was soon reduced such that many goods became scarce. In the late 1980s Brazil returned to hyperinflation. In 1990, under the presidency

of Fernando Collor de Mello, a new attempt was made to ensure macroeconomic stability. A new price freeze was implemented, most financial assets were frozen, and fiscal reforms were carried out. This plan failed as well, however, and the economy entered a new period of recession. It took until 1994 before the crisis came to an end, when the Brazilian currency (the real) was pegged to the US dollar. Since then, economic growth has remained generally high and Brazil has succeeded to attract high levels of FDI. For the EU, Brazil is the second most important destination for FDI of all BRIC countries.

We now turn to a comparison of the economic performance of the BRIC countries during their respective 'take-off' periods. Defining the 'take-off' period for Brazil is rather difficult, because – as noted in the previous section – no real 'take-off' has taken place due to the absence of macroeconomic stability for most of the last decades. While in Brazil average inflation was 151 percent, inflation was 19 percent in Russia (though this is mostly due to the 1998 crisis), and only 8 and 6 percent in India and China, respectively. Between 1984 and 2009, average GDP growth in Brazil was only 1.3 percent. However, due to high population growth, the total GDP volume increased by an average of 2.9 percent. In India, GDP per capita has increased by an average of 4.1 percent between the start of reforms in 1980 and 2009. Just as has been the case in India, high population growth has resulted in a relatively high growth of GDP volume. In Russia, the population is shrinking. While GDP per capita increased by 5.8 percent on average between 1998 and 2009, growth of the volume of GDP was somewhat lower at 5.4 percent. China has experienced by far the most successful 'take-off' period, as growth of GDP per capita as more than twice that of India, and about six times that of Brazil.

Compared to the other BRIC countries, China has experienced a much stronger growth of exports (and imports), thus illustrating the success of its outward oriented growth strategy in the early years. In China, export growth averaged at 15.5 percent during almost three decades. Exports increased much faster than GDP. In Brazil and Russia, this trend is opposite. Not only did exports increase by as little as 1.9 percent (Brazil) and 4.0 percent (Russia), exports increased at a lower rate than GDP. India's growth has to a large extent been driven by exports, but not to the extent of China.

**Table 2.4. Key data on Brazil, China, India and Russia during ‘take-off’**

	Brazil 1984–2009	China 1980–2009	India 1980–2009	Russia 1998–2009
Average annual percentage changes				
<b>Volumes</b>				
Gross Domestic Product (GDP)	2.9	10.0	6.3	5.4
GDP per capita	1.3	8.9	4.3	5.8
Household consumption expenditure	2.1	8.7	5.3	4.6
Government consumption expenditure	6.7	9.6	6.9	5.8
Gross fixed capital formation	3.0	11.8	7.8	7.9
Exports of goods and services	1.9	15.5	10.2	4.0
Imports of goods and services	4.1	14.4	9.4	3.3
Consumer price index	151	5.9	7.9	19.1

Source: IMF International Financial Statistics, 2010.

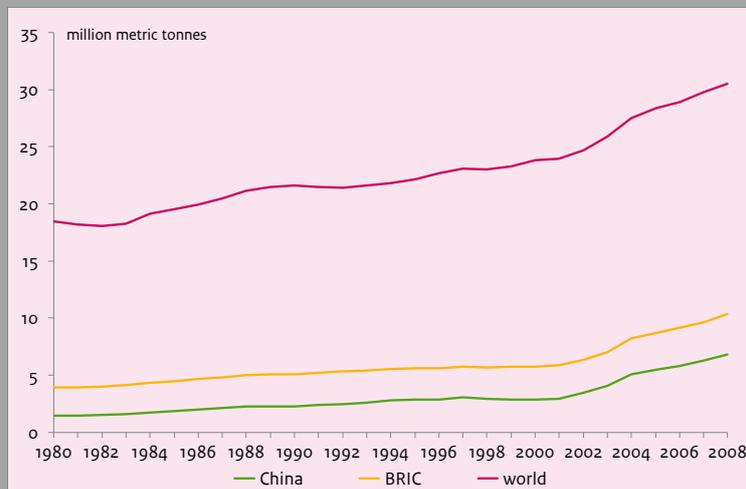
### **Box 2. Impact of the BRIC countries on climate change and natural resources**

Because of their sheer economic size and high annual growth rates, the BRIC countries have an increasingly important impact on global demand for natural resources and climate change. The share of the BRIC countries in global carbon dioxide emissions has increased from 22 percent in 1980 to 24 percent in 2000 and 34 in 2008. This aggregate growth, however, hides dynamics within the BRIC countries. Emission growth has mainly taken place in China, where the share in global emissions has increased from 8 percent in 1980 to 12 percent in 2000 and 22 percent in 2008 (see Figure 2.6). While GDP increased by about 10 percent per year between 2000 and 2008, energy consumption increased at an even higher rate of 13 percent. While China was by far the country with the highest CO<sub>2</sub> emissions of the world in 2008 (the latest year for which definite figures are available), its 17.4 percent share in global energy consumption was still slightly below that of the US. Preliminary figures show, however, that China has surpassed the US in 2010 (IEA, 2010).

More than two thirds of Chinese CO<sub>2</sub> emissions are related to the use of coal (which is an energy resource that is relatively harmful for the environment), while this figure is 32 percent for the rest of the world. In addition, the energy intensity of the BRIC countries and in particular China is relatively high (e.g., relatively high amounts of energy are used to produce a euro worth of production).

As per capita energy consumption and carbon dioxide emission of the BRIC countries remains to be far below the average of advanced economies, their future economic transition is likely to result in increased demand for scarce natural resources and increased emissions per capita and per unit of GDP (see De Groot et al., 2004, for a discussion of Income Emission Relationships in China). Predictions of the International Energy Agency indicate that this may increase global carbon dioxide emissions by as much as one third (IEA, 2010). While the effect of lower prices of consumption goods is likely to disappear in the future when income convergence occurs, increased demand for natural resources due to domestic demand from the BRIC countries could increase world prices in the long term.

**Figure 2.6. Annual CO<sub>2</sub> emissions (in millions of metric tonnes) 1980 –2008**



Source: International Energy Agency (IEA, 2010).

### 3 BRIC trade and FDI – a sectoral perspective

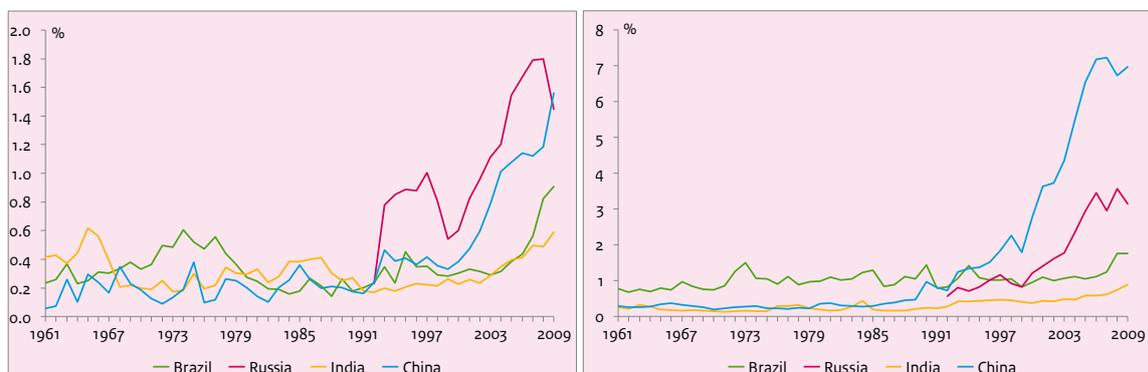
This chapter aims to describe the intensity and development of trade of the Netherlands with the BRIC countries and the implications for the competitive position of Dutch industries. Trade is the most important channel through which the emergence of the BRIC countries affects the Netherlands. On the demand side, the growth of the BRIC countries leads to export opportunities for Dutch firms. On the supply side, Dutch consumers and firms can import goods and services from the BRIC countries, which leads to more product variety and lower prices. Another aspect is that Dutch firms will experience more competition from the BRIC countries, both on the Dutch market as well as in foreign markets to which firms from the Netherlands and the BRIC export.

#### 3.1 Stylized facts on trade

This section considers the importance of the BRIC countries for Dutch trade. It will show the development of trade over time and compare the trade between the Netherlands and the BRIC countries with the trade between other countries in the EU-15 and the BRIC countries.

Figure 3.1 shows the export and import shares of the Netherlands to and from the BRIC countries. These shares are based only on goods for the years until 1998, due to the lack of data on trade in services. From 1999 and onwards the shares are based on goods as well as non-factor services. This minor inconsistency is hardly visible since from 1999 onwards trade in services is included in both the numerator and the denominator, and since trade in services was small compared to trade in goods.

Figure 3.1. Dutch export (left) and import (right) shares to and from the BRIC countries

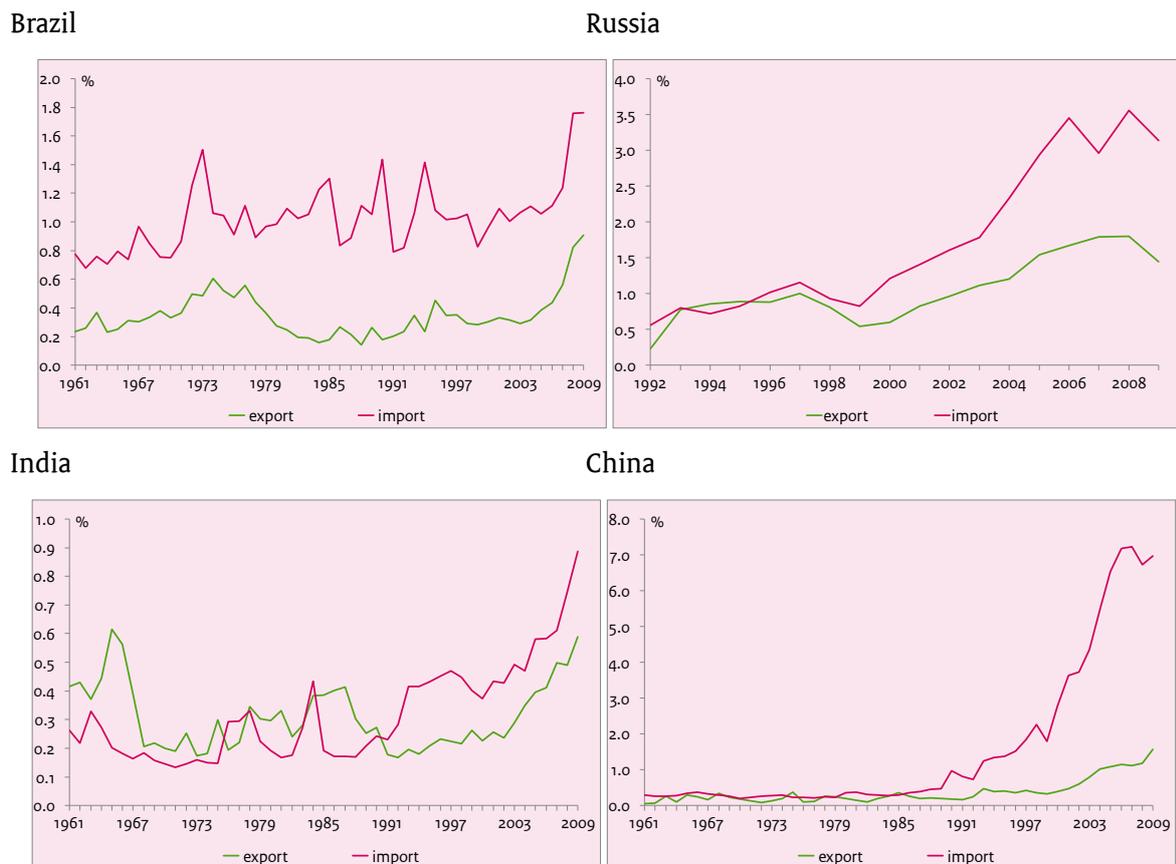


The scale of the vertical axis in Figure 3.1 makes clear that the BRIC countries are much more important for Dutch imports than they are for Dutch exports. The import shares of the BRIC countries in 2009

range from about one percent (India) to about seven percent (China), while the export shares vary between 0.6 percent (India) and 1.6 percent (China). Furthermore, the figure shows that China and Russia are more important trading partners for the Netherlands than Brazil and India.

In order to show more clearly how the trade shares of the individual BRIC countries developed over time, Figure 3.2 contains a figure for each of the BRIC countries separately.

**Figure 3.2. Dutch export and import shares for each BRIC country**

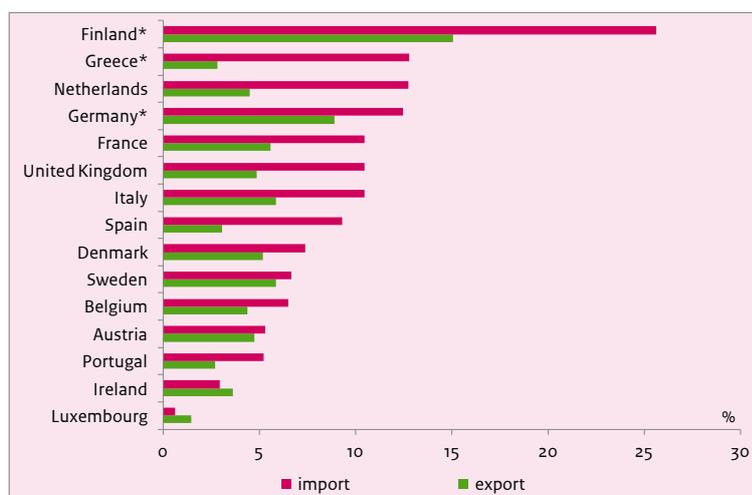


This figure clearly shows the increasing share in Dutch exports and imports to and from most BRIC countries in the last twenty years. The trade shares with Brazil remained fairly stable, but the annual volatility is high. In 2009, the Netherlands still trades more with Brazil than with India. The figure also shows that the share of BRIC countries in Dutch imports has increased much faster than their share in Dutch exports, while for Russia, India, and China the Dutch export and import shares were approximately equal around 1990. In particular, the rising import share of Chinese products is remarkable. China is the second largest importer of the Netherlands now. Currently the Dutch import shares are higher than the Dutch export shares for all BRIC countries, indicating a trade deficit with the

BRIC countries.<sup>10</sup> This could be explained by the Dutch position in Europe as a gateway to Europe for these emerging countries. This port function has become more important over the last twenty years. Before that, Dutch exports and imports to and from the BRIC countries were more balanced (and substantially smaller).

In order to compare the trade position of the Netherlands with the BRIC countries with those of other developed countries, Figure 3.3 shows the trade with the BRIC countries of all EU-15 countries. Most countries in the EU-15 are net-importers of the BRIC countries, with Luxembourg as a clear exception to the rule. The share of import from the BRIC countries of the Netherlands is the second largest, after Finland. This confirms the position of the Netherlands as a gateway to Europe. The very high share of Finland (25 percent) is mainly due to imports from Russia (16 percent). The export share of the Netherlands (4.5 percent) is somewhat below the average of the EU-15. However, when the net indirect exports are also considered, the Dutch export share to the BRIC countries increases somewhat (see Section 3.4).

**Figure 3.3. Export and import shares of goods and services to the BRIC countries of EU-15 (2009)**



Source: own calculations based on OECD ITCD database. \* based on 2008 instead of 2009.

## 3.2 Revealed comparative advantages

The concept of comparative advantage is one of the first and most influential concepts in economics that goes back to the seminal work of David Ricardo. A country has a comparative advantage in producing a good or service if the opportunity costs of producing that product in terms of other

<sup>10</sup> Note that the export and import shares are calculated based on total Dutch exports and imports. These figures are therefore not sufficient to determine whether the Netherlands runs an absolute trade deficit or surplus with an individual country, since this also depends on the ratio of total Dutch exports to total Dutch imports.

products is lower in that country than in other countries. Comparative advantages can be empirically identified by focussing on realised export flows (see Balassa, 1965). The most popular index for measuring them is the Balassa index which gives the exports of a certain product (indexed  $j$ ) by a certain country (indexed  $i$ ) as a share of the total exports of that country divided by the share of the exports of that product in the total exports of a reference group (indicated with an index  $w$ ):

$$BI_{i,t}^j = \frac{X_{i,t}^j / X_{i,t}}{X_{w,t}^j / X_{w,t}} = \frac{X_{i,t}^j / X_{w,t}^j}{X_{i,t} / X_{w,t}}, i \in I, j \in J \quad (3.1)$$

where  $X_{i,t}^j$  equals country  $i$ 's exports of product/sector  $j$  at time  $t$ ,  $X_{w,t}^j$  equals the exports of the reference group of countries product/sector  $j$  at time  $t$ ,  $I$  is the group of countries considered,  $J$  is the set of products considered,  $X_{i,t} \equiv \sum_j X_{i,t}^j$  and  $X_{w,t} \equiv \sum_j X_{w,t}^j$ .

In words, the Balassa index thus measures the ratio of the share of product  $j$  in total exports of country  $i$  relative to the share of product  $j$  in world exports.<sup>11</sup> Alternatively, it can be described as country  $i$ 's share in world trade of product  $j$  relative to country  $i$ 's share in aggregate world trade. An RCA value exceeding one indicates that a country exports a lot of the product relative to what all other countries export. Deviations of the value of the index from unity may reflect differences in relative costs as well as differences in non-price factors. The Balassa index may reflect a comparative advantage in production as well as in assembly or in trade of a certain good. The last interpretation is particularly relevant for a small open economy such as the Netherlands. Comparative advantages in production may be due to several factors such as cheap inputs, unique resource endowments, but also government support for specific industries in the form of subsidies or special tax treatments under the heading of industrial policy (see, e.g., Rodrik, 2007).

In order to get a more detailed insight into the most important export goods and services of the Netherlands and of the BRIC countries, this section describes the goods and services with the largest export shares and the sectors with the highest RCA. For goods this will be done at the two-digit SITC level and for services at the one-digit EBOBS level.

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<sup>11</sup> Note that we use total trade to calculate the Balassa indices, which includes both domestic trade and re-exports. This means that it is not possible to distinguish between comparative advantages in production or in trade. Since the share of re-exports in total trade is relatively high in the Netherlands (about 30 percent in 2009), the Balassa index will be relatively high for product groups with high re-export shares (mostly manufacturing products) and relatively low for product groups with low re-export shares (like services). It is not possible to separate domestic exports from re-exports for global trade due to lack of data. Although these data are available for the Netherlands, using domestic trade for the Netherlands in the nominator and total trade for the reference group in the denominator would underestimate the Balassa index for product groups with relatively much re-exports and overestimate the Balassa index for product groups with few or no re-exports.

**Table 3.1. Goods and services with large national export shares and with strong revealed comparative advantages in 2008**

top 5 export product groups				top 5 RCA				
SITC-2 product group (2 digit)	RCA	export share (in %)	world export share	SITC-2 product group (2 digit)	RCA	export share (in %)	world ex share	
<b>The Netherlands</b>								
33 Petroleum, petroleum products and - Other business services	0.8	9.9	10.8	29 Crude animal and vegetable	8.7	1.7	0.2	
75 Office machines & automatic data - Transportation	2.1	6.2	3.0	94 Animals, live, zoo animals, dogs,	4.5	0.0	0.0	
34 Gas, natural and manufactured	2.3	4.9	3.7	12 Tobacco and tobacco manufactures	3.8	0.7	0.2	
Total		4.0	1.8	0 Live animals chiefly for food	3.5	0.3	0.1	
		31.6	23.5	43 Animal-vegetable oils-fats,	3.4	0.2	0.1	
				Total		2.9	0.6	
<b>Brazil</b>								
28 Metalliferous ores and metal scrap	6.7	9.0	1.3	22 Oil seeds and oleaginous fruit	17.0	4.8	0.3	
33 Petroleum, petroleum products and - Other business services	0.8	8.2	10.8	6 Sugar, sugar preparations and	14.6	2.5	0.2	
1 Meat and meat preparations	10.3	6.3	0.6	1 Meat and meat preparations	10.3	6.3	0.6	
78 Road vehicles (including air-	0.9	6.1	6.5	25 Pulp and waste paper	7.9	1.7	0.2	
Total		35.9	23.4	8 Feeding stuff for animals, not	7.0	2.1	0.3	
				Total		17.4	1.6	
<b>Russia</b>								
33 Petroleum, petroleum products and	5.4	42.5	7.9	34 Gas, natural and manufactured	8.7	11.2	1.3	
34 Gas, natural and manufactured	8.7	11.2	1.3	56 Fertilizers, manufactured	7.0	1.5	0.2	
93 Special transactions not classified	2.2	7.3	3.3	24 Cork and wood	5.6	1.9	0.3	
68 Non-ferrous metals	3.0	6.2	2.1	33 Petroleum, petroleum products and	5.4	42.5	7.9	
67 Iron and steel	1.8	5.2	2.9	32 Coal, coke and briquettes	4.5	1.5	0.3	
Total		72.4	17.5	Total		58.6	10.0	
<b>India</b>								
- Computer and information services	17.1	17.3	1.0	- Computer and information services	17.1	17.3	1.0	
33 Petroleum, petroleum products and - Other business services	1.1	11.4	10.8	26 Textile fibres (except wool tops) and	4.5	0.7	0.2	
66 Non-metallic mineral manufactures,	4.2	7.2	4.2	66 Non-metallic mineral manufactures,	4.2	5.9	1.4	
67 Iron and steel	1.4	5.9	1.4	8 Feeding stuff for animals, not	3.3	1.0	0.3	
Total		4.2	3.1	6 Sugar, sugar preparations and	3.3	0.6	0.2	
		46.0	20.5	Total		25.5	3.1	
<b>China</b>								
75 Office machines & automatic data	3.7	11.2	3.0	83 Travel goods, handbags and similar	4.5	0.9	0.2	
76 Telecommunications & sound	3.0	10.3	3.4	85 Footwear	4.0	1.8	0.4	
77 Electrical machinery, apparatus &	1.6	9.8	6.1	84 Articles of apparel and clothing	3.9	7.6	2.0	
84 Articles of apparel and clothing	3.9	7.6	2.0	75 Office machines & automatic data	3.7	11.2	3.0	
89 Miscellaneous manufactured	1.9	5.2	2.8	65 Textile yarn, fabrics, made-up	3.1	4.2	1.4	
Total		44.1	17.3	Total		25.7	7.0	

Sources: own calculations based on OECD ITCS database and Service Trade database.

For many countries, gas and petroleum products are among the largest export sectors. Products from these sectors are traded in large quantities around the world. Petroleum is the largest export sector of the Netherlands, but the export share of this sector is still smaller than in the rest of the world. The export share of gas is relatively high due to the Dutch natural gas reserves. Other large export sectors are business services and transportation services. The share of transportation services is large mainly as

a result of Rotterdam functioning as gateway to Europe. Most of the sectors in which the Netherlands has a high relative comparative advantage are related to (manufactured) animal products.

Table 3.1 shows the largest export sectors and the sectors with the highest RCA for the Netherlands and for the BRIC countries. This table makes clear that there are large differences between the BRIC countries in their specialization. Especially Russia has a very homogeneous export product mix, with petroleum products and natural gas accounting for over 50 percent of its total exports. And the five product groups with the largest export shares account for over 70 percent of total exports of Russia. The export composition of India, China and Brazil is less homogeneous, with the top five export product groups accounting for 46 percent, 44 percent and 36 percent, respectively. The Netherlands has the least specialized export composition, the top five export product groups accounts for about 31 percent of Dutch exports. An interesting observation is the high share of services in the exports of India. Computer and information services and other business services account for almost 25 percent of the total Indian exports. An explanation for this is the low wages in India combined with English being the native language. The top five of Chinese export product groups is dominated by electronic products and textile products, which confirms the status of China as the factory of the world, resulting from relatively low wages.

Table 3.2 contains the five product groups (goods only) that constitute the largest trade flows between the Netherlands and China in 2009. The largest export product group of the Netherlands to China is called metalliferous ores and metal scrap. Looking at a more detailed SITC level reveals that over 90 percent of the trade in this product group is actually metal waste and scrap. The export value of this product group to China is equal to 0.24 percent of the total Dutch exports in terms of value. More than 23 percent of the Dutch exports in this product group are exported to China. These metal waste products are likely to be exported to China for recycling purposes. Other export products with a large share are organic chemicals and machinery for industry. On the import side, the Netherlands receives mainly office machines, telecommunication apparatus, electrical machinery, and clothing from China. This suggests that the production of electronics is done in China, while the machines that are required for this production are imported from the Netherlands. Note that for all product groups in the top four, more than 20 percent is imported from China. The export shares to China are all below six percent, except for the product group containing metal scrap. This confirms that China is much more important for Dutch imports (8.6 percent) than for Dutch exports (1.6 percent). Even though China has a very high import share for the Netherlands, the export flow of China to the Netherlands is only 2.5 percent of total Chinese exports.

**Table 3.2. Largest trade flows between the Netherlands and China in 2009**

## Dutch exports to China

SITC-2 (2 digit) product group	share in exports (in %)		share in Chinese imports (%)
	of total	of product group	of product group
28 Metalliferous ores and metal scrap	0.2	23.3	1.1
51 Organic chemicals	0.2	3.6	1.7
72 Machinery specialized for particular industries	0.2	5.5	2.4
74 General industrial machinery & equipment, and parts	0.1	4.8	1.5
58 Artificial resins, plastic materials, cellulose esters and ethers	0.1	2.7	0.8
Total exports to China		1.6	0.6

## Dutch imports from China

SITC-2 (2 digit) product group	share in imports (in %)		share in Chinese imports (in %)
	of total	of product group	of product group
75 Office machines & automatic data processing equipment	2.6	29.9	5.8
76 Telecommunications & sound recording apparatus	1.3	22.3	3.2
89 Miscellaneous manufactured articles, n.e.s.	1.0	23	5
84 Articles of apparel and clothing accessories	0.7	28.4	2.3
77 Electrical machinery, apparatus & appliances n.e.s.	0.6	13.1	1.5
Total imports from China		8.6	2.5

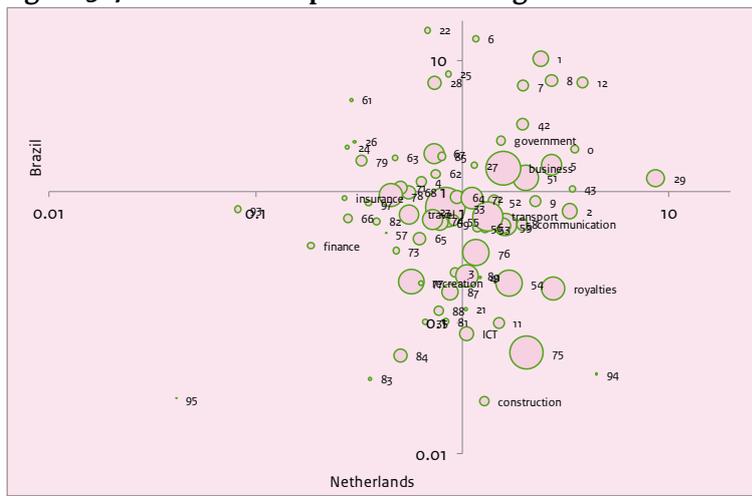
Sources: own calculations based on OECD ITCS database.

The next section compares the RCA's for the Netherlands with the RCA's for the BRIC countries. Product groups in which the BRIC have a strong revealed comparative advantage are potentially also exported to the Netherlands, which could imply lower prices for consumers and firms. On the other hand, exports from the BRIC countries could also lead to increased competition for Dutch firms, both in the Dutch market as well as in markets abroad.<sup>12</sup> Such increased competition would particularly affect Dutch firms in case of product groups with high Dutch RCA's and with high Dutch export shares. To identify these

<sup>12</sup> Note that possible negative effects of increased competition will typically occur only in the short run. In the long run the economy will adjust to producing products for which it has a comparative advantage. Standard trade theory suggest that trade will eventually benefit both countries by allowing a higher total production.

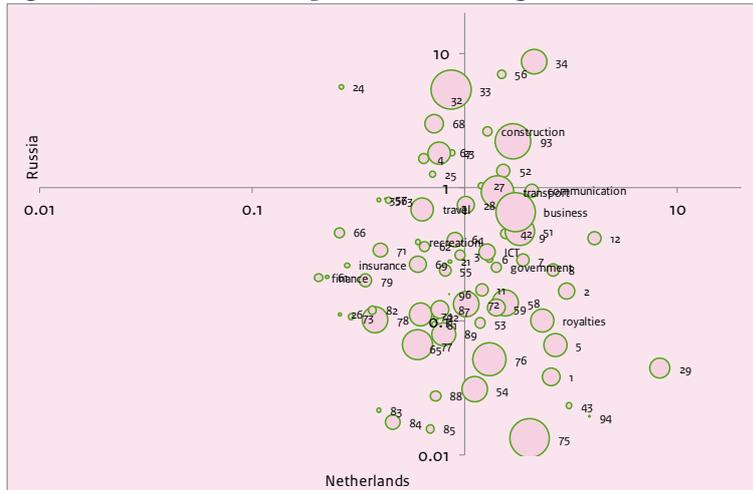
product groups, Figures 3.4–3.7 plot the RCA's of the BRIC countries against the RCA's of the Netherlands, where the size of the circles reflects the Dutch export share of the product group. Note that exports of BRIC countries and of the Netherlands could potentially also be complementary to each other. For example, this is the case if exports from the BRIC countries are exported to the Netherlands and then re-exported. The question whether exports from the BRIC countries are competing or complementary to Dutch producers, depends on the extent to which the Dutch product groups are driven by a comparative advantage in trade or in production.

**Figure 3.4. Revealed comparative advantages Brazil versus the Netherlands (2008)**

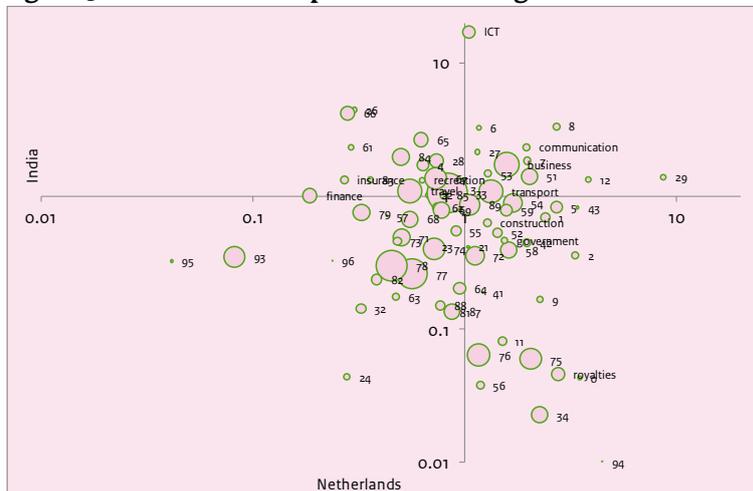


The upper right quadrant contains the sectors in which both countries have a revealed comparative advantage. Sectors in which both countries have a revealed comparative disadvantage are in the lower left quadrant. The other two quadrants contain sectors in which one of the countries has a revealed comparative advantage and one has a revealed comparative disadvantage.

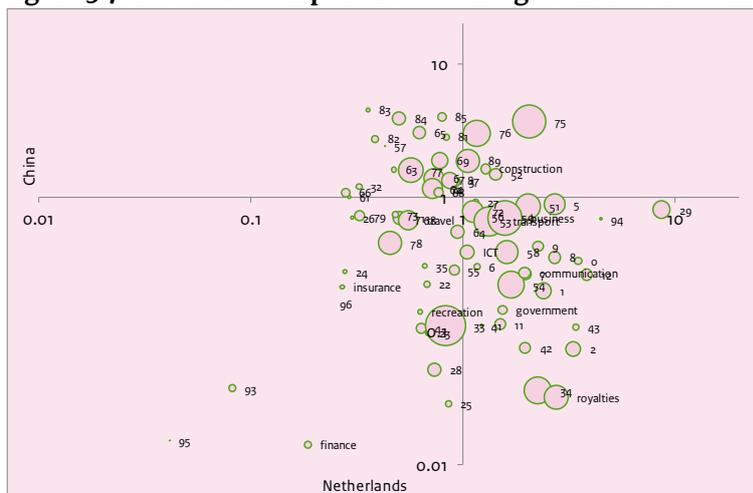
**Figure 3.5. Revealed comparative advantages Russia versus the Netherlands (2007)**



**Figure 3.6. Revealed comparative advantages India versus the Netherlands (2008)**



**Figure 3.7. Revealed comparative advantages China versus the Netherlands (2008)**



Based on the export specialisation patterns, the economies of China and Russia seem to be the most different from the Netherlands. There are only five product groups in which both China and the

Netherlands have a comparative advantage. Those sectors are mainly office machinery, equipment for telecommunications, and construction. The overlapping export product groups between Russia and the Netherlands are oil and gas, some chemical products, and construction. India is slightly more similar to the Netherlands (with eleven product groups in the upper right quadrant), but still the vast majority of product groups are in the other quadrants. The overlap between India and the Netherlands partly reflects their specialization in agricultural products and some chemical products. India and the Netherlands are also both specialized in ICT and communication services. Of the BRIC countries, Brazil is the most comparable to the Netherlands mainly driven by agricultural products, although overall there is no positive correlation between the Dutch and Brazilian RCA's in Figure 3.4.

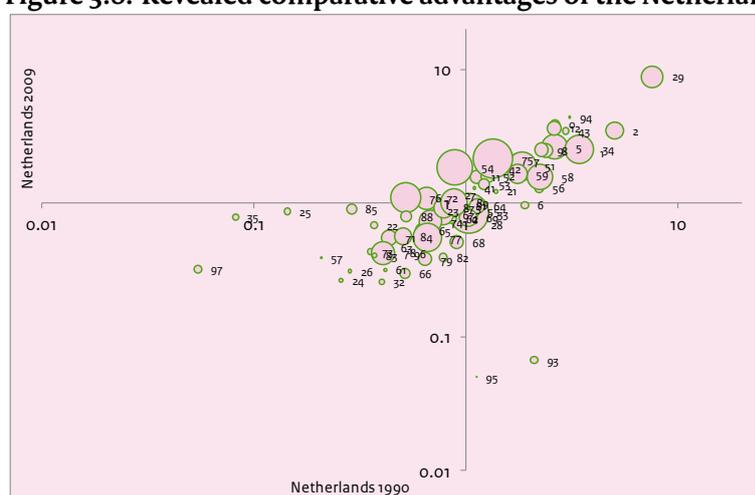
In addition to the size of the sector in the Netherlands, another interesting dimension is the distance over which products are typically transported. This matters for the extent to which products from the BRIC countries are competing with Dutch products. If products are usually not transported over large distance, Dutch firms will probably not have to compete with firms from the BRIC countries. This is likely to be the case for products that have high transportation costs or for perishable goods. To give some insight into the importance of distance, Annex C provides a table which shows for each product group the share of exports that has a destination which is relatively far away from China. This is only done for China, since this is by far the largest exporter of the four BRIC countries. To determine the share of exports that is transported over a large distance, we include all destination countries except for those that have a distance to China that is below 5500 km.<sup>13</sup> This exercise is only done for the product groups consisting of goods (2-digit SITC revision 2), since the data on export of services is not yet available for each destination country. The product group with the lowest share of exports that is transported to countries not mentioned above is 'live animals chiefly for food' (SITC 00). In fact, all Chinese exports of these products are exported to nearby countries. This makes sense because live animals are relatively difficult to transport over large distances. Hence, it is unlikely that Dutch firms will have to compete with Chinese firms in this sector. The product groups consisting of goods that have an RCA above one for the Netherlands as well as China are 'inorganic chemicals' (SITC 52), 'office machines' (SITC 75), 'telecommunications and sound recording apparatus' (SITC 76), and 'miscellaneous manufactured products' (SITC 89). These product groups are all fairly global in nature, with export shares to countries not listed above of 45 percent, 64 percent, 55 percent, and 70 percent, respectively.

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<sup>13</sup> Countries that have a distance to China which is below 5500km are North Korea, South Korea, Mongolia, Hong Kong, Macao, Japan, Vietnam, Laos, Bhutan, Philippines, Bangladesh, Nepal, Myanmar, Kazakhstan, Thailand, Cambodia, Kyrgyzstan, India, Pakistan, Brunei Darussalam, Uzbekistan, Northern Marina Islands, Palau, Tajikistan, Afghanistan, Malaysia, Singapore, Turkmenistan, Sri Lanka, and Indonesia.

Besides comparing Dutch RCA's with those of the BRIC countries, it is also informative to compare the RCA's of a single country over time. This indicates whether the economy has been stable over time or whether it has experienced a transition. The RCA's of the Netherlands of 2009 are plotted against 1990 in Figure 3.8. This figure is based only on exports of goods, since early data on services are not available. The size of the circles is based on the share of the product group in the total Dutch exports of goods in 2009. In this figure, most observations are close to the 45° line, which indicates a stable export composition between 1990 and 2009. The Dutch pattern is similar to that of Brazil, Russia and India. However, plotting the RCA's of China of 2009 against 1990, gives a much more scattered pattern (see Figure 3.9). The size of the circles is based on the share of the product group in the total Chinese exports of goods in 2009. The scattered pattern in this figure indicates that the Chinese economy has gone through a fairly drastic restructuring of its comparative advantages.

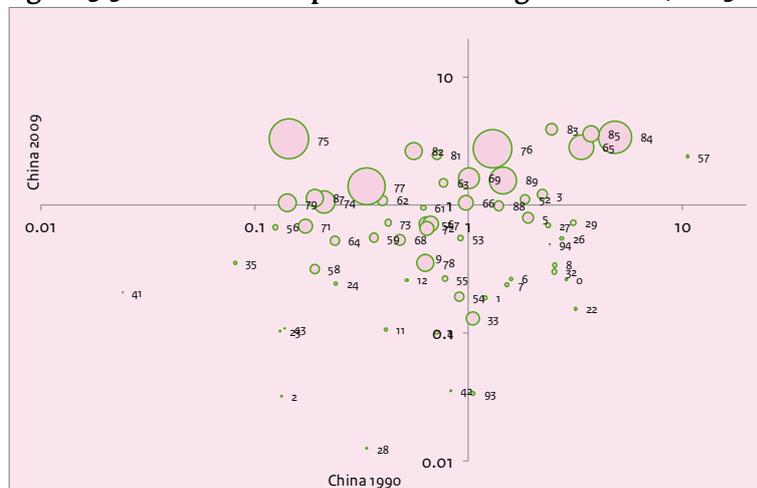
**Figure 3.8. Revealed comparative advantages of the Netherlands, 2009 versus 1990**



An example of a product group of which China was exporting much more in 2009 than in 1990, relative to the rest of the world, was office machinery (SITC 75). The RCA of China for office machinery was 3.3 in 2009, while it was only 0.1 in 1990. In fact, in 2009 this product group had the largest Chinese export share and accounted for 13 percent of all Chinese exports of goods. Other examples of large product groups that had a very low RCA in 1990 but experienced a large increase during this period are industrial machinery (SITC 74), Electrical machinery (SITC 77), and other transport equipment (SITC 79), furniture (SITC 82) and professional and scientific controlling instruments (SITC 87). Feenstra and Wei (2009) conclude that the share of machinery and equipment in Chinese exports has tripled between 1992 and 2006, at the expense of textiles and footwear. There are also several product groups that had a high RCA in 1990 but a low RCA in 2009. This is the case for many agricultural product groups: live animals (SITC 00), meat (SITC 01), cereals (SITC 04), vegetables and fruit (SITC 05), sugar (SITC 06),

coffee, tea, cocoa and spices (SITC 07), feeding stuff for animals (SITC 08). This clearly illustrates the rapid economic transition of China from agriculture to manufacturing.

**Figure 3.9. Revealed comparative advantages of China, 2009 versus 1990**

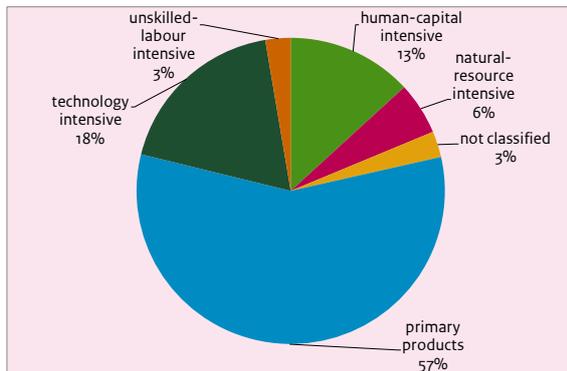


### 3.3 Factor intensities of exports of goods

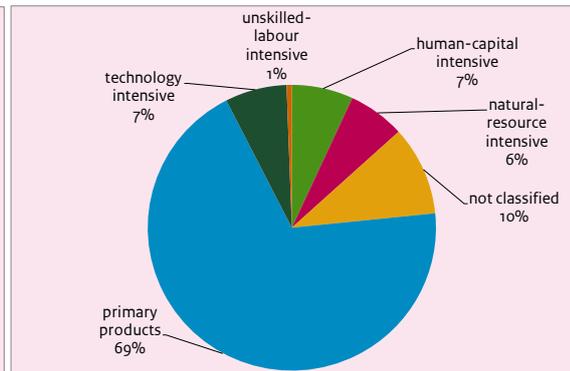
In order to put some more structure to the type of products being exported, exports of goods have been classified into several categories ranging from technology intensive to resource based. This is done based on the classification by Hinloopen and Van Marrewijk (2006), which is available at the SITC three-digit level. Figure 3.10 presents the factor intensities of exports of goods of Brazil, Russia and India in 2009. The export composition of China and the Netherlands are presented in Figure 3.11 for 1990 as well as for 2009. Note that these figures reflect the factor intensities of the products that are being exported, and not of the production structure in the country. These are different concepts, because goods are often produced using imported intermediates. These circle-diagrams once more show the very high share of primary products in Russia's export composition. Over half of Russia's export consists of petroleum and gas products. Brazil also has a high share of primary products, although these largely consist of agricultural products. India's export composition is the most diverse, with all five categories having between 14 percent (natural-resource intensive) and 27 percent (primary products).

**Figure 3.10. Factor intensities of exported goods of Brazil, Russia and India (2009)**

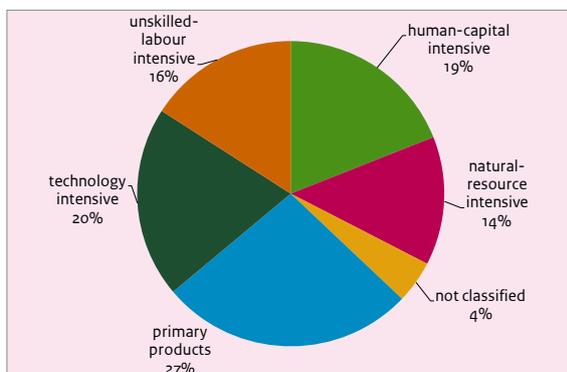
**Brazil**



**Russia**



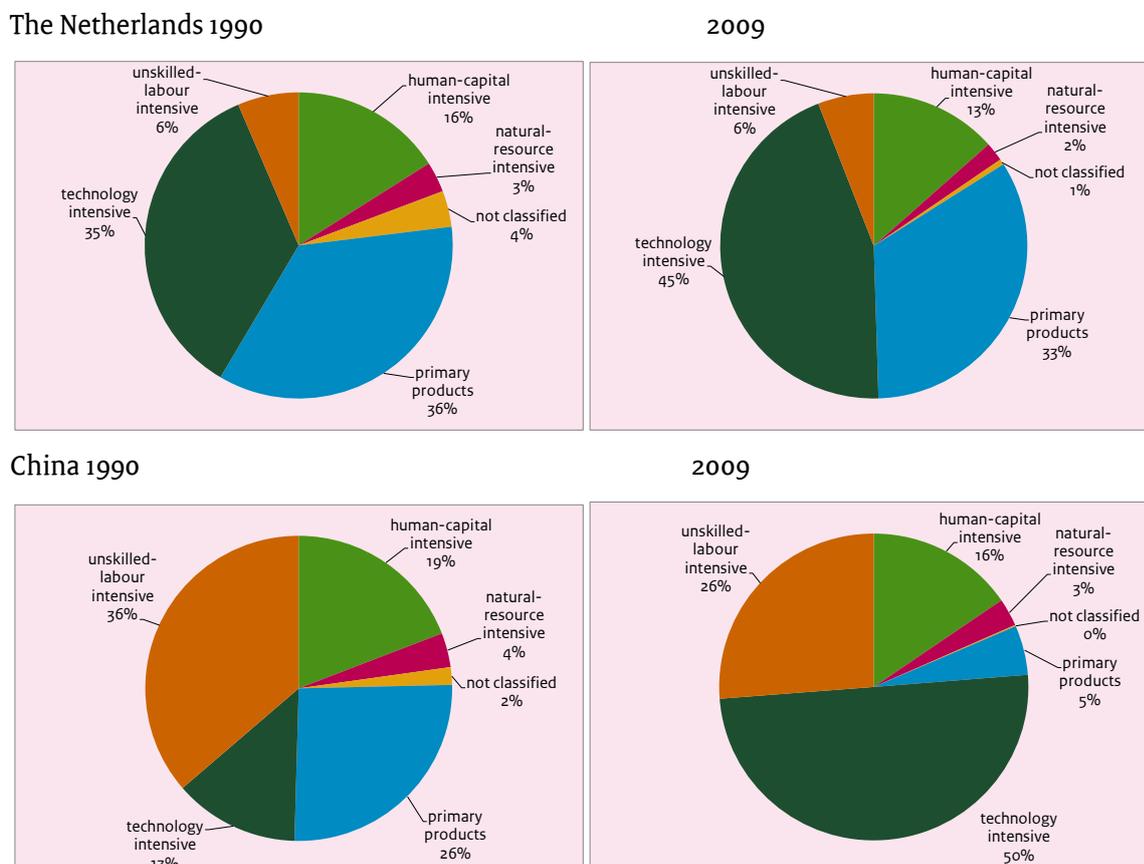
**India**



Comparing the circle diagrams of 2009 with those of 1990 provides insight into the development of the export composition over time. Figure 3.11 shows that almost 60 percent of the Dutch exports are technology or human-capital intensive in 2009. These shares are substantially lower for Brazil, Russia and India, with shares of 31 percent, 14 percent, and 39 percent, respectively. The share of products that are technology or human-capital intensive is actually higher for China than for the Netherlands in 2009 with 66 percent. Remember that this reflects the composition of the exports, and not the factor intensities of the economy. For example, a large part of Chinese exports consists of goods that are imported as intermediate products which are assembled in China. The final product may be technology intensive while the assembling process is actually unskilled-labour intensive. Amiti and Freund (2010) find that the skill upgrading takes mainly place in processed exports of China, suggesting a high skill content of the imported intermediates. Wang and Wei (2010) argue that this is not the only reason of the higher skill content of processed exports. Chinese government policies play also an important role. What ever the underlying reasons might be, the factor intensities of Chinese exports in 2009 are very different from those in 1990, when the exports of China consisted for only 19 percent of human-capital

intensive goods, 13 percent technology intensive goods, 26 percent primary products and 36 percent unskilled-labour intensive products. This again confirms the fast economic transition of China.

**Figure 3.11. Factor intensities of exported goods of the Netherlands and China (1990 and 2009)**



### 3.4 Indirect exports

The presented stylized facts on trade are based on the standard trade statistics, which record the origin and destination of goods and services. However, trade statistics do not report on what happens with the goods and services after they have arrived in the destination country. Some will be used to satisfy final demand in the destination country and others will be used in the production process. A part of the output that results from production will be exported, where they will again be used to satisfy final demand or as intermediates. This iterated process implies that the exports to a certain destination country, say China, are not only driven by Chinese final demand, but also by final demand of many other countries. We refer to this as indirect exports through China to the rest of the world. Likewise, a part of the Dutch exports to other countries is actually driven by Chinese demand. We refer to this as indirect exports through the rest of the world to China. The difference between the latter and the former can be considered the net indirect exports to China. The sum of net indirect Dutch exports to all

countries equals zero by definition. The sum of the trade flows to a country as observed by the trade statistics and the net indirect exports, is the amount of Dutch exports that are driven by the final demand in that country. For some countries, this number is quite close to the amount of export observed in trade statistics. However, for the BRIC countries the amount of Dutch exports that is driven by their final demand is considerably higher than the observed exports. This implies that the Netherlands export relatively much to countries who use these imports to produce goods and services which are then exported to the BRIC countries. Table 3.3 shows the Dutch export shares as observed by the trade statistics, as well as the share of Dutch exports that are driven by the final demand in these countries. Note that the concept of indirect exports does not only involve goods, but services as well. For example, when a Dutch firm provides a business service to a German factory that produces some products that are exported to China, the Dutch services are in fact driven by Chinese final demand.

**Table 3.3. Observed Dutch exports with and without adjustment for indirect exports (2009)**

	Export share (%)	
	(direct)	(adjusted for indirect trade)
Brazil	0.9	1.0
Russia	1.4	1.6
India	0.6	1.0
China	1.6	2.2
total BRIC	4.5	5.8

For all BRIC countries combined, the adjusted export share is higher than the observed export share. This means that the observed export share underestimates the amount of Dutch exports that is eventually related to by final demand from the BRIC countries. After adjusting for indirect exports, the Dutch exports to the BRIC countries are estimated to be 5.8 percent instead of 4.5 percent. The export shares adjusted for indirect trade are estimated based on an input-output analysis for the global economy. This involves an international input-output table, which contains the economic flows from each country to each country (exports), domestic supply of intermediate products, and final demand of each country. See Annex B for a technical note on estimating the indirect exports.

### **3.5 Foreign Direct Investment**

There is a close relation between international trade and Foreign Direct Investment (FDI). Off-shoring activities to one of the BRIC countries, for example, implies first building up an FDI stock, and then

exporting intermediates or final goods.<sup>14</sup> Furthermore, international trade and FDI are substitutes when multinationals face the choice between serving markets from other countries through exports or by starting a new branch that serves the market directly. Whereas the previous sections have discussed international trade, this section shifts attention to FDI.

Table 3.4 shows the amount of FDI invested in the BRIC countries by the Netherlands and the EU-15 (and vice versa) as of 2009. Since 1995, the stock of FDI originating from EU-15<sup>15</sup> countries invested in China<sup>16</sup> has increased from almost nothing to 151 billion euro. The total stock of FDI of the EU-15 (the Netherlands) in the BRIC has now accumulated to 396 (28) billion euro, while the stock of the BRIC in the EU-15 (the Netherlands) is 106 billion (2 billion). The Netherlands is thus a relatively large investor in the BRIC countries (relative to GDP), while the amount of FDI attracted from the BRIC countries is rather small. Figure 3.12 shows foreign direct investment relative to international trade (defined as the sum of imports and exports) of the BRIC countries towards the Netherlands (quadrant A) and the EU-15 (quadrant B), as well as foreign direct investments originating from the Netherlands (quadrant C) and the EU-15 (quadrant D) directed towards the BRIC countries. Because FDI and international trade are generally considered as substitutes, it is interesting to assess the relative importance of FDI compared to trade. As Panel A and B show, the only country with a substantial FDI stock in Europe (though not in the Netherlands) is Brazil. The FDI stock from China is relatively small. There is relatively less FDI going towards the Netherlands compared to other EU-15 countries (even though it is still above the EU-15 average in terms of GDP due to a far above average openness of the Dutch economy). The flow of FDI towards the BRIC countries is much larger than the flow from the BRIC countries, which could be expected based on the differences in economic development. The Netherlands is a relatively large investor in all other BRIC countries compared to the rest of the EU-15. Brazil is the largest recipient of FDI.

**Table 3.4. FDI stocks EU-15, the Netherlands and the BRIC (billions of euros)**

	Brazil	China	India	Russia	Total BRIC
FDI stock of the BRIC in the Netherlands	0.2	1.3	0.01	0.3	1.8
FDI stock of the BRIC in the EU-15	55.5	24.3	5.4	21.2	106.3
FDI stock of the Netherlands in the BRIC	7.7	11.5	2.0	7.0	28.2
FDI stock of the EU-15 in the BRIC	131.8	151.1	26.8	86.0	395.7

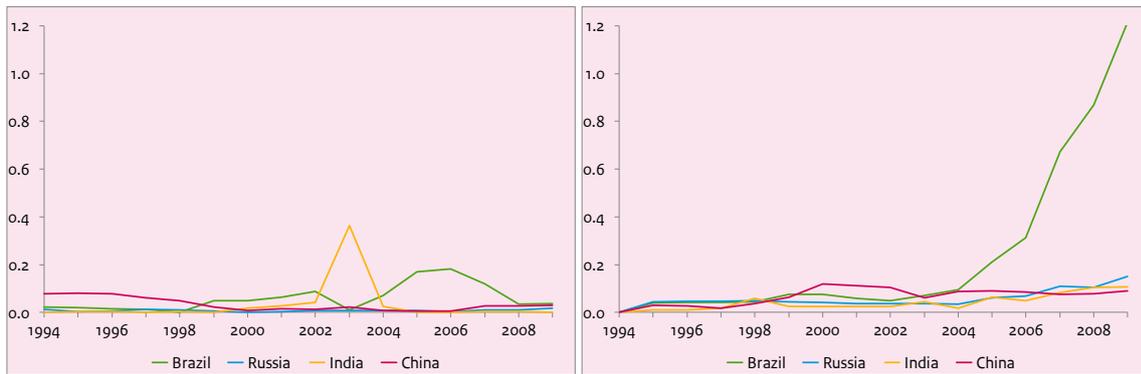
<sup>14</sup> Off-shoring is generally defined as the process of moving production to foreign countries, whilst keeping it within the firm. This is conceptually different from outsourcing, whereby a firm stops producing certain inputs by itself and starts acquiring it from an external supplier. This supplier can be both domestic and foreign. See, e.g., De Groot (2001) for a discussion of motives and implications of outsourcing.

<sup>15</sup> Data for the EU-27 are available only for recent years. To assure consistency, we present figures only for the EU-15 (which accounts for almost all FDI of the EU-27 towards the BRIC countries).

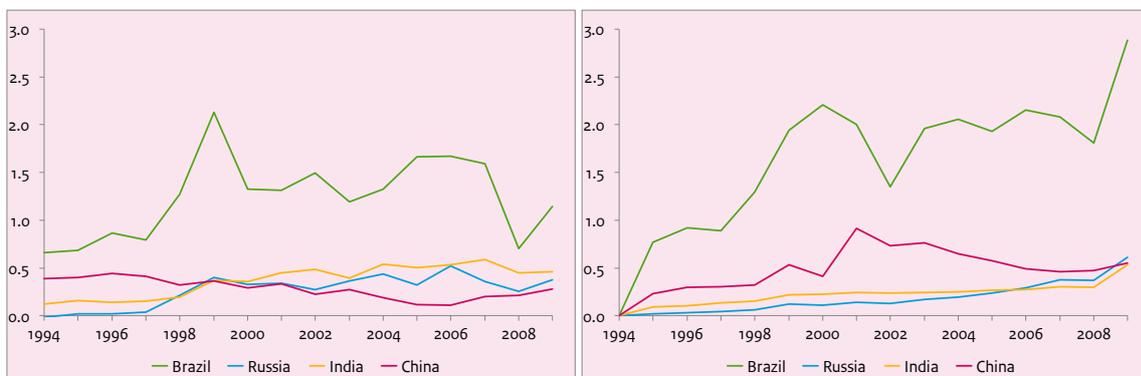
<sup>16</sup> Because Hong Kong functions as a hub for mainland China, we have added the FDI towards and from Hong Kong to the FDI of China. 62 percent of the FDI stock of the EU-15 in China and Hong-Kong combined is towards Hong Kong. For the Netherlands, this figure is 44 percent. For FDI towards the EU-15 and the Netherlands, these figures are even higher: 79 percent for the EU-15 and 95 percent for the Netherlands.

**Figure 3.12. FDI relative to trade (sum of imports and exports)**

A. FDI stock of the BRIC countries in the Netherlands B. FDI stock of the BRIC countries in the EU-15



C. FDI stock of the Netherlands in the BRIC countries D. FDI stock of the EU-15 in the BRIC countries



Source: own calculations based on Eurostat.

It is important to note that observed FDI flows and stocks which are based on financial data do not necessarily reflect ownership structure. Financial flows are likely to reflect optimal locations for taxation as well, rather than actual ownership. For example, if a firm located in the Netherlands is owned by a UK based firm that has Chinese owners, the Dutch firm will be observed as a daughter of a company from the UK. The ultimate controlling institute is, however, in China. The fact that as much as 95 percent of investments of China including Hong-Kong in the Netherlands are registered as originating from Hong-Kong in this dataset illustrates this problem: even though the transactions took place through intermediaries located in Hong-Kong, the ultimate controlling institute will often be located in mainland China. Section 4.5 uses micro data on the number of firms from India and China from a different data source providing the means for more in depth analyses on this topic. The findings in that section suggest that the Netherlands does not perform below the European average in attracting FDI from the BRIC countries.<sup>17</sup>

<sup>17</sup> The finding that the FDI stock from the BRIC is relatively low does not conflict with the view that the Netherlands is often used as a gateway to Europe by foreign investors. This depends on the actual amount of FDI that needs to be invested in the Netherlands to set up a subsidiary for that purpose.

## 4 Dutch trade and FDI interactions with the BRIC countries – a micro-perspective

### 4.1 Introduction

Our analysis so far has focused on trade and FDI patterns at the meso (sectoral) level. This provides us with a good and detailed overview of Dutch comparative advantages and the dynamic evolution of trade relationships with individual countries. These analyses have clearly revealed that Dutch trade with most BRIC countries increased rapidly during the last decade, and sometimes even from the 1990s onwards. The Netherlands has trade deficits with all these countries and these trade deficits have become larger over time.

The recent literature is increasingly focusing on trade relationships at more refined levels of aggregation, viz. at the level of individual firms. This literature has convincingly shown that the representative firm paradigm that implicitly underlies the meso analysis in Chapter 3 is not sufficient to provide a complete picture of trade relationships, and suffers from important deficiencies when drawing relevant policy conclusions. ‘One size fits all’ policies do not exist in a world where heterogeneity matters. More specifically, this literature points at the fact that trade and FDI is predominantly something in which the larger and more productive firms are active. An important implication of this is that barriers to trade that can only be overcome by a specific subset of firms. For a series of interesting contributions to this literature in the Dutch context, we refer to Bergeijk et al. (2011).

This chapter digs deeper into the determinants of these trade relations at the level of the firm, with a specific focus on the BRIC countries.<sup>18</sup> More specifically, we will decompose the changes in trade at the firm level. We focus on the decisions of firms to enter the BRIC countries and describe the size of their trade volumes. On the import side, we make a distinction between the decisions to source products from these countries and the size of the import flow. Creusen et al. (2011) use these transaction data to decompose Dutch exports in general. The result for the BRIC countries could be different than for other trading partners. On the one hand, the rapid economic development creates new opportunities, from which we can expect that the number of trading firms will increase as well as the number of products. Because of the increasing market size, we could also expect that export relations are bound to fail less quickly. On the other hand, these markets are less familiar in a cultural and institutional sense and also

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<sup>18</sup> Lejour and Van den Bijgaart (2011) provide more details on the dynamics of firms and products exporting to and importing from the BRIC countries. The data are from the International Transactions data base from Statistics Netherlands (CBS). Annex D provides more details. We thank CBS for providing these data. The authors are fully responsible for the calculations and presentation of the results.

geographically further away, creating particularly large uncertainties associated with the accession of these countries. This could be an additional barrier for firms entering these markets, and also a reason for a relatively large number of failures due to underestimation of the difficulties to set up a successful trading relationship with countries that are at large distance.

## 4.2 Characteristics of firms trading with the BRIC countries

Table 4.1 classifies the number of Dutch firms involved in international trade according to their trade status. With an average annual growth rate of 1 percent, the total number of firms involved in international trade has grown slowly over the years. Both the number of importers and the number of two-way traders have increased, whereas the number of exporters has slightly fallen. Just over half of all Dutch firms involved in international trade are two-way traders. Muûls and Pisu (2007) find similar results for Belgian firms that trade internationally.

The data exclude – by definition – all Dutch firms that do not participate in international trade. Statistics Netherlands (2009) compares these firms with the total number of firms and concludes that roughly 13 percent of all Dutch firms imported goods in 2007 and approximately 8 percent is involved in exports.

**Table 4.1. Number of firms involved in international trade by trade status and year; full dataset (all countries)**

		Trade status			
		Exporter	Importer	Two-way trader	Total
2002	Number of firms	2311	7189	9964	19464
	<i>Share in total number of Dutch firms trading internationally</i>	<i>11.9%</i>	<i>36.9%</i>	<i>51.2%</i>	<i>100%</i>
2008	Number of firms	2244	7951	10420	20615
	<i>Share in total number of Dutch firms trading internationally</i>	<i>10.9%</i>	<i>38.6%</i>	<i>50.6%</i>	<i>100%</i>
	Average annual growth rate	-0.5%	1.7%	0.7%	1.0%

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

Most of the exporting firms (55 percent) traded with only one or two countries.<sup>19</sup> Two-way traders export – on average – to more countries. Only 31 percent of them exports to one or two countries and

<sup>19</sup> 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).

21 percent imports from one or two countries. For importers, this share is about twice as high (46 percent). The average exporting firm (including two-way traders) has about nine destinations. Table 4.2 shows that this number of destinations increases significantly between 2002 and 2008. The average importing firms sources its products from about six countries. The finding that the average number of import partners is lower than the average number of export partners is common in the existing literature (see Manova and Zhang, 2009, for Chinese firms, and Bernard et al., 2009, for US firms). Firms trading with one or more BRIC countries or the US have more import and/or export partners than the average firm which is internationally active. In 2008 the number of importing countries varies from 10 for firms also are importing from the US or China to 18 for firms also importing from Russia. Exporting firms which also export to India have on average 29 export destination countries. Firms trading with other BRIC countries have a comparable number of export destinations. For firms exporting to the US the average number of destinations is a bit lower. It is not surprising that Dutch firms trading with the BRIC countries or the US have – on average – more export destinations or sourcing countries than the average Dutch exporter or importer. For Dutch exporters, these markets are far away compared to the European destinations and are often only served by larger and more productive firms (see Smeets et al., 2008). These firms have the capacity to overcome the market access barriers of foreign countries. Larger and more productive firms serve on average more exports markets. This also holds for firms importing from these countries.

**Table 4.2. Average number of trade partners across firms with different import and export status**

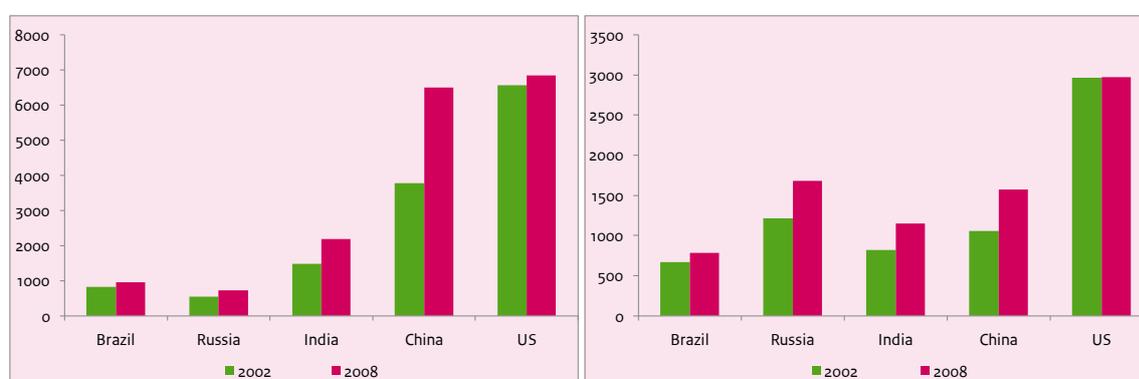
	if importing from					
	average	Brazil	Russia	India	China	US
2002	6.1	15.6	16.8	13.7	11.0	9.1
2008	6.6	16.6	18.1	13.9	10.3	10.1
	if exporting to					
	average	Brazil	Russia	India	China	US
2002	8.4	34.6	26.8	30.9	28.1	18.1
2008	9.9	33.7	26.6	29.4	25.4	20.0

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

Figures 4.1a and 4.1b 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 to the world market. The figure on the left shows, for example, that in 2002, 22 percent of importing Dutch firms imported goods from China. By 2008, this share has increased to 35.4 percent. For exporters, these shares were lower: 8.6 percent and 12.4 percent, respectively. A modest number of firms imports goods from Russia compared to the other BRIC countries. Brazil is the least favourite destination for exporting firms. For both importers and exporters, the US is the most popular source/destination country with shares of respectively 37.2 percent and 23.5 percent of Dutch importers and exporters. 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. Muûls and Pisu (2007) find that both 31 percent of importing and exporting Belgian firms trade with the US. Even though the US is still ‘on top of the list’, the share of firms importing from and exporting to the US seems to be stable between 2002 and 2008. This is different for the BRIC countries. The dynamics of their economies does lead to increasing shares in Dutch trade and to a higher share of Dutch firms trading with the BRIC countries. The increase in the number of firms trading with Brazil is meagre compared to the other BRIC countries, but this is also the case for the Brazilian share in Dutch trade as was illustrated in Figures 3.1 and 3.2.

**Figure 4.1. Number of Dutch firms importing from (left) or exporting to (right) a country**



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

### 4.3 Entry and exit in import and export markets

Figure 4.1 points out that the number of firms trading with the BRIC countries is rapidly increasing. This implies that every year, many firms start trading with (one of) these countries. We will now take a closer look at the patterns of entry and exit, for both importing and exporting firms. We find that high entry and exit rates co-exist, and that both rates are higher for the BRIC countries than for the US. Table 4.3 displays the entry and exit rates for firms importing from one of the BRIC countries or the US in 2008. Both entry and exit rates are highest for Russia, and lowest for the US. Clearly, the dynamics in the group of firms importing from the BRIC is higher than for the US: relatively more firms enter, and more firms exit. Moreover, countries with high entry rates generally seem to have high exit rates, too. Entry and exit rates on the Chinese market are comparable to those on the US market.

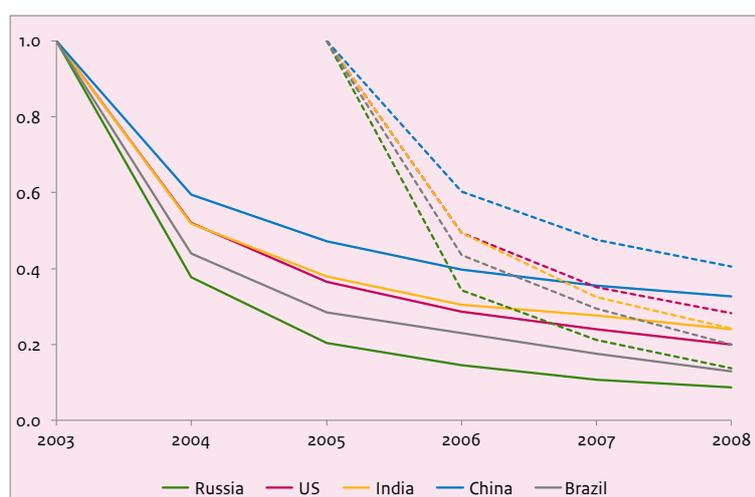
**Table 4.3. Entry into and exit from importing in 2008, as % from firms in 2007**

	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%

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

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 do not import goods for two successive years. This can be seen in Figure 4.2, which displays the survival rates for the 2003 and 2005 cohorts of entering firms. Only 38 percent of firms starting to import from this country in 2003 continued this importing relationship in 2004. Of the same cohort, only 9 percent still imported goods in 2008. This shows that, especially for Russia, many firms terminate their import activities within a few years. The survival rate for importing Chinese goods is much higher: 60 percent of the new exporters continues in 2004 and 33 percent is still active in 2008. This could be related that most of the Chinese imports are re-exported by wholesale firms. The comparison of the survival rates of the 2003 cohort with those of the 2005 cohort shows that rates have declined, except for China.

**Figure 4.2. Importer survival rates**



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

Table 4.4 lists the entry and exit rates for exporting firms in 2008. An interesting difference with the survival rates for importing firms is that country differences in entry and exit rates are smaller for exporting firms. Moreover the entry rates are significantly higher than the exit rates. Brazil has 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.

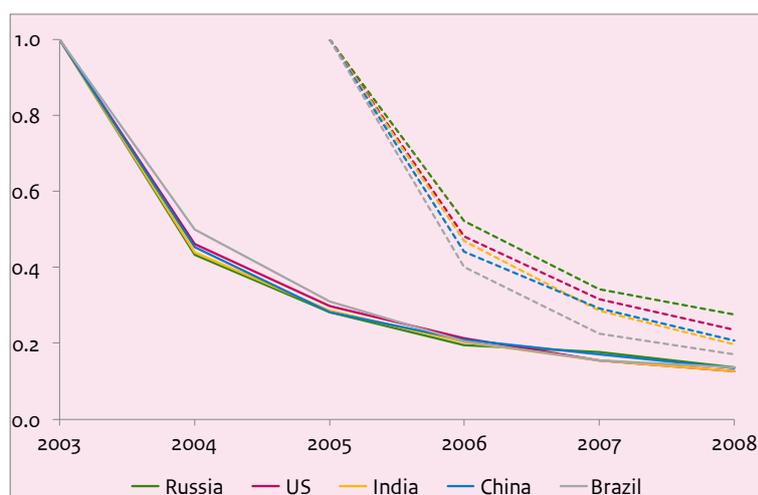
**Table 4.4. Entry into and exit from exporting in 2008, as % of firms in 2007**

	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%

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

The survival rates of the export destinations are remarkably similar. Figure 4.3 shows that about 45 percent of the firms starting to export to one of the BRIC countries in 2003 continued to do so in 2004. About 13 percent 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 in line with what is known from the literature. Cadot et al. (2011) report, for example, similar rates for African exporting firms.

**Figure 4.3. Exporter survival rates**



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

## 4.4 The origin of trade value growth

Contrary to what one might expect on the basis of the high entry and exit rates, entry and exit have only a very modest effect on total import and export value growth with the BRIC countries and the US in the year of entry. Table 4.5 shows the average import and export value of entering and exiting firms as a share of the average value of the continuing exporter. The table should be read as follows: a firm which did not import from Russia in 2002, but did record a positive import value in 2003, imports on average only 2% of the 2003 import value of the average firm that imported goods from Russia both in 2002 and 2003. As for exiting firms: a firm which imports goods from Russia in 2002, but not anymore in 2003, imported on average 7.2% of the 2002 import value of the average firm that imported goods from Russia in 2002 and continues his imports in 2003. Hence, Table 4.5 shows 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 average firm continuing its operations on that market. Across all destinations and averaged over 2003–2007, Creusen and Lejour (2011) have also found that on average, continuers export almost three times as much as starters or stoppers. Moreover, for all countries except Russia and India for exports, firms entering into importing or exporting have grown in relative size. Also 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 4.5. Average trade value of entering firms**

Average import value of firms entering or exiting as share of staying firms' import value		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%

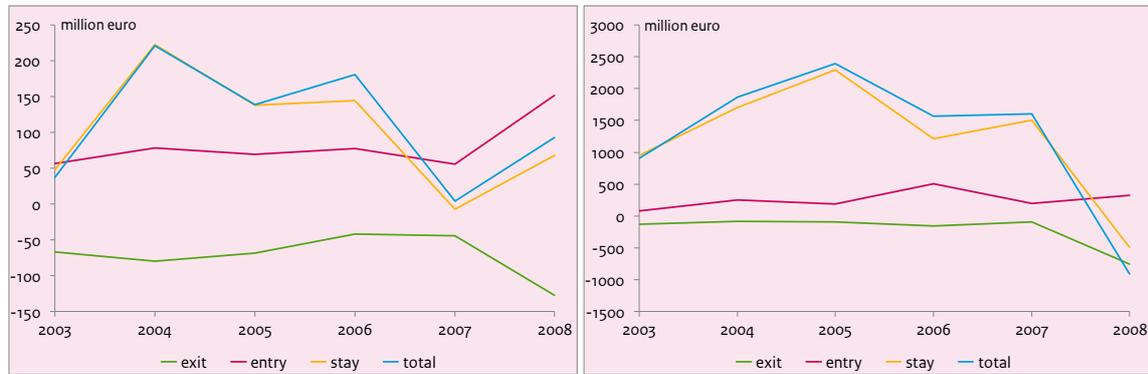
Average export value of firms entering or exiting as share of staying firms' export value		Brazil	Russia	India	China	US
2002–2003	Entry	18.0%	12.3%	24.4%	12.5%	7.0%
	Exit	20.5%	15.3%	33.3%	18.0%	6.8%
2007–2008	Entry	20.9%	11.2%	20.8%	19.3%	9.7%
	Exit	20.8%	10.3%	18.3%	21.2%	24.5%

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

We can also look at a decomposition of China's total import and export value growth (see Figure 4.4). Exiting firms have by definition always a negative effect on trade growth. This effect is most pronounced in 2008. The contribution of new firms importing or exporting Chinese goods is limited compared to the incumbents. In exporting, the differences are smaller and in 2008 entrants contribute

more to export growth than the incumbent exporters. For imports in particular, the figure clearly shows that these are primarily staying firms that account for total trade value growth from one year to another.

**Figure 4.4. Decomposition of Dutch export (left) and import (right) growth to and from China**



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

Figure 4.4 and Table 4.5 might lead to the conclusion that export market entry is not important. This may be right for the short term, but is incorrect for the longer term. While average imports or exports of the entering firm are relatively small compared to the incumbent firm and their aggregate contribution is small in the year of entry, the size of their operations tends to grow rapidly if they survive the first few years. There is hence a clear 'knowing the market' effect. Table 4.6 lists the average import and export value growth rates of firms that have imported and/or exported for all years in our sample. It also shows firms that have started importing and/or exporting in 2003, have continued to do so until 2008. The growth rates clearly show that entrants grow at least twice as fast as incumbents. This holds for exporting and importing. The relative gap between the growth rates of entrants and incumbents is largest in India. For this country, we find that the share of entrants in trade has exceeded the share of incumbents in 2008. This holds for imports and exports. For the other three countries, the average size of entrants as a share of the average incumbents' size ranges from 2.2% (Russian importers) to 54.4% (Russian exporters).

**Table 4.6. Trade value growth rates of 2002-2003 entrants versus incumbents**

Average annual import value growth rates of 02-08 importing firms versus 03-08 importing firms

	Brazil	Russia	India	China	US
2002-2008	10.0%	28.9%	4.9%	11.0%	10.9%
2003-2008	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

	Brazil	Russia	India	China	US
2002-2008	7.6%	13.4%	10.3%	13.7%	11.9%
2003-2008	40.2%	38.9%	37.3%	29.7%	32.5%

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

Table 4.7 lists these shares 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. Without the entry of new exporters or importers the shares should be 100 percent. The table shows the dynamics for the BRIC countries compared to the US. The latter is a relatively stable market with a high trade share of the incumbent Dutch firms, while for India more than half of the import and export value is accounted for by firms who have started importing goods from or exporting goods to India, at some point between 2002 and 2008.

**Table 4.7. Trade value accounted for by all-year importing/exporting firms in 2008**

Share of 2008 import value accounted for by firms importing in all years from 2002-2008

	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

2008	47.8%	43.0%	39.6%	55.5%	75.3%
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Source: own calculations based on firm-level international transaction data of Statistics Netherlands.

Overall, we conclude that new exporting or importing firms, who manage to survive until 2008, grow much faster than incumbents and a small number of them will dominate the incumbents in total trade to the BRIC countries, in particular exports. 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).

## **4.5 FDI of the BRIC directed towards the Netherlands**

The first four sections of this chapter have discussed trade with the BRIC countries. An alternative mode of interaction is through foreign direct investments. In deciding how to get access to foreign markets,

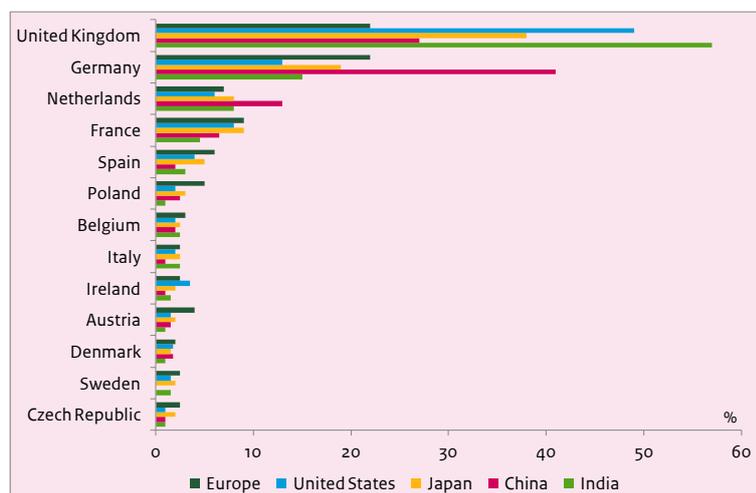
firms make trade-offs between costs of transport, costs of setting up a foreign subsidiary, possibilities to avoid import taxes or export levies, risks of expropriation, etc.. We refer to, for example, Dunning (1988) for an exposition of motives to engage in FDI and Brainard (1997) and Lankhuizen et al. (2011) for an analysis of the trade-offs between trade and FDI as alternative ways of entering foreign markets. Section 3.5 has presented macro evidence on FDI stocks of the BRIC towards the Netherlands, using Eurostat data. Based on those data, the Netherlands seemed to receive relatively low amounts of FDI from the BRIC countries. In this section, we look at micro-evidence on foreign direct investments.

Evidence on FDI at the firm level is very scarce. Still, the BRIC countries, and in particular China – which runs large current account surpluses – are increasing their investments in the rest of the world, although the size of their FDI stock in the EU is still low compared to other countries. We rely in this section on a recent study by PBL (2011) which discusses FDI directed towards the Netherlands (and Europe). Even though FDI of the BRIC is not particularly, it is interesting to assess its distribution across Europe. The PBL study draws on the Amadeus data set, a large firm-level data set that collects the ownership structure of all firms in Europe. A first finding that can be drawn from PBL (2011) is that the share of the BRIC countries in all foreign owned firms located in the Netherlands is very small. Only 0.6 percent of foreign owned firms is owned by Chinese investors (which corresponds to slightly more than 80 firms), 0.7 percent by investors from India (less than 100 firms), while the share of Brazil and Russia is negligible (and are therefore neglected in the remainder). Even though the share of foreign owned firms is relatively small, it must be noted that foreign firms are – on average – much larger than domestic owned firms, as well as more productive. This is perfectly in line with the firm heterogeneity literature that we referred to in the beginning of this chapter (see also Fortanier and Moons, 2011). The figures presented are thus only to compare the importance of FDI from and towards different countries, not to assess the absolute impact of the FDI flows on the respective economies.

Figure 4.5 shows the distribution of firms from Europe, the US, Japan, China and India in different European countries (neglecting the shares of countries that are omitted, the total for each of these five groups is thus 100%). Germany has the highest share of Chinese owned firms within its borders: 41 percent of all Chinese owned firms in Europe are located in Germany. As much as 57 percent of Indian owned firms are located in the United Kingdom (which is explained by the historical bond between the countries). A relatively large share of Chinese owned firms is located in the Netherlands (13 percent), while about 8 percent of Indian firms in Europe is located in the Netherlands. This makes the Netherlands the third most important location for firms owned by the BRIC countries, after Germany and the United Kingdom. The pattern that can be observed from Figure 4.5 is rather different from the pattern that was observed in Section 3.5, which was based on FDI data from Eurostat. When looking at

the number of firms according to the Amadeus database, relatively more firms from India and China are located in the Netherlands than could be expected from economic size. As noted in Section 3.5, FDI data that is based on observed financial flows is likely to be biased towards optimal locations for taxation rather than actual production structures.

**Figure 4.5. Distribution of foreign-owned firms per country, 2010**



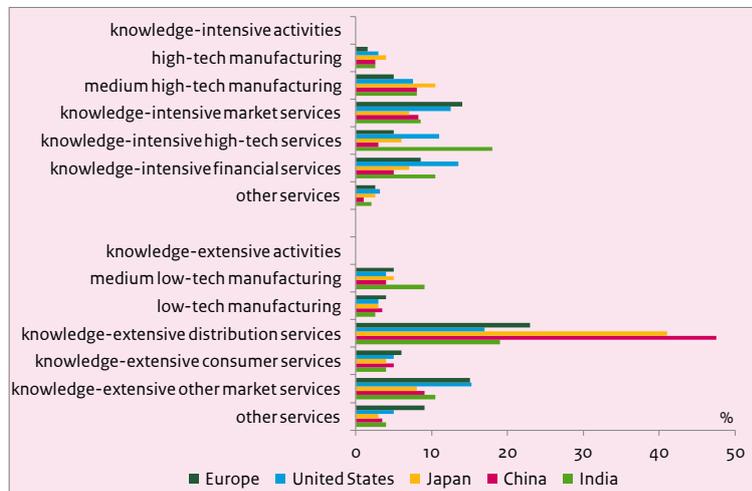
Source: PBL (2011, Fig. 2.12, p. 56).

There are two likely explanations for the relatively low share of the BRIC countries in FDI compared to their trade shares. The first is related to the nature of the exports of China and India. These exports are to a large extent through foreign firms with established branches in China. These foreign firms invest in factories in these countries to use the large pool of low cost labour that is available, while at the same time gaining access to the domestic markets. Wang and Wei (2010) find that in 2005 58 percent of Chinese exports were by fully foreign owned firms or joint ventures with foreign owned firms, with a strong upward trend. For high-tech products, this figure was as high as 83 percent in 2009 (Xing, 2011). A second explanation may be that Dutch (and, for that matter, European) markets are relatively easy to access through international trade. As international trade and foreign direct investment are close substitutes, this may have resulted in a focus on trade relations.

Apart from location choice of FDI flows originating from the BRIC countries, the industries where investments take place is an interesting dimension of FDI. Figure 4.6 shows a breakdown of foreign owned firms by industry. A large share of FDI is targeted at firms in the (knowledge-intensive) distribution sector; this is particularly the case for FDI from China. Another interesting observation that can be made is that FDI from India is overrepresented in knowledge-intensive firms, whereas the opposite is the case for FDI from China, which is mostly targeted towards acquiring firms in

knowledge-intensive industries. These are mainly distribution services, probably related to the large import flows from China and re-exported to other European countries.

**Figure 4.6. Distribution of foreign-owned across different industries in the EU, 2010**



Source: PBL (2011, Fig. 2.18, p. 60).

## **5 Macroeconomic impacts of trade with BRIC countries**

The economic interactions that we described in the previous chapters affect countries in various ways. Trade gives firms the opportunity to specialize and to exploit economies of scale. These effects materialize in the form of higher productivity and lower prices, and ultimately in increased global welfare. Trade will also induce changing allocations on the labour market. Whether unemployment rates will be affected depends – especially in the long run – mainly on the functioning of the labour market (labour market institutions) and not so much on globalization itself (see Suyker and De Groot, 2006). And finally, the interpersonal income distribution may be affected by globalisation, not only by changes in consumer prices, but also by changes in wages for specific groups on the labour market and by changes in the return to capital.

It is beyond the scope of this chapter to assess empirically the relevance of all these factors in an integrated way. Instead, we look at three important aspects, viz. (i) the impact of imports from the BRIC countries on prices, (ii) the impact on the employment structure and value added and (iii) the development of income inequality in the Netherlands.

### **5.1 Impact of imports from BRIC countries on Dutch price levels**

An important channel through which trade with BRIC countries will affect the Dutch economy is through lower import prices. The relatively low production costs in the BRIC countries are most likely the main reason for the large increase in imports from these countries, and as such a reflection of specialization according to comparative advantages. Products in which China has a comparative advantage will be more often imported instead of domestically produced, while production is shifted towards products in which the Netherlands has a comparative advantage. This has a downward effect on prices for imported intermediates and on consumer goods relative to products that remain to be produced in the Netherlands, and will also result in increased purchasing power for Dutch consumers.

However, it is difficult to measure the extent to which imports from the BRIC countries exert a downward pressure on prices, because an appropriate counterfactual is difficult to establish. Furthermore, inflation is mostly determined by monetary policy set by the central bank. Even though cheap imports from China might result in a reduction of prices of imported goods relative to those of

other goods, overall inflation would still be slightly below two percent if the ECB successfully kept inflation in the euro zone at its target rate. The OECD (2006) has attempted to estimate the effect of Chinese exports on consumer prices in the euro zone countries. They estimated that Chinese exports decreased the inflation rate in the euro zone *ceteris paribus* (e.g. at a given monetary policy and nominal value of output) by 0.02 percent-point per year in the period 1991–1995 and by 0.19 percentage point per year in the period 2001–2005. They did not find an effect in the intermediate years (*viz.* in the period 1996–2000). This effect was measured as the sum of the effect of intensifying imports from China and the effect of the moderate inflation rate of import prices from China. A third channel was the effect of increased competition on the mark-ups and productivity of domestic firms. Increased competition could decrease mark-ups and increase productivity due to higher exit rates of the less productive firms. However, the OECD believed this effect to be very small and did not attempt to estimate it. The estimate by the OECD of 0.19 percentage point per year corresponded to a reduced inflation of 0.95 percentage point in the entire 2001-2005 period. At a median income of 33,000 euro per year, the effect of Chinese imports on purchasing power for Dutch citizens was estimated to be about 300 euro per year (see Suyker and De Groot, 2006).<sup>20</sup> The OECD has not conducted these estimates for 2006 and later years. Therefore we did not have the opportunity to extend this back-of-the-envelope calculation until 2010. However, below we judge price developments since 2006.

Apart from price differences, the Netherlands can also benefit from low import prices due to a possible undervaluation of the currency of BRIC countries. The over- or undervaluation of currencies is very relevant, since the only way to be able to say whether imports are relatively cheap or expensive is by expressing the prices in our own currency. Whether currencies are over- or undervalued depends on the prices of tradable goods (or on monetary policies to keep exchange rates artificially low). If exchange rates are fully flexible, it is expected that it will adjust in such a way that there are no more price differences in tradable goods (after transaction costs). If exchange rates are not flexible but determined by the central bank, like it is the case in China, it is possible that an over- or undervaluation persists. It would be difficult for the central bank to sustain an overvalued currency for a long period of time, because the central bank would be forced to buy large amounts of domestic currency in return for foreign currency. This means that the central bank will eventually run out of foreign currency. Sustaining an undervalued currency is less difficult, because the central bank can issue its own

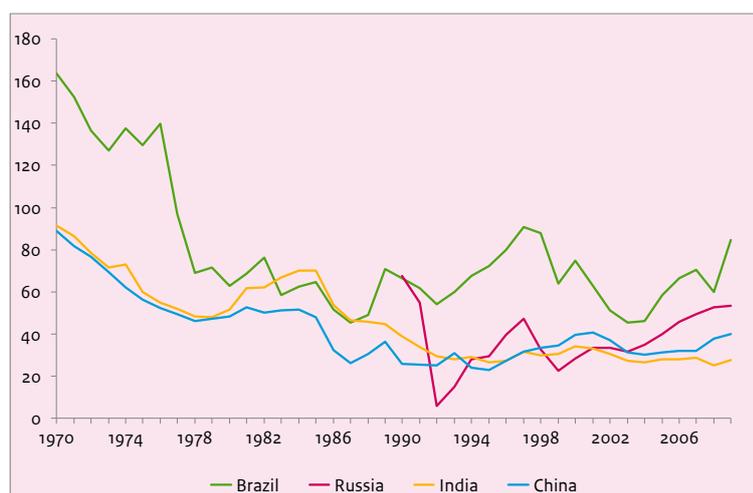
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<sup>20</sup> A complicating factor in estimating the effects of imports on inflation is that the ECB sets an inflation target. The effect of cheap imports should therefore not be found in the overall inflation rate, but rather in relative prices and terms of trade gains. It is also possible that trade has no effect on prices at all, but that it raises GDP as a result of increased productivity due to comparative advantages and specialization. The analysis of the OECD took account of these general equilibrium effects.

currency, while accepting foreign currency in exchange. This is essentially what happens in China, which has built up large amounts of foreign assets.

One way to determine to what extent a currency is over- or undervalued, is by comparing the purchasing power adjusted exchange rate with the nominal exchange rate. However, the purchasing power parity (PPP) is based on consumer prices of a basket of products, including services and other non-tradables. It is possible that there is a difference in the overall price level between two countries, while prices of tradables are the same. In this case the exchange rate is not out of equilibrium. Still, comparing the overall price level provides useful information about the maximum potential over- or undervaluation of a currency, even though it is a combined effect of tradables and non-tradables. The figure below show the general price levels of the four BRIC countries, in terms of the Dutch currency.

**Figure 5.1. Price levels compared to Dutch price level (normalized at 100)**



Source: own calculations based on Penn World Table 7.0.

The Dutch price level is indexed at 100 in each year. The figure shows that the price level in Brazil was actually higher in terms of Dutch currency in the 1970s, meaning that one could buy more products in the Netherlands than in Brazil with one euro. In 2010 the Brazilian price level is very close to the Dutch price level, at about 84 percent. The difference in the price level between Brazil and the US is even smaller, since the price level in the US is slightly lower than in the Netherlands. For China and India we notice much larger differences in the price level compared to the Netherlands. However, the Chinese price level seems to increase somewhat in the last few years. This is due to the relatively high inflation rate in China, and the appreciation of the Chinese Renminbi against the euro. The debate on the exchange rate with China often focuses on the potential disadvantages of an undervalued Chinese Renminbi for the domestic industries of western countries, while the benefits for western of being able to import products at low prices get less attention.

The higher inflation rates China experienced in the last years also led to higher wages. Ceglowski and Golub (2011) show that although Chinese unit labour costs were decreasing between 1998 and 2003, they have been increasing since 2003, both in absolute terms as well as relative to US unit labour costs. This observation corresponds to the pattern that emerges from looking to the price levels in figure 5.1. Despite the recent increase in Chinese unit labour costs, they are still low compared to the EU and the US. So it is likely that Dutch firms and consumers will benefit from a lower inflation rate due imports from China in the coming years. However, if the trends in the appreciation of the Renminbi or in Chinese inflation continue, this will raise prices of imports from China which would likely slow down the growth rate of Chinese exports and the benefits in terms of the impact of lower prices of imported intermediaries and consumer goods in the Netherlands.

## **5.2 Exports to the BRIC, Dutch employment and Dutch value added**

This section aims to determine which part of the Dutch economy is involved in producing exports for the BRIC countries and re-exports that originate from the BRIC countries. This is measured in terms of number of jobs (in full time equivalents) and in value added. This information is useful to assess how dependent the Dutch economy is on the BRIC countries. For example, if the economy of the BRIC countries slows down, how much will this affect the Dutch economy in the short-run?

The number of jobs and the value added that is related with domestic exports to the BRIC countries, can be assessed by looking at the Dutch exports that is destined for the BRIC countries and at the employment and value added that is associated with total Dutch exports. An input-output framework is used to allow for interdependencies between Dutch sectors. These interdependencies are taken into account, because when manufacturing sectors export goods to the BRIC, these sectors are also using inputs from other sectors, for example from business services. Although the services sector does not export much to the BRIC itself, it is involved indirectly through other sectors (Groot and Möhlmann, 2008). In the input-output framework, the relevance of BRIC trade is determined by removing the exports that go to the BRIC countries from the final demand of the Dutch sectors, and calculating the new equilibrium. In the new equilibrium we determine how much the output of each sector is reduced. The amount of output is translated to number of jobs and value added by assuming that output, number of jobs and value added have a linear relationship that is fixed for each sector.

The relevance of re-exports that originate from the BRIC countries is based on the trade- and transport margins that are realized on re-exports that originate from the BRIC countries. The total Dutch re-exports are estimated to account for about 2 percent of the Dutch GDP (see e.g. Mellens et al., 2007; Groot and Möhlmann, 2008). Since the origin of re-exports is generally unknown, we assume that the share of the BRIC countries in the origins of re-exports is equal to the share of the BRIC countries in total Dutch imports.<sup>21</sup> In the input-output framework, the trade- and transport margins associated with re-exports from the BRIC are deducted from the final demand of the sectors ‘trade and repairs’ and ‘transport, storage and communications’, based on their shares in the total trade- and export margins of the Dutch economy. After deducting these trade- and transport margins, the new equilibrium is determined and the changes in output are translated to number of jobs and value added in the same manner as described in the previous paragraph.

The following table shows number of jobs and the share of value added that are related to exports to and re-exports from the BRIC countries. The relevance of re-exports originating from the BRIC is much smaller than the exports to the BRIC countries, because re-exports in general have a smaller contribution to the Dutch economy than domestic exports. Re-exports from China are about equally important as re-exports from Brazil, Russia and India together. For exports, China is still the most important country, but the difference with Brazil and Russia is not so large. The reason for this is that China is more important for the Netherlands as an origin for imports than it is as an export market (see section 3.1).

**Table 5.1. Relevance of exports to and re-exports from the BRIC for the Dutch economy**

Country	share of GDP (in %) related to exports	number of jobs (1000) related to exports	share of GDP (in %) related to re-exports	number of jobs (1000) related to re-exports
Brazil	0.36	22.1	0.03	2.1
Russia	0.32	18.6	0.08	5.1
India	0.16	9.3	0.02	1.3
China	0.50	26.9	0.18	12.2
BRIC	1.34	77.1	0.31	20.8

Notes: jobs are measured in full time equivalents (fte); values may not add up due to rounding.

The number of jobs and share of GDP that are related to exports to the BRIC countries in Table 5.1 are based on the observed exports to these countries. If we also include net indirect exports to the BRIC,

<sup>21</sup> This probably somewhat underestimates the share of the BRIC countries in the origins of re-exports, since re-export typically originate from countries relatively far away. Therefore the resulting estimates for the relevance for the Dutch economy of re-exports from the BRIC countries should be interpreted as a lower bound estimate.

these values increase by about 10 percent for Brazil, 15 percent for Russia, 65 percent for India, 40 percent for China and 30 percent for the BRIC total (see section 3.4). The reason for this increase is that some of the Dutch exports are exported to other countries in the world as intermediates before they are sent to the BRIC countries.

It is important to note that the jobs and value added related to trade with the BRIC countries, would not fully disappear if there would have been no trade with the BRIC countries. In that case the resources that are now involved with producing exports to the BRIC and processing re-exports from the BRIC, would be allocated for other production purposes, either for foreign markets or the domestic market. Therefore, these figures should not be interpreted as the effect of the BRIC countries on Dutch employment and value added, but rather as a short-term dependence on the BRIC countries. If the import of the BRIC countries from the Netherlands would increase (decrease), it is likely that the Dutch economy would initially experience additional (less) growth, but in the long-run, the effect would diminish as the economy reaches equilibrium again. However, these short-run effects of a reduction of imports of the BRIC remain rather modest: for example, if the BRIC countries would suddenly increase their imports from the Netherlands by ten percent, the effect on Dutch employment and GDP is estimated to be less than 0.2 percent.

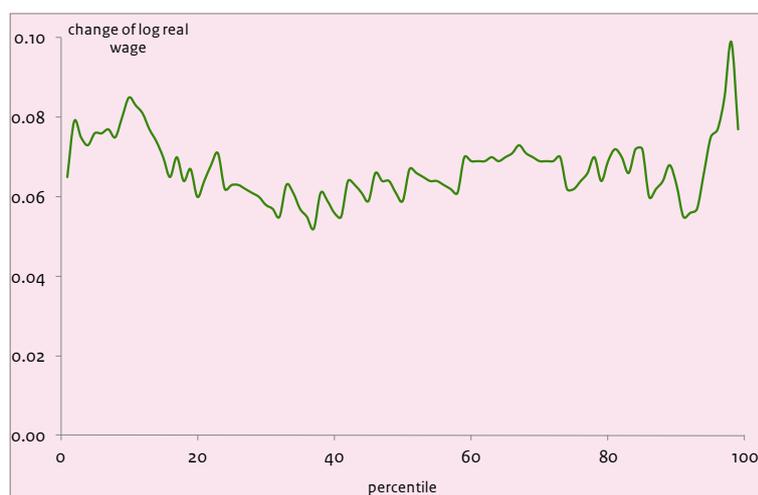
### **5.3 Relevant trends on the Dutch labour market**

There is a widespread public fear for the possible effects of increasing trade with countries like India and China on the labour market. For example, according to a recent OECD poll, 37 percent of the population considers globalisation as beneficial, whereas 46 percent considers it a threat (OECD, 2007). In the economic literature, free trade is widely considered to enhance welfare for the average citizen. However, the distributional effects of globalisation are not trivial. It is well possible that the gains from free trade are concentrated in high income cohorts, while workers in the lower cohorts may experience decreased wage or employment growth during a transition period. Some authors claim this to be the case in the US in the late 1970s and 1980s (Gottschalk and Smeeding, 2000; Smeeding, 2002).

This section will not attempt to directly relate international trade with the BRIC to wages and employment in the Netherlands, but instead describes some general trends that occurred in the Dutch income distribution during the last decade. For this purpose, we draw on the work of Groot and De Groot (2011), who describe and decompose trends in Dutch wages using an extensive set of micro-data.

Many advanced countries, and the US in particular, have experienced rising wage inequality during the 1980s and 1990s. Even though this trend is mostly attributed to skill biased technological progress<sup>22</sup> (see, for example, Autor et al., 1998 and 2006), globalisation is considered as a potential cause as well. It has proven to be difficult to separate the empirical effects of different potential causes for observed changes in wage inequality, and it is not yet clear how the contribution of different potential explanations should be judged. It is, however, possible to draw some conclusions from observed trends in the distribution of wages. Figure 5.2 shows the change in real hourly (log) wages for different percentiles of the wage distribution. Although workers at the highest percentiles have gained somewhat relative to those at the lower percentiles, the difference with workers in the rest of the distribution is small. Furthermore, wages at the bottom have increased somewhat more than wages of workers at the median.

**Figure 5.2. Trends in wage inequality, 2000–2008**



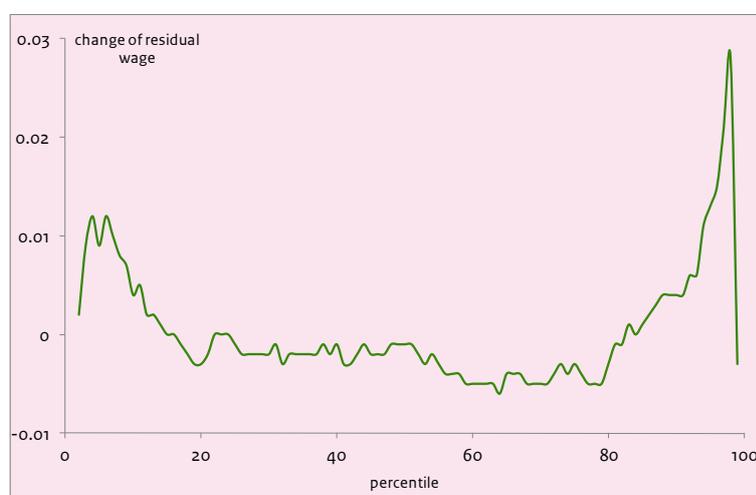
Source: Groot and De Groot (2011).

Figure 5.3 shows trends in the residual wage distribution, which is the part of changes in wages that are not explained by any worker characteristics (such as age, gender, level of education, full-time versus part-time worker, or country of birth). Trends in wages after correcting for the effects of labour market composition look very similar to trends in absolute wage inequality (that is, before correcting for composition effects) that were presented in Figure 5.2. Wages of workers at the top have increased the most, but the wages of workers at the lowest percentiles of the wage distribution have increased somewhat faster compared to workers at the middle percentiles. Even though a negative impact of increased international trade on wage inequality cannot be ruled out from a theoretical perspective,

<sup>22</sup> Skill-biased technological progress implies that employees in certain occupations benefit more from technological progress than others. Technology is complementary to some workers but a substitute for the work of others.

the empirical findings presented in Figures 5.2 and 5.3 show that strongly increased trade, amongst others with the BRIC countries, during the last decade has not resulted in a substantial increase of wage inequality in the Netherlands.<sup>23</sup> This finding is consistent with earlier empirical findings of, for example Atkinson and Salverda (2005) who find that Dutch inequality between 1973 and 1999 remained fairly constant. It is also consistent with the finding of CPB (2008) that there has been an increase of wage inequality in the Netherlands between 1979-2002 (albeit the increase was found to be moderate and inequality remained relatively low from an international perspective), but that the observed trend was mostly the result of skill-biased technological progress and a reduction of the minimum wage.

**Figure 5.3. Trends in residual wage inequality, 2000–2008**



Source: Groot and De Groot (2011).

Even though we do not observe a substantial negative effect of increased international trade on wage inequality, it is possible that there have been some negative effects on employment or wages of specific types of workers. Akçomak et al. (2011) have found some evidence for a process of unbundling of tasks (that is, a process whereby employees become more specialised), whereby specialization in tasks that are relatively difficult to off-shore is taking place. This process, however, is not specific to certain income groups but rather to certain tasks. More research to the process of task off-shoring and its effect on the wage distribution is, however, needed to gain insight in the causes of task-unbundling and observed trends in the composition of tasks performed by Dutch workers.

<sup>23</sup> Even though the finding that wage inequality remained fairly constant in the Netherlands does not rule out a negative effect of trade that was balanced out by other forces that decreased inequality, it makes a strong negative effect of increased international trade with the BRIC on Dutch wage inequality unlikely.

## 6 Conclusions and policy recommendations

### 6.1 Conclusions

The developing countries Brazil, China, India and Russia are expected to belong to the top ten of largest economies in the world by 2050 according to Goldman Sachs. We conclude in this study that these countries indeed obtain a large and increasing share of the world economy. Of the four countries, China dominates the developments in terms of speed, size and also the diversity of sectors in which it has started to play a substantial role in the world economy. GDP growth rates of China have been very high during the last three decades, and while it is expected that these will start to return to lower levels somewhere during the coming decade, economic performance has continued to be strong throughout the recent year of economic crisis. Characteristic for China so far is the exceptionally high savings rate. Increased awareness of its prosperity, a reduced role of the central government and a rapidly changing age distribution of its population is expected to result in reduced savings rates in the years to come. This will alleviate global imbalances, but will also put an upward pressure on global interest rates. From a long-run historical perspective, one can safely conclude that China and India are reclaiming the large shares in the world economy which they had until around 1800.

Dutch trade with the BRIC countries has grown substantially over the past decades, although at different rates. Also trade balances with the four countries are different, but in all cases the Netherlands has an increasing trade deficit. In particular China's exports have become increasingly important during recent years. It is currently the second largest exporter worldwide and the Dutch import share of Chinese products is among the three highest of the EU-15. Dutch exports to the BRIC countries are limited when measured as share to total trade, not only compared to imports, but also compared to other EU-15 countries. However, a part of our exports goes indirectly to the BRIC countries via other European countries, mainly through Germany. Comparing direct and indirect exports of all EU-15 countries improves the Dutch position to some extent. These indirect exports are more prevalent in the Netherlands than other EU-15 countries.

The overlap in comparative advantages between the BRIC countries and the Netherlands as measured by the revealed comparative advantage is limited. The overlap is largest with Brazil, mainly due to specialization of both countries in agricultural products, and smallest with China. The product groups in which both the Netherlands and China have a revealed comparative advantage are traded world wide

and could therefore be competitive. However, it is important to assess the dynamic character of the Chinese economy. China's comparative advantage is rapidly changing and moving towards high-tech goods as seen from the technology and skill content of its exports. A part of this content comes from imported intermediates, but it still reflects the changing production structure in China. This trend was already visible five years ago, but has accelerated substantially.

The number of firms exporting to and importing from the BRIC countries is rapidly increasing. Especially China and India stand out in this respect. This is different from trading partners with more stable markets, like the US. However, 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 these markets 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.

Apart from trade, economic relations with the BRIC countries also develop through foreign direct investment (FDI). The Netherlands has about average foreign direct investments in the BRIC countries, compared to other European countries. However, this is not the case the other way around. The amount of FDI from the BRIC countries in the Netherlands is very low. In 2009 the total FDI stock of the BRIC countries was nearly two billion euro, of which most came from China. This is a modest amount compared to the FDI stock of 106 billion euros in the EU-15. Outward FDI can be seen as an alternative for exports. The importance of Dutch investments relative to trade is largest in Brazil and smallest in China. This could imply that cultural and institutional barriers might be relatively large for China.

Through trade and FDI, the economic developments in the BRIC countries have considerable macroeconomic effects on the Dutch economy. Nearly 100 thousand jobs and 1.7 percent of value added can be attributed to export to the BRIC countries and Dutch re-exports of goods originating from these countries. If we also take into account the indirect exports to the BRIC countries, about two percent of the Dutch economy is associated with economic developments in the BRIC countries. These numbers reflect the gross benefits for the Dutch economy. The net effects are smaller, because most employees and firms would develop other activities if trade with the BRIC countries was absent. Benefits for the Dutch economy are realised mostly on the import side through, for example, lower prices. In 2005 the average benefit of a higher purchasing power resulting from cheaper Chinese imports was 300 euro. The price differences are largest for India and China, but very small for Brazil. However, the positive effects of lower import prices on inflation could have reached a turning point, in particular for Chinese imports. Recently, the Renminbi has appreciated, while Chinese inflation has been relatively high. If these trends continue, the price advantage of China will decrease. Trade could also affect labour markets. Since 2002 hourly wages in the highest percentiles of the Dutch wage

distribution have risen relative to the lower percentiles, but nevertheless there has been no substantial increase in wage inequality as wages at the lowest percentiles increased at an above average speed as well. Moreover, there are strong indications that the modest increase in wage inequality in the past was mainly caused by skill-biased technological change, and not by increased trade with the BRIC (or other) countries.

## **6.2 Future and policy**

The impact of the BRIC countries is expected to increase in the next decades. If the growth rates that have been observed since the 1980s remain stable over the next 15 years, China and India will increase their combined share in global output to over 40 percent. The ongoing shift of production activities will continue to move to Asia as a consequence of comparative advantages. This process which started with relocations to Japan and later to China is likely to continue in the direction of countries like India, Malaysia, Vietnam and Indonesia. In view of its rich and successful history, the potential of China to regain its strong position as an economic and innovative power is present, notwithstanding the huge uncertainties regarding social and political transformations that China will have to go through in the decades to come, in order to maintain its growth rate. The BRIC countries will soon be larger than the US in terms of the amount of trade with the Netherlands. The BRIC countries already have an import share of 14 percent for the BRIC percent versus 8 percent for the US. This is mainly due to China, which almost exports as much to the Netherlands as the US does. The BRIC countries are not yet as important for Dutch exports as the US (export share of 4 percent for BRIC versus 5 percent for US). Compared to 1990, trade with the BRIC countries has increased tremendously, while the export and import shares to and from the US have remained fairly constant.

Experience so far has revealed that acquiring sustained access to the BRIC countries is difficult for exporting firms. Cultural and institutional barriers are an important impediment, especially when compared to trade with our main trading partners in Europe. This requires a fundamentally different way of approaching these countries, in which support from governmental agencies is an important ingredient. Moreover, although Brazil, China and India are members of the WTO, and Russia is expected to become member soon, trade barriers with these countries remain high. Import tariffs are slashed down in particular when China entered the WTO, but other regulatory barriers are still in place. This is particularly important for services trade. The Netherlands has a relatively strong position in international transport and business services. But regulatory hurdles limit effective market entry. Unclear regulations and administrative bureaucracy also affects successful investment in the BRIC countries. Free trade agreements that include services trade and investment between the EU and these countries could help to lower these hurdles. A multilateral agreement would be preferable, however.

Then it would not be necessary to formulate rules of origin which guarantee that a minimum part of the product is produced in the home country. These rules limit trade and could be incompatible with many export products from China which are only assembled there, while all intermediates come from other countries. Second, the WTO has a dispute settlement system, which disciplines the countries to conform to the trade rules. However, a multilateral agreement would benefit all participating countries equally, and thus not result in a competitive advantage for the Netherlands and other European countries relative to non-participants.

A large part of the imports of the Netherlands from the BRIC countries is re-exported. It is to be expected that these flows will increase further. If the Netherlands aims to facilitate these flows, its infrastructure capacity has to meet its demand to remain an attractive location for handling trade. The costs and negative external effects have to be balanced against the benefits of re-exports.

Apart from trade, outward and inward investment could strengthen the ties between the Netherlands and the fast-growing BRIC countries. Although the FDI flows do not point to a significant establishment of firms from BRIC countries in value terms, the micro data on firm ownership indicate that the Netherlands seems to be an attractive location for these firms in Europe. This could be related to the large distribution and logistic sectors. However, firms and in particular headquarters become more footloose. Therefore it remains important to monitor the quality of the factors determining the establishments of internationally operating firms.

Increasing trade and FDI will also affect jobs and wages. Unemployment is low in the Netherlands and wage inequality is modest in international perspective and only slightly increasing. Existing labour market policies that have been put in place in the past seem to be sufficient to deal with job losses associated with trade and off-shoring. However, specific jobs and tasks can be more vulnerable and if these jobs and tasks can be identified in the future, it could be helpful to retrain these workers.

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## Annex A. The economic upswing of the ‘Next 11’<sup>24</sup>

The ‘Next 11’ are eleven countries – Bangladesh, Egypt, Indonesia, Iran, Mexico, Nigeria, Pakistan, Philippines, South Korea, Turkey and Vietnam – that have been selected by Goldman Sachs as having high potential for becoming the largest economies of the world together with the BRIC countries that are central in this study and South Africa. Common characteristics of this group of countries are their large population sizes and high economic growth rates (driven by productivity growth, population growth, or a combination of both). This Annex presents some of the analyses that have been presented in Chapter 2 for the BRIC countries for the ‘Next 11’ and South Africa.

Table A.1 presents key figures for the ‘Next 11’ countries and South Africa, and is comparable to Table 2.1. While even the least populous country of the ‘Next 11’ (Iran with a population of 73 million) has almost five times as many inhabitants as the Netherlands, only South Korea and Mexico have larger economies than the Netherlands as measured by GDP. Bangladesh and Vietnam, the smallest economies, are only 1/7th of the economic size of the Netherlands. In fact, all members of the ‘Next 11’ together have a current GDP of 4.8 trillion US\$, whereas that of China alone is 5.9 trillion US\$. Therefore, despite the high growth potential, it must be noted that the ‘Next 11’ countries are at the moment still of relatively minor importance in terms of size.

As is the case with the BRIC countries, there are large differences between ‘Next 11’ countries in their current stage of development. While South Korea is quickly converging to the level of economic prosperity enjoyed by advanced economies, Mexico, Turkey, Iran and South Africa are middle income countries. The other countries of the ‘Next 11’ remain low income countries. Bangladesh has a GDP per capita of less than 1,500 US\$ (PPP), which is less than half of the per capita income in India. When looking at the structure of final demand, Vietnam, Iran and Indonesia have relatively high gross investments, while in several other countries investments are relatively low (especially in Turkey and the Philippines). All countries in Table A.1 have relatively high household consumption compared to government consumption. There are substantial differences in the amount of openness. Vietnam has the most open economy of the ‘Next 11’. South Korea is also strongly integrated in the world economy. The most closed economy is that of Pakistan, although its economy is more open than that of Brazil.

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<sup>24</sup> Growth decompositions for the ‘Next 11’ are available upon request.

**Table A.1. Key statistics the 'Next 11' and South Africa**

	Bangladesh	Egypt	Indonesia	Iran	South Korea	Mexico	Nigeria	Pakistan	Philippines	Turkey	Vietnam	South Africa
Surface (1000 sq. km, 2009)	144	1001	1905	1648	100	1964	924	796	300	784	331	1219
Population (million, 2009)	162	83	230	73	49	107	155	170	92	75	87	49
Life expectancy at birth (years, 2009)	67	70	71	72	80	75	48	67	73	72	75	52
Mortality rate, under-5 (per 1,000, 2009)	41	21	39	31	5	17	138	87	33	20	24	62
Fertility rate (births per woman, 2009)	2.3	2.8	2.1	1.8	1.3	2.1	5.6	3.9	3	2.1	2	2.5
GDP (current dollars, billion, 2010)*	100	219	707	331	1014	1040	194	175	200	735	104	364
GDP per capita (dollars at PPPs, 2010)*	1585	6417	4347	11883	29997	14406	2437	2721	3920	13557	3143	10518
Gini coefficient of incomes (latest av. year)	31	32.1	36.8	38.3	31.6	51.7	42.9	32.7	44	39.7	37.6	57.8
Poverty (consumption share of poorest 10%, latest av. year)	4.3	1.6	3.3	2.6	2.9	1.5	2	4	2.4	2.1	3.2	1.3
Agriculture, value added (% of GDP, 2009)	19	14	16	10	3	4	33	22	15	9	21	3
Industry, value added (% of GDP, 2009)	29	37	49	44	37	35	41	24	30	26	40	31
Services, value added (% of GDP, 2009)	53	49	35	45	61	61	27	54	55	65	39	66
Household consumption expenditure (% of GDP, 2009)	77	76	57	45	54	67	<i>n.a.</i>	80	74	72	66	60
Government consumption expenditure (% of GDP, 2009)	5	11	10	11	16	12	<i>n.a.</i>	8	11	15	6	21
Gross savings (% of GDP, 2009)	39	17	23	<i>n.a.</i>	30	22	<i>n.a.</i>	22	40	13	29	15
Gross fixed capital formation (% of GDP, 2009)	24	19	31	33	26	22	<i>n.a.</i>	19	15	15	38	19
Exports of goods and services (% of GDP, 2009)	19	21	25	24	50	30	39	13	35	23	71	27
Imports of goods and services (% of GDP, 2009)	25	28	23	17	46	31	27	19	37	26	83	28
Dutch export share of goods and services (% , 2009)**	0.03	0.30	0.20	0.20	0.60	0.50	0.80	0.10	0.10	1.10	0.10	0.50
Dutch import share of goods and services (% , 2009)**	0.12	0.10	0.60	0.30	0.60	0.40	0.40	0.10	0.20	0.60	0.20	0.50
Dutch outgoing FDI share (% of stock, 2009)***	<i>n.a.</i>	0.28	0.19	<i>n.a.</i>	0.29	0.62	0.32	<i>n.a.</i>	0.07	0.55	<i>n.a.</i>	0.82
Dutch incoming FDI share (% of stock, 2009)***	<i>n.a.</i>	0.06	0.03-	<i>n.a.</i>	0.09	0.19	0.08	<i>n.a.</i>	0.02	0.08	<i>n.a.</i>	0.08
Urbanisation (% of population, 2009)	28	43	53	69	82	78	49	37	66	69	28	61
Sanitation facilities (% of population with access, 2008)	53	94	52	<i>n.a.</i>	100	85	32	45	76	90	75	77
Water availability (% of population with access, 2008)	80	99	80	<i>n.a.</i>	98	94	58	90	91	99	94	91
Internet users (per 1,000 people, 2009)	4	200	87	383	809	265	284	120	65	353	275	90
Fixed line and mobile phone subscribers (per 1,000 people, 2009)	320	790	840	1120	1380	960	480	630	850	1060	1360	103
Motor vehicles (per 1,000 people, 2008)	2	43	77	128	346	264	31	11	33	138	13	159
Energy use (kg of oil equivalent per capita, 2008)	175	876	874	2808	4669	1698	735	499	455	1333	689	2756
CO-2 emission (x1000 kg per capita, 2007)	0.3	2.3	1.8	7	10.4	4.5	0.6	1	0.8	4	1.3	9
Quality of governance, in percentiles (2010)****	18	30	35	9	73	48	9	11	30	55	32	63
Ease of doing business, in percentiles (2010)****	42	49	34	30	92	81	25	55	19	65	58	82

Sources: World Development Indicators (Worldbank, 2011), \*IMF-IFS, \*\* OECD-ITCS database, \*\*\*Eurostat.

As can be expected for a group of countries that is as economically heterogeneous as those presented in Table A.1, differences on non-economic indicators for development are substantial as well. Life expectancy ranges from 48 in Nigeria to 80 years in South Korea, while child mortality ranges from 5 per 100 children born in South Korea to 138 in Nigeria. Differences in fertility rates (the most important determinant of future population growth) are very large as well. In South Korea, only 1.3 children per woman are born, which is not sufficient to keep the population constant. In Nigeria, on the other hand, an average woman gives birth to 5.6 children.

Table A.2 compares trends in the 'Next 11', in the same way as we did in Table 2.4 for the BRIC countries. For reasons of data availability and comparability we have used 1980 as a cut-off point, so we compare trends from 1980 onwards for countries like South Korea, despite the fact that the 'take-off' in South Korea started prior to 1980. Growth of GDP and GDP per capita show that even though in all countries (with the exception of Mexico) substantial growth is taking place, this is mostly due to high population growth. So no real 'take-off' is taking place as of yet. In fact, growth of GDP per capita in Mexico, Turkey, Iran and South Africa has been lower than in the Netherlands and other advanced economies. Only South Korea, Vietnam and Nigeria are experiencing above-average growth rates of per capita income.

Especially Turkey has experienced episodes of macroeconomic instability during recent decades, with high inflation and in the 1980s even hyperinflation. Furthermore, while growth in most countries was at least in part export-driven (especially in Bangladesh, South Korea and Mexico), growth was driven primarily by domestic demand in most other countries.

**Table A.2. Key data on the 'Next 11' during 'take-off' or since 1980**

	Bangladesh 1980-2009	Egypt 1982-2009	Indonesia 1980-2009	Iran 1988-2009	South Korea 1980-2009	Mexico 1989-2009	Nigeria 1984-2009	Pakistan 1980-2009	Philippines 1986-2009	Turkey 1980-2009	Vietnam 1989-2009	South Africa 1980-2009
Average annual percentage changes												
<b>Volumes</b>												
Gross Domestic Product (GDP)	4.7	4.8	4.7	3.6	6.1	2.5	4.6	4.8	4.3	4.1	7.0	3.3
GDP per capita	2.6	2.7	3.1	1.4	5.2	1.1	3.9	2.1	2.1	1.7	4.4	1.8
Household consumption expenditure	5.2	5.1	4.5	n.a	5.5	2.5	n.a	4.7	4.8	4.1	n.a	3.2
Government consumption expenditure	5.3	3.6	4.4	n.a	7.2	3.1	n.a	4.0	4.6	6.8	n.a	3.6
Gross fixed capital formation	9.3	3.8	6.1	n.a	5.8	1.7	n.a	4.7	3.0	2.2	n.a	5.9
Exports of goods and services	10.4	4.5	3.8	n.a	7.6	5.8	n.a	4.8	5.4	5.8	n.a	4.8
Imports of goods and services	8.1	3.9	4.5	n.a	6.6	5.3	n.a	4.3	4.8	5.4	n.a	5.7
Consumer price index	5.8	10.8	10.0	12.7	4.7	11.8	20.0	7.8	6.8	44.3	5.7	6.3

Source: IMF International Financial Statistics, 2010.

## Annex B. Estimating indirect exports

This Annex describes how the international input-output table is used to estimate indirect export flows. The first step is to determine the technology matrix ( $A$ ), which contains information on the extent to which countries use imports from other countries in their production process. With this we can calculate the Leontief inverse  $(I - A)^{-1}$ . The Leontief inverse can be used to calculate the total production of each country based on all the final demands. The following equation holds:

$$X = (I - A)^{-1} F,$$

where  $X$  is a vector of total production,  $(I - A)^{-1}$  is the Leontief inverse and  $F$  is a vector of final demand.

With  $X$  known, and with the technology matrix known, it is possible to calculate the entire input-output table again (which contains all the bilateral exports). This method allows us to see what happens to the bilateral exports when we change the final demand.

The indirect export flows are then estimated by individually setting the final demand in each country to zero, and determining what happens to all the trade flows. For example, after setting German final demand to zero, the following observations can be made:

1. Any exports still going to Germany must be used for German exports to other countries. Since there is no consumption in Germany left, they are only producing to meet foreign demand. We consider these remaining exports to be indirect exports through Germany to the rest of the world.
2. The decrease in exports to the rest of the world, is caused by the decrease in German demand. We consider these exports to be indirect exports through the rest of the world to Germany.

The difference between 2 and 1 can be considered to be the net indirect exports to Germany.

## Annex C. Export destination of Chinese exports

In order to get some feel for the extent to which exports of China end up in the main destination markets of Dutch producers, Table C.1 gives information on the share of total Chinese exports that is exported over large distances (viz. more than 5500 km, and hence including Europe as a destination market).

**Table C.1. Share of Chinese exports exported over large distances**

Product group (2-digit SITC revision 2)	share of exports to countries more than 5500 km away* (in percent)
00: Live animals chiefly for food	0
01: Meat and meat preparations	9
02: Dairy products and birds' eggs	54
03: Fish, crustaceans, mollucs, preparations thereof	52
04: Cereals and cereal preparations	40
05: Vegetables and fruit	56
06: Sugar, sugar preparations and honey	59
07: Coffee, tea, cocoa, spices, manufactures thereof	62
08: Feeding stuff for animals, not including unmilled cereals	42
09: Miscellaneous edible products and preparations	43
11: Beverages	15
12: Tobacco and tobacco manufactures	38
21: Hides, skins and fur skins, raw	14
22: Oil seeds and oleaginous fruit	51
23: Crude rubber (including synthetic and reclaimed)	44
24: Cork and wood	66
25: Pulp and waste paper	65
26: Textile fibres (except wool tops) and their wastes	61
27: Crude fertilizers and crude materials (excluding coal)	49
28: Metalliferous ores and metal scrap	61
29: Crude animal and vegetable materials, n.e.s.	60
32: Coal, coke and briquettes	44
33: Petroleum, petroleum products and related materials	38
34: Gas, natural and manufactured	1
35: Electric current	0
41: Animal oils and fats	73
42: Fixed vegetable oils and fats	33
43: Animal-vegetable oils-fats, processed, and waxes	51
51: Organic chemicals	64
52: Inorganic chemicals	46
53: Dyeing, tanning and colouring materials	53

*Continued*

54: Medicinal and pharmaceutical products	67
55: Essential oils & perfume materials toilet polishing and cleansing preparations	62
56: Fertilizers, manufactured	30
57: Explosives and pyrotechnic products	87
58: Artificial resins, plastic materials, cellulose esters and ethers	51
59: Chemical materials and products, n.e.s.	61
61: Leather, leather manufactures, n.e.s. and dressed fur skins	53
62: Rubber manufactures, n.e.s.	82
63: Cork and wood manufactures (excluding furniture)	77
64: Paper, paperboard, articles of paper, paper-pulp/board	61
65: Textile yarn, fabrics, made-up articles, related products	55
66: Non-metallic mineral manufactures, n.e.s.	64
67: Iron and steel	52
68: Non-ferrous metals	45
69: Manufactures of metal, n.e.s.	74
71: Power generating machinery and equipment	53
72: Machinery specialized for particular industries	67
73: Metalworking machinery	60
74: General industrial machinery & equipment, and parts	67
75: Office machines & automatic data processing equipment	64
76: Telecommunications & sound recording apparatus	55
77: Electrical machinery, apparatus & appliances n.e.s.	51
78: Road vehicles (including air-cushion vehicles)	75
79: Other transport equipment	56
81: Sanitary, plumbing, heating and lighting fixtures	84
82: Furniture and parts thereof	82
83: Travel goods, handbags and similar containers	73
84: Articles of apparel and clothing accessories	64
85: Footwear	77
87: Professional, scientific & controlling instruments	48
88: Photographic apparatus, optical goods, watches	40
89: Miscellaneous manufactured articles, n.e.s.	70
93: Special transactions not classified according to kind	21
94: Animals, live, zoo animals, dogs, cats etc.	73
95: Arms, of war and ammunition therefore	79
96: Coin (other than gold) , not being legal tender	18
97: Gold, non-monetary	62

\*Countries that are more than 5500 km away from China include all countries except for North Korea, South Korea, Mongolia, Hong Kong, Macao, Japan, Vietnam, Laos, Bhutan, Philippines, Bangladesh, Nepal, Myanmar, Kazakhstan, Thailand, Cambodia, Kyrgyzstan, India, Pakistan, Brunei Darussalam, Uzbekistan, Northern Marina Islands, Palau, Tajikistan, Afghanistan, Malaysia, Singapore, Turkmenistan, Sri Lanka, and Indonesia.

Source: own calculations based on OECD ITCS database and the CEPII distances database.

## Annex D. The international trade 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 that for EU-trade one has to rely on surveys is that intra-EU trade is not recorded at the customs office since 1992. Statistics Netherlands surveys only firms with total exports (or imports) above a threshold in order to lower the administrative burden on smaller firms.<sup>25</sup> 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.<sup>26</sup> Aggregating transactions by unique firm country and product combinations yields about 2 million observations per year for the period 2002–2008.

For the analysis in this study we have focused 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 CBS Statistics Netherlands and will most likely not bias any descriptive statistics or estimates. Compared to National accounts data (Statline) approximately one third of total trade value (excluding re-exports) is missing in the dataset.<sup>27</sup>

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<sup>25</sup> Until 2005, the threshold of total firm exports was 225.000 euro. In 2006 and 2007 it was 400.000 euro.

<sup>26</sup> 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 provides no information about the legal and organizational status of the trading firm.

<sup>27</sup> This is known from earlier analyses that were done on the basis of the same dataset (see Creusen et al., 2011, and Statistics Netherlands, 2009).