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Explanation of symbols

.	Data not available
*	Provisional figure
**	Revised provisional figure (but not definite)
x	Publication prohibited (confidential figure)
–	Nil
–	(Between two figures) inclusive
0 (0.0)	Less than half of unit concerned
empty cell	Not applicable
2012–2013	2012 to 2013 inclusive
2012/2013	Average for 2011 to 2012 inclusive
2012/'13	Crop year, financial year, school year, etc., beginning in 2012 and ending in 2013
2010/'11–2012/'13	Crop year, financial year, etc., 2010/'11 to 2012/'13 inclusive

Due to rounding, some totals may not correspond to the sum of the separate figures.

Foreword

The Dutch economy slipped back into recession in 2012, as the Netherlands struggled to deal with the consequences of the Euro crisis, the uncertainty surrounding private wealth and very low levels of consumer confidence. The country will be hard-pressed to make an export-driven recovery as it did in 2010, as most of its European trading partners are also either in recession or barely growing. Moreover, the recovery from the financial crisis in 2009 was not broadly based: only a small group of large and internationally active enterprises have been responsible for the overall growth in trade and turnover since 2010. The average Dutch firm, however, has not yet recovered.

Just as there are differences in economic growth and the impact of the crisis between countries in Europe, so too are there differences in performance, resilience and vulnerability between Dutch regions. To examine these in more detail, this sixth edition of the Internationalisation Monitor pays special attention to developments of internationalisation at the regional or micro level. Regional differences in exposure to internationalisation and its consequences are explored in-depth in six analytical chapters. The book illustrates which regions usually benefit from the open character of the Dutch economy, but are now suffering as a result of it because of the supply-chain character of Dutch exports. For example, although the northern provinces of the Netherlands export relatively little directly, they are important suppliers for the main exporting provinces of Zuid-Holland, Noord-Holland and Noord-Brabant. This means that a worldwide collapse in trade like the one in 2009 not only affects the province exporting the goods concerned, but also the regions further up the production chain. The presence of foreign knowledge workers is another feature of regional exposure to internationalisation. In general, they are highly productive, earning on average 15 percent more than Dutch knowledge workers. They are strongly overrepresented in the largest agglomerations such as Amsterdam, Rotterdam, The Hague, Utrecht and Eindhoven. Specific border regions like Maastricht, Geleen/Sittard and Enschede also attract a fair share of foreign knowledge workers.

For this edition, we invited researchers from the Netherlands Environmental Assessment Agency (PBL) to collaborate with us with a view to expanding our knowledge of internationalisation and providing relevant information for policymakers. They have written the chapter on regional productivity differences, and contributed to the article on knowledge workers. Researchers from the PBL, VU University Amsterdam and Utrecht University provided feedback and input throughout the writing process.

In addition to in-depth articles on the impact of internationalisation on Dutch regions, this Internationalisation Monitor also presents articles on trends and key figures pertaining to the basic aspects of economic globalisation, such as international trade, foreign investment and international sourcing. These figures and analyses are increasingly anchored in the standard statistical programme of Statistics Netherlands. More information can be found in the 'Globalisation' dossier on Statistics Netherlands' website (www.cbs.nl).

Director General of Statistics
G. van der Veen

Heerlen/The Hague, October 2013

Contents

Summary and main findings

This publication consists of one introductory chapter, five articles on trends in internationalisation (chapters 1 through 5), seven analytical chapters on the impact of internationalisation on Dutch regions and regional differences in internationalisation (chapters 6 through 12) and four chapters with key figures and annotated tables (chapters 13 through 16). This summary provides a short overview of the main findings and results.

1   Trends in Dutch international trade

In the past few years, international trade was the main driver of Dutch economic growth. Noteworthy developments in Dutch international trade in goods and services are illustrated in this chapter.
— Despite positive trade growth, the Dutch economy went into another recession in 2011.
— Trade growth decelerated in 2012, especially the export of domestically produced goods (+3 percent versus +16 percent a year earlier). Re-exports continued to grow strongly (+9 percent) as did international trade in services. The downward trend in economic growth and trade in goods is continued in the first few months of 2013.
— In the first quarter of 2013 Dutch GDP declined by 1.8 percent, mainly due to further bottoming out of investments and consumption. The barely positive trade growth was not sufficient to counterbalance this decline.
— In terms of goods trade, Germany, Belgium, the United Kingdom, the United States and China were the most important trading partners of the Netherlands in 2012. Declining shares of trade with the EU is due to the growing importance of emerging markets such as the BRIC countries.
— Dutch imports from China have stagnated since 2010. The European debt crisis and the economic slowdown had a negative impact on European imports from China. As an important distribution hub, Dutch imports from China destined for other European countries have therefore also decreased.
— Dutch imports from China, the US and Japan comprise to a large extent re-export goods. Low shares of re-exports are found in imports from Russia and Norway. Dutch exports to the US and China comprise a relatively small amount of re-exports, while our EU partners receive larger shares of re-exports, with Slovakia, the Czech Republic and Finland heading the list.
— Since 2008 the US is the most important market for the imports of services. Imports from Bermuda came second, closely followed by the United Kingdom. The top five is completed by Germany and France. Ireland was the most

important destination for Dutch services followed by Germany, the UK, the US and Belgium.

2 Global value chains and the value added of trade

Fragmentation of production processes create value chains that span across many countries and continents. Looking at the value added of exports that is domestically created and determining who ultimately consumes the goods, reveals the true importance of trade for an economy as well as its interconnectedness and interdependencies with other countries.

– Gross exports statistics show direct goods flows between countries, but could cause the full value of exports to be attributed to the last link in the production chain, even when that final link only made a minimal contribution (i.e. in the case of re-exports). This can lead to overestimating the importance of trade and suggest macro-economic imbalances that do not exist in reality.

– The share of Dutch value added that is generated in the production of export goods grew slowly between 1995 and 2011 to 38 percent in 2011. This share is comparable to that of Belgium and higher than for other EU countries.

– A high share of exports in total value added implies greater vulnerability to foreign macro-economic shocks, like the financial crisis of 2008 (see also chapter 7). On the other hand, in good times, exports function as the motor behind Dutch economic growth.

– The share of Dutch value added due to exports to BRIC countries increased from 1.5 percent in 1995 to 3.8 percent in 2011. The largest share is still created by exports to the EU.

– In 2011, manufacturing and mining exported 84 percent of their created value added (either by exporting directly or by producing for exports of other sectors). This share was only 29 percent for retail trade, restaurants and hotels.

– The share of domestic demand fulfilled by imports from BRIC countries increased from 1.7 percent in 1995 to 5.7 percent in 2011. Imports from the rest of the world also grew, at the expense of the share of the EU-15.

– The share of domestic demand fulfilled by imports is much higher for the Netherlands than for other EU countries. Combined with the high share of value added due to exports, it follows that the Netherlands is vastly integrated in global value chains.

– Policies aimed at obtaining and maintaining a good position in a production or value chain help realising the goals of creating employment, technology transfer and knowledge building.

3 Trends in foreign investments

This chapter presents the latest data on and insights in Dutch foreign direct investments, foreign controlled enterprises in the Netherlands, and Dutch controlled enterprises in the rest of the world.

- In 2011 the Netherlands was the country with most outward foreign direct investment (FDI) worldwide, and the second country with respect to inward FDI. However, not including Special Purpose Entities, such as PO-boxes that "function as financial turntables", the Netherlands is the seventh country as far as outward FDI is concerned.
- Preliminary figures show that global FDI flows have declined by 14 percent in 2012. So after the earlier decline in the period 2008–2010 because of the global financial crisis, the recovery in 2011 did not continue.
- For the first time ever (2012), developing countries absorbed more FDI than developed countries.
- Total Dutch FDI flows were smaller in 2012 than in any other year between 2000 and 2011. In the first quarter of 2013 both inward and outward FDI flows recovered, but it is too soon to tell if this trend will continue or not.
- The bulk of worldwide inward FDI comes from countries in the EU-15, i.e. 60 percent. The share of the EU-15 in outward FDI also remained fairly constant, about 47 percent.
- The share of foreign investments by Dutch SMEs is relatively low: In 2010 SMEs reported 13 billion euros of foreign investments abroad, which is two percent of total Dutch outward FDI (715 billion euros).
- Around 12,000 SMEs, or one percent of all SMEs, report foreign investments. Activity in foreign investment increases with firm size, and the likelihood of investing abroad is highest in manufacturing and wholesale.
- SMEs with foreign investments are larger, they are more likely to export, have higher export intensity and are more productive. This pattern is also visible in other countries.
- Foreign controlled enterprises in the Netherlands are few in numbers but accounted for 26 percent of value added in the private sector which is 15 percent of GDP against factor costs. They also account for 23 percent of private sector investments and employ 856 thousand people.

4   Sustainability: quantifying CO_2-emissions according to the control criterion

Globalisation has not only social and economic consequences but also environmental effects such as greenhouse gas emissions. Total emissions of Dutch controlled companies are a lot larger than emissions in the Netherlands itself.

– Globalisation expands production and world economic output which can lead to growing pressures on the environment due to increased pollution and natural resource depletion.
– In 2008, enterprises in the Netherlands emitted 168 Mton CO_2. Dutch controlled enterprises emitted 62 percent of this amount and foreign controlled enterprises 38 percent.
– Emissions of Dutch controlled enterprises in rest of the EU equalled 35 Mton CO_2 in 2008 (using foreign emission coefficients). Especially in Germany there are a lot of emissions of Dutch controlled enterprises active in the manufacturing of chemicals, chemical products and basic metals.
– Emissions attributed to Dutch controlled enterprises outside the European Union equalled 103 Mton CO_2 in 2008 (using foreign emission coefficients). Especially in the USA, Brazil, China and Canada a large number of emissions stem from Dutch controlled enterprises active in the manufacture of chemicals and chemical products, mining, food, beverages and tobacco.
– Total emissions of Dutch controlled enterprises in the Netherlands and abroad are equal to 242 Mton CO_2. Approximately 43 percent of these Dutch controlled emissions are emitted by Dutch residents and 57 percent is emitted by Dutch controlled firms abroad.
– Most policies regarding climate change, for example the Kyoto protocol, have so far focused on reducing CO_2-emissions by addressing the country in which they are emitted. However, the Social and Economic Council of the Netherlands advises the government to promote sustainable consumption by taking the (global) production chain into account, i.e. policies aimed at reducing CO_2-emissions in the Netherlands and abroad, caused by Dutch consumption.

5   Trends in international sourcing

International sourcing is the movement of business functions to enterprises located abroad. Access to cheap labour, raw materials, advanced technologies or (fiscal) regulations play an important role in enterprises' choice for (re)locating their business functions in the most appropriate region or country.

- Between 2009 and 2011, 9.8 percent of large enterprises (>100 employees) were active in international sourcing. This percentage was 13.5 percent between 2001 and 2006.
- The Netherlands is an average country compared to other European countries in the survey when it comes to international sourcing. Denmark is the country where international sourcing occurred most often, followed by Finland. In Lithuania and Bulgaria enterprises source internationally least often.
- Enterprises with a foreign parent company are more often involved in international sourcing than Dutch controlled enterprises.
- In 2009–2011 relatively less core business functions but slightly more support business functions were sourced internationally than in 2001–2006. Firms seem to focus their resources on their core business and source support functions.
- ICT, administrative and management services and distribution and logistics were sourced internationally most frequently. Remarkably, international sourcing of R&D activities decreased in 2009–2011.
- About 80 percent of Dutch international sourcing was done within the enterprise group in 2009–2011. Also, relatively more core business functions than support functions were sourced internationally within the group. However, for each type of business function international insourcing occurs much more frequently than international outsourcing.
- Dutch enterprises mainly source to the EU-15 and EU-12, but these shares are decreasing. Sourcing to other European countries (e.g. Norway, Switzerland etc.) Russia and Brazil have increased.
- Like international trade and foreign direct investments, enterprises often choose nearby countries to source to. These countries are familiar with (similar) languages, cultures and legal systems. Less travel distance, lower transport costs and ease of exerting influence are also important reasons.
- The most important motivations to source business functions are reduction of labour costs and strategic decisions taken by the group head.

6   Regional differences in trade and the impact of location on trade patterns

International trade in goods is not merely an activity of enterprises in the Randstad. Other provinces such as Limburg and Noord-Brabant are also quite active in trade in goods. Regional and enterprises characteristics have an impact on the incidence of trading and on the trade portfolio of a province.
- Zuid-Holland is the largest trader in the Netherlands in 2012, with 95 billion euros imports and exports exceeding 78 billion euros. Noord-Holland is second

with 57 billion euros in imports and almost 63 billion in exports. Drenthe and Friesland are the smallest traders.

- Limburg had relatively the most international traders in 2012 (40 percent). Friesland had the lowest share (19 percent). Zuid-Holland and Noord-Holland both had a below average share of traders.
- Germany is the main Dutch trading partner; this also holds true at the provincial level. However, for Zeeland, Groningen and Noord-Holland respectively Belgium, Norway and the US are important import markets.
- Groningen mainly imports and exports mineral fuels (imports 60 percent and exports 74 percent), often imported from Norway and exported to Germany. In the trade of Zuid-Holland mineral fuels are also a relatively important. Chemical products are key trading products of Limburg, Overijssel and Zeeland. The exports of the Northern provinces, Gelderland and Zeeland comprise relatively much food and live animals.
- In Utrecht and Noord-Holland between 72 and 82 percent of trade is carried out by SMEs. In Groningen the bulk of trade is carried out by large enterprises (63 percent of imports and 78 percent of exports).
- In Groningen, Zeeland and Friesland the manufacturing sector exports relatively much. In Noord-Holland, Utrecht and Flevoland, wholesalers are export intensive. The logistics sector plays a key role in the exports of Limburg. In Noord-Brabant the manufacturing sector is active in trade due to the presence of the high-tech cluster/top sector.
- Foreign controlled firms are responsible for 70 percent of imports in Limburg. In Groningen and Friesland this share is respectively 12 and 25 percent. Noord-Holland (62 percent) surpasses Limburg (58 percent) in exports by foreign firms.
- Firms in Limburg, Noord-Brabant, Zeeland, Gelderland, Overijssel and Flevoland are more likely to export and import than enterprises in the other provinces (when controlling for firm characteristics).
- An establishment in Limburg is 2.5 times more likely to import or export than a local unit in Friesland (after adjusting for relevant factors).
- The average trade value of firms in Groningen, Friesland, Zeeland and Utrecht is lower than that of similar firms in other provinces. In Noord-Holland, Noord-Brabant, Overijssel and Flevoland the trade value of firms is higher than average (correcting for relevant factors).

7 Regional differences in export dependency

International trade in goods contributes significantly to Dutch economic growth. However, the impact of trade on regional growth differs substantially indicating differences in export dependency between provinces.

- Provinces with largest trade flows (Zuid-Holland, Noord-Holland, Noord-Brabant) sustained the largest shocks in trade value due to the financial crisis.
- Groningen had the most annual export growth (>9 percent) between 2002 and 2012. Friesland en Utrecht had the least export growth (<3 percent).
- Noord-Holland is relatively specialised in re-exporting (56 percent in total provincial exports). Noord-Brabant exports a larger than average share of Dutch manufactured products. Groningen tops the chart with 80 percent domestically produced exports in total exports.
- In absolute terms, the exports of Zuid-Holland, Noord-Holland and Noord-Brabant contribute the most to Dutch GDP. However, exported goods are not completely produced in these provinces so part of the value added created in the production for export should be attributed to other provinces.
- The Gross Regional Product of Groningen (36 percent), Zeeland (27 percent) and Limburg (25 percent) is relatively dependent on export of goods (either direct exports or production for exports). Utrecht is least dependent on exports and despite large export values, Zuid-Holland and Noord-Holland are also less dependent on exports than e.g. Drenthe or Overijssel.
- Provinces in the North and East of the Netherlands produce more for exports than they export themselves. They are often the (national) starting point of the value chain for a lot of export products, which ends in the South or West where the product is often finished or exported.
- A decline in exports (e.g. in 2009 due to the crisis) has a big influence not only on the regions directly involved in exporting but also on those mainly producing for exports like Groningen, Zeeland and Limburg.
- Provinces with a relatively high export dependency (Groningen, Zeeland and Limburg) had a larger decline in GRP in 2009 but experienced a greater recovery in 2010 when world trade increased again.
- Utrecht and Noord-Holland, the least export dependent provinces, saw the best development in GRP between 2008 and 2010.

8 Regional differences in economic performance in the context of the financial crisis

Macroeconomic developments mask heterogeneity between enterprises and regions within a country. At the macroeconomic level the Dutch economy seems to have found its way out of the crisis of 2009, but developments at the micro level show that the revival is not broad-based.
- In 2012 the Dutch economy faced another recession. At the macro-economic level, Dutch imports and exports still increased but turnover, GDP and jobs decreased.

- The average firm in the Netherlands had negative turnover and trade growth as of 2009. In fact, trade and turnover growth after the crisis is mainly carried by a small group of large (two-way) traders. In this period, 60 percent of the panel under consideration lost trade and turnover. As of 2012, their performance only worsened. Turnover of the average firm decreased even stronger in 2012 than in 2009 and again 60 percent of the panel lost turnover.
- Excluding the top 65 best performing exporters in 2010, the remarkable recovery of exports that year (+20 percent) would have been nullified.
- Two-way traders had on average positive turnover growth between 2007 and 2012 while only exporters, only importers and non-traders saw their turnover decline.
- Provinces in the South of the Netherlands were hit the hardest by the financial crisis while Groningen and Flevoland fared best. In 2012, most provinces saw their turnover decrease again, except for Noord-Holland, Groningen, Drenthe en Flevoland.
- Flevoland is the province with the best overall turnover performance between 2007 and 2012.
- Look at the average firm per province, Flevoland is surpassed by Zeeland. In Zeeland the decrease in turnover is spread more evenly over the firm population than in other regions.
- Location has an impact on how well firms fare during the economic crisis. Firms in Zeeland had a greater positive turnover growth between 2007 and 2012 than comparable firms in other provinces. Enterprises in Noord-Holland and Utrecht had the largest loss in turnover (corrected for relevant factors).
- Internationalisation (trade and foreign investment) is positively related to turnover growth and speedy recovery after crises.

9 Internationalisation of top sectors in a regional dimension

Top sectors are sectors with the highest growth potential and as such they play a key role in our international competitive position. They are closely linked to certain regions in the Netherlands. This chapter provides an overview of the characteristics of top sectors, with a special focus on internationalisation and regional differences.
- The top sectors encompass more than 290 thousand local business units (30 percent of all local business units). They generate 25 percent total value added, create 1.4 million jobs, 80 percent of R&D expenditure and 55 percent of total export value of goods in the Netherlands.
- Top sectors are concentrated in the South and the West of the Netherlands. Top sectors in Westland and Delfzijl have the highest concentrations of jobs.

- On average, 1.7 percent of all local units in top sectors are foreign controlled. The highest shares are found in the Zaanstreek, Groot-Rijnmond, Zuid-Limburg, Noord-Limburg and West-Noord-Brabant.
- In 2011, about 15 percent of local business units in top sectors exported goods. Most are located near the borders with Germany and Belgium. Limburg has the largest share of exporters in top sectors (26 percent). The export values of firms in the West are larger. Noord-Holland, Zuid-Holland and Noord-Brabant are responsible for more than 60 percent of total exports by top sectors.
- The top sectors chemicals and energy have the largest share of exporters and foreign controlled local units but not the highest export value. The high tech sector has the highest export value (48 billion euros), but the share of exporters and foreign controlled establishments is limited. The share of exporters and foreign controlled establishments is lowest in agro & food, the sector accounted for 16 percent of total exports of all top sectors. The creative industry is the least internationally oriented: the share of exporters, foreign controlled local units and its export value is very limited.
- Being part of a top sector has a positive impact on the export value. The export value of local business units in a top sector is 3 times higher than that of local business units that are not in a top sector (controlled for region and other relevant factors).
- The highest average export values in top sectors are found for business units in chemicals and horticulture (controlled for region and relevant factors).
- Firms in the top sector horticulture in Zuid-Holland have a significantly higher export value than firms in the North active in horticulture.
- The export value of firms in the high tech sector is highest in Limburg, followed by Zeeland and Noord-Brabant.

10 Foreign knowledge workers in the Netherlands

Foreign knowledge workers often work at internationally active firms; i.e. international traders or foreign controlled firms. Policy makers have placed attracting foreign knowledge workers high on their agenda.
- More than 33 percent of Dutch workers are knowledge workers; for foreign employees in the Netherlands this is one in six. The latter are however younger, work more hours and earn on average a 15 percent higher wage.
- Around 4 percent of all knowledge workers in the Netherlands is foreign. The share of foreigners is higher among non-knowledge workers (11 percent), i.e. the Netherlands still mainly attracts low skilled foreign labour.
- Foreign non-knowledge workers come from all over the world. Knowledge workers are often European (45 percent), mainly the UK and Germany.

- Nearly 30 percent of foreign knowledge workers work in a foreign controlled firm. This figure is twice as high as for Dutch knowledge workers. Especially knowledge workers from non-EU countries work for a company originating in their home country (e.g. Japanese, Chinese and US workers).
- Foreign knowledge workers work in relatively internationalised enterprises. In these firms the average share of goods exports amounts to 15 percent of total turnover. This export share is twice as high as for firms where Dutch knowledge workers are employed.
- Both in absolute and in relative terms, most foreign knowledge workers are found in Amsterdam, Rotterdam, Den Haag, Utrecht and Eindhoven. They are overrepresented in the largest agglomerations.
- Greater Amsterdam employs 22 percent of all foreign knowledge workers in the Netherlands.

11 Internationalisation and firm productivity: firm and regional level effects

Many countries aim to increase the internationalisation of their economy with the intent to stimulate growth, development and productivity. Linking internationalisation to productivity, with a special focus on any additional regional impact, leads to the following findings.
- Differences in firm productivity are associated with trade and foreign ownership, but only at the firm level. The extent to which a region is internationalised is not statistically significant for productivity levels.
- Foreign controlled firms in the panel are 49 percent more productive than domestically owned firms.
- Exporting firms have an 18 percent higher productivity level than non-exporters. Doubling the share of exports in turnover is associated with a 6 percent increase in productivity (controlled for relevant factors).
- Firms that use imported intermediary goods are more productive than firms that use domestically produced goods.
- Total factor productivity is somewhat higher in the western and central parts of the Netherlands, after controlling for firm heterogeneity, sector etc. Effects are however small.
- No evidence for spill-over effects from internationalisation was found. The presence of foreign firms, exports and foreign (knowledge) workers in a region is almost unrelated to productivity.

12 International trade and job termination in the Netherlands

In this chapter the probability of job termination is related to several international trade measures at the firm and at the sector level, as well as to the region in which the firm is located. A higher import penetration ratio is particularly related to job losses in the lower wage categories.
- Around two thirds of Dutch employees (excl. public sector) in the Netherlands work for a firm engaged in international trade. The majority (44 percent) is employed by a two-way trader. Almost 38 percent works for a non-trader.
- The share of employees working for two-way traders is highest in Limburg (50 percent) and lowest in Friesland (38 percent).
- In Noord-Brabant the share of employees working in sectors with an above average import penetration ratio is highest (34 percent). This share is lowest in Groningen (27 percent). Relatively many employees in Limburg and Noord-Brabant work in sectors with an above average export ratio.
- Employees in Overijssel and Zeeland face a lower probability of job termination than in Utrecht (controlled for relevant factors). For employees living in Groningen the probability is significantly higher.
- The probability of job termination for employees working for a two-way trader is almost 3 percent larger than for people working for non-traders.
- A 10 percentage point increase in the import penetration ratio on the sector level is associated with an increase of less than 1 percentage point in the probability of job termination. A higher import penetration ratio is related to job termination for workers in the lower wage categories.
- An increase in the export ratio of 10 percentage points reduces the probability of a job termination by less than 3 percent. Low paid workers employed in export-intensive sectors have a slightly higher chance to see their job end than highly paid workers.

13 International trade in goods by enterprises

This chapter provides key figures on the international trade in goods by enterprises active in the Netherlands during the period 2002–2012.
- Foreign controlled firms form circa 5 percent of the Dutch trader population. Almost half of Dutch exports and 55 percent of the import value can be attributed to them. Over time, their share in Dutch trade has increased.
- SMEs imported at least 160 billion euros worth of goods in 2012; large enterprises 117 billion euros. Between 2002 and 2012, the imports of large firms grew faster (+80 percent) than imports carried out by SMEs (+47 percent).

- The total export value of SMEs was 181 billion euros compared to 116 for large enterprises. SMEs saw more export growth (+70 percent) in the past ten years than large enterprises (+45 percent).
- In 2012, 72 percent of imports and 74 percent of exports were by enterprises active in manufacturing and wholesale. Slightly more than half of this trade value can be linked to enterprises under foreign control.
- Importers constituted 15 percent of the total Dutch enterprise population of enterprises, while 10 percent exported in 2012.
- The largest shares of importers and exporters are found in wholesale trade (respectively 50 percent and 42 percent) and manufacturing (respectively 36 percent and 29 percent).

14 International trade in services by enterprises

Modern economies are increasingly dominated by services. However, the share of services exports as a percentage of total exports is relatively low (20 percent), which is generally the result of difficulties associated with transferring services.
- The Netherlands exports more services than it imports. In 2012 services exports amounted to 102 billion and the import value of services was 92 billion euros. Since 2008, the annual growth rates of services exports were higher than those of services imports.
- In 2012, a little more than half of the imports of services can be attributed to Dutch controlled enterprises. Dutch controlled firms carry out 55 percent of the exports of services. These shares are relatively constant over time.
- Enterprises active in agriculture, mining and manufacturing accounted for 29 percent of the import value of services. The sectors transport, storage and communication, financial intermediation, real estate and business activities account for 26 percent of imports. These above three sectors were also the most important exporters.
- Roughly 80 percent of services importers and 91 percent of services exporters trade in only one or two types of service. Of all services importers, 1 percent imported at least ten types of services in 2012. For exporters, this share was only 0.1 percent.
- Enterprises that import one or two services, accounted for 30 percent of the total services import value in 2012. This share was much higher for exports (59 percent). The extensive margin of services shows a skewed distribution, and the distribution of exports is more skewed than that of imports. This is also the case for the product extensive margin of commodities.

15 Foreign direct investments

FDI is defined as a cross-border investment made by a resident in one economy with the objective of establishing a lasting interest in an enterprise abroad. This chapter presents key figures on foreign direct investment.
- The share of the Netherlands in the global stock of inward FDI was 2.5 percent in 2012 (0.3 percentage points lower than in 2011).
- In 2012 outward FDI stock accounted for 783 billion euros and inward FDI stock for 457 billion euros.
- The Dutch economy has become more open with respect to outward FDI since 2008, from 108 percent of GDP to 123 percent of GDP. However, the inward FDI/ GDP ratio has decreased slightly.
- In 2005, almost 11 percent of inward FDI of the EU-15 was due to Dutch investments (third rank). This share has decreased to 8 percent in 2012, making the Netherlands the sixth most important investor in the EU-15.
- Of the EU-15 countries, the Netherlands was the fourth most important outward investor from 2005 to 2010. In 2012 the Netherlands was fifth, accounting for 10 percent of the EU-15 outward FDI stock.
- The United States and the EU-15 countries (e.g. Luxembourg, UK, Belgium) are the main investors in the Netherlands and accounted for 340 billion euros, or three quarters of total Dutch inward FDI stock in 2011.
- Approximately 63 percent (480 billion euros) of Dutch outward FDI stock went to the US and EU-15 countries in 2011.

16 Internationalisation and employment

This chapter presents figures on employment at domestically and foreign controlled enterprises, such as the number of jobs, the average enterprise size, workforce composition, wage distribution and job dynamics.
- Almost 12 percent of Dutch employees worked at a foreign controlled firm in 2010.
- Foreign ownership is associated with job creation and job retention and is therefore considered to have a positive effect on employment and welfare.
- The loss of registered jobs between 2008 and 2010 was stronger for foreign controlled enterprises (–2 percent) than for domestically controlled enterprises (–1.6 percent).
- Foreign enterprises typically employ 6 times more employees.
- The workforce of Dutch controlled firms comprises 26 percent workers over fifty, almost 50 percent female workers and 81 percent native Dutch employees. For foreign controlled firms these shares are lower, namely 23, 34 and 73 percent.

- In 2010, around 80 percent of the employees working for a Dutch controlled firm already worked for the same enterprise in 2009. Foreign controlled enterprises in the Netherlands show even higher retention rates (83 percent). This might be related to higher wages, better options of in-house training and/or opportunities for job mobility.
- The share of highly paid employees in the workforce of foreign controlled firms (31 percent) is substantially higher than that of Dutch controlled firms (17 percent) in 2010. FDI may require more highly-skilled labour and therefore more highly paid personnel in host countries. Also, foreign firms often pay higher wages to avoid employees switching to domestic enterprises.

Introduction

The Dutch economy continued to be plagued by recession in 2012 and the first months of 2013. Uncertainty about house prices, extremely low levels of consumer confidence and planned government cutbacks put a strain on Dutch consumption and investment. In addition, trade growth decelerated in early 2013 indicating that an export-driven recovery like in 2010 has not happened yet.

For a small and open economy like the Netherlands the importance of international activity for economic growth cannot be understated. Roughly 30 percent of Dutch GDP is created through exports and the production for exports of goods and services. In addition, the Netherlands was the third largest investor in the EU-15 and the sixth most important outward investor in 2012. Foreign controlled enterprises contribute roughly 15 percent to GDP, employ 12 percent of all employees in the private sector and account for 23 percent of private sector investments.

With the Internationalisation Monitors, Statistics Netherlands provides coherent and annotated information on international trade, international investment and other dimensions of globalisation that influence the Dutch economy, employment and welfare. This is important since international developments often have significant consequences for Dutch enterprises and economic growth.

This publication is the sixth in the series of Internationalisation Monitors (Statistics Netherlands, 2008–2012), which were preceded by an initial publication named *Key Figures Internationalisation* (2007). These publications – as well as this 2013 edition – serve a threefold goal:

- First, trends in determinants of globalisation can be monitored. International trade in goods and services, international investment, the activities of Dutch controlled enterprises abroad and the impact of foreign controlled firms on the Dutch economy as well as the interaction between these determinants are illustrated and annotated.
- Second, the publication explores the consequences of trends and international developments for employment, economic growth and enterprise performance based on combining micro-data on enterprises. In this edition, the central focus is on the regional impact of internationalisation.
- Third, the publication facilitates a fact-based debate on globalisation and its socio-economic consequences for the Netherlands.

Besides presenting macroeconomic developments, this series also pays special attention to the consequences of internationalisation at the micro-level. Macroeconomic figures can mask heterogeneity at the level of individual enterprises. This is one of the major contributions of the Spearhead International

Economic Relations at Statistics Netherlands, which resulted in the production of the various internationalisation Monitors. Analysis in this edition shows for instance that the recovery from the financial crisis in 2010 and 2011 turned out not to be broad-based. Only a small group of very large, internationally active enterprises were responsible for the overall growth in trade and turnover. The average firm is still struggling to recover its lost turnover while employment is rising to unprecedented levels.

Just as there are differences between macroeconomic developments and developments at the firm level, so too are there differences in regional performance, resilience and vulnerability. So far little was known about the consequences of internationalisation for different regions in the Netherlands. This edition seeks to fill that gap as the consequences of internationalisation for different regions in the Netherlands form its central theme. Seven analytical chapters focus on the implications of international trade, the financial crisis, foreign employment and foreign ownership for the individual firm, top sectors, productivity, export dependency and job termination. We found that regions that are traditionally very active in trade experienced the crisis, recovery and subsequent new recession very differently than regions that are less dependent on trade and international activity. In this respect, it is also interesting and necessary to take into account the value chain that precedes exports. Regions that, at face value, seem to be less internationally active, can turn out to be important suppliers of intermediates for the exports of other regions and therefore still be very vulnerable to economic shocks.

Measuring internationalisation: statistical innovation

Being restricted to a national mandate, it is a great challenge to statistical agencies to say something a about globalisation and its consequences for the Dutch economy, enterprises and employment. It is a vital function of statistical agencies to integrate statistics on the activities of (multi)national enterprises, active in and outside the Netherlands. Integrating micro-data on the many dimensions and effects of globalisation in such a way that the intrinsic and methodological nuances of the individual indicators as well as the interconnectedness of their dimensions are justified, requires statistical innovation. This challenge resulted in two major innovations in the statistical work on measuring internationalisation.
— In 2006 Statistics Netherlands started to develop a long term research agenda on globalisation, addressing the structure and impact of globalisation. In the national and international debate, coherent information was urgently needed on the effects of economic globalisation, in particular on the international

behaviour of enterprises (Luppes and De Winden, 2007). In order to provide such information, the integration of different types of statistics on the actors involved in international activity was required. Van der Veen (2007) describes a model of integrating micro-data from business statistics with social statistics, which form the core in much of the analytical work in the various editions of the Internationalisation Monitor thus far. For example, this model guided the construction of the so-called Linked Employer-Employee Database (LEED) which enables us to integrate micro-data on individuals with micro-data on enterprises obtained from various sources (international trade survey, FATS, the General Business Register etc.) (Fortanier, Korvorst and Luppes, 2009). These linked micro-data are available in annual time series from 2002 until 2012.

— The second innovation is the development of the concept 'international orientation' (Luppes and Van Brummelen, 2008). The international orientation of an enterprise is defined by its position on the dimensions of trade, ownership and investments. Throughout the analytical work of the Internationalisation Monitor this concept is used in the breakdowns of indicators and in-depth (causal) analyses. As such this concept is now also part of the international work on global value chains.

This year, we also added regional information on the establishments of enterprises. These so-called local business units are subsequently enriched with information on international trade in goods and information on foreign ownership in order to investigate the impact of trade and foreign control on different regions in the Netherlands.

Structure of the publication

In each edition of the Internationalisation Monitor, a comprehensive range of key figures, in-depth analyses and new statistics is presented. The *Internationalisation Monitor 2013* comprises 16 chapters, starting with five chapters on trends in internationalisation (chapter 1 to 5), analytical papers focused on the regional consequences of internationalisation (chapter 6 to 12) and five chapters with key figures and annotated tables (chapters 13 to 16). There is also a section summarising the main results and conclusions.

The first five chapters illustrate and monitor trends in several key areas of internationalisation.
— Chapter 1 focuses on international trade on goods and services.
— Chapter 2 digs deeper into the importance of trade on the Dutch economy by estimating the 'net' effect of trade for the Netherlands.

- Chapter 3 presents current developments and trends in international investments, this year focusing on SMEs in investments.
- The emissions of Dutch and foreign controlled enterprises provide insight in the sustainability of international activity, which is the topic of chapter 4.
- Chapter 5 provides insight in the (international) sourcing behaviour of Dutch firms.

The next seven chapters revolve around a common topic, namely the impact of internationalisation on the regions. Some chapters focus on the role the region plays in international behaviour, while others analyse differences in regional impact.
- Chapter 6 starts with illustrating regional trends and differences in trade patterns. The likelihood of trading and the impact of location on trade flows are subsequently analysed.
- Regional dependency on exports and regional differences herein are the subject of chapter 7. In this chapter we take the fact into account that export goods are produced in a value chain, rather than merely attributing trade to the last link in the chain (i.e. the exporting province).
- Chapter 8 builds on chapter 9 of last year's Internationalisation Monitor and disentangles the impact of the economic crisis on a regional level.
- The internationalisation of enterprises in so-called top sectors is analysed in chapter 9.
- Chapter 10 provides information on foreign knowledge workers in the Netherlands, i.e. numbers, characteristics, regional clusters and interaction with other international activities.
- Regional differences in productivity are the topic of chapter 11.
- The extent to which international activity impacts on job termination is described in chapter 12. Regional differences are also taken into account.

The last five chapters present key figures and annotated tables on trade, investment and employment. Many of these statistics can already be found on StatLine, others are in the process of being made available through that channel.
- Chapter 13 presents key figures on international trade in goods.
- The trends in international trade in services are the topic of chapter 14.
- International investment is illustrated in chapter 15.
- Chapter 16 concludes the publication with key figures on employment at domestically controlled and foreign controlled enterprises.

The publication is a result of close cooperation with different researchers within and outside Statistics Netherlands. On the one hand, this illustrates the variety of available statistics present within the portfolio of our organisation. On the

other hand, external cooperation allows for an expansion and deepening of our knowledge on the topic so that policy makers are even better informed.

Statistical agencies have an obligation and a responsibility to prevent that partial or incorrect conclusions are drawn from their data and analyses. In order to ensure a correct interpretation of the trends and analyses, each chapter provides a clear overview of which data is used, which limitations we encountered and which methods and empirical tools were implemented. As such, each table, statistic and analysis is presented within a context in order to provide our findings in a well-balanced and exhaustive manner.

Further developments

While this sixth edition of the Internationalisation Monitor addresses many determinants and consequences of globalisation, many more and increasingly complex questions arise. Questions on the heterogeneity of enterprises, the integration of trade in goods and trade in services and the position of the Netherlands in global value chains have spurred Statistics Netherlands to include several new initiatives in the *Strategic multi-annual programme 2014–2018.*
− Using microeconomic figures at the level of the enterprise in order to explain macroeconomic indicators and provide insight in heterogeneity of businesses.
− Integrating international trade in goods and international trade in services.
− More research on value chains and the value added of trade. This allows for a further breakdown of macroeconomic figures on value added, employment and productivity.
− Further continuation of current partnerships and cooperation on the topic of regional and spatial research (mainly with Netherlands Environmental Assessment Agency) and on foreign investment and exports of SMEs (mainly with Panteia/EIM and the Ministry of Foreign Affairs).

Several external parties have expressed their interest in participating in such research (e.g. the University of Utrecht, Vrije Universiteit, TNO, RUU, Erasmus/ISS). The advisory board on Economic Statistics has reacted positively to the proposed projects in the aforementioned *Strategic multi-annual programme 2014–2018.* Concrete cooperation plans will be determined in the course of 2014.

Within the framework of international co-operation, Statistics Netherlands participates in a project on defining of economic globalisation indicators, in projects on matching trade in goods and trade in services (TEC/STEC) and in a project on enhanced measurement of global value chain activities. These

projects, defined and granted by Eurostat, are focused on establishing statistical information on the increasingly globalised way of doing business, i.e. the new way that enterprises are organised, the flow of resources and capital between their enterprise units, their capacity to create new jobs and sustainable growth in Europe. Results of these projects will feed into the future editions of the Internationalisation Monitor.

1.

Trends in Dutch international trade

Authors
Marjolijn Jaarsma
Fintan van Berkel

The Dutch economy faced yet another recession in the fourth quarter of 2011. Despite decreasing consumption and investments, international trade still continued to grow in 2012. The bulk of Dutch trade is the trade in goods that takes place with other EU countries. Although adding less to Dutch GDP than exports of domestic products, re-exports have become more important in time. In 2012 almost half of the export value of goods could be assigned to re-exports. The relatively low share of services trade in total trade reflects the difficulties associated with transferring services from one country to another.

1.1 Introduction

The hope that 2012 would bring renewed economic growth and the revival of the Dutch economy turned out to be idle. The Dutch economy already slipped into another recession in the fourth quarter of 2011. Continued insecurity about developments in private wealth (e.g. pensions and house prices), the euro crisis and subsequent austerity measures have weakened the Dutch economy. In previous years export growth was a mitigating factor during times of recession. However, in 2012 and at the start of 2013, international trade in goods and services still continued to grow, but its rate has been decelerating rapidly since 2010. The provisional figures of April 2013 actually show a decrease in the volume of Dutch goods exports (working day adjusted) on April 2012. Dutch international trade is still tightly bound to the European internal market, where economies are struggling to implement strict fiscal discipline in order to maintain solvency. As such, trade growth remains sluggish.

The total value of exported goods and services amounted to 528 billion euros in 2012, which corresponds to 88 percent of Dutch GDP (the value added of exported goods and services to GDP was 29 percent in 2009; see Kuypers et al. (2012)). Imported goods and services corresponded to 80 percent of GDP. In absolute terms, trade in goods outweighs the trade in services by far. In 2012 around four fifths of total exports and imports consisted of trade in goods. However, in terms of value added, trade in services contributes relatively much to GDP. This is due to the fact that services often require more knowledge-intensive inputs than commodities and that they less often than commodities (partly) consist of imported inputs of which the value added is created elsewhere. Re-exports form a clear example as in 2009 they contributed only around 7 cents of value added per euro, while one euro of domestically produced exports contributed around 59 euro cents to GDP (Kuypers et al., 2012). Nevertheless, due to its sheer volume,

re-exporting is an important activity for the Netherlands. Furthermore, it seems to be the only source of growth in the commodities trade at the moment.

As one of the main drivers of Dutch economic growth and a key determinant of internationalisation, the importance of international trade for the Netherlands cannot be overestimated. Therefore chapter 1 kicks off with the main developments in Dutch international trade in goods and services (section 1.2). This information is put into context by a macro-economic overview of the Dutch economy and the contribution of international trade to Dutch GDP (section 1.3). In section 1.4 Dutch international trade is broken down by partner country. This section also presents the largest rising trading partners. A closer look at which products and services are traded will be provided in section 1.5, followed by a closer look at re-exports. Extra insight in this special trade flow is provided by illustrating the magnitude of re-exports as well as their origin and destination. Chapter 1 ends with the conclusions of the main figures and developments.

1.2 Developments in Dutch international trade

Table 1.2.1 shows that the unprecedented decline in Dutch international trade in goods in 2009 was followed by an equally large upswing in 2010. In 2011 both imports and exports exceeded pre-crisis levels and their value grew by 10 percent. Especially exports of domestically produced goods grew significantly, namely by 16 percent. In 2012, commodities trade growth slowed down somewhat. Export growth was the lowest since the economic crisis of 2009 and especially apparent in the relatively small growth of domestic exports (+3 percent). Re-exports continued to grow strongly in 2012, namely by 9 percent compared to 2011. The preliminary figures on the first four months of 2013 show a further bottoming out of trade growth, with a decrease in imports of 1 percent and no export growth. Only re-exports continue to grow, which implies that there were less domestically produced commodities exported in this period than in the same period in 2012.

Exports of domestically produced goods grew by 3%

1.2.1 Dutch international trade in goods

| | Imports | | Exports | | of which | | | |
| | | | | | domestic exports | | re-exports | |
	value	growth rate	value	growth rate	value	growth rate	value	growth rate
	billion euros	%	billion euros	%	billion euros	%	billion euros	%
2005	249.8	9	281.1	10	159.2	10	121.9	10
2006	285.4	14	319.0	13	179.0	12	139.9	15
2007	307.3	8	347.5	9	192.3	7	155.2	11
2008	355.9	9	370.5	7	212.5	11	157.9	2
2009	274.0	−18	309.4	−16	169.4	−20	139.9	−11
2010	331.9	21	371.5	20	199.9	18	171.6	23
2011	364.9	10	409.4	10	231.1	16	178.3	4
2012*	389.9	7	431.4	5	237.9	3	193.5	9
2013 (Jan–Apr)*	127.0	−1	143.0	0	78.2	−3	64.8	4

Source: Statistics Netherlands, Statline, International trade in goods statistics (extracted: 23-7-2013).

The economic downturn had less impact on the international trade in services than on the international trade in goods (see table 1.2.2 and also Jaarsma and Van Berkel, 2012). In 2009, only services exports were lower than in the preceding year, namely 5 percent. This decrease was mainly caused by a decline of 3.4 billion euros in transportation, which dealt directly with the collapse in commodity trading. Services exports have recovered remarkably well ever since. In 2012, however, as was the case for trade in goods, the growth rate (+3 percent) was considerably smaller than in 2011 and 2010. Therefore, the 9 percent higher export value in the first quarter of 2013 was a real boost.

The imports of services grew during the economic crisis of 2009 by 2 percent and continued to grow annually. There was an especially high growth rate in 2011 (+9 percent). In 2012, services imports were 6 percent higher than in the preceding year. They amounted to 92 billion euros, while services exports reached 102 billion euros.

1.2.2 Dutch international trade in services

	Imports		Exports	
	value	growth rate	value	growth rate
	billion euros	**%**	**billion euros**	**%**
2005	67.9	6.0	74.0	8.4
2006	69.2	1.9	77.0	4.1
2007	71.7	3.6	81.5	5.9
2008	76.5	6.6	85.9	5.4
2009	78.0	2.0	81.9	−4,7
2010	80.2	2.9	89.1	8.8
2011	87.5	9.1	99.5	11.6
2012*	92.4	5.6	102.3	2.8
2013Q1*	21.0	5.4	25.4	9.0

Source: Statistics Netherlands, International Trade in Services Statistics
(extracted 23-7-2013).

1.3 Balance of international trade and contribution to Dutch GDP

This section illustrates the importance of international trade relative to Dutch GDP and its contribution to the GDP growth. Using National Accounts data, the importance of international trade in goods and that of international services trade can be compared. The National Accounts data differ from the 'original' source data (because of integration in the overall economic framework) and are only used here.

Because of lower imports and an even stronger decline in exports during the economic crisis, the total Dutch trade surplus was only 40 billion euros in 2009. The share of the trade balance in Dutch GDP in that year was also at its lowest point since 2003. However, after the crisis the trade surplus increased again. In 2011 and 2012 the Netherlands exported respectively 51 and 50 billion euros more goods and services than it imported. The goods and services trade balance was close to 9 percent of Dutch GDP in these years. If we have a closer look on the composition of the trade surplus, we can clearly see that the international trade in goods contributes the most. In 2012 no less than 91 percent of the trade surplus is generated by a positive goods balance. Chapters 2 and 7 in this publication will dig deeper into the net contribution of trade to GDP. Specifically, the value added of trade to the Dutch economy will be discussed.

1.3.1 International trade relative to Dutch GDP

Goods and services
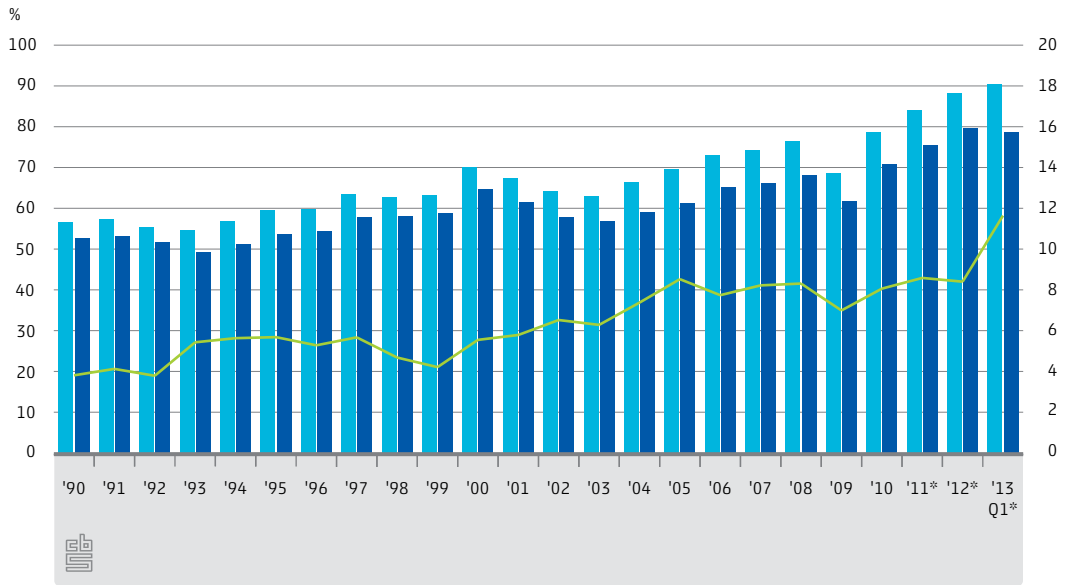
Goods
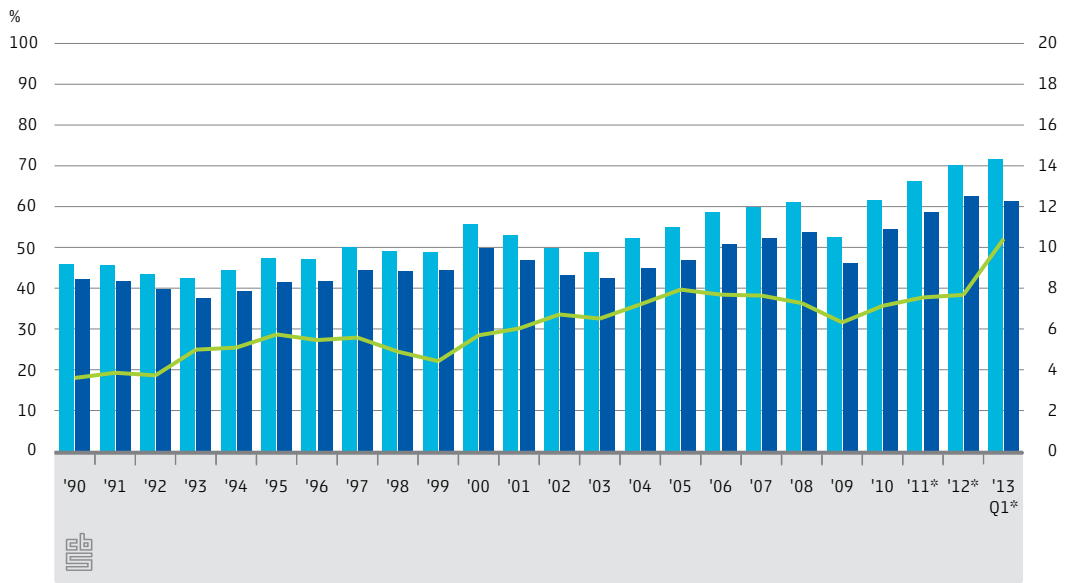
1.3.1 International trade relative to Dutch GDP (end)

Services

Exports in GDP   Imports in GDP   Trade balance
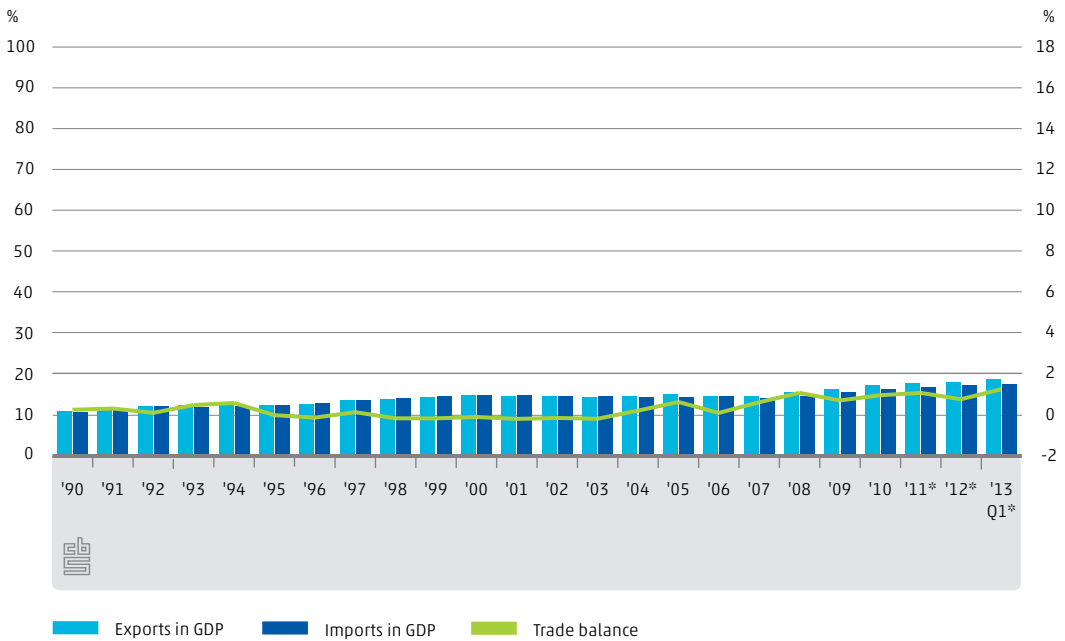
* Provisional figures.

Source: Statistics Netherlands, National Accounts (extracted 23-7-2013).

Table 1.3.2 shows the decomposition of Dutch economic growth since 2009. In 2010 and 2011 the Dutch economy realised positive economic growth, but since then the economy has again gone into recession. In the first quarter of 2013 Dutch GDP declined by 1.8 percent, which was mainly due to further bottoming out of investments of enterprises and the government. Consumption of households also decreased further in this period.

Renewed growth of exports of goods and services was the main driving force behind the recovery in 2010. Since then this growth has also slowed down, to 1.4 percent in the first quarter of 2013. Dividing this growth rate into exports of goods versus exports in services, we see that the exports of services continued to grow firmly in this period (2.8 percent), while the growth rate of goods exports is still positive but declining.

1.3.2 Breakdown of Dutch economic growth

	2009	2010	2011**	2012*	2013Q1*
% volume changes, year-on-year					
GDP	−3.7	1.5	0.9	−1.2	−1.8
Imports	−7.1	10.3	4.2	3.3	−0.8
goods	−9.4	11.9	4.7	3.6	−0.6
services	1.8	5.4	2.5	2.3	−1.6
Exports	−7.7	11.6	4.1	3.2	1.4
goods	−9.3	12.9	4.3	3.6	1.1
services	−1.4	7.2	3.3	1.9	2.8
Consumption	0.5	0.4	−0.6	−1.3	−1.7
households	−2.1	0.3	−1.1	−1.6	−2.4
government	5.0	0.5	0.2	−0.7	−0.6
Investments	−12.0	−7.4	6.1	−4.0	−11.8
corporate and household	−15.3	−8.8	9.5	−4.6	−13.5
government	4.4	−1.8	−7.0	−1.3	−4.5

Source: Statistics Netherlands, Statline, National Accounts (extracted: 23-7-2013).

The trade growth in the first quarter of 2013 was not sufficient to counterbalance the decline in investment and consumption. The hope is that the Dutch economy will recover by an acceleration of world trade growth (ING, 2012; OECD, 2012). However, the Export Radar of May 2013 (Statistics Netherlands, 2013a) shows that the factors that influence Dutch exports continue to worsen. Producer confidence levels decreased in Germany and in the Eurozone as a whole. Dutch entrepreneurs were also pessimistic about an increase in their foreign order portfolio, and consumer confidence levels are still at record-low levels. The historically developed pattern of Dutch trade, where large amounts of trade are destined for the European market does not help in this regard either. Many of these EU countries are still struggling to cope with the euro crisis and are not expected to grow significantly in the near future. They have implemented severe austerity measures in order to finance their national debts. An incidental effect of these measures may be that they stifle economic growth and trade. This not only hurts the export of domestically produced exports, but also the re-export activities of Rotterdam and other Dutch distribution centres. Since emerging markets such as BRIC countries and other developing Asian countries are the main drivers of world economic growth, it could be beneficial for Dutch traders to shift their focus away from traditional markets to growth markets (OECD, 2012; Statistics Netherlands, 2012b).

1.4 The most vitally important import and export markets for the Netherlands

Germany, Belgium, the United Kingdom, the United States and China were generally the most important trading partners of the Netherlands in 2012. Concerning trade in goods (table 1.4.1), Germany and Belgium are still the main import and export markets. The bulk of Dutch commodities trade is with countries of the EU, although this share has been declining steadily. In 2012 circa 73 percent of exports went to the EU and 52 percent of imports originated from the EU.

1.4.1 International trade in goods by partner country

	Import value					Export value				
	2008	2009	2010	2011	2012*	2008	2009	2010	2011	2012*
billion euros										
Total	**335.9**	**274.0**	**331.9**	**364.9**	**389.9**	**370.5**	**309.4**	**371.5**	**409.4**	**431.4**
EU	**185.1**	**151.8**	**176.7**	**193.6**	**201.5**	**282.7**	**231.3**	**275.7**	**302.9**	**313.8**
Belgium	33.9	27.5	31.9	36.4	37.7	43.0	34.6	41.3	48.7	50.8
Czech Republic	3.7	3.8	4.5	5.2	5.5	4.5	3.8	5.3	5.9	6.0
France	16.9	13.6	14.4	16.8	17.5	32.4	27.5	32.5	36.2	36.7
Germany	64.6	52.5	58.9	60.9	62.2	90.6	75.2	90.3	99.2	104.6
Italy	8.0	6.3	7.2	7.8	7.9	19.6	16.0	18.6	19.5	19.6
Poland	3.9	3.6	4.6	5.1	5.4	7.3	5.9	7.4	8.4	8.6
Spain	6.0	4.8	7.0	6.6	6.8	12.7	10.5	12.6	12.2	11.8
Sweden	5.7	4.0	5.3	6.2	6.6	6.5	5.2	6.6	7.2	7.2
United Kingdom	21.2	17.6	22.1	24.5	27.5	33.6	25.9	29.7	32.3	35.0
other EU	21.2	18.1	20.7	24.1	24.2	32.6	26.7	31.4	33.1	33.5
BRIC	**45.2**	**37.9**	**52.7**	**57.0**	**62.3**	**13.2**	**11.8**	**14.5**	**17.2**	**19.7**
Brazil	4.9	3.9	4.4	5.6	5.5	1.2	1.1	1.8	2.3	3.1
China	25.0	22.0	31.0	30.9	31.9	3.9	4.6	5.4	6.7	7.7
India	2.3	2.4	3.3	3.6	4.5	1.6	1.7	1.7	1.9	1.9
Russia	13.0	9.6	14.0	17.0	20.3	6.6	4.4	5.6	6.4	7.1
Non-EU (excl. BRIC)	**105.6**	**84.3**	**102.5**	**114.3**	**126.1**	**74.6**	**66.2**	**81.3**	**89.2**	**97.9**
Japan	9.5	7.3	9.3	10.1	9.8	2.9	2.4	3.2	3.4	3.6
United States	27.0	23.0	25.1	23.5	26.5	16.5	13.9	16.9	19.6	19.8
rest of world	69.1	54.1	68.2	80.7	89.8	55.1	49.9	61.3	66.2	74.5

Source: Statistics Netherlands, Statline, International trade in goods (extracted: 23-7-2013).

The main reason for the declining shares of trade with the EU is the growing importance of BRIC countries. However, in 2011 and 2012 Dutch imports from China – one of the BRIC countries – stagnated. The European debt crisis and the economic slowdown have had a negative impact on European imports from China. In 2012, imports from China decreased by 1.3 percent for the EU-27 as a whole. Nevertheless, China was still the number one import partner for the EU from beyond the European Union (Eurostat, 2013). As an important distribution hub for Chinese products, Dutch imports from China destined for other European countries have therefore also decreased. Comparatively, imports from Russia and India – two other BRIC countries – have increased substantially since 2010. This is mainly due to a large increase in the imports of mineral fuels and related products originating from these countries. Exports of goods to BRIC countries also continued to grow as of 2010. Exports to Brazil grew significantly in 2012, due to a rise in the exports of special equipment and machinery, pharmaceuticals and mineral fuels and products.

The United States has been the largest services import market for the Netherlands since 2008 (see graph 1.4.2). In 2012 the Netherlands imported 14 billion euros of services from this country. As was the case in previous years, the 'other business services'[1] is major, constituting more than a third of the services imports from the United States. Bermuda was the second largest services import market with a trade value of 10.3 billion euros, closely followed by the United Kingdom. Services imports from Bermuda have increased substantially in the last five years. The top five of main trading partners in 2012 is completed by Germany and France. The services imported most from these two countries are 'other business services'.

Graph 1.4.3 shows that, with 13.4 billion euros, Ireland was the most important export destination for the Netherlands in 2012. Germany came in second place with an export value of 12.7 billion euros. Transportation was the largest service category exported to this country. The United Kingdom and the United States were also in the top five, with trade values of 10.4 and 9.8 billion euros respectively in 2012. 'Other business services' were imported the most from the Netherlands by both countries. With a trade value of 5.2 billion euros in 2012, Belgium completed the top five of most important export destinations. Approximately a third of all the services exported to this country fell within the category transportation.

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[1] This category includes merchanting and other trade-related services; operating leases; legal services; accounting, auditing and tax advice; business consulting, management consulting and public relations services; advertising, market research and opinion polls; research and development; architects, engineering and other technical services; waste management and environmental services; agricultural, mining and other services performed on site; other business services not mentioned elsewhere; intra-group services not mentioned elsewhere.

1.4.2 Import values of services from the largest markets
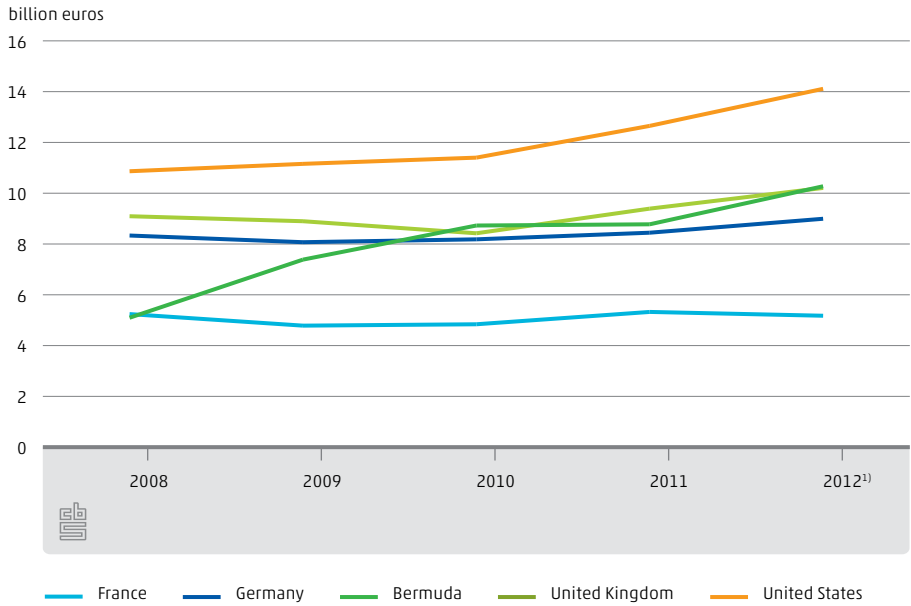
billion euros

France | Germany | Bermuda | United Kingdom | United States

1.4.3 Export value of services to the largest markets
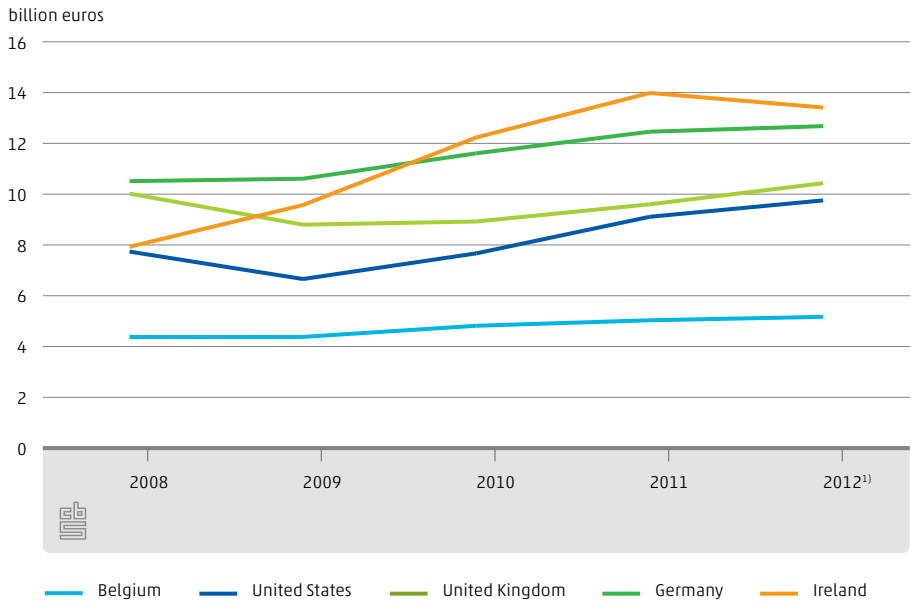
billion euros

Belgium | United States | United Kingdom | Germany | Ireland

Dutch services imports from and exports to BRIC countries increased tremendously between 2004 and 2008, but in 2009 this growth was stunned by the economic crisis. Remarkably, the imports and exports of services with BRIC saw their steepest declines a year later (–17 and –19 percent in 2010 respectively). This was due to a sharp decline of trade in services with Brazil; imports and exports to and from Russia, India and China continued to grow that year. The recovery came in 2011 in which especially exports of services to BRIC grew substantially – and much stronger than services exports as a whole – in 2012 (+6 percent). This was mainly due to a significant growth in exports of 'other business services' to Brazil, especially intra-group services and services related to agricultural or mining activities. Interestingly, imports of services from Brazil decreased substantially by 16 percent in 2012 and this, again, concerned intra-group services. The main growth in imports of services from BRIC in 2012 came from China (see also table 1.4.4) and was due to an increase in the category 'other business services' and transportation.

1.4.4 The largest rising trading partners in services

	Value		Growth rate
	2011	2012*	2011–2012
	billion euros		%
Imports			
Bermuda	8.8	10.3	17
Norway	0.9	1.1	16
China	1.7	2.0	14
United States	12.7	14.1	12
Turkey	0.7	0.7	10
Exports			
Australia	1.2	1.4	18
Brazil	1.6	1.9	17
Norway	1.0	1.2	16
Turkey	0.5	0.6	14
United Kingdom	9.6	10.4	9

Source: Statistics Netherlands, International Trade in Services Statistics (extracted 23-7-2013).
Threshold: only the countries with a minimum trade value of 0.5 percent of total Dutch services imports (0.438 billion euros) or exports (0.497 billion euros) in 2011 were included.

Bermuda was not only the second largest services import market, but it also was the largest rising trading partner in 2012 (see table 1.4.4). The value of the services the Netherlands imported from this country between 2011 and 2012 increased from 8.8 to 10.3 billion euros (17 percent). Norway was the second largest rising trading partner for services imports (in excess of 16 percent), mainly due to increases in 'other business services' and travel. China came in third place

with a growth rate of 14 percent. The imports of 'other business services' and transportation by the Netherlands from this country have grown considerably between 2011 and 2012. The top five of largest rising trading partners for services imports is completed by the United States and Turkey, which had growth rates of 12 and 10 percent respectively.

Concerning services exports, Australia was the largest rising trading partner. In 2012 the services export value to Australia was 18 percent higher than in 2011. This growth is mainly due to the category royalties and license fees. Brazil came in second place with a growth rate of 17 percent, followed by Norway (+16), Turkey (+14) and the United Kingdom (+9 percent). Transportation contributed most to Norway's growth, whereas 'other business services' was the largest contributor for Turkey as well as for the United Kingdom.

1.5 The Dutch international trade broken down by product groups and services categories

International trade comprises various product groups and services categories. Table 1.5.1 shows the import and export values for each product group for the period 2005–2012 as well as per group the shares of exports that are destined for re-exports. Trade in machinery and transport equipment is the largest product category, with over 100 billion euros imported and exported in 2012. With an import value of 99 billion euros and an export value of 83 billion euros, mineral fuels are the second largest product group. Chemical products come in third, with more significantly more exports than imports.
Re-exports form the bulk of trade in manufactured articles and machinery and transport equipment. Noteworthy is the rise in the share of re-exports in mineral fuels since 2005. The fact that the port of Rotterdam has ample storage capacity for such products as well as the excellent logistical network surrounding the import and export of mineral fuels makes the Netherlands a significant player in the production but also distribution of mineral fuels worldwide.

1.5.1 Imports and exports of commodities, by SITC classification

	Import value			Export value			of which re-exports		
	2005	2010	2012*	2005	2010	2012*	2005	2010	2012*
	billion euros								%
Total	249.8	331.9	389.9	281.3	371.5	431.4	43	46	45
Food and live animals	19.2	28.3	33.7	32.4	45.2	50.2	23	25	25
Beverages and tobacco	2.7	3.3	4.0	5.6	6.2	7.2	9	11	19
Crude materials, inedible ex. fuels	9.8	13.3	14.7	15.4	19.1	21.3	31	34	33
Mineral fuels, lubricants, related materials	37.0	60.0	99.1	30.8	51.0	83.3	22	26	38
Animal and vegetable oils, fats and waxes	2.0	2.7	5.1	1.8	3.0	4.2	38	20	27
Chemicals and related products	32.5	51.0	50.4	47.7	70.6	77.0	32	42	36
Manufactured goods classified by materials	28.3	33.6	36.2	27.1	33.2	35.8	32	41	42
Machinery and transport equipment	89.1	100.1	105.5	90.7	106.5	110.6	67	66	62
Miscellaneous manufactured articles	29.2	37.8	39.4	28.9	34.6	38.5	60	71	70
Commodities not classified elsewhere	0.2	1.6	1.7	0.8	2.2	3.2	10	55	45

Source: Statistics Netherlands, Statline, International trade in goods (extracted: 23-7-2013).

Between 2006 and 2012, 'other business services' represent by far the largest value in services imports (graph 1.5.2) as well as exports (graph 1.5.3). Within this category, approximately half of all imports and exports could be ascribed to 'services between affiliated enterprises not included elsewhere (n.i.e)'. Other important services that belong to this extremely diverse category are merchanting, services related to agricultural or mining activities and research and development. For imports as well as exports of services, transportation was the second largest category in 2012 with 16.7 and 23.4 billion euros respectively. This category consists of sea, air and other transport. The other transport subcategory includes all transportation services involving the transport of passengers or freight by road, rail or inland waterway, and transport by pipeline and electricity transmission and other supporting and auxiliary transport services. This subcategory is the largest from 2007 onwards. Especially imports and exports of freight transport by road have become more and more important ever since. The third and fourth most important services categories in Dutch imports and exports in 2012 were royalties and license fees and travel. While the imports and exports of travel have remained relatively stable since 2005, those of royalties and license fees have grown remarkably from 2006 onwards.

1.5.2 Import values of the largest services categories

billion euros

1) Provisional figures.

Source: Statistics Netherlands, International Trade in Services Statistics (extracted 23-7-2013).

1.5.3 Export values of the largest services categories

billion euros

Travel — Royalties and licence fees — Transportation — Other business services

1) Provisional figures.

Source: Statistics Netherlands, International Trade in Services Statistics (extracted 23-7-2013).
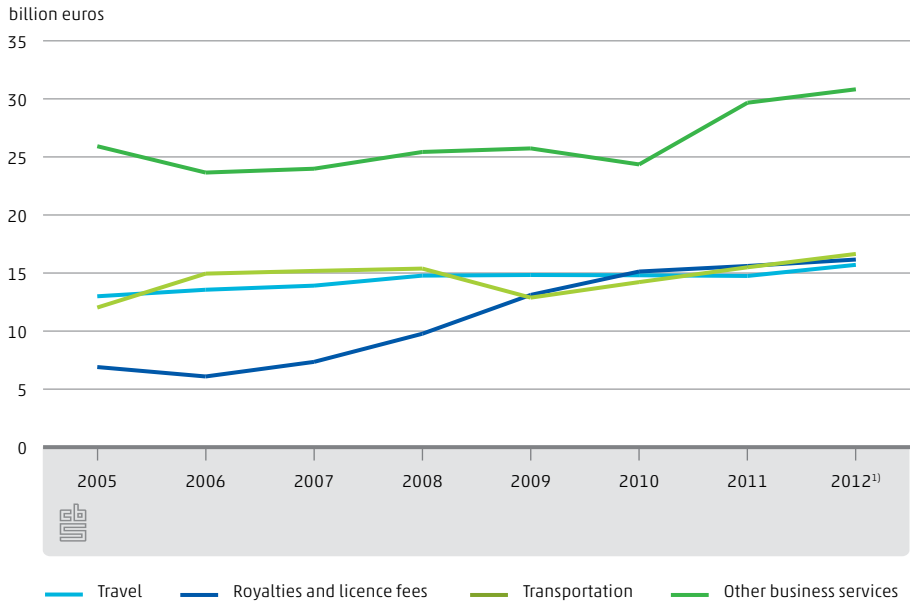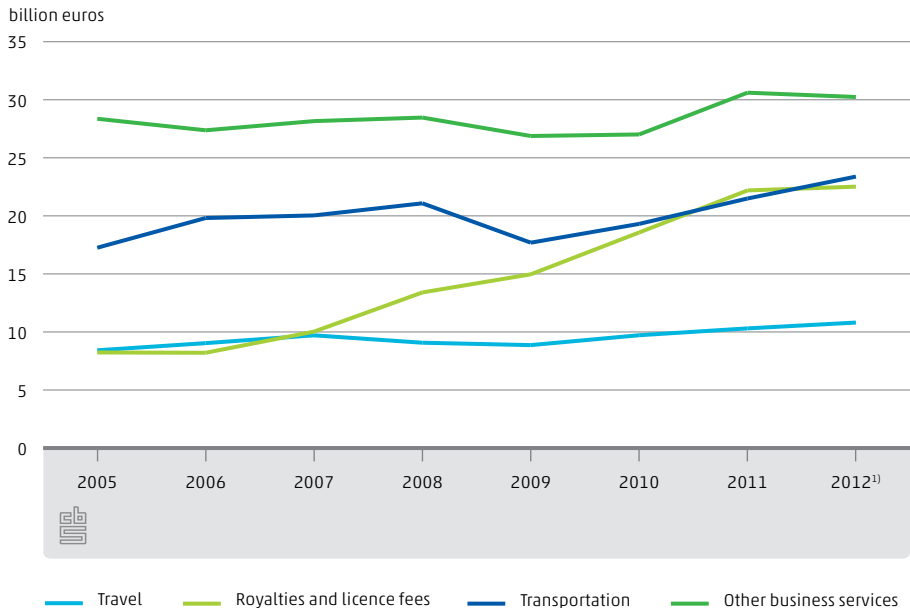
1.6 A closer look at re-exports

In this section we take a closer look at the re-exports of commodities, which is a vital part of Dutch international trade. As table 1.5.1 shows, 45 percent of the Dutch export value of goods consist of re-exports. Due to its geographical location, the Netherlands is a gateway to the rest of Europe. As such, many goods enter the Netherlands with the purpose of distribution to other EU countries. In the past Statistics Netherlands has conducted several ad-hoc studies with respect to the destination of re-export products (e.g. Ramaekers & De Wit, 2010). We updated these results. This allowed us to determine which countries obtain the most re-exports. Not surprisingly, this resulted in the same list of countries as depicted in section 1.4, of which Germany, Belgium, France, the UK and Italy were the most important. We updated this study with new information on the year 2012, but more importantly, we extended it to include imports as well. This allows us to determine which part of Dutch imports coming from e.g. China is actually destined to be re-exported.

Graphs 1.6.1 and 1.6.2 show the relative importance of each partner country in Dutch goods imports and exports in 2012. The main trading partners have the darkest colours to indicate their large share in Dutch import and export values.

Graphs 1.6.3 and 1.6.4 show how important re-exports are in imports from and exports to a certain partner country. For instance, our import value from Germany consist for almost 40 percent of goods that are not destined for the Dutch market i.e. they are re-exported. Dutch exports to Germany consist for almost 50 percent of re-exports, meaning more than half of our export value to Germany is domestically produced. Considering our most important import partners, the share of re-exports in imports is highest for China, the US and Japan. Relatively low shares of re-exports are found in imports from Russia and Norway. Dutch exports to the US and China comprise a relatively small amount of re-exports, while our EU-partners receive larger shares of re-exports with Slovakia, the Czech Republic and Finland at the top of the list. Despite the large amounts of re-export products coming from South-East Asia, the share of re-exports in imports from the EU-27 is still slightly higher than that of the rest of the world. However, our exports to the EU-27 are far more often re-exported goods than our exports to other countries.

1.6.1 Dutch import values, by country of origin, 2012

0 to 1 billion euros
1 to 2 billion euros
2 to 5 billion euros
5 to 10 billion euros
10 to 75 billion euros
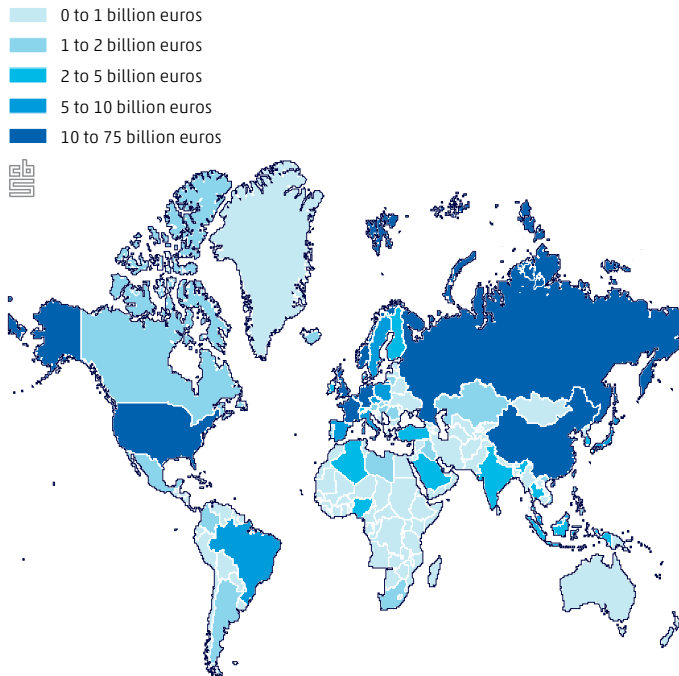
1.6.2 Dutch export values, by destination, 2012
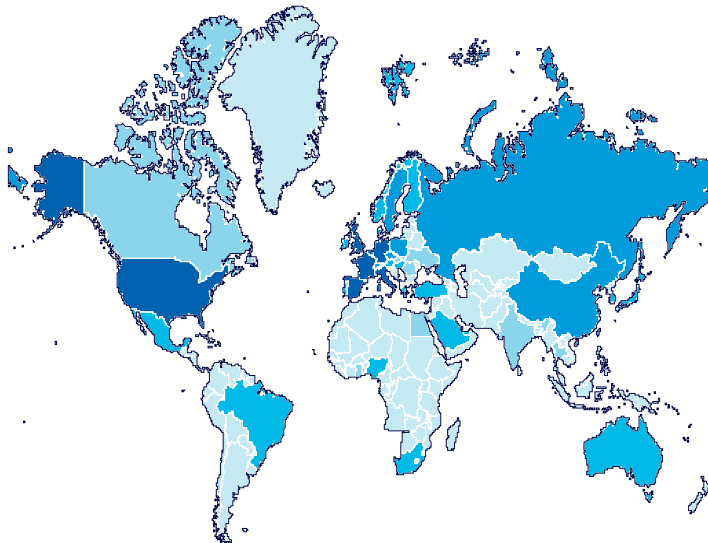
1.6.3 Share of Dutch imports destined for re-exports, by country of origin, 2012

Legend:
- 0 to 20 percent
- 20 to 40 percent
- 40 to 60 percent
- 60 to 80 percent
- 80 to 100 percent
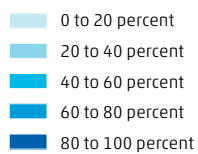
1.6.4 Share of re-exports in Dutch exports, by destination, 2012
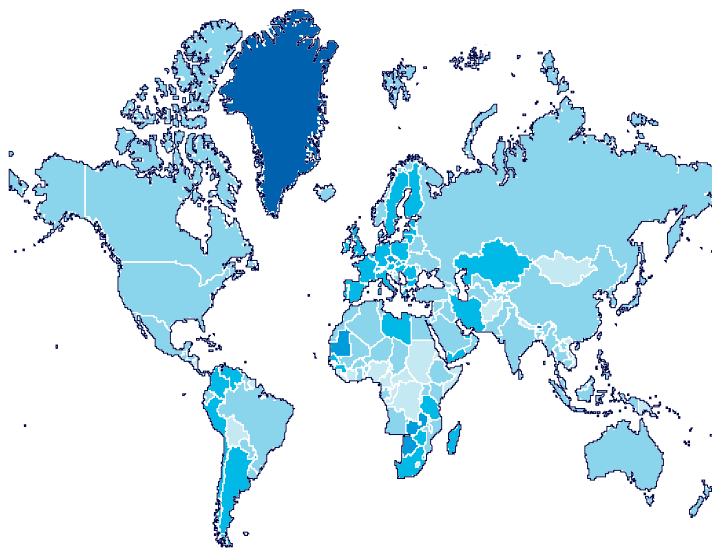
1.7 Conclusions

In absolute terms, trade in goods far outweighed trade in services in 2012. Around four fifths of total exports and imports, 420 and 374 billion euros respectively, consisted of goods trade. The relatively low share of services trade in total trade reflects the difficulties associated with transferring services. This is because services often require more knowledge-intensive inputs than commodities and that they less often than commodities consist wholly or in part of imported inputs of which the value added is created elsewhere (see chapter 2).

The Netherlands exports far more goods and services than it imports, resulting in a positive trade balance. In 2011 and in 2012 the Netherlands exported respectively 51 and 50 billion euros more goods and services than it imported. The goods and services trade balance was close to 9 percent of Dutch GDP in these years. A closer look at the composition of the trade surplus shows us that the international trade in goods contributes the most by far. In 2012 approximately 91 percent of the surplus was generated by a positive goods balance.

The economic crisis of 2009 had quite an impact on Dutch international trade. It took until 2011 before the pre-crisis levels of both goods imports and exports were exceeded. However, in 2012, commodities trade growth slowed down again. Growth of export value was the lowest since the economic crisis in 2009. Re-exports continued to grow strongly in 2012, namely by 9 percent. The economic downturn had less impact on the international trade in services than on the international trade in goods. In 2009, only services exports were lower than in the preceding year. Since then, services exports have recovered remarkably well. In 2012 however, the growth rate here too (+2.8 percent) was considerably smaller than in 2011 and 2010.

The EU countries, the United States and China were generally the most important trading partners of the Netherlands in 2012. Concerning trade in goods, Germany and Belgium are still the main import and export markets. However, in the past years the EU countries have lost ground compared to other countries, especially the BRIC countries. Considering our most important import partners, the share of re-exports in imports is highest for China, the US and Japan. Relatively low shares of re-exports are found in imports from Russia and Norway. Our exports to EU-countries comprise the largest shares of re-exports.

For services, the United States is the largest import market for the Netherlands since 2008. Bermuda not only came in second place, but was also the largest rising trading partner in 2012 concerning the imports of services. Vice versa, Ireland was the most important export destination for Dutch services, followed by Germany. Australia was the largest rising trading partner for services exports in 2012.

2.

Global value chains

and the

value added of trade

Author
Oscar Lemmers

Fragmentation of production processes created global value chains for products: from conception to end use. These value chains become better visible when one considers flows of value added instead of gross value. For every country they show the true importance of its trade and its interconnectedness and dependencies with other countries. For example, the share of value added created due to exports was higher in the Netherlands than in other countries. The share of value added due to exports to the BRIC countries was also higher in the Netherlands. We also find that imports fulfil a relatively high share of Dutch final demand.

2.1 Introduction

"Global value chains are binding us together"
Pascal Lamy, Director-General WTO, 2012

Several studies (e.g. Hummels et al. (2001), OECD (2013a), UN (2013)) show that the strong growth of international trade is mainly driven by a growing share of intermediate goods and services. Complete production chains are split up over countries. Countries used to produce their own exports in full, but now these are only partially produced in their own country. The value added of exports for the local economy is therefore not equal to total exports.

Gross exports show the direct flows between countries, but not the interdependencies along the value chain between the countries that supply or demand. They attribute the full value of exports to the last link in the production chain, even when that final link only made a minimal contribution. This implies that traditional trade statistics, that only show gross exports of a country, are no longer sufficient. Looking solely at these figures it is impossible to determine the real contribution of exports to a country's GDP, nor do they show the countries that are really responsible for supply and demand. This is clearly illustrated by figure 2.1.1. Traditionally, country B is seen as the source of imports for country C, and there is no obvious connection between country C and country A. However, it is clear that they have a strong connection in reality. Country A produces the intermediate goods and services for country B that are used to produce the exports of country B to country C. Thus, country C is dependent on country A for supply, and country A is dependent on country C for demand. This becomes clear when one does not consider gross exports from A to C, but rather how much value added in country A is created thanks to final demand in country C. These so-called exports

of value added from A to C equals 100 in this example. Country B creates 10 of value added due to final demand in country C, so exports of value added of B to C equal 10 although gross exports from B tot C equal 110.

2.1.1. Concepts of gross exports and exports of value added
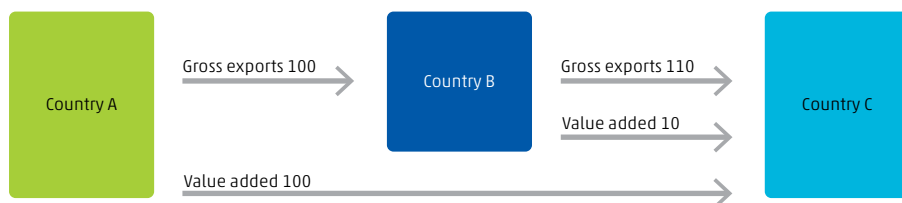
Source: OECD (2013a).

This concept of trade in value added adds a valuable dimension to the existing statistics because it shows interdependencies between countries which at first sight are not doing business together. And it avoids confusion with respect to the size of trade: in Figure 2.1.1 total value added is 110, whereas total gross exports equals 210. Measuring trade in value added provides a better picture of the supply side because it shows where the value is really created. This helps to determine in which industries a country is competitive thanks to production, and where it only seemingly looks competitive thanks to its position at the end of the value chain. Of course the traditional statistics remain fully relevant, as they give detailed information about the demand side of the economy: how much consumers, firms and administrations have spent on goods and services from abroad.

In this chapter we will shed some light on the involvement of the Netherlands in global value chains by showing new information about trade in value added. We will compare it to other countries for indicators such as the share of value added that is created thanks to foreign demand for products and services and the share of final domestic demand that is fulfilled by foreign countries. This shows the relative dependency from abroad. Throughout the chapter there is special attention for the BRIC countries.

The structure of this chapter is as follows. First, we provide some background and point out several policy issues. Next we explain the methods and data. Then we present the results. The chapter ends with conclusions and suggestions for further research.

2.2 Background

Grossman and Rossi-Hansberg wrote (2006) "The rise of offshoring: it's not wine for cloth anymore", expressing that a lot had changed since the 19th century. Back then, the full value of exported goods was seen as output of the national economy, and trade was in final products: Portuguese wine for English cloth. However, business practices have changed, and companies now import raw materials and intermediates from other countries. Sometimes they even move part of the production abroad (chapter 5 in this publication). So, a product is no longer made from start to finish in the same country, but it consists of parts that are being produced in different countries all over the world.

This fragmentation of the production process created global value chains (GVCs) that link firms, workers and consumers around the world. The value chain describes the full range of activities that firms and workers perform to bring a product from its conception to end use. This includes activities such as design, production, marketing, distribution and support to the final consumer. Sturgeon (2013) gives a good overview of ideas and literature.

Until recently there were no statistics available to reflect this and researchers and policy makers had to rely on gross export statistics. But because of re-exports and the inflation of gross statistics due to the trade in intermediates as mentioned in the introduction, this can lead to overestimation of the importance of trade. A good example in which gross export statistics do not tell the complete story is Singapore. It has a ratio of trade to GDP of more than 100 percent, so obviously value added of exports must be smaller than gross exports. Besides gross exports, the trade surplus (or deficit) also gives insufficient information. It only gives a net value and does not discern between a country that heavily relies on imports for local consumption and on exports of domestic products and a country that has only limited international trade.

Lamy (2012) stated that if we want to understand the true nature of trade relationships, "We need to know what each country along a global value chain contributes to the value of a final product. We also need to know how that contribution is linked to those of other suppliers in other countries coming before and after along the chain." He also noted that "The high level of import intensity in export production has created an unprecedented level of inter-dependency among countries in supply chains."

New insights due to statistics about trade in value added

Statistics about trade in value added show the interdependencies mentioned above: on which countries is one really dependent, for imports, for exports, for welfare and for jobs? United Nations (2013b) gives the example of the 2011 tsunami in Japan, which transmitted specific shocks to those countries that are related to Japan in the value chain of certain industries. Escaith et al. (2010) identify the risk of a "bullwhip effect" in global value chains: when there is a sudden drop in demand, firms will run down their inventories instead of making new orders. Then this fall of demand is amplified along the value chain and might cause a standstill for firms that are upstream in the chain. So, besides resilience this growing interconnectedness also brings the risk of contagion (OECD 2013a).

Traditional statistics attribute the full commercial value of imports to the last link in the production chain, even where the contribution made by that final link has been minimal. This might suggest macro-economic imbalances that do not exist in reality. Dedrick et al. (2010) give the example of an iPod, assembled in China and exported to the United States. The exports from China to the United States would be about $150, and the trade surplus of China with respect to the United States would be $150. But only $4 of value added is created in China. The rest of value added is partly created by Apple because of design, marketing and R&D, and partly by suppliers of the parts of the iPod in Japan and the United States. The surplus of China with respect to the United States in terms of value added is only $4 for this iPod. So, the trade surplus of China with respect to the United States is much smaller in terms of value added than in gross trade statistics. Similarly, the Netherlands has a great trade deficit with China and a large trade surplus with the European Union, because of sizeable imports from China that are subsequently re-exported to the European Union. Measured in value added, the deficit and surplus shrink. However, note that the total trade deficit (or surplus) of a country is the same in value added as in gross statistics. Only the distribution among its trade partners may be different.

Policy issues

What the new statistics also teach us, is that one needs to take a holistic view of international production processes. Traditionally, policies were aimed at promoting exports and attracting foreign investments. But now more attention is paid to obtaining and maintaining a good position in a production or value chain. Is this position related to low or high value activities, to labour intensive production or to design and R&D? Policies arise to integrate in value chains, to use them to be

more competitive thanks to specialisation and get spill overs for the local economy through transfer of technology and knowledge (OECD (2013b)). That implies focus on imports as well because they are necessary for exports, and on outward FDI because a subsidiary abroad may help getting high quality inputs against a reasonable price.

Policies concerning developing/emerging countries

Also, there is focus on designing policies that enable emerging and developing countries to reap the benefits of global value chains. How can these countries tap into GVCs and how can other countries help them? Gurriá (2013) states that "To overcome existing constraints and integrate into GVCs, developing countries can open up to foreign trade and investment, improve infrastructure, strengthen trade facilitating measures, and improve the business environment. They can provide access to networks, global markets, capital, knowledge and technology. With such key actions, integration in an existing GVC can provide a first step to the economic development of developing countries that is often easier than building a complete value chain." And he notes that "aid for trade initiatives enable least developing countries to build their supply-side capacity and trade-related infrastructure so they can too further reap the benefits of trade".

2.3   Data and methodology

The data that was used in this chapter follows from the World Input Output Database (WIOD) project (Timmer et al. (2013)). The core of the database is a set of harmonised supply and use tables, alongside with data on international trade in goods and services. These two sets of data have been integrated into sets of inter country (world) input-output tables. Others also created multi-regional input-output (MRIO) databases, for example the Global Trade Analysis Project (GTAP), the University of Sydney (EORA database) or the OECD. For an overview, see Wiedmann et al. (2011).

The WIOD contains, among others, input-output tables with 40 countries, a Rest of World category and 35 industries for the period 1995–2009. For 2010 and 2011 we used WIOD projections with possible larger margins of error. An MRIO table shows the relation between production, foreign trade (imports and exports of intermediates and final products) and final demand, not only within countries but

also between countries. A row in this table shows how the output of an industry is distributed among other industries and final demand (consumption, investments and exports). The necessary inputs for the output can be derived from the columns of an input output table. They show how much input from which industry is needed. The difference between output and costs of the inputs used is the added value of an industry.

This enables us to picture a value chain around an industry, because the origin of the inputs and the origin of these inputs and so on are known. Similarly, one knows the destination of the outputs and the destination of these outputs again. Figure 2.3.1 shows an example of part of such a value chain. The main inputs for the Dutch metal industry come from the German metal industry, the Dutch metal industry itself and the Dutch retail industry. One step downstream the value chain the inputs for the German metal industry come from the German metal industry itself, from several business activities in Germany, and the German wholesale industry. Similarly, the products of the Dutch metal industry go to the German metal industry, the Dutch construction industry and the Belgian metal industry.

2.3.1 Part of the value chain for the Dutch metal industry, 2011
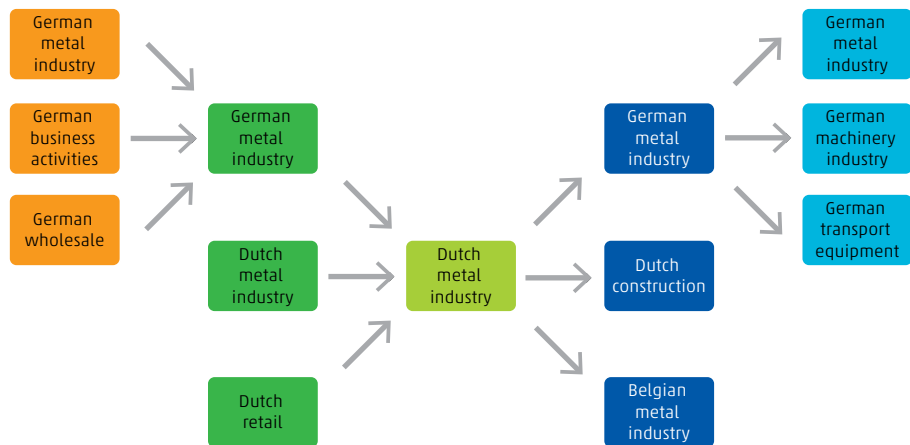
Source: WIOD, calculated by Statistics Netherlands.

Traditionally, value added of exports of commodities and services is attributed to the exporting industry. For example, the value added of exports by the manufacturing industry is attributed completely to this industry. However, the manufacturing industry uses inputs from other industries as well. These can be foreign inputs or inputs from other Dutch industries. The industries that produce

these intermediate inputs contribute to the value added of exports. The method to calculate these contributions is described by Kranendonk and Verbruggen (2011), who used national input-output tables. Groot and Möhlmann (2008) showed that, compared to the traditional way described above, the distribution of value added of exports is completely different among the industries when taking the supplying industries into account. Especially the services sector contributes far more to the value added of exports than in the traditional registration. The same phenomena can be observed in other countries.

2.4 Results on exports

Table 2.4.1 shows the share of value added that is created through the production for exports. This share slowly grew for the Netherlands during the period 1995–2011 and was 38[1] percent in 2011. It grew for most of the countries listed, which shows that they integrated more in the world economy and were less dependent on their home markets. Germany had a very large rise; Notten et al. (2013) extensively studied the causes and found that a major cause for this growth was the flourishing transport equipment industry. The share for all countries dropped from 2008 to 2009, when world exports took a sharp downfall. This drop took a large toll on China, but it should not be forgotten that this was one of the few boom countries in 2009. When other economies shrunk, exports shrunk, the Chinese economy grew and took a larger share in total value added while the foreign share dropped.

The Netherlands is more dependent on exports for economic growth than the average EU-14 country, which relies more on consumption and investments in its own economy for economic growth. This has advantages and disadvantages. It makes the Dutch economy more resilient and fragile at the same time. If the Dutch economy fares less well than foreign economies, exports may soar compared to other categories of final demand such as consumption and investments. And due to the large share of exports in total value added, this will have a visible effect on the Dutch economy, which is less dependent on domestic economic growth. On the other hand, large exports imply greater vulnerability to foreign macro-economic shocks.

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[1] Kuypers et al. (2013) calculated that the share of value added due to exports in Dutch GDP was 29 percent in 2009. Here we calculated a different number, namely the share of value added due to exports in total Dutch value added (also called GDP at basic prices). Thus, in the two ratios the denominator is the same, but the numerators are different. GDP is equal to total value added plus taxes less subsidies on products plus VAT.

2.4.1 Share of exports of value added in total value added

	1995	2000	2005	2008	2009	2010*	2011*
	%						
Netherlands	35.8	36.5	35.6	37.6	35.3	37.0	38.0
EU-14	25.9	29.0	28.6	30.0	28.1	29.2	29.7
Belgium	38.1	40.5	38.5	39.0	37.3	38.3	38.2
Denmark	27.1	31.1	30.8	31.5	28.1	30.2	31.0
France	17.5	19.7	18.0	17.5	15.8	16.8	17.2
Germany	18.8	24.7	29.1	32.3	28.4	30.2	31.0
United Kingdom	21.4	21.0	19.8	22.1	21.4	21.9	22.8
United States	8.5	7.7	7.3	8.8	8.1	8.9	9.5
China	19.1	18.8	26.2	25.8	20.7	21.9	21.2

Source: WIOD, calculated by Statistics Netherlands.

Figure 2.4.2 and 2.4.3 are extensions of table 2.4.1: they split the value added of exports by country group. They show that the share of Dutch value added due to exports to BRIC countries in total Dutch value added rose from 1.5 percent in 1995 to 3.8 percent in 2011. So, for every 1,000 euros of value added created in the Netherlands, 38 euros was thanks to production for the BRIC countries. That can be direct production, for example exported cheese, but also indirect, for example Dutch steel that is used in German cars that are exported to China.

For the European countries shown in Figure 2.4.3, a large part of value added is created in the process of exports for other countries in the European Union. And by far the largest part is thanks to countries that joined the European Union before 2004. Both facts are not surprising. It is a stylised fact that size of an economy and distance are important determinants for trade (e.g. Linders (2006)). And the countries in the EU-15 are closer to the Netherlands, Germany, Belgium, France, the United Kingdom and Denmark than the countries in the EU-12, and their economies together are also much larger.

2.4.2 Share of destination of value added, 1995

%

Source: WIOD, calculated by Statistics Netherlands.
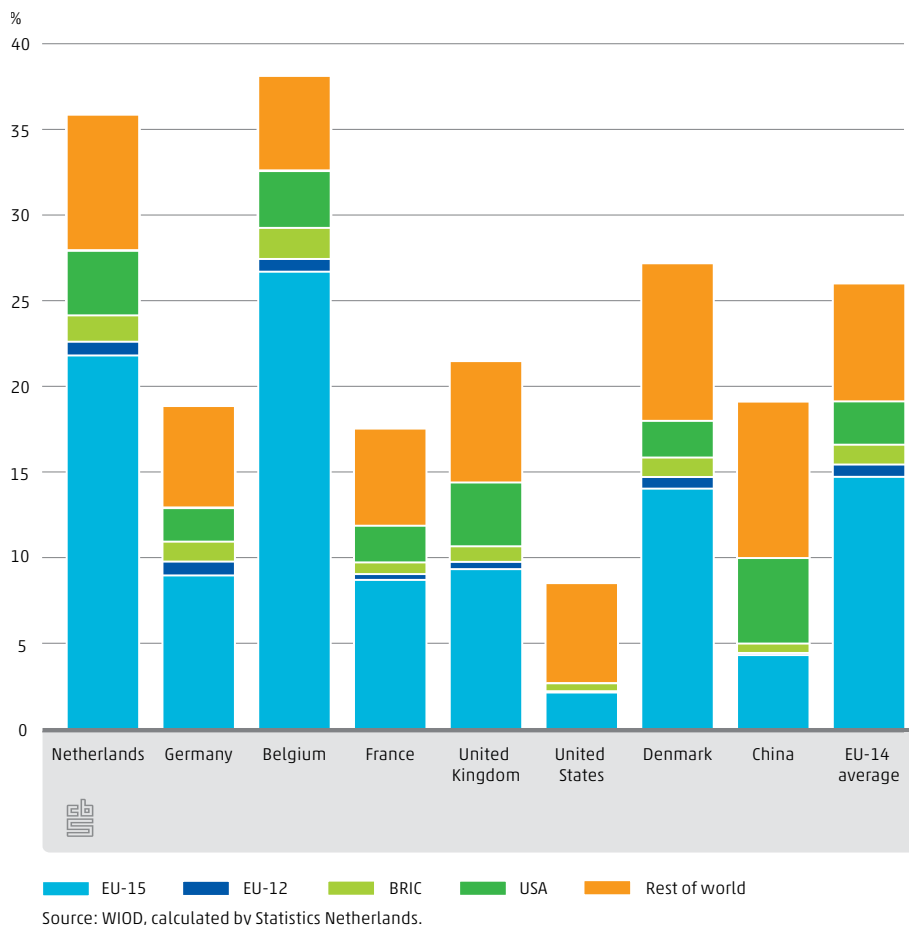
Compared to other countries, the exports of the Netherlands are relatively less focused on emerging markets and more on the EU instead. For example, the share of the BRIC countries[2] in total exports of the Netherlands is small compared to that share in exports of other countries. Several sources (OECD 2012, Groot et al. 2011) voiced the opinion that the Netherlands does not optimally use the possibilities offered by globalisation. But, as was already pointed out in the Miljoenennota (2012), this ignores the fact that the Netherlands has a very open economy and exports more than other countries (in absolute terms). So, due to the size of total Dutch trade, the low share of the BRIC countries in Dutch exports still amounts to a large absolute value, even compared to GDP.

[2] WIOD allows to consider other emerging markets, such as Indonesia, Mexico or Turkey, as well.

2.4.3 Share of destination of value added, 2011*
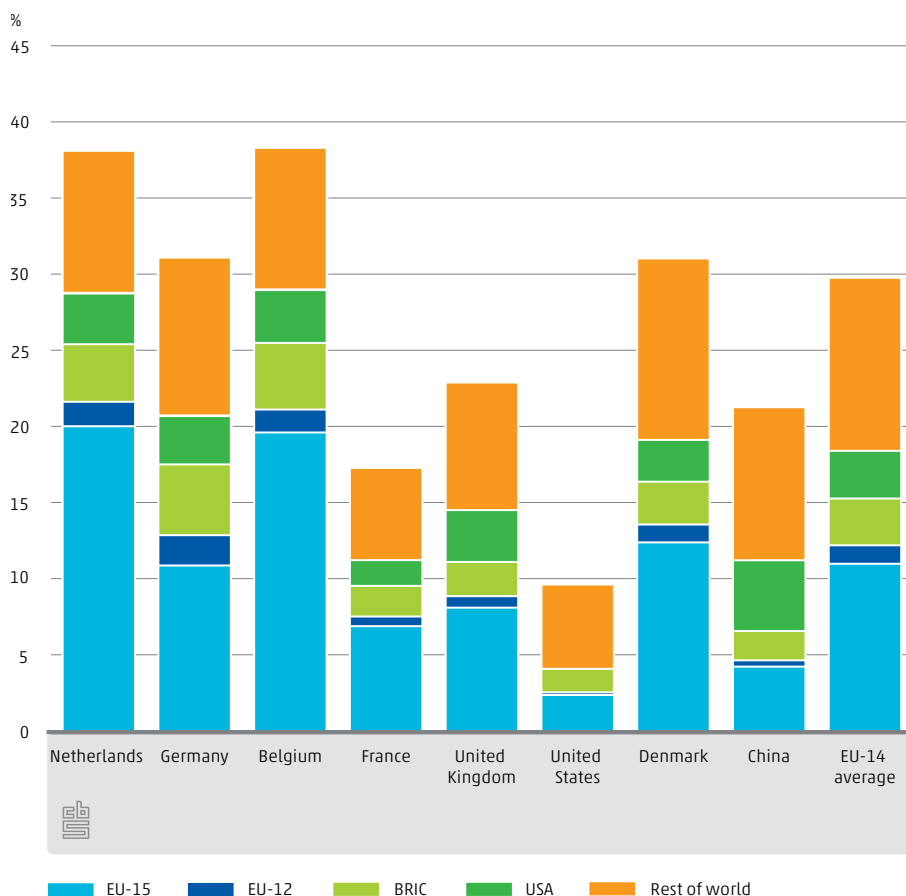
Source: WIOD, calculated by Statistics Netherlands.

And indeed, although Germany has relatively more value added thanks to the BRIC countries (4.7 percent of total value added), the Netherlands managed to tap into these markets more successfully than the average EU-14 country or the United States.

As expected, there is a lot of heterogeneity between industries in terms of value added created thanks to exports. In general, services are more often provided at arm's length (for example, by a hairdresser), whereas commodities can be traded more easily. In 2011, the manufacturing and mining industry exported 84 percent of their created value added, whereas this was only 29 percent for retail trade and restaurants and hotels. The distribution of exported value added by an industry among the several country groups is in general the same as this distribution for all industries together. However, note that the BRIC countries are responsible for

almost a quarter of exported value added by the construction industry. And the countries in the group "Rest of the World" generate half of exported value added by the transport industry.

2.4.4 Share of destination of value added, by sector, 2011*

EU-15   EU-12   BRIC   USA   Rest of world

Source: WIOD, calculated by Statistics Netherlands.
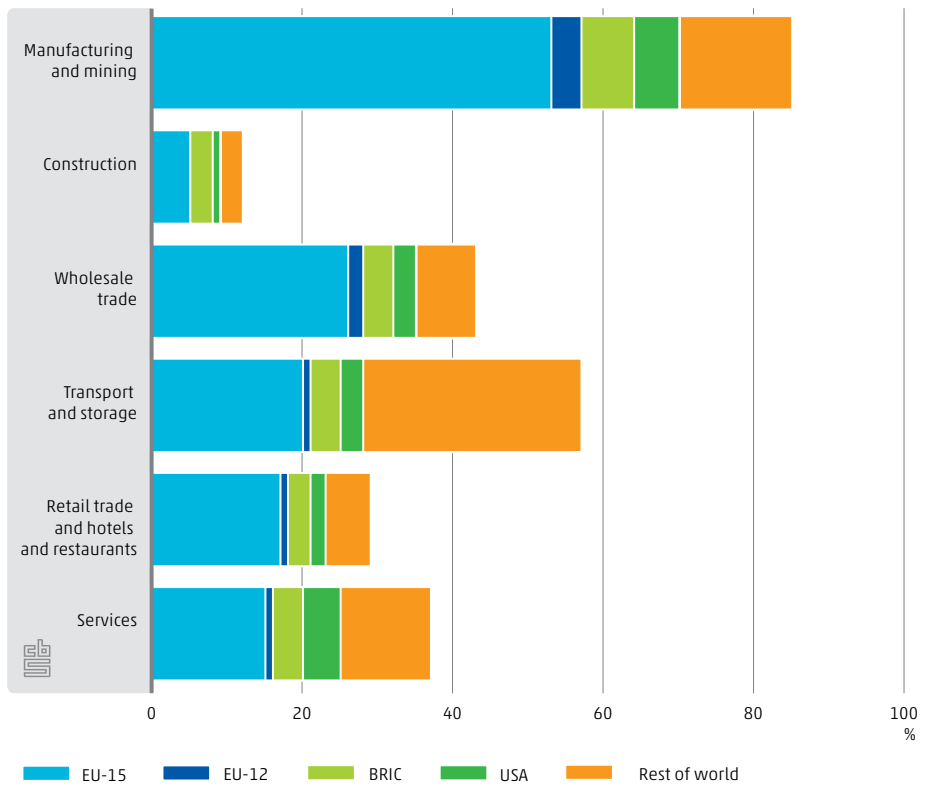
Almost **4%** of Dutch value added due to exports to BRIC countries

2.5 Results on imports

A large part of final domestic demand (i.e. final demand excluding exports) in the Netherlands is fulfilled with imports. This share is higher than for most countries. We also observed that a larger part of Dutch value added was exported. Together this shows that the Netherlands is vastly integrated in global value chains. Conversely, the United States has a small share. This is common for large economies, as they can be more self-sufficient than smaller countries that may lack raw materials, or may be specialised in certain industries. In all countries, the share of final demand met by imports from abroad grew during the period 1995–2011. Also, in all countries this share dropped from 2008 to 2009 due to the economic crisis that was especially hard on international trade. But it recovered quickly and in 2011 the levels were comparable to those of 2008 again.

2.5.1 Share of final domestic demand fulfilled by imports, 2011

	1995	2000	2005	2008	2009	2010*	2011*
	%						
Netherlands	30.7	31.8	29.1	31.5	30.1	31.2	31.7
EU-14	24.0	28.0	27.4	29.1	26.4	27.5	28.1
Belgium	33.5	37.5	35.1	37.7	34.7	36.1	36.7
Denmark	23.3	26.0	27.1	29.2	25.2	26.1	26.8
France	15.9	19.0	18.5	19.3	17.3	18.5	19.5
Germany	16.4	22.2	22.9	25.5	22.7	24.0	25.3
United Kingdom	20.5	20.9	21.0	22.5	21.7	22.9	23.5
United States	9.0	10.3	11.4	12.6	10.2	11.6	12.4
China	15.8	15.3	20.2	18.0	15.6	17.4	17.6

Source: WIOD, calculated by Statistics Netherlands.

Figure 2.5.2 and 2.5.3 reflect, among others, the rise of the BRIC countries during 1995 and 2011. For example, in 1995 imports from BRIC fulfilled 1.7 percent of Dutch final demand, but in 2011 this share had already risen to 5.7 percent. The share of the group "Rest of World" also grew, at the expense of the share of the EU-15. However, this is only a relative drop, and not an absolute one – it does not imply that they "lost" market share. On the contrary, their welfare grew during this period thanks to international trade. Their share diminished only because other countries grew even more.

2.5.2 Share of final domestic demand fulfilled by imports, 1995

%

2.5.3 Share of final domestic demand fulfilled by imports, 2011*

%

Legend: EU-15 | EU-12 | BRIC | USA | Rest of world

Source: WIOD, calculated by Statistics Netherlands.
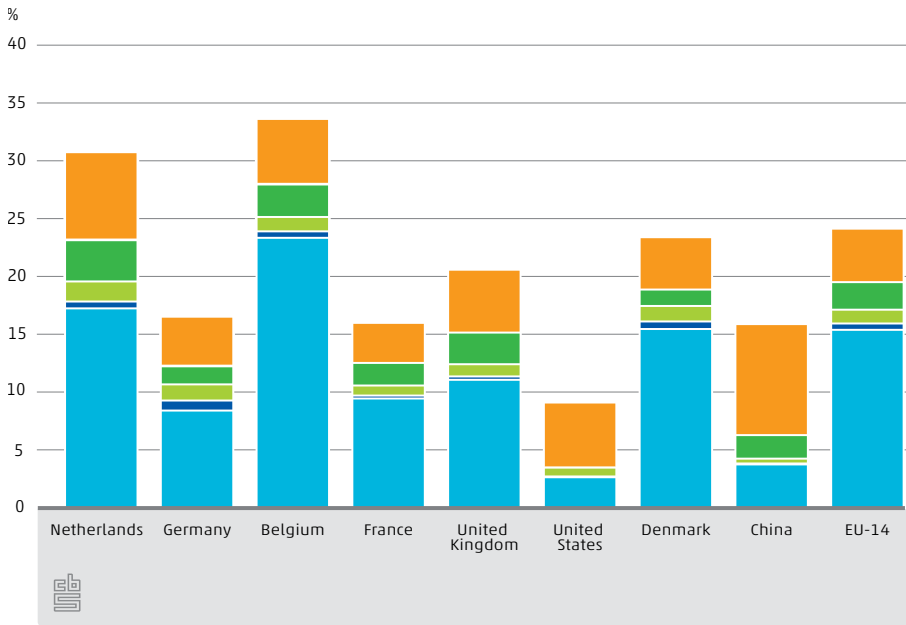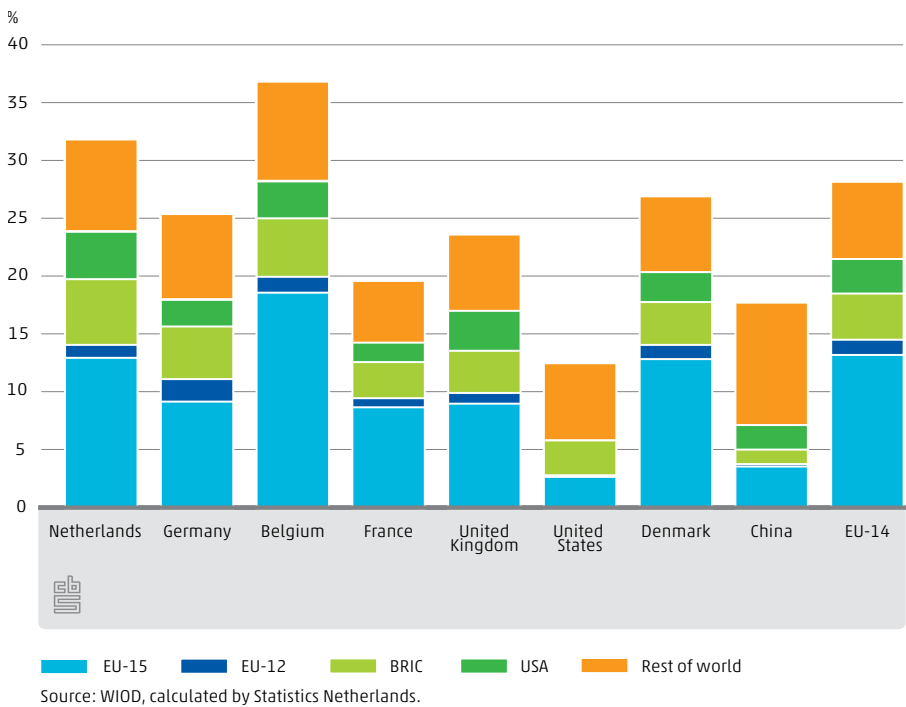
2.5.4 Foreign countries fulfilling Dutch final domestic demand, 2011*

%

Source: WIOD, calculated by Statistics Netherlands.
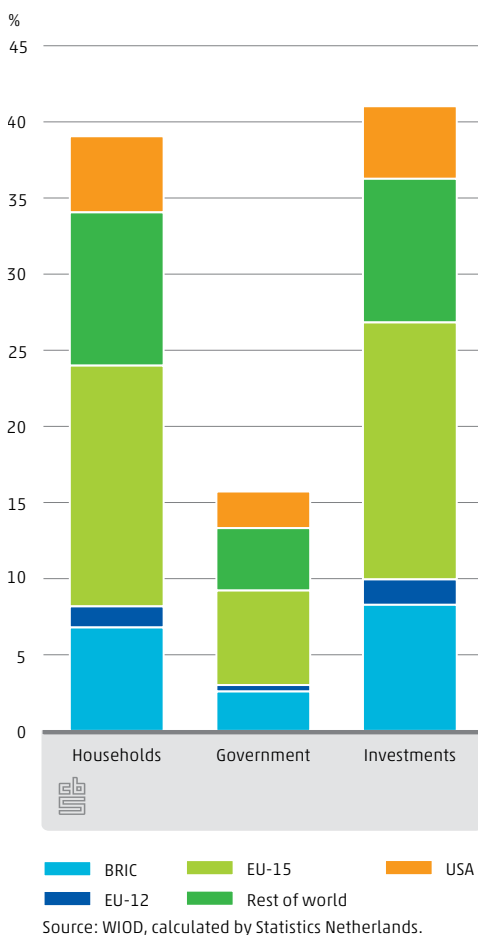
Figure 2.5.4 shows to what extent the individual components of domestic demand (household and government consumption and investment by the government and corporations) were satisfied by imported goods and services from specific country groups. As was to be expected, most of the commodities and services consumed by the government were created in the Netherlands. But about 40 percent of final demand by households and firms was fulfilled by foreign countries. The BRIC countries provided 7 percent of all value added for final demand of households, and 8 percent for that of investments by firms. Examples are apparel and consumer electronics for households and computers and business services for firms. However, the bulk of the value added is still created in the Netherlands.

2.6 Conclusions and suggestions for further research

This chapter showed that for the Netherlands the share of value added thanks to exports remained fairly constant between 1995 and 2011, whereas it increased for other countries such as Germany. Also, the share of foreign value added in Dutch final demand remained constant, whereas this rose for other countries. However, the share that abroad demands from and supplies to the Dutch economy was already high in 1995 and still is above average.

Compared to other countries, the Netherlands uses more commodities and/or services from the BRIC countries to fulfil final demand. Also, the share of value added thanks to the BRIC countries is higher in the Netherlands than in the average EU-14-country. In this way the Netherlands uses the possibilities of emerging markets. The value chains in turn also give emerging countries the possibility to benefit from globalisation.

Industries in the Dutch economy vary in terms of dependency on exports. Manufacturing and mining create over 80 percent of value added due to exports, but retail trade and restaurants and hotels only 29 percent. This is not surprising, because products of the manufacturing and mining industry can be transported easily to be consumed abroad. Whereas services usually have to be consumed close to where they were created.

Further research is necessary to show the consequences of global value chains. Besides statistics on trade in value added, statistics are needed on trade in income, trade in jobs and trade in CO_2 emissions (see chapter 4 in this publication or Hoekstra et al. (2013)) to properly consider their impact. Also, policy makers want to know in which value chains the Netherlands is involved, which types of jobs, which kinds of skills are needed and involved, and how the value chains are distributed among the regions in the Netherlands.

These questions can only be answered by a combination of macro and micro-statistics. The macro-statistics are necessary, because they give an integrated, consistent image of the Dutch economy. The OECD (2013a) pointed out that it is impossible to disentangle every single value chain by hand, and that such a case study approach would typically only show where the intermediate components were produced, but not where the intermediates parts for these components were produced and so on. This problem, albeit on a very aggregate scale, is solved if one

starts from the framework of National Accounts. The micro-statistics are necessary to properly introduce the heterogeneity that is not visible in the National Accounts. For example, using standard input-output techniques yields that for one euro of production by an enterprise in a given industry the same employment is needed, regardless whether this enterprise exports or only produces for the domestic market. But it is a stylised fact that exporters are more productive than non-exporters (Bernard and Jensen (1997), Wagner (2005), Jaarsma and Lemmens-Dirix (2011)).

A successful example of integrating macro-statistics and micro-statistics was the work on environmental footprints (Hoekstra et al. 2013). Traditionally, national accounts do not distinguish between countries of imports. Micro-data on international trade shows from which countries which commodities and services are imported, and production of the same commodities and services in different countries yields different CO_2 emissions. Furthermore, the micro-data added information on the share of imports by country of origin destined for the Dutch market. This greatly helped to further improve the already existing estimates and thus reduce margins of error.

3.

Trends in foreign investments

Author
Oscar Lemmers

This chapter presents the latest data and insights on Dutch Foreign Direct Investments, foreign controlled enterprises in the Netherlands, and Dutch controlled enterprises outside the European Union. Dutch FDI flows remain affected by the economic crisis. About 99 percent of small and medium sized enterprises (SMEs) do not invest abroad, but there are still about 12 thousand SMEs that do. The value of their investments is small compared to those of large enterprises. The share of foreign controlled enterprises in the Dutch business economy continues to grow.

3.1 Introduction

In 2011 the Netherlands was the country with most outward foreign direct investment (FDI) worldwide, and the second country with respect to inward FDI (IMF 2013). Disregarding the volume created by the Special Purpose Entities (see text box) it would be the seventh economy with respect to outward FDI. Foreign controlled enterprises accounted for 26 percent of value added in the business economy, or 15 percent of GDP against factor costs.

The European Competitiveness Report 2012 notes that countries usually benefit from hosting multinational companies. Being internationally oriented can bring in new sources of finance, diffuse new technology, and introduce new processes and best practices. This increases the efficiency of the economy. The technologies and skills can be transferred to domestic enterprises by labour migration (Fortanier 2008). Enterprises see advantages in investing abroad as well. It gives them easier access to new markets for their products, to raw materials or intermediates, to qualified personnel or to lower wages (see chapter 5 of this edition, Lo (2009)).

Lately, there is a great deal more attention for global value chains (UN 2013, OECD 2013a, WTO/OECD 2013). Multinationals can choose to invest abroad, to establish more control over the foreign part of the value chain, or to buy products from enterprises there and subsequently import them. Global value chains coordinated by multinationals account for some 80 percent of global trade (UN 2013). Participating in such a chain can bring benefits, both for developing and developed countries. But it can also bring risks, such as remaining stuck in low value added activities, environmental impacts and worsening working conditions. It also increases vulnerability to external shocks (UN 2013). Hence, it is important to

design the right policies. The UN notes that it is important to synchronise trade and investment policies, to avoid counterproductive reciprocal effects.

In this Internationalisation Monitor 2013 we present, for the first time, results about outward foreign investments by small and medium sized enterprises. Their share in total Dutch FDI is small. We find that the enterprises involved outperform their non-investing peers: they have higher export intensity and are more productive, even after correcting for size and industry.

This chapter deals with statistics about foreign direct investments (FDI) and about activities of multinationals abroad (FATS). FDI describes the *financial* relations, namely the financial flows to and from countries. It is part of the Balance of Payments. FATS describe the impact of these investments on the real economy, the *economic* relations. It is part of the Structural Business Statistics. Note that not all FDI is reflected in FATS because sometimes it is channelled through countries without having an effect on the real economy. And some foreign investments do not lead to foreign control, which is necessary to be included in FATS.

We start by presenting developments in FDI flows. In section 3.3 we present results about foreign investments by small and medium sized enterprises. The next section gives information about the activities of foreign controlled enterprises residing in the Netherlands. This is followed by a description of the activities of Dutch controlled enterprises in foreign countries. In section 3.6 we present our conclusions and suggestions for further research.

Definitions and methodology FDI

The leading authority on FDI in the Netherlands is De Nederlandsche Bank (DNB). It collects, compiles and publishes the data on incoming and outgoing FDI as a part of the Balance of Payments according to the IMF Balance of Payments Manual 5 (IMF, 1993). DNB distinguishes between FDI into manufacturing (the sectors A-F in NACE Rev. 2, which includes for example mining and the metal industry) and services (the sectors G-S minus O, which includes for example trade and the financial sector). For inward and outward FDI, the economic sector is derived based on that part of the enterprise in the Netherlands that receives or makes investments.

3.2 Development of FDI flows and stocks

Preliminary estimates of the OECD (2013b) show that global FDI flows have declined by 14 percent from 2011. The OECD itself was affected even more; its investments abroad declined by 15 percent while the OECD attracted 21 percent less foreign direct investments than in 2011. So after the earlier decline in the period 2008–2010 because of the global financial and economic crisis, the recovery in 2011 did not continue. The United Nations (2013) expects only a moderate rise of FDI flows over the next two years. The UN also points out that the global picture masks substantial heterogeneity. FDI flows to developing regions only showed a small decline, just like transition economies. But FDI flows to developed countries plummeted. The result is that, for the first time ever, developing economies absorbed more FDI than developed countries. Developed countries also continue to generate more FDI outflows, and accounted for almost one third of global FDI outflows in 2012.

Zooming in on the Netherlands, figure 3.2.1 shows that total Dutch FDI flows were smaller in 2012 than in any other year between 2000 and 2011. This is mainly due to fewer investments, but it should be taken into account that one-off factors such as a major transaction can also greatly influence the figures. So they should be interpreted with caution. For example, inward FDI rose substantially in 2007, largely due to the takeover of ABN AMRO by foreign banks. But in 2008 it fell sharply because the Dutch government acquired the Dutch part of Belgian Fortis. In

the first quarter of 2013 both inward and outward FDI flows recovered, but it is far too early to decide whether this trend will continue or not.

3.2.1 Dutch FDI flows, 2000-2013Q1

billion euros
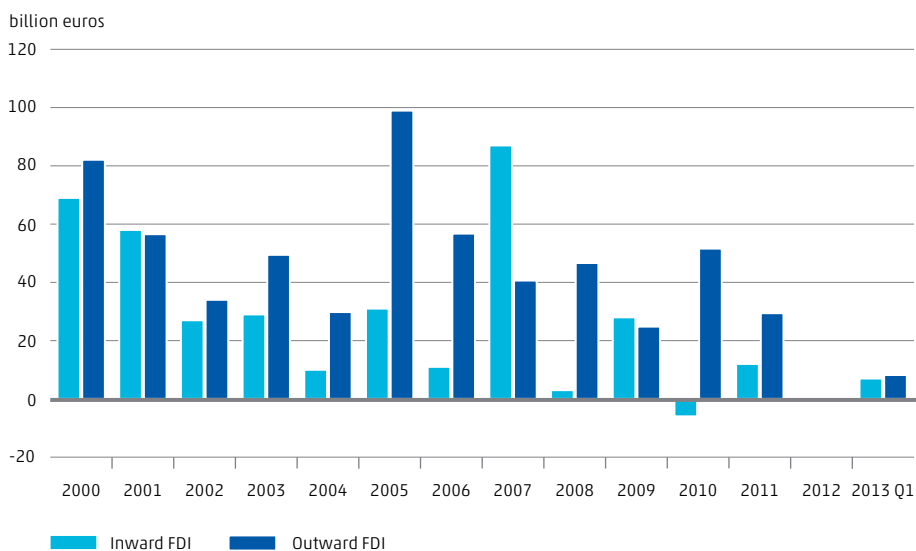
Inward FDI   Outward FDI
Source: De Nederlandsche Bank.

The share of the EU-15 in stocks of Dutch inward FDI was the same in 2000 and 2012 (table 15.4.1 in this edition), about 60 percent. The share of the EU-15 in outward FDI also remained fairly constant, about 47 percent. This is surprising, because one might expect a shift from intra-EU to extra-EU reflecting the growing importance of emerging markets such as the BRIC countries. But table 15.2.1 shows that the share of the EU in worldwide FDI also was the same in 2000 and 2012. Thus, the EU in general and the Netherlands in particular remain major destinations of FDI and major sources of it as well. And it will take more time before the growing share of developing countries in worldwide FDI flows will become very visible in worldwide accumulated investments (FDI stocks).

Chapter 15 focusses in detail on the distribution of stocks of Dutch inward and outward FDI, by country and by industry.

3.3 Outward investments of small and medium sized enterprises (SME)

This section is based on research of Alberda et al. (2013) commissioned by the Ministry of Foreign Affairs. The study considered the outward foreign investments of Dutch controlled small and medium sized enterprises. Small and medium sized enterprises are defined by the number of employees, i.e. fewer than 250.

Policy makers are interested in having more information about the investments of SMEs, because literature (Ministry of Economic Development, New Zealand, 2002; Baldwin and Gu, 2003, OECD 2013c) shows that internationalised SMEs consistently outperform their non-internationalised peers, having higher productivity and paying higher wages. However, it is not yet clear what drives these differences. It might be exposure to international best practise, but also the absorption of excess production capacity or output or improved resource utilisation.

Although the number of SMEs with foreign investments is even higher than the total number of large enterprises (with or without foreign investments), the value of SME investments is low compared to that of the large enterprises. In 2010 SMEs reported 13 billion euros of foreign investments abroad, which is two percent of total Dutch outward FDI. This amounted to 715 billion euros.

3.3.1 Distribution of outward foreign investments by SMEs among size classes, 2010

	Share of enterprises with foreign investments	SMEs with foreign investments	Foreign investments
	%	#	million euros
Total SME	1.0	12,167	12,905
0–9 persons employed	0.5	6,246	1,651
10–19 persons employed	5.4	1,617	640
20–49 persons employed	11.9	2,138	1,501
50–99 persons employed	20.5	1,245	1,338
100–249 persons employed	24.2	921	7,774

Source: Statistics Netherlands.

Table 3.3.1 shows that 12 thousand SMEs, or one percent of all SMEs, report foreign investments. This implies that 99 percent of all SMEs do not. The data also show that participation of SMEs in foreign investment activities increases with firm size. For example, almost a quarter of all SMEs in the category 100–249 persons employed had foreign investments. This phenomenon can be observed in many countries (OECD 2013c, Lo 2009).

3.3.2 Value distribution of foreign investments by SMEs among industries, 2010

Legend:
- Manufacturing
- Wholesale
- Business services including renting
- Transport
- Information and communication
- Other industries
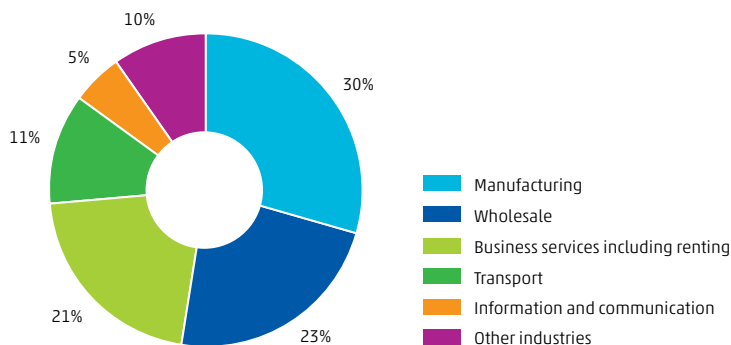
Source: Statistics Netherlands

Figure 3.3.2 shows that the value of foreign investments by Dutch SMEs is created by a few industries. The investments of Dutch manufacturing and wholesale enterprises together form already more than half of total investments by SMEs. Another big part is played by the business services, which – among others – include holdings.

There are big differences between industries in the propensity of SMEs to have foreign investments. This is partly explained by the different capital intensities of industries. This is high for mining and quarrying and for the utility industry. Figure 3.3.3 shows that 13 percent of SMEs in mining and quarrying has foreign investments, but it should be noted that these are often subsidiaries of large Dutch multinationals. Also, their absolute number is low, because there are only a few SMEs in mining and quarrying. The same arguments also hold for utility enterprises, where 9 percent of SMEs has foreign investments. Manufacturing and wholesale are industries with more SMEs (respectively 53 and 78 thousand) that have relatively often foreign investments.

3.3.3 Propensity of SME to have foreign investments, by industry, 2010
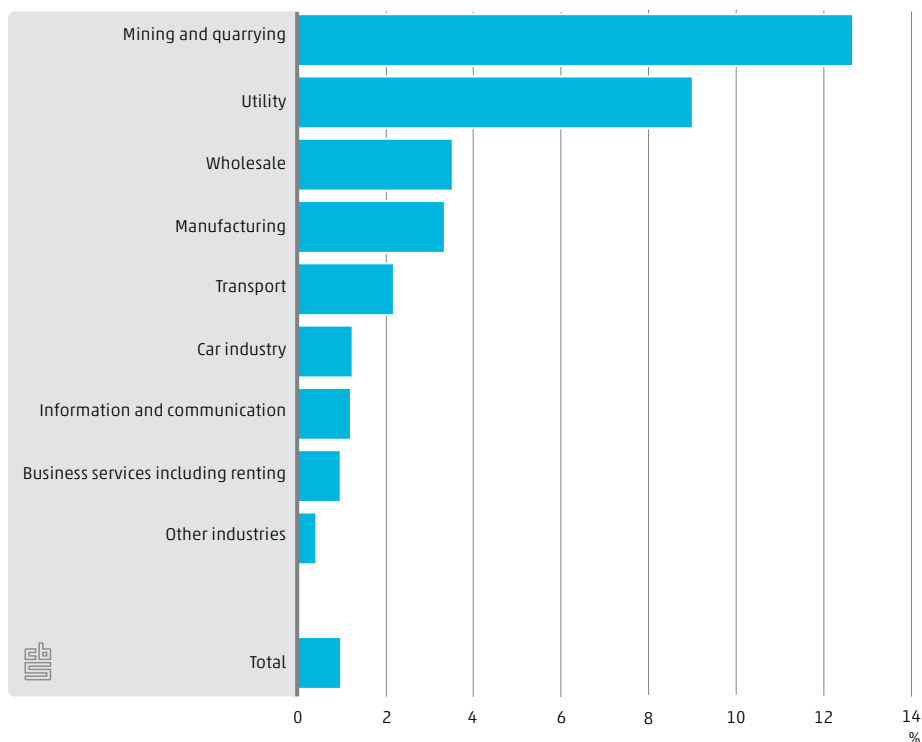
Source: Statistics Netherlands

99% of all SMEs in the Netherlands has no foreign investments

There is not yet a complete overview of the countries in which Dutch SMEs invest most frequently. A survey on the internationalisation of top sectors (Van der Linden et al. 2013) suggests that China and the United States are by far the most important destinations, followed by Russia, India and Brazil. However, SMEs from other OECD countries invest most frequently in large developed countries such as the United Kingdom, Germany, Spain, the United States and France (OECD 2013c). This is in line

with section 3.2, which notes that half of Dutch outward FDI is still in the European Union.

Alberda et al. (2013) show that there are large differences between Dutch SMEs with and without foreign investments. First of all, SMEs with foreign investments are larger. Secondly, after controlling for size and industry, they are more likely to export, have higher export intensity and are more productive. This pattern is also visible in other countries; in general multinationals are larger, more capital intensive and more productive than their domestic counterparts (Helpman et al. (2004) and Tomiura (2007)). The explanation in the literature is that the fixed costs barrier of investing abroad can be overcome only by the most productive enterprises. For the Dutch situation, Alberda et al. note that it is too early to decide whether foreign investments are the *cause* of the observed differences, or the *result*.

It was already known from literature that foreign controlled enterprises (the results of inward foreign investments) are different from domestically controlled enterprises. Even after controlling for size and industry, they are larger, they are more productive (Fortanier and Van de Ven, 2009), they pay higher wages (Fortanier and Korvorst, 2009) and they are more often involved in international trade of commodities and services (Jaarsma and Lemmens-Dirix, 2011). This is observed for different countries. Theory suggests (Melitz 2003, Helpman et al. 2004) that the underlying cause is the higher productivity of foreign controlled enterprises.

These results suggest that, instead of considering two groups (under foreign or domestic control), it would be better to compare three groups. Namely, domestically controlled enterprises without foreign investments, domestically controlled enterprises with foreign investments and foreign controlled enterprises.

3.4 Foreign controlled enterprises in the Netherlands

Table 3.4.1 describes the activities of all enterprises (SMEs and large enterprises) residing in the Netherlands that have a foreign Ultimate Controlling Institutional Unit (UCI). These statistics are part of the Inward Foreign Affiliate Statistics (inward FATS).

3.4.1 Share of foreign controlled enterprises in total private Dutch sector (excluding financial sector)

	2001	2002	2003	2004	2005	2006[1]	2007	2008[1]	2009	2010	2011
	%										
Number of enterprises	0.7	0.8	0.7	0.7	1.2	1.1	1.0	1.0	1.0	1.0	1.1
Number of persons employed	11.9	13.5	12.9	14.0	14.5	13.9	13.4	14.0	15.5	15.4	15.9
Turnover	23.7	25.1	25.3	27.1	26.7	29.9	29.4	31.4	32.4	33.5	34.8
Value added at factor costs	17.5	20.5	19.2	20.9	20.5	23.4	22.3	24.4	24.4	25.3	26.0
Gross fixed capital formation	16.9	19.2	15.4	17.6	17.8	20.0	20.6	21.8	22.8	24.4	23.3

Source: Statistics Netherlands, Inward FATS.

[1] Between 2005 and 2006, 2007 and 2008, there are breaks in the time series due to changes in the definitions.

Although there are relatively few foreign controlled enterprises, they play an important role in the Dutch economy. In 2011, they employed 856 thousand people. Furthermore, they generated 26 percent of the value added in the private sector, which amounts to 15 percent of GDP against factor costs. And foreign controlled enterprises accounted for 23 percent of private sector investments.

During the period 2008–2011, the year before the crisis and the most recent year with data available, total employment by foreign controlled enterprises grew, whereas it fell at Dutch controlled enterprises. However, this does not automatically imply that the average foreign controlled enterprise grew. Urlings et al. (2011) showed that the continuous rise in employment levels at foreign controlled enterprises during the period 2000–2007 was mainly related to the number of jobs at previously Dutch-owned enterprises that are acquired by foreign owners.

Comparing 2008 to 2011, employment, turnover and value added at foreign controlled enterprises all grew. There are several possible explanations. It may be that these enterprises took over Dutch controlled enterprises, but it could also be autonomous growth. One cause of autonomous growth may be that foreign controlled enterprises are more internationally orientated; table 13.4.1 and 14.2.2 of this publication show that they account for about half of Dutch exports of commodities and services. And table 1.3.2 already showed that Dutch exports fared better than consumption and investments during this time. It is also possible that foreign controlled enterprises were often present in industries with growth for all enterprises (foreign and Dutch), and that Dutch controlled enterprises were often present in industries with general productivity losses or standstills. Then the different distribution among industries would be the cause of the observed differences instead of real gains by foreign controlled enterprises only. It would

need further research to be able to decide what the main factors driving the growth of the foreign controlled enterprises were.

Methodology inward FATS, differences FATS and FDI

The foreign affiliate statistics (FATS) present detailed data on the activities of foreign affiliates, e.g. employment levels, turnover and value added. The inward FATS cover the private sector excluding the financial sector. The outward FATS cover the whole private sector. Detailed information at the country and economic sector levels can be found on StatLine, the free online database of Statistics Netherlands.

FATS data only concern a sub-set of the entities involved in FDI. According to the Inward FATS regulations, enterprises that are controlled by a foreign enterprise by more than 50 percent of its shares are considered foreign-controlled. Inward FDI encompasses enterprises where a foreign enterprise has 10 percent or more of the voting power. Therefore there are fewer enterprises taken into account by Inward FATS than by inward FDI, implying that the share of employment, value added (and so on) generated by the enterprises considered by Inward FATS is by definition lower than that of enterprises considered by Inward FDI.

Another important difference between FATS and FDI statistics is that FATS use the concept of ultimate controlling institute (UCI), whereas FDI uses the concept of direct investor. For example, suppose a Dutch enterprise controls a German enterprise, which in turn controls a second Dutch enterprise. Then the UCI of the second Dutch enterprise is Dutch, hence it is not counted in the FATS. However, the direct investor is German so it is counted in the FDI.

Table 3.4.1 shows that 16 percent of employment in the Dutch private sector is at foreign controlled enterprises. However, the share differs by industry. For example, foreign controlled enterprises account for 30 percent of employment in manufacturing. But in general, they are less present in services. Still, in several services industries that provide a sizeable share of total Dutch employment, namely wholesale, IT-services, transport and storage, their presence is higher than average.

The United States is the main controlling country (UCI) of the enterprises as far as employment is concerned: 200 thousand jobs. Other countries whose enterprises had at least 50 thousand employees in the Netherlands are France, Germany, the United Kingdom and Switzerland. The main employer among the BRIC countries

was India; it accounted for 15 thousand employees. That is more than Brazil, Russia and China together. During the period 2008–2011, employment controlled by enterprises in United States, the United Kingdom and Switzerland grew most. Again, it is too early to conclude whether or not these enterprises created new and additional jobs. Their total employment might have grown due to takeovers and then total Dutch employment would not have changed. Employment at enterprises controlled by Luxembourg declined the most.

There are several reasons why foreign enterprises come to the Netherlands. In several studies (Ernst & Young (2012), AmCham (2010)) foreign enterprises point out the highly educated employees, good infrastructure, and stable social environment. And as Bouman (2013) already pointed out, the Netherlands continuously ranks highly on rankings such as the Global Innovation Index (Cornell University, INSEAD, and WIPO (2013)), the Human Development Index (World Bank), or the Global Competitiveness Report (Schwab 2013).

3.5 Dutch controlled enterprises abroad

The Outward Foreign Affiliate Statistics (Outward FATS) describe the activities of Dutch controlled enterprises outside the European Union. The Internationalisation Monitor 2012 was the first to describe these activities in more detail, showing that turnover was concentrated in the manufacturing and trading industries.

3.5.1 Key figures on the presence of Dutch controlled enterprises outside the EU

	Unit	2008	2009	2010[1]
Daughter enterprises		6,125	8,055	8,225
Employees	x 1,000 fte	784	761	796
Turnover	billion euros	493	363	485

Source: Statistics Netherlands, Outward FATS.

[1] Numbers about 2011 will appear only after the deadline for this publication, namely around 1 September.

Table 3.5.1 clearly shows that turnover of Dutch controlled enterprises located outside the European Union was negatively affected by the worldwide economic

crisis in 2009. In 2010 it recovered and returned to the level of 2008. It is possible that the severe drop in turnover and the quick recovery is related to the movements of international trade that also contracted heavily in 2009 to recover in 2010 again, because foreign controlled enterprises are more involved in international trade than domestically controlled enterprises. The number of employees working at Dutch controlled enterprises outside the EU also decreased somewhat during the financial crisis, but also recovered in 2010. The number of enterprises under Dutch control, however, did not decline between 2008 and 2010.

Methodology Outward FATS

Statistics about the activities of Dutch controlled enterprises abroad are limited. They are available only for Dutch daughter enterprises in countries outside the European Union. Data collection for the Outward FATS started for reporting year 2007, and only for the variables sector of activity, number of enterprises, turnover and number of employees. It is theoretically possible to construct the same statistics about the presence of Dutch controlled enterprises in EU countries by using the statistics of other countries about activities in their country. However, on a detailed level such data are often confidential because so few enterprises are involved.

Detailed information on the country and economic sector level can be found on StatLine, the free online database of Statistics Netherlands.

Using information from Eurostat, the bureau of statistics of the European Union, one can derive that in 2009 Dutch controlled enterprises employed about 1.3 million people in the rest of the European Union. Adding this to employment outside the European Union, in total they employed 2.1 million persons abroad. In the United States, Germany, Spain, France, Poland and the United Kingdom Dutch controlled enterprises employed over 100 thousand people. The turnover of Dutch controlled enterprises in the rest of the European Union was approximately 330 billion euros. Adding the turnover of those outside the European Union, total turnover of Dutch controlled enterprises abroad amounted to approximately 700 billion euros. Of the employment and turnover generated by these enterprises, approximately 179 thousand jobs and 47 billion euros were in the BRIC countries. The share of the BRIC countries continued to rise between 2008 and 2010. They experienced much higher economic growth during this period than the European economies.

Although one might be inclined to think that subsidiaries of European enterprises are mainly located in low wage countries, almost half of turnover outside the European Union is generated in the United States (mainly manufacturing and trade) and Switzerland. These wealthy countries have a high turnover per employee (Lemmers 2012). This explains why turnover per employee was two times higher outside the European Union than inside it.

3.6 Conclusions and further research

Just as in other developed countries, Dutch FDI flows were affected in 2012 by macroeconomic fragility. But developing countries were less affected and absorbed more FDI than developed countries for the first time in history. Still, the shares of the EU-15 in worldwide FDI stocks were almost the same in 2012 as in 2000. The investment flows to and from BRIC countries have increased rapidly over time, but built up to a limited share in worldwide accumulated investments.

In 2011, the share of foreign controlled enterprises in the Dutch business economy continues to grow in terms of employment, turnover and value added. During the period 2008–2011, employment at enterprises controlled from the United States, the United Kingdom and Switzerland grew most. However, it is too early to conclude that these enterprises created new jobs. Their total employment might have grown solely because of takeovers. Employment at enterprises controlled from Luxembourg declined most.

The first results about SMEs show that they have a limited share (two percent) in total Dutch outward FDI stocks, but that there are many SMEs with foreign investments. The value of these investments is mainly concentrated in a few industries, namely manufacturing, wholesale and business services. However, the propensity to have foreign investments is not exceptionally high in these industries. It is much higher in the utility industry, mining and quarrying. A general analysis reveals that SMEs with foreign investments are larger, more prone to export, and are more productive than SMEs without foreign investments.

However, it is not yet clear what the cause of these differences is. Are certain enterprises more productive, and does this give them the opportunity to take the barrier of the fixed costs related to foreign investing? Or do they learn from investing abroad and do they transform the newly learned skills into higher productivity? Similar questions arose for exporting and non-exporting enterprises

(Bernard and Jensen, 1997, Wagner 2005, Vogel and Wagner 2010). It is very important for policy makers to know the chain of causality. If investing abroad is not the cause but the result of higher productivity, it would make less sense to stimulate SMEs to invest abroad. A first step to outline the chain of causality would be to consider enterprises that invested abroad and those who did not, and study the differences before and after the decision to invest abroad. For exporting and non-exporting firms this research was already conducted by Genee and Fortanier (2010a, 2010b, 2010c). This would also help to answer the questions: Which enterprises take the step to invest abroad and which ones do not? And what are the underlying factors?

Because considerable differences exist between enterprises with and without foreign investments, analysis on performance of enterprises should be undertaken differently. Now it is standard practice to consider two groups (under foreign or domestic control), but it would be preferable to compare three groups. Namely, domestically controlled enterprises without foreign investments, domestically controlled enterprises with foreign investments and foreign controlled enterprises.

Sustainability: quantifying CO_2-emissions according to the control-criterion

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Globalisation has all kinds of socio-economic as well as environmental effects. There are different ways of attributing responsibility for greenhouse gas emissions to individual countries. In this paper we introduce a new approach whereby we attribute CO_2-emissions according to the country of the ultimate controlling enterprise. We find that total emissions of Dutch controlled companies are a lot larger than emissions in the Netherlands itself, both according to a production approach – the Dutch air emission accounts – or the territory-based Kyoto figures. This study is experimental and is still in the learning phase.

4.1 Introduction

There are many mechanisms through which globalisation affects the natural environment (OECD, 2002). For example, globalisation expands production and world economic output. This can lead to growing pressures on the environment due to increased pollution and natural resource use. In addition, globalisation is characterised by a reallocation of production and consumption across sectors and countries, with different consequences for the natural environment in each country. At the same time, globalisation is paired with the development and diffusion of new technologies, resulting in new products and services as well as more efficient production processes which may have a beneficial impact on the environment (Fortanier and Maher, 2001). In an earlier edition of the Internationalisation Monitor, Delahaye and Schenau (2009) already addressed several elements, in particular the dependency of the Dutch economy on external sources of energy, its development over time, and the variation across energy sources, sectors, and geographic regions. Here we will address the topic how to allocate emissions to different countries in a globalising world economy. We will concentrate on carbon dioxide (CO_2) emissions, as the main greenhouse gas.

There are different ways of attributing responsibility for carbon dioxide emissions to individual countries (Peters 2008). Well-known are the territory-based approach which underlies Kyoto Reporting, the production-based approach which is followed in the System of Environmental-Economic Accounting (SEEA, UN et al. 2012) and the consumption-based approaches using environmentally-extended input-output analysis (Peters and Hertwich 2008). From a production point of view, globalisation leads to an increase in international transportation and tourism. In addition, developed countries may also 'export' their pollution by decreasing domestic production of pollution intensive products and increasing imports of these goods.

In contrast, the consumption approach considers global pollution as a result of consumption demands. Until now most policies regarding climate change, for example the Kyoto protocol, focus on reducing CO_2-emissions that occur during the production processes. However, the Social and Economic Council of the Netherlands advises the government to promote sustainable consumption by taking the (global) production chain into account (cf. SER, 2008).

Due to the advancement of globalisation, these different perspectives yield different estimates. There is by now a large amount of literature around "carbon leakage" (IPCC, 2007)) which investigates whether developed economies, with adopted carbon mitigation policies and national emission ceilings, shift environmental burden towards developing economies. Globalisation poses a number of challenges for allocation of emissions according to the different approaches.

In this chapter we explored a new approach to account for responsibility by attributing emissions by the criterion 'span of control' or ultimate controlling institute (UCI). We include emissions abroad in case the UCI is a Dutch resident company, while we exclude domestic emissions by foreign controlled companies. The main intuition here is that in a globalising world, the controlling units not only are most likely to receive most of the profits, but they also decide on the location of polluting activities.

The main research question of this study is to assess CO_2-emissions according to the criterion 'span of control' by enterprises and compare them with alternative approaches for attributing emissions.

This chapter is structured as follows. Section 2 discusses the data and methodology used. It starts by explaining how we allocated total Dutch production emissions to Dutch span of control and foreign control. Subsequently it explains the compilation of figures for emissions related to Dutch span of control production activities abroad. Section 3 presents the results of these compilations. Section 4 summarises the main findings and suggests several areas of further research to improve the estimates, as this study is experimental and is still in the learning phase.

4.2 Data and methodology

Globalisation can be monitored using the concept of enterprise control. Enterprise control is based on the concept of the Ultimate Controlling Institute (UCI). Thus, all enterprises can be classified according to country of control. The chosen reporting year is 2008, as this is the most recent reporting year for which all the required data is readily available. Results are presented at meso level according to industry classification NACE Rev.2.

The span of control analysis consists of two parts, dividing the domestic emissions between Dutch and foreign span of control and estimating the Dutch control emissions abroad. The former is determined in three steps. First, we calculated stationary emissions of enterprises based on micro information. This data is based on energy use data available at enterprise level, and includes information about energy-related emissions. Using the UCI, the micro-based emissions are assigned to either the category of foreign controlled enterprises or to the Dutch controlled enterprises. Secondly, we added emissions from mobile sources, which are available only at the industry level, following the ratio Dutch/foreign of stationary emissions derived in the first step. Thirdly, remaining emissions (total minus stationary and mobile) for enterprises that were not dealt with in the previous steps are distributed among industries proportionally to employment data. As a result the total emissions of residents in the Netherlands are split into emissions by foreign controlled and Dutch controlled enterprises.

The Dutch span of control emissions abroad are estimated as follows. First, note that it is very important to have the information by industry because this enables us to estimate the level of emissions associated with the activities of the Dutch controlled enterprises. Some industries are very emission intensive while others are less so. One employee in the chemicals and chemical product industry tends to generate more emissions than an employee in the financial intermediation industry.

Direct information on emissions by these enterprises abroad is not available and therefore has to be derived using a number of assumptions. Emissions in the Netherlands per NACE class are known due to the Dutch environmental accounts. Per NACE class one can calculate the emissions per unit employment ('emission-intensity'). First it is assumed that the emission intensity of Dutch controlled enterprises abroad is the same as the emission intensity of the similar industry in the Netherlands. Emissions of foreign enterprises controlled by Dutch residents can now easily be calculated by multiplying the emission-intensity (based on employment) with employment in a given industry and country.

However, Dutch emission coefficients may not be representative for foreign economies. Therefore, we have estimated two variants of the Dutch controlled foreign emissions. The first assumes that enterprises abroad have the same emission intensity as their counterparts in the Netherlands. The second uses country- and industry-specific information. In order to calculate the latter, the former emissions have been multiplied with correction factors. The correction factor is based on the ratio of emission intensities in foreign economies and the emission-intensity in Netherlands for each NACE class. These emission intensities have been calculated using the World Input Output Database (WIOD, 2012) that contains the necessary information on emissions and production on industry and country level. The correction factors are therefore NACE and country-specific.

The employment data is used as a proxy for the size of the economic activity of an industry and this proxy is combined with emission coefficients in order to estimate the emissions of these industries. This is applied for both variants. The Inward Foreign Affiliates Statistics (Inward FATS) of other EU member states contains employment data about Dutch controlled enterprises in EU countries. The Outward FATS contains employment data about Dutch controlled enterprises in non-EU countries (outward FATS). Together, this yields employment data for about 35 NACE classes and all countries.

We put a high priority on the analyses of the manufacturing industries because they are more emission-intensive than the average industry. It is also important to analyse the electricity companies in depth as they form by far the most emission-intensive industry. Eurostat data makes explicit to what extent Dutch companies have control over foreign European energy companies. It is quite important to determine whether these companies indeed produce electricity (emission intensive) or distribute gas and/or electricity or execute network activities (far less emission intensive). After consulting a few experts and an online search we concluded that the Dutch controlled energy companies in foreign economies predominantly deal with distribution and network activities rather than with electricity production. Emissions of these distribution and network activities are limited. Therefore we assume that Dutch controlled energy companies in Europe solely engage in distribution and network activities. Mining is also responsible for large amounts of emissions. Dutch controlled companies engaged in exploration activities also belong to the NACE class Mining, which unfortunately is not homogenous. Extraction activities cause particularly much emission while exploration activities are emission-extensive. Companies engaged in exploration are very active abroad and control a lot of companies in foreign economies.

The necessary actions are discussed in more detail in the underlying report of Van Rossum et al. (2012).

4.3 Results

This section will first present emissions by the Dutch economy disaggregated by Dutch and foreign UCI and next the emissions of Dutch controlled enterprises abroad. The results for emissions abroad will be presented in two variants: one, assuming that industries abroad have the same emission intensities as in the Netherlands, and a second one, using country-specific emission intensities. Because the emission intensities for EU-countries are very different from those for non-EU countries, the results for EU and non-EU countries are presented separately first. Only in the last paragraph they are being aggregated to arrive at the total emissions of Dutch controlled enterprises in the Netherlands and abroad.

Domestic emissions related to Dutch and foreign control

In 2008, enterprises in the Netherlands emitted 168 Mton CO_2. Dutch controlled enterprises emitted 62 percent of this amount and foreign controlled enterprises emitted 38 percent. As figure 4.3.1 indicates, electricity and gas supply had by far the largest CO_2-emissions. This industry is responsible for almost one third of CO_2-emissions by enterprises in the Netherlands. It emitted 53[1] Mton, of which 34 Mton by Dutch controlled enterprises and 18 Mton by foreign controlled enterprises. Most power stations burn fossil fuels to generate electricity, and in this process CO_2 is generated and emitted.

Figure 4.3.1 shows that within electricity production and the more emission intensive manufacturing industries, significant emissions are caused by production activities and entities that are under foreign span of control. For the Dutch economy as a whole the production activities under foreign control are responsible for 38 percent (64 Mton) of the overall emission caused by production activities within the Dutch economy.

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[1] Due to rounding, numbers do not add up.

4.3.1 CO_2-emissions of Dutch industries with span of control (UCI), 2008

Dutch UCI ■ Foreign UCI
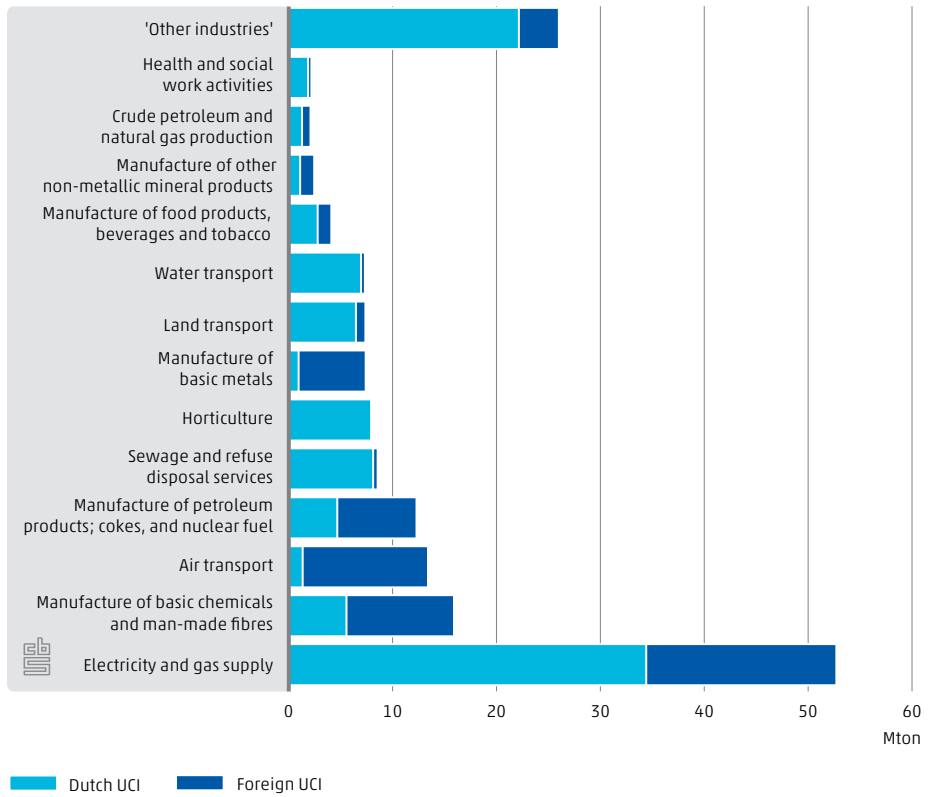
Source: Van Rossum et al. (2012).

38% of CO_2 emissions from production
in the Netherlands are by foreign controlled enterprises

4.3.2 Shares of CO$_2$-emissions by industry under foreign control, by industry, 2008
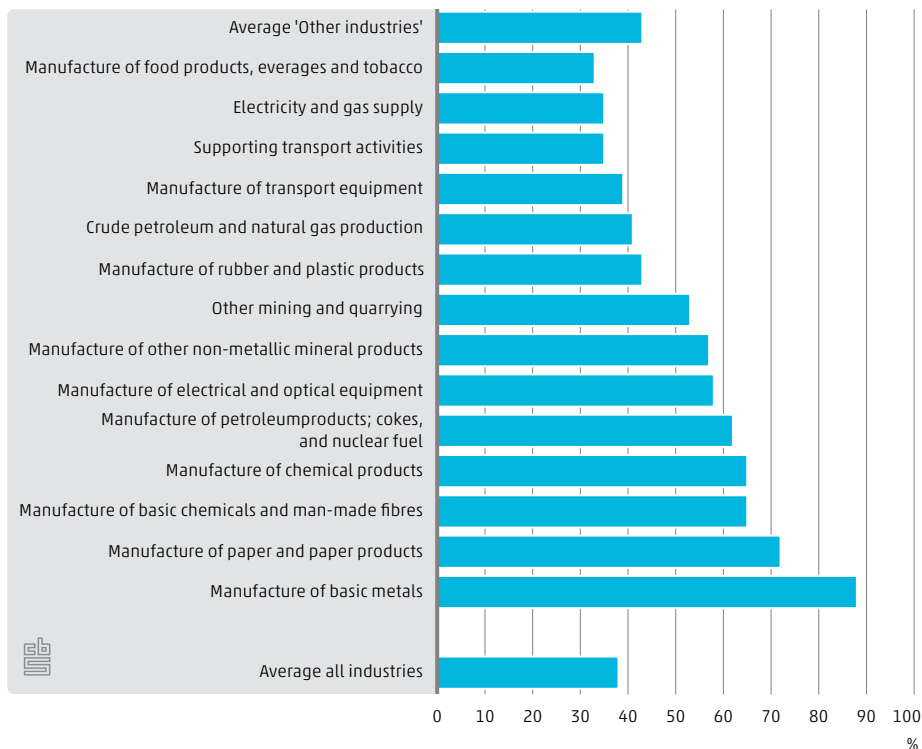
Source: Van Rossum et al. (2012).

Emissions in the European Union related to Dutch span of control

Emissions attributed to Dutch controlled enterprises in the European Union equalled 28 Mton CO$_2$ in 2008 (using Dutch emission coefficients). Especially in Germany there are a lot of emissions associated by activities of Dutch controlled enterprises. This is due to the fact that a lot of Dutch controlled employment is located in Germany. It is also partly explained by the emission-intensive nature of the activities in Germany under Dutch control. Activities such as the manufacture of basic metals, of chemicals and chemical products, of basic pharmaceutical products and pharmaceutical preparations and of food products are very important in this respect. In Spain the activities manufacture of chemicals and chemical products and of basic pharmaceutical products and pharmaceutical preparations play a relative big role. In Poland the manufacture of basic pharmaceutical products and pharmaceutical preparation, of food products and of other non-metallic mineral products are especially important industries.

4.3.3 CO$_2$-emissions of Dutch controlled enterprises in the EU, 2008

Dutch emission coefficients   Foreign emission coefficients
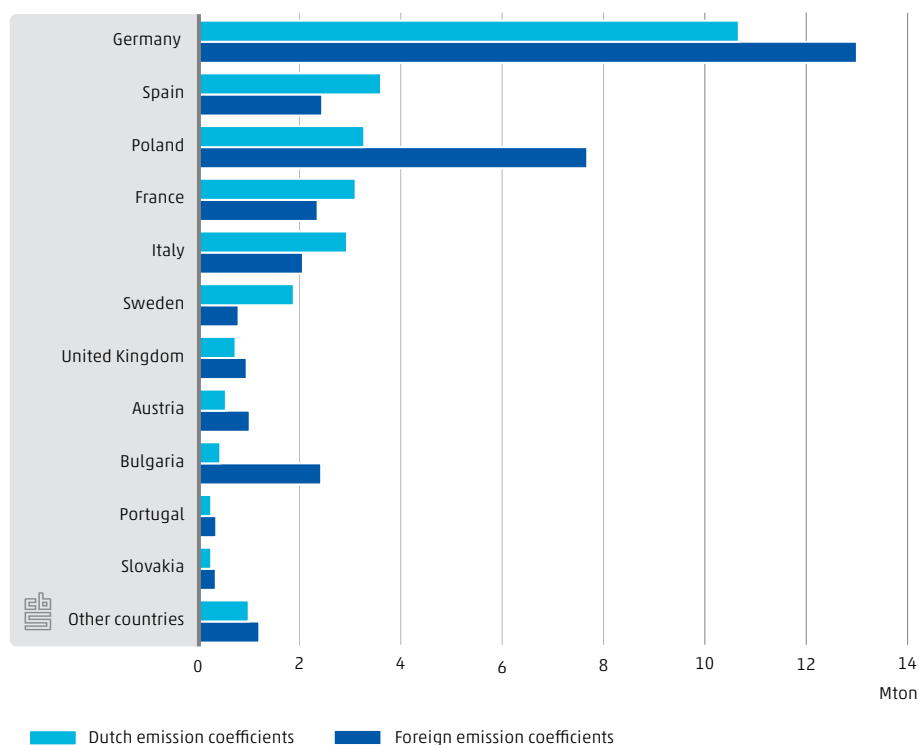
Source: Van Rossum et al. (2012).

The emissions of Dutch controlled enterprises in the European Union are for a large part in manufacturing of chemicals and chemical products; 11 Mton CO$_2$ using Dutch emission coefficients. Another industry that plays a significant part is the manufacture of basic metals, with 5 Mton of emissions.

As figure 4.3.2 showed, there are sometimes large differences between emissions using Dutch or foreign emission coefficients. For example, for the manufacturing of chemicals and chemical products industry, the difference is 2.6 Mton, or one quarter of the emissions using Dutch emission coefficients. There are several explanations. First, it is likely that processes in different countries cause different emissions, due to different methods and efficiency. Secondly, the Dutch enterprises in a specific industry may have a different specialisation than the foreign enterprises, with different production processes and corresponding emission patterns.

4.3.4 CO_2-Emissions of Dutch controlled enterprises in the EU, by industry, 2008
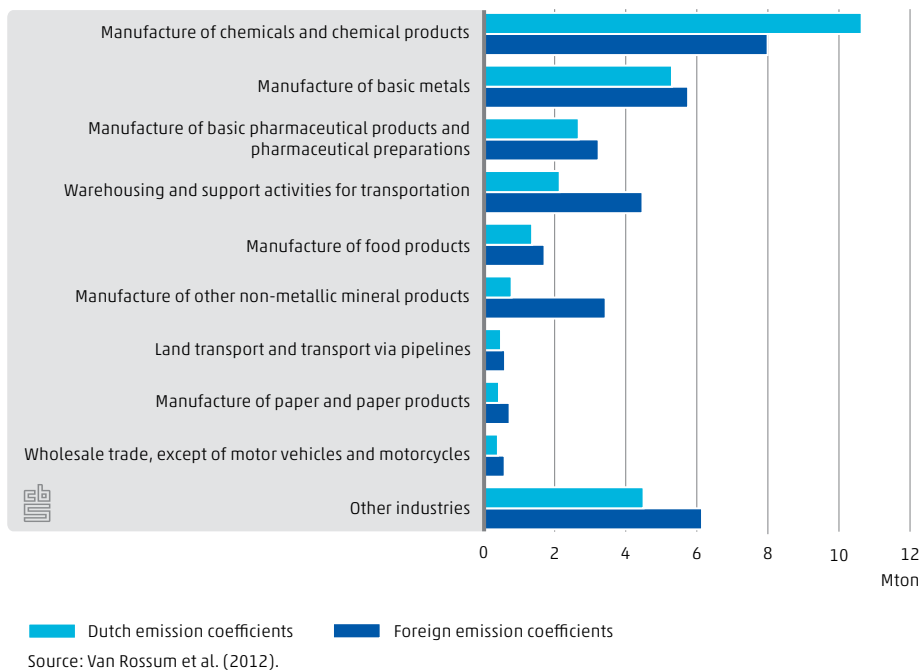
Dutch emission coefficients   Foreign emission coefficients

Source: Van Rossum et al. (2012).

Emissions outside the European Union related to Dutch span of control

Emissions attributed to Dutch controlled enterprises outside the European Union equalled 49 Mton CO_2 in 2008, using Dutch emission coefficients. Especially in the USA a large number of emissions stem from Dutch controlled enterprises, as a substantial part of Dutch controlled employment was located there. Moreover, the nature of the activities in USA under Dutch control is highly emission-intensive. The manufacture of chemicals and chemical products, mining and the manufacture of food, beverages and tobacco were all very prominent in this respect. Also in Brazil, China and Canada there were a lot of emissions controlled by Dutch enterprises. In China and Brazil the manufacture of chemicals and chemical products is mainly responsible for these emissions.

4.3.5 CO$_2$-emissions of Dutch controlled enterprises in non-EU countries, 2008

Dutch emission coefficients   Foreign emission coefficients
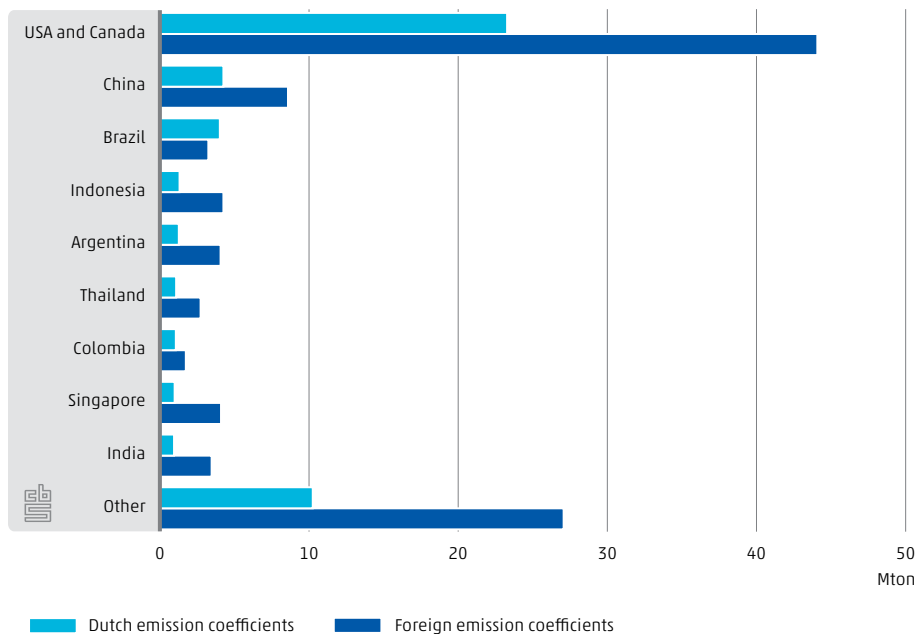
Source: Van Rossum et al. (2012).

N.B. To keep data of individual enterprises confidential, we had to aggregate the totals of the United States of America and Canada.

Almost all of the emissions attributed to Dutch controlled enterprises outside the European Union stem from two industries: manufacturing of chemicals and chemical products, and mining and quarrying. Together they emitted 42 Mton CO$_2$ (using Dutch emission coefficients), 87 percent of Dutch controlled emissions outside the European Union. Using foreign emission coefficients does not change this picture.

4.3.6 CO_2-emissions of Dutch controlled enterprises in non-EU countries, by industry, 2008

Source: Van Rossum et al. (2012).

Dutch emission coefficients ▮ Foreign emission coefficients ▮
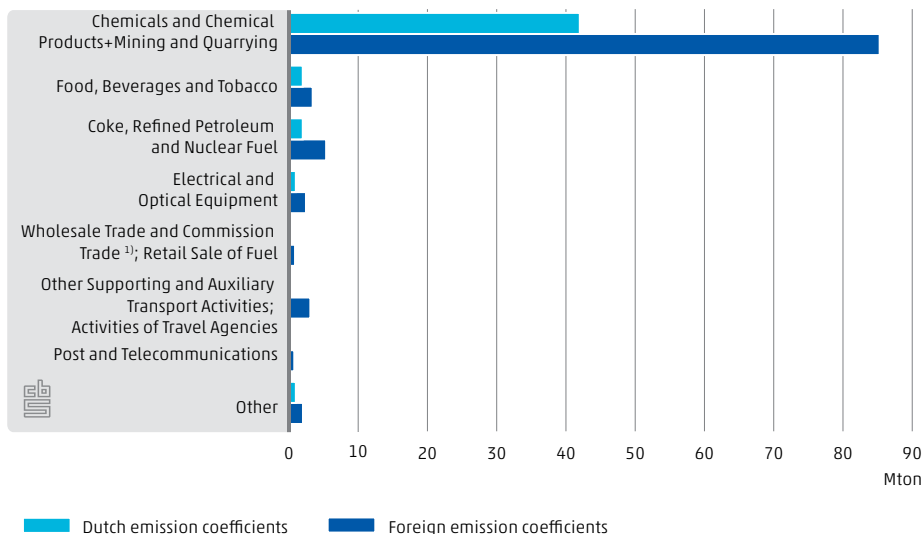
[1] Except of Motor Vehicles and Motorcycles+Sale, Maintenance and Repair of Motor Vehicles and Motorcycles.

N.B. To keep data of individual enterprises confidential, we had to aggregate the totals of the chemical industry and the Mining and Quarrying industry.

Total emissions of Dutch controlled enterprises in the Netherlands and abroad

In presenting the total picture we advocate the use of the foreign emission coefficients instead of the Dutch emission coefficients because this seems more realistic. Using Dutch emission coefficients we would probably underestimate the emissions of Dutch controlled foreign enterprises. Still there is substantial uncertainty in the outcomes, especially for countries outside the EU.

Using the results from the previous sections, total emissions of Dutch controlled non-residents can now be calculated. Using foreign emission coefficients, emissions attributed to Dutch controlled enterprises outside the European Union equal 103 Mton CO_2, while emissions attributed to Dutch controlled enterprises in the European Union equal 35 Mton CO_2. Together this makes 138 Mton CO_2 attributed to activities of Dutch controlled enterprises in foreign economies (77 Mton CO_2 using Dutch emission coefficients).

4.3.7 Dutch CO_2-emissions according to different approaches, 2008

Type of emissions		CO_2-emissions	
		Mton CO_2	
I	Emissions of Dutch controlled enterprises, residents in the Netherlands	104	I = V - IV
II	Emissions of Dutch controlled enterprises, foreign residents outside the Netherlands	138	
III	Total emissions of Dutch controlled enterprises	242	III = I + II
IV	Emissions of foreign controlled enterprises, residents in the Netherlands	64	
V	Emissions according to the residents principle (SEEA type emissions)	168	V = I + IV

Source: Van Rossum et al. (2012).

The different approaches and aggregations for assessment of CO_2-emissions yield considerable different results. Table 4.3.7 shows that total emissions of Dutch controlled enterprises in the Netherlands and abroad are equal to 242 Mton CO_2. Approximately 43 percent of these Dutch controlled emissions are emitted by Dutch residents and 57 percent is emitted by foreign residents in foreign economies. In the Netherlands, approximately 62 percent of all emissions from production in the Dutch economy (production approach, 104 Mton of 168 Mton) are emitted by Dutch controlled enterprises. The other 38 percent of emissions stemming from Dutch production (SEEA type) are by foreign controlled enterprises active in the Netherlands.

Also note that CO_2-emissions of Dutch controlled enterprises in the Netherlands and abroad together are 44 percent larger than the CO_2-emissions according to the SEEA production approach (excluding households). And they are 27 percent larger than the CO_2 emissions according to the consumption approach.

CO_2 emissions according to different frameworks

CO_2 emissions according to the IPCC regulation ('territory principle')
The IPCC (Intergovernmental Panel on Climate Change) has drawn up specific guidelines to estimate and report on national inventories of anthropogenic greenhouse gas emissions and removals (IPCC, 1996). "Anthropogenic" refers to greenhouse gas emissions and removals that are a direct result of human activities or are the result of natural processes that have been affected by human activities. In general the IPCC records all emissions that occur on the Dutch territory, with a few specificities. Emissions originating from the so-called short cyclic carbon cycle, such as the combustion of biomass and emission from biochemical processes, are left aside in the IPCC calculations (see for more information the website of UNFCCC).

CO$_2$ emissions by the Dutch economy (SEEA-production type emissions)

Statistics Netherlands annually publishes the total greenhouse gas emissions by economic activities, which are calculated according to the national accounting principles. These include all emissions caused by the residents of a country, regardless where the emissions take place. For stationary emission sources the resident principle will generally converge with emission data as recorded in the emission inventories. There may however be substantial differences for mobile sources. Transport activities by residents, like road transport, shipping and air transport, and related emissions to air may also occur abroad. Likewise, non-residents may cause pollution within the Dutch territory (see for more information Statistics Netherlands (2010)).

Global CO$_2$ emissions from Dutch consumption needs

The *production approach* according to SEEA considers greenhouse gas (GHG) emissions caused during the economic activities of a country's residents. However, the production approach does not take into account GHG emissions that occur abroad, during the production of products that are consumed in the home country[2], the so called embodied or indirect emissions. The approach in which GHG emissions are related to the consumption requirements of countries is referred to as the *consumption approach* or carbon footprint. The Dutch emissions according to the consumption approach consist of the emissions embodied in imports for domestic use plus a part of the domestic GHG emissions, namely those inherent in the production of products destined for domestic final consumption. The remaining domestic GHG emissions that occur during the production of products destined for export are attributed to consumption abroad (see for more information Statistics Netherlands (2010)).

CO$_2$ emissions from Dutch controlled enterprises

In this chapter we have explored a new approach to account for responsibility by attributing emissions by the criterion 'span of control' or ultimate controlling institute (UCI) of enterprises. We include emissions abroad in case the UCI is a Dutch resident company, while we exclude domestic emissions by foreign controlled companies. The main intuition here is that in a globalising world, the

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[2] A wide definition of consumption is used here that consists of all final demand categories minus exports: final consumption by households, final consumption by government, investments and changes in inventories

controlling units not only are most likely to receive most of the profits, but they also decide on the location of polluting activities. The UCI is defined as an institutional unit, starting from a foreign affiliate's chain of control, which is not controlled by another institutional unit. Therefore, foreign controlled enterprises have a centre of control outside the Netherlands, whereas Dutch controlled means that the locus of control is in the Netherlands. 'Control' is defined as the ability to determine general corporate policy by appointing appropriate directors.

4.3.8 'Dutch' CO_2-emissions 2008 following different frameworks and concepts, 2008
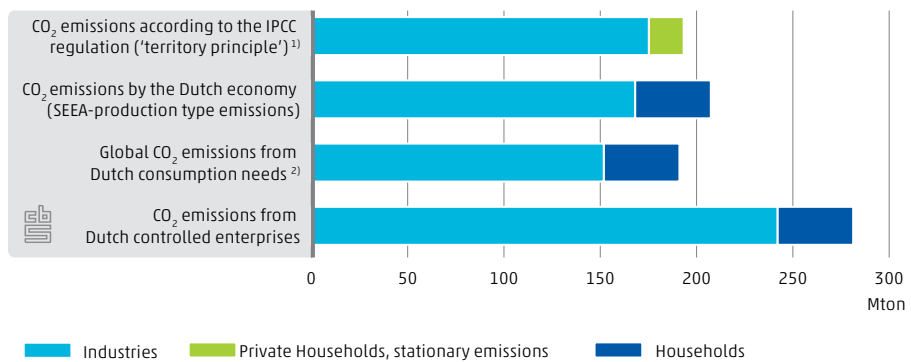
Source: Van Rossum et al. (2012).

[1] Private households: A collection of one or more people sharing the same living space, who provide their own everyday needs in a private, non-commercial way. Here only stationary emissions are presented separately, as emissions from transport are excluded because not separately distinguished.

[2] Figure based upon actual figure for emissions by residents in 2008 and the surplus of the 'Emission balance of trade' in 2009.

4.4 Conclusions and recommendations for further research

The main finding of our study is that total emissions of Dutch controlled companies are a lot larger than emissions according to alternative frameworks such as the Dutch air emission accounts or the territory based Kyoto figures. The interpretation that we give to this approach is as follows.

In the System of National Accounts (SNA), residency is defined in terms of predominant economic interest. In practice this means that a Dutch resident is an enterprise or person 'predominantly' present within the Netherlands. Following the SEEA production approach (UN et al, 2012); pollution of these enterprises is accounted for as emissions caused by and to be assigned to the production of the Dutch economy. In this way these emissions can be compared with economic aggregates like GDP. However, many of the residents engaged in polluting activities are not controlled by Dutch residents. Economic activities under Dutch control both generate value but cause (CO_2) emissions as well. In many cases exercising control results in income transfers (for example dividends in the case of securities) which will be reflected in a country's national income. The value added of a 'span of control' analysis in a globalisation context is that income and the global effect on the environment of Dutch enterprise control can be evaluated. In that sense, this approach would be closer to an income perspective[3].

The results presented in this study may therefore be relevant for policy makers – as it takes into account that economies and power do not stop at borders – and can help policy makers in fact based decision-making dealing with environmental issues in a globalising world.

We conclude by discussing some recommendations for further research, analysis and improved estimates, as this study is still in the learning phase.

The study presents a 'span of control' analysis for emissions for one single year and can be improved presenting a time series. Dynamics in activities relevant for span of control abroad and domestically are very interesting to monitor over time. In order to gain insight in the dynamics of span of control (changes in UCI), in quality of the data and the methods applied it is recommended to repeat the analysis for another year. To enhance relevance for policy we recommend compiling time series data for emissions based on the criterion 'span of control'. Such time series data can eventually help in answering questions regarding 'carbon leakage'.

We recommend exploring more alternative data sources for emission coefficients besides the WIOD data used in this study. Such emission coefficients can be more detailed and/or accurate for certain activities in certain regions/countries. Because the coefficients used in this study are not directly based on observed data, instead we make use of computing techniques using data on different emission coefficients and economic information on foreign control which is available at Statistics

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[3] In the SNA national income is an aggregate which takes also income transfers with the rest of the world into account.

Netherlands and Eurostat. Note that the quality of the assessment of foreign controlled emissions in the Netherlands is better than the quality of the data on emissions of Dutch controlled emissions in foreign economies. Because the former is mainly based on observations and partly on modelling making use of some rule of thumb assumptions.

It would be very interesting to link "span of control emissions" and national income. Emission intensity of an economy, the ratio of emissions to GDP, is nowadays very often monitored over time in many countries. For example the Green Growth framework of the OECD (2011) recommends monitoring this indicator over time. As an extension to emission intensities calculated from production type emissions and GDP, we recommend monitoring emission-intensity based upon a quite different concept for both the 'physical' part as well as the 'economy' part. In this study we made an attempt to calculate emissions related to span of control. These 'span of control emissions' would be the new numerator. These 'controlled' emissions can best be confronted, from a conceptual point of view, with national income of a country. National income will in this case be the new denominator. To make this new indicator, we would need information on income transfers with destination 'the Netherlands' by industries in foreign economies which are Dutch controlled (inflow of income). Vice versa, we also need information on income transfers from foreign controlled enterprises in the Netherlands having destination 'abroad' (outflow of income).

5.

Trends in international sourcing

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International sourcing means shifting business functions to enterprises located abroad. This chapter provides an overview of the results of the 2012 survey on international sourcing and a comparison with the first survey (2007). We found that sourcing behaviour differed only slightly between the two reference periods. The vast majority of 90 percent of the large enterprises did not source internationally between 2009 and 2011. The ones that did mainly chose European destinations. Reduction of labour costs is the main reason for international sourcing. We see a shift from sourcing core functions in 2001–2006 to sourcing support functions in 2009–2011. Sourcing is mainly driven by enterprises in industrial sectors, and by subsidiaries from foreign controlled enterprises. The most likely functions to be moved abroad after the core business function are ICT and administration.

5.1 Introduction

One of the most eye-catching phenomena of globalisation is international sourcing: the relocation of business functions from one country to another. As country borders diminish, trade tariffs are lifted, costs of logistics decline and information and communication technologies are improving, more enterprises organise their activities globally. Access to cheap labour, raw materials, advanced technologies or (fiscal) regulations play a key role in the choices for relocating business functions to the most appropriate place in the world. The increasingly fragmentation of supply and hence value chains leads to an increase in international trade in intermediate goods (Sturgeon & Gereffi, 2009). Developments in telecommunications and information technology, limiting the need for physical proximity of service providers to their customers, caused the international trade in services to expand. For example the rise of IT helpdesks and call centres in Eastern Europe and in India, which provide support services to enterprises in high wage countries. The movement of business functions abroad and the related loss of domestic jobs generate much media attention focusing on the negative effects. As statistics on these phenomena are scarcely available, most discussions are based on anecdotal evidence. Policy makers need hard evidence about international sourcing and its effects on the economy and the labour market. As communicated in the EU's growth strategy for the coming decade, a key challenge for Europe (and of course for the Netherlands) imposed by globalisation is how to secure existing jobs and create new jobs on a sustainable basis (European Commission, 2010).

To provide policy makers, researchers and the public with statistical evidence, twelve European countries launched a survey about international sourcing in 2007. The Netherlands was one of the participating countries. The outcome of this study describes to what extent enterprises move their business functions abroad, their motives deciding to do so, and also the destinations they chose to source their activities (Statistics Denmark, 2008; Alajääskö, 2009). We distinguish outsourcing (outside the enterprise group) from insourcing (within the enterprise group), and look at different enterprise group characteristics. In 2012, fifteen European countries repeated this survey for the period 2009–2011. We will compare several outcomes of the two surveys despite the dramatic change in economic climate from a relative high GDP growth to one of the worst economic crises ever. Is there a change in sourcing behaviour? Do the destinations for international sourcing change? And how about the motives for making decisions on sourcing?

This chapter starts with the definitions and concepts used in this study (5.2). The survey is described in section 5.3. Chapter 5 ends with the main results (5.4), followed by the conclusions (5.5).

5.2 Definitions and concepts

We define international sourcing in this study as the total or partial movement of (core or support) business functions currently performed in-house or domestically sourced by the resident enterprise out of the country to enterprises (within or outside the enterprise group) located abroad. When activities are moved to affiliates abroad, we talk about international insourcing. The international relocation of activities to external suppliers is referred to as international outsourcing.

The two key dimensions of the survey on international sourcing are business functions and geographical area. Business functions are divided into the core and support business functions. The core business function is the primary activity of the enterprise and will, in most cases, be similar to the NACE code of the enterprise. It includes production of final goods or services intended for the market/third parties carried out by the enterprise, and that yield income. Support business functions (ancillary activities) are carried out by the enterprise in order to permit or facilitate production of goods or services intended for the market/third parties. The outputs of these functions themselves are not directly intended for the market/third parties.

We distinguish the following support business functions:
- *Distribution and logistics* consist of transportation activities, warehousing and order processing functions.
- *Marketing, sales and after sales services including help desks and call centres* consist of market research, advertising, direct marketing services (telemarketing), exhibitions, fairs and other marketing or sales services. Call-centre services and aftersales services such as help-desks and other customer supports services are included as well.
- *ICT services* include IT services and telecommunication. IT services consist of hardware and software consultancy, customized software data processing and database services, maintenance and repair, web-hosting, other computer related and information services. Packaged software and hardware are excluded.
- *Administrative and management functions* include legal services, accounting, bookkeeping and auditing, business management and consultancy, HR management (e.g. training and education, staff recruitment, provision of temporary personnel, payroll management, health and medical services), corporate financial and insurance services. Procurement functions are also included.
- *Research & Development, engineering and related technical services* include R&D, intramural research and experimental development, engineering and related technical consultancy, technical testing, analysis and certification. Design services are included as well.
- *Other support functions* are all other functions not previously mentioned, including manufacturing as a secondary activity for services enterprises.

The geographical areas distinguished in this study are the *EU-15*, *EU-12*, *Russia*, *Other European countries* (Switzerland, Iceland, Liechtenstein, Norway, Turkey, Belo Russia, Ukraine, the Balkan states), *China*, *India*, *Oceania and other Asian countries* (Japan, Korea, Near, Middle and Far-East, Australia and New Zealand), *USA and Canada*, *Brazil* and *Rest of the world* (Mexico, South and Central America except Brazil, and Africa).[1] With this selection of countries we cover the most important economies in the world, enable BRIC aggregate and restrict response burden for enterprises selected for the survey.

[1] For further details on these country aggregates see Balance of Payments Vademecum, latest update of December 2012 (Euro-stat, 2012).

5.3 Survey

The target population of the 2007 and 2012 surveys consists of all enterprises with 100 or more employees in the NACE Rev.2 sections B to N, excluding K (financial services). In 2007 the questionnaire was sent to one third of the target population. In 2012 almost half of the enterprises in the target population were selected. The samples are randomly selected, but stratified. Both times, we applied a mixed mode data collection strategy: starting with online questionnaires, followed by paper questionnaires and finally reminders by telephone. In 2007 the response rate was 65 percent (1002 enterprises); in 2012 it was 63 percent (1370 enterprises). The data we present in this paper is weighted and grossed up to the population according to the strata defined in the sample design.

Differences between the 2007 and 2012 survey

Although the concept of both surveys is similar, there are some differences which limit the possibilities for comparisons. The most important difference was the time span covered. In the 2012 survey it was only three years (2009–2011), while in 2007 it was six years (2001–2006). This makes it impossible to compare absolute figures properly. However, it allows for benchmarking relative figures on subpopulations, for example by breaking down and comparing the enterprises that were engaged in international sourcing. There is also a methodological difference in the question on motives, which shifts the response distribution over the categories. We take this into account when drawing our conclusions. Further, the 2007 support business function *Engineering and other technical services* was merged with *R&D* into one new support business function in 2012. In order to enable comparisons we recalculated the 2007 figures and merged them into a business function, which makes them comparable to the 2012 figures.

Response and stratifications

In both surveys most enterprises in the sample and response are categorised in the section Manufacturing (NACE Rev.2 section C). This represents the real distribution in the target population. In this chapter we apply several types of stratifications. The most important one is by selected aggregates of NACE sections:
— All sectors: NACE Rev.2 Sections B to N, excluding K
— Industry: NACE Rev.2 Sections B, C, D, E
— Other sectors: NACE Rev.2 Sections F, G, H, I, J, L, M, N

We also apply the following types of enterprises for stratifying figures:
— Enterprise group head
— Subsidiary with global head in the Netherlands
— Subsidiary with global head within EU27
— Subsidiary with global head outside EU27
— Not in enterprise group

Furthermore, the seven different business functions (and some aggregates based on these) are used for stratifying the data. See section 5.2 for a description of the business functions.

5.4 Trends in international sourcing

Table 5.4.1 shows the percentages of enterprises engaged in international sourcing during the periods 2001–2006 and 2009–2011. Overall, in 2009–2011, 9.8 percent of the enterprises with more than 100 employees were active in international sourcing. This percentage was lower than the 13.5 percent in the (longer) 2001–2006 period.

Most large enterprises (**90%**) did not source internationally between 2009 and 2011

5.4.1 Enterprises engaged in international sourcing, by type of enterprise group structure

	2001–2006	2009–2011
	%	
Total	13.5	9.8
In enterprise group	18.1	12.5
Not in enterprise group	2.7	1.5
Enterprise group head	14.4	4.5
Subsidiary	19.5	16.7
Subsidiary with global head in the Netherlands	10.3	7.6
Subsidiary with global head within EU27	22.3	23.9
Subsidiary with global head outside EU27	36.8	25.6

Source: Statistics Netherlands.

The types of enterprises engaged in international sourcing during the two periods are also presented in table 5.4.1. In 2009–2011, 12.5 percent of the enterprises belonging to an enterprise group were active in international sourcing. This percentage was higher in the period 2001–2006. Despite of the latter period being shorter, we can clearly see a big difference in enterprise group heads. In 2009–2011 only 4.5 percent was engaged in international sourcing compared to 14.4 percent in 2001–2006. The difference between the two periods was smaller among subsidiaries. Only the subsidiaries with a global head outside EU27 were clearly more often engaged in international sourcing in 2001–2006 (36.8 percent) than in 2009–2011 (25.6 percent). There is a notably larger percentage of subsidiaries with global head within EU27 that sourced internationally in 2009–2011. An important conclusion from this table is that foreign controlled enterprises are much more often involved in international sourcing than Dutch controlled enterprises. This is perhaps because they are less sensitive to social and political pressure to save domestic jobs. Also, by definition they have affiliates in other countries and may therefore face lower thresholds when moving functions abroad. Subsidiaries with a Dutch head may be part of a fully Dutch group without experience with international sourcing, so they are likely to face higher thresholds when they consider relocating activities abroad.

International sourcing in a European perspective

The main outcomes of the international sourcing survey are presented in figure 5.4.2. All participating countries reported the percentages of enterprises

engaged in international sourcing for the industrial sectors, other sectors and all sectors in 2009–2011.

We see that Denmark is the participating country with the most international sourcing – approximately one in four enterprises was engaged in it. In the industrial sectors it was even over one third. Finland, Belgium and Portugal have a relatively high share of enterprises active in international sourcing. The Netherlands is in the middle group (9.8 percent), while international sourcing occurred the least in Lithuania and Bulgaria in 2009–2011. It seems that most activities are moved abroad from the old EU-member states with high labour costs, while the new member states show lower international sourcing rates.

5.4.2 Enterprises engaged in international sourcing, by country and by aggregated sector (2009-2011)

Source: Statistics Netherlands & Eurostat.
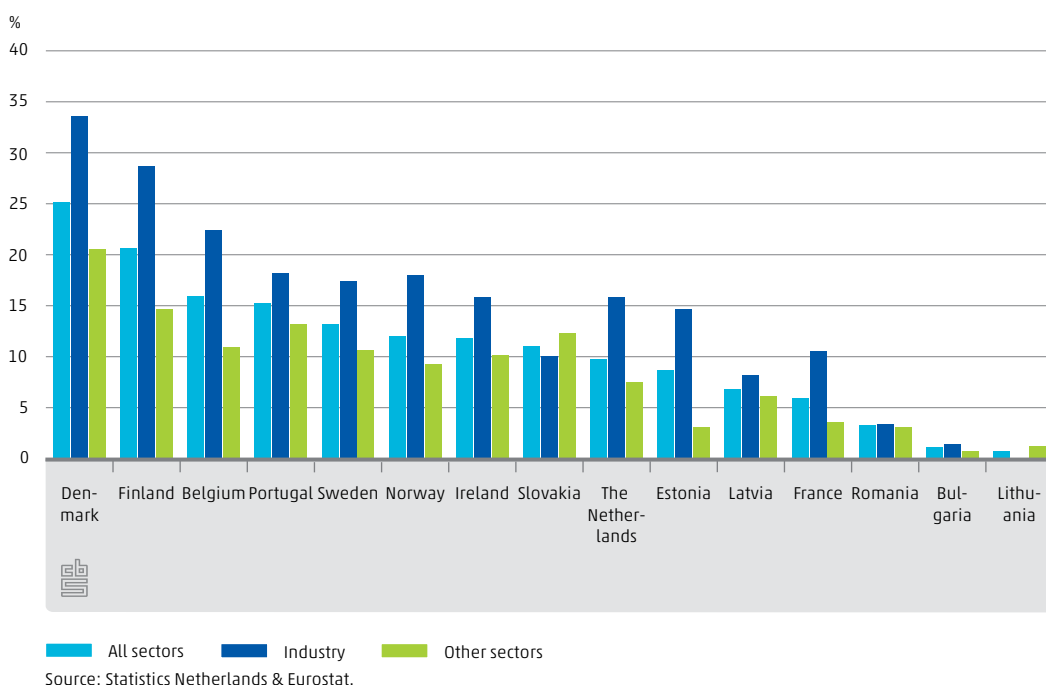
In most countries the percentages of enterprises that sourced internationally were higher in industrial sectors than in the other sectors. The only exceptions to this rule are Slovakia and Lithuania. For industrial sectors as well as for other sectors international sourcing occurred the most in Denmark, followed by Finland. Of all participating countries the Netherlands is in the middle group when it comes to the industrial sectors, where 15.8 percent of the enterprises was engaged in

international sourcing in 2009–2011 compared to 7.5 percent in the other sectors. So international sourcing is mainly driven by enterprises in the industrial sectors.

International sourcing of business functions

Figure 5.4.3 shows that relatively less core business functions, but slightly more support business functions were sourced internationally in 2009–2011 than in 2001–2006. It indicates that enterprises tend to focus their limited resources more on their core business, and source their support functions. Another explanation, especially for industrial enterprises, is that relocating core business functions – which are often production facilities – requires a great deal of investment. In most cases international sourcing concern insourcing, which means that production lines have to be (re)build. Sourcing support functions is much more flexible, since it requires only an office environment in most cases.

5.4.3 International sourcing by business functions and by aggregated sector, as a percentage of enterprises engaged in international sourcing

Source: Statistics Netherlands.
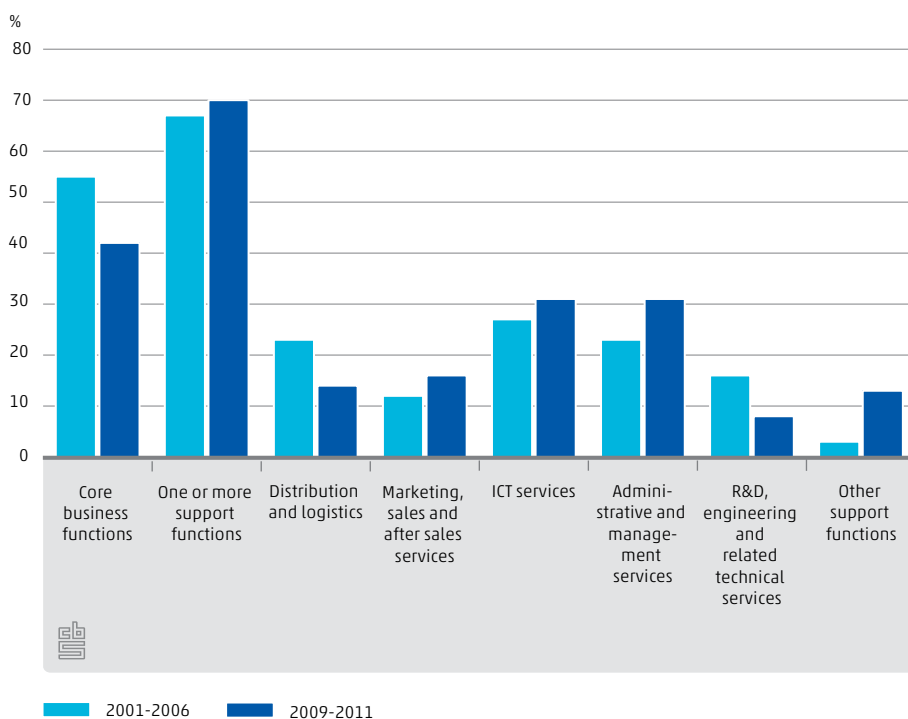
In this figure we also distinguish the six different types of support functions, apart from the core business, and aggregate of all support business functions. Most internationally sourced were ICT services: 27 percent of enterprises engaged in international sourcing did so. Next came the administrative and management services, and distribution and logistics. In 2001–2006 both stood at 23 percent. In 2009–2011 administrative and management services played an even greater role with a percentage equal to that of ICT services (31 percent). Marketing, sales and after sales services (16 percent) was the third most frequently internationally sourced activity in that period.

Compared to 2001–2006, enterprises sourced distribution and logistics less frequently in 2009–2011. This decrease was mainly attributable to the other sectors (see 5.4.4). Remarkable is the decrease in the international sourcing of R&D activities in 2009–2011. These knowledge-intensive high value added generating support business functions seem to be sourced less often internationally. Take into account that this only concerns enterprises which have R&D as a support activity, and not the ones with R&D as their primary task.

The international sourced business functions are broken down by aggregated sector in table 5.4.4. We see that industrial enterprises internationally sourced their core business functions more frequently (54 percent) than enterprises in the other sectors (32 percent) in 2009–2011. It was the other way around with support functions. Approximately three-quarter of the enterprises in the other sectors engaged in international sourcing, sourced one or more support functions. For industrial enterprises this share was 62 percent. In 2001–2006, the shares differed even more.

The reason for these differences probably lies with proximity to the customers which is more important for service than for manufacturing core business functions. Therefore, the enterprises in the other sectors rather seek their gains in the international sourcing of support business functions. Also, core functions in industrial enterprises tend to be more low-skilled labour intensive than core functions in services, which are more knowledge-intensive. Knowledge-intensive labour is more difficult to substitute than low-skilled labour.

5.4.4 International sourcing by business functions and by aggregated sector, as percentage of enterprises engaged in international sourcing

	2001–2006			2009–2011		
	all sectors	industry	other sectors	all sectors	industry	other sectors
	%					
Core business functions	55	73	42	42	54	32
One or more support functions	67	55	76	70	62	77
of which						
distribution and logistics	23	17	27	14	14	14
marketing, sales and after sales services	12	15	10	16	17	15
ICT services	27	25	27	31	31	31
administrative and management services	23	19	26	31	25	36
R&D, engineering and related technical services	16	19	13	8	12	4
other support functions	3	2	3	13	9	17

Source: Statistics Netherlands.

International insourcing versus international outsourcing

International sourcing can be done within or outside the enterprise group. Figure 5.4.5 shows that 80 percent of all international sourcing was within the enterprise group in 2009–2011. In this period international insourcing involved relatively more core than support functions. In 2001–2006 enterprises sourced relatively more support than core business functions within the enterprise group. We see a decrease in the international insourcing of ICT support functions, making it the least sourced within the group.

International insourcing occurs much more often than international outsourcing for all types of activities. Especially multinational enterprise groups are often involved in moving business functions abroad (see also table 5.4.1). This suggests that their internal, cross border relocation activities cause a large part of the observed international sourcing phenomenon. In 2009–2011 enterprises sourced R&D, engineering and related technical services (89 percent) and other support functions (87 percent) mostly within the enterprise group. R&D activities are knowledge intensive, and usually enterprises are very protective of them. It seems that, in 2009–2011, even more than in 2001–2006, enterprises keep sensitive knowledge within the enterprise group and hence under their own control.

5.4.5 International sourcing within the enterprise group, by business function, as a percentage of enterprises engaged in international sourcing

%

Legend:
■ 2001-2006   ■ 2009-2011
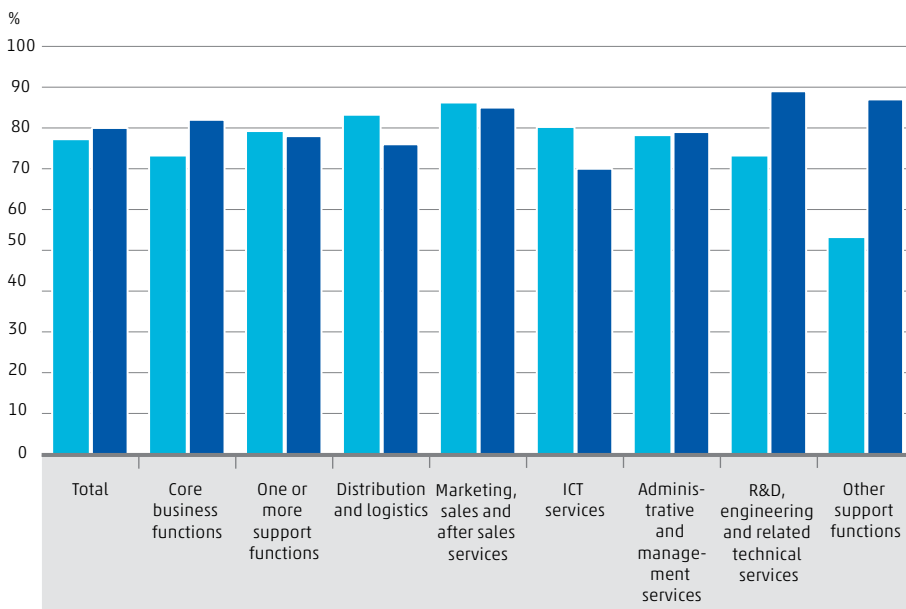
Source: Statistics Netherlands.

Sourcing destinations

In figure 5.4.6 international sourcing is categorised by destination. If we compare the destinations in 2009–2011 with those in 2001–2006, we see that enterprises sourced relatively more to the 'other European countries' (+10 percent point), Russia and Brazil (both +1 percent point). Other European countries are non-EU member states, like some of the Balkan states, Ukraine, Turkey and the EFTA countries (Norway, Switzerland, Iceland and Liechtenstein). The shares to all other destinations were lower. Between 2001–2006 and 2009–2011, sourcing to the EU-12 and EU-15 countries declined most with 13 and 9 percent respectively. Despite these decreases, the EU-countries remained the main destinations for Dutch international sourcing (67 percent), indicating that activities are not massively moved to far away destinations like China and India. Just as with international trade and foreign direct investments, enterprises seem to choose nearby countries. They do this, because they are more familiar with the (similar) languages, cultures and legal systems in those countries. Furthermore, travel distance and transport

costs play a role. In addition, it is easier to exert influence and keep control on nearby facilities.

5.4.6 Destinations of international sourcing, as a percentage of enterprises engaged in international sourcing

2001-2006   2009-2011
Source: Statistics Netherlands.
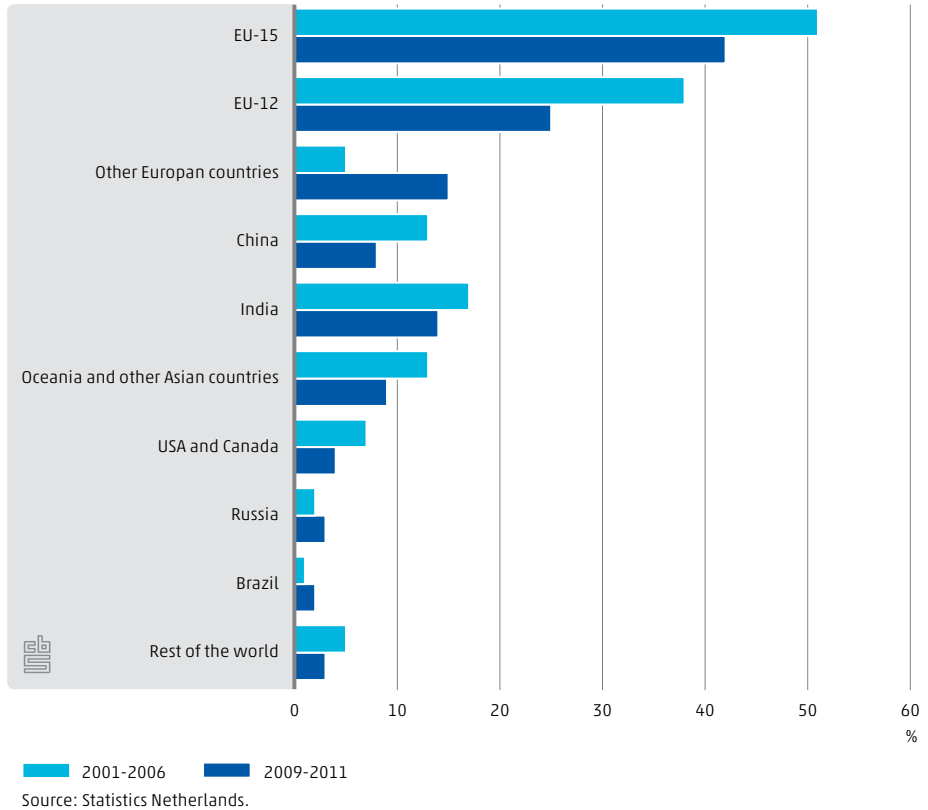
The international sourcing destinations broken down by business functions are presented in table 5.4.7. We see that the EU-15, EU-12 and 'other European countries' were the most important destinations for core business functions in 2009–2011. Support functions were mainly sourced to EU-15 (36 percent), followed by the EU-12 (16 percent) and India (12 percent). Compared with 2001–2006, the EU-12 countries have lost their position as main destination for core business functions. It seems that, in some cases, enterprises preferred the 'other European countries' as destinations for their core business functions. In 2009–2011, the share of these countries in international sourcing of core business functions was 8 percent point higher than in 2001–2006. Since the 'other European countries' is quite a diverse group of countries, it is difficult to identify

reasons for the popularity of these destinations. One could think of lower labour costs in countries like Ukraine, Albania and Turkey. However, other countries in this group have higher labour costs (Norway, Switzerland). Another remarkable observation is that India attracts mainly support functions, while core functions are relatively more sourced to China. This pattern is visible in both reference periods. An explanation for this is that China is probably a more appropriate destination for production activities, while India is more appropriate for services, e.g. because English is the second official language of India (Lacity and Rottman, 2008).

5.4.7   **Destinations of international sourcing, by business function, as percentage of enterprises engaged in international sourcing**

	2001–2006			2009–2011		
	total	core business functions	one or more support functions	total	core business functions	one or more support functions
	%					
EU-15	51	17	42	42	12	36
EU-12	38	27	18	25	10	16
Other European countries	5	1	4	15	9	8
China	13	11	4	8	7	2
India	17	7	11	14	4	12
Oceania and other Asian countries	13	8	7	9	4	5
USA and Canada	7	3	4	4	1	3
Russia	2	1	1	3	1	1
Brazil	1	1	0	2	1	1
Rest of the world	5	4	1	3	2	2

Source: Statistics Netherlands.

Motivations

Table 5.4.8 shows that reduction of labour costs and strategic decisions taken by the group head were the most important motivations for international sourcing in 2009–2011. Reduction of costs other than labour costs came in third place. These were also the most important motivations in 2001–2006. Unfortunately because of a methodological difference between the questions in both surveys (see section 5.3.1) the results of this survey cannot be compared directly with those from the previous one. The lower percentages in 2009–2011 are the result of this methodological difference. However, we see that strategic decisions taken by the group head have become more important over time. This was the only motivation that had a higher frequency than in 2001–2006. Take into account that only daughter enterprises can give this motivation. Note also that it is not a real

motivation. There should be another motivation behind a 'strategical' decision, for example reduction of labour costs.

5.4.8 Motivations for international sourcing, as percentage of enterprises engaged in international sourcing

	2001–2006	2009–2011
	% indicating motivation as important	
Reduction of labour costs	83	69
Strategic decisions taken by the group head	67	69
Reduction of costs other than labour costs	67	51
Focus on core business	42	29
Access to specialised knowledge/technologies	37	18
Improved quality or introduction of new products	31	16
Access to new markets	40	16
Lack of qualified labour	26	13
Less regulation affecting the enterprise, e.g. less environmental regulation	17	6

Source: Statistics Netherlands.

5.5 Conclusions

When it comes to international sourcing, the Netherlands is not among the frontrunners within Europe. Denmark, Finland, Belgium and Portugal reported higher shares in 2009–2011. In the Netherlands, only 9.8 percent of the enterprises with more than 100 employees were active in international sourcing during this period, so the overwhelming majority of 90 percent was not. In 2001–2006 the engagement of the Netherlands was higher (13.5 percent) than in 2009–2011. International sourcing is mainly driven by enterprises in industrial sectors, and these enterprises increasingly source their support functions.

Although the period covered by the second survey was shorter than in the first, there is a big difference concerning enterprise group heads. In 2009–2011 only 4.5 percent was engaged in international sourcing compared to 14.4 percent in 2001–2006. Enterprises that are part of a group are more often engaged in international sourcing, and subsidiaries source much more often than group heads. Subsidiaries with a foreign group head show a much higher sourcing rate than their Dutch controlled counterparts, as they seem to have lower thresholds for moving activities abroad. (see also Bongard (2010) and Fortanier & Van de Ven (2009)).

Enterprises insourced their business activities more often than that they outsourced them. Especially R&D, engineering and related technical services are sourced within the enterprise group. R&D activities are often knowledge-intensive and strategically important for enterprises. Enterprises want to keep these business functions under control and hence not source them to external suppliers. ICT support functions are most likely to be sourced outside the group.

Proximity is a key factor in sourcing. The EU-countries remained the main destinations for Dutch international sourcing (67 percent) in 2009–2011. However, compared to 2001–2006, the share of sourcing to the European Union declined, while 'other European countries' gained in popularity. Business functions are not massively sourced to far away destinations like China and India. Just as with international trade and foreign direct investments, enterprises seem to prefer nearby destinations.

Reduction of labour costs and strategic decisions taken by the group head were the most important motivations for international sourcing in both 2001–2006 and 2009–2011.

In general the observed differences in international sourcing between the two periods studied are small. The overwhelming majority of the large enterprises is not involved in international sourcing. International sourcing did not start in this century: enterprises may already have sourced activities abroad in the twentieth century. By only studying international sourcing in a certain period, we do not cover the expansion of activities abroad which were sourced in earlier periods. Further research could shed light on this aspect. Another important field for further research is effects of international sourcing on employment and performance of enterprise. Chapter 8 in the 2011 edition of the Internationalisation Monitor already covers this topic (Bongard, 2011), but still some questions remain unanswered.

6.

Regional differences in trade and the impact of location on trade patterns

Authors
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International trade in goods is not merely an activity of enterprises in the Randstad. Limburg and Noord-Brabant are also quite active in trade in goods. Proximity to borders, the presence of mainports, sectoral composition and many other regional characteristics have an impact on the incidence of trading and on the trade portfolio of a region. Limburg and Noord-Brabant, Gelderland, Flevoland and Overijssel are far more likely to trade. Enterprises in Noord-Brabant, Flevoland and Overijssel also enjoy a higher than average trade value, when correcting for province and enterprise characteristics. This implies that there are specific advantages to traders in these regions of which location is one.

6.1 Introduction

When we think of international trade the Port of Rotterdam immediately comes to mind. In 2012, 441.5 million metric tonnes were loaded and unloaded in more than 7 million containers (Port of Rotterdam, 2012). Some 12 percent of Dutch imports and 18 percent of Dutch exports of goods pass through Rotterdam. Amsterdam and the Haarlemmermeer with Schiphol airport, together accounted for another 12 percent of imports and exports in 2012. Even though these cities play a crucial role in Dutch international trade, this is not the entire picture. Other regions also contribute to the Dutch international trade and, in turn, are relatively dependent on international trade for their economic growth (see chapter 7). International trade is not only beneficial for the economy as a whole, but also for individual regions and provinces since it creates employment and higher productivity (Ministry of Infrastructure and the Environment 2013; Dumont et al., 2010).

In the 2012 edition of the Internationalisation Monitor we made a start with breaking down trade information at the national level to the regional level (Braams et al., 2012). One of the main conclusions was that while most of Dutch trade value can be attributed to enterprises in the Randstad, Limburg and Noord-Brabant house relatively the most internationalised firms. In this chapter, we build on this line of research by investigating to what extent the location of a firm contributes to the degree of internationalisation of an enterprise. Some regions are highly specialised in terms of activities, while others are very complementary in terms of buyer-supplier networks and relatedness between industries (Diodato and Weterings, 2012). Such characteristics can influence the extent to which regions are active in trade but it can also determine their trade pattern. Combining this with regional differences in enterprise population and the impact of foreign firms, we

wonder to what extent the region in which an enterprise is located influences its international trade. Is the likelihood of being involved in international trade equal for all regions and can location "add" to trade value?

The outline of this chapter is as follows. Section 6.2 illustrates which data were used to investigate regional difference in trade and trading behaviour. Then section 6.3 continues by providing an overview of Dutch international trade broken down by province. The main trading partners and products traded by provinces are pitted against the general Dutch trade pattern. Regional characteristics such as sectorial specialisation or the prevalence of foreign controlled firms, and the consequences this has for the trade pattern of a region is the topic of section 6.4. In section 6.5 we combine regional and enterprise characteristics in a regression analysis in order to distil a statistical effect of location on the internationalisation of an enterprise. First we test whether location has an impact on the likelihood that an enterprise trades, while controlling for other factors. Second, we want to determine if location also influences trade value when enterprises are otherwise comparable. The chapter is wrapped up with a short summary of the main results and suggestions for further lines of research.

6.2 Data and methodology

In order to illustrate the international trade pattern of Dutch regions, datasets from several sources needed to be combined. First of all, data from the international trade in goods statistic of 2012 was matched to the General Business Register of 2012. We based our analyses and descriptive statistics on 2012 since the results are not likely to vary widely over a short period of time. These actions resulted in a dataset with information at the level of the enterprise, including their characteristics such as size and economic activity, whether or not they reported trade in 2012 and if so, the countries with which they traded and the products that were traded.

To determine the exact geographical location of the trader, this dataset of enterprises was disaggregated even further, to the level of the local business unit. In most cases, an enterprise is small and consists of one local business unit. If an enterprise is made up of more business units, these are very often located in the same province. In those cases where the business units are spread over several provinces, respective trade values were assigned according to size and sector. The analyses in this chapter are based on the level of the province, in order to avoid too much data manipulation.

Foreign control is also an enterprise characteristic with a significant impact on the likelihood of trade and its trade pattern (Jaarsma and Lemmens-Dirix, 2010). Even though only roughly 5 percent of trading enterprises are foreign controlled, they carry out approximately half of the imports and exports. We determined whether a business unit is foreign controlled further up the chain of command based on the concept of UCI. Foreign controlled enterprises are not evenly spread across the Netherlands. They are relatively often found in the Randstad area and other large cities in the Netherlands. As such, we expect to see that regions where there is a relatively large concentration of foreign controlled enterprises more trade is carried out by such firms. All these efforts resulted in a dataset comprising more than 1.7 million business units of which almost 400,000 business units belonged to enterprises with international trade in 2012. This dataset was used to make our descriptive statistics.

In order to statistically assess the impact of geographical location on internationalisation and determine whether there are regions where enterprises are more likely to trade and have large trade values, we added extra enterprise information to the dataset. We want to control for characteristics that also influence trade and/or trade size to somewhat isolate the effect of location on likelihood and size of trade. For each business unit we determined its main trading partner as well as its main product traded. This allows us to compare traders in terms of orientation with respect to country and product. Additionally, we included the number of jobs at a business unit in the analysis. This provides an additional indication of firm size (a business unit can be small but can be part of a large enterprise, which could have an impact on its degree of internationalisation). Lastly, we added turnover to the dataset.

6.3 Descriptives on international trade in goods by province

Overview of international trade in goods by province

Table 6.3.1 provides an overview of the Dutch international goods trade per province in 2012. As is to be expected, the provinces where the mainports Rotterdam and Schiphol are located have the most international commodities trade. Areas where important transport hubs and mainports are located are very important to the local economy due to their contribution to employment and to

the infrastructure that surrounds these transport routes, which attracts additional entrepreneurial activity.

With the Port of Rotterdam as its mainport, the province of Zuid-Holland is the largest trader in the Netherlands. In 2012, the import value of goods topped 95 billion euros and exports exceeded 78 billion euros. Noord-Holland is the second largest trader, with almost 57 billion euros in imports and almost 63 billion in exports. Drenthe, Friesland and Flevoland are the provinces with the lowest amount of international trade.

Table 6.3.1 also shows that there are significant differences in the incidence of trading. In some provinces establishments are more active in international trade in goods than in others. Limburg is the province with relatively the most international traders in its population of local business units, namely 40 percent in 2012. This concurs with the findings of the 2012 Internationalisation Monitor. The lowest share of traders is found in Friesland where less than one in five establishments engages in international trade in goods. Zuid-Holland and Noord-Holland both have a below average share of traders but a high trade value as some traders are very large.

6.3.1 International trade in goods per province, 2012

Province	Share of traders	Import value	Export value
	%	million euros	million euros
Drenthe	24	2,359	3,695
Flevoland	23	4,783	4,710
Friesland	19	3,122	4,254
Gelderland	26	20,597	23,026
Groningen	22	6,988	14,849
Limburg	40	22,061	23,929
Noord-Brabant	30	46,582	56,242
Noord-Holland	22	56,798	62,959
Overijssel	29	12,305	18,254
Utrecht	21	17,236	13,720
Zeeland	33	5,568	7,203
Zuid-Holland	23	95,417	78,457
Total	25	293,816	311,298

Source: Statistics Netherlands.

An important issue to keep in mind is that trade is not necessarily synonymous with value added and economic growth. The bulk of commodities enters and leaves the Netherlands at some border point, but these goods are not all destined for that region nor are they always produced there. For instance, products that are exported

via Rotterdam could very well be produced in Noord-Brabant, with value added and employees in that region. Chapter 7 digs deeper into the regional distribution of the value added due to international trade.

Trading partners

Graph 6.3.2 shows the composition of provincial trade in terms of main trading partners. Germany has been the main trading partner for the longest time. This also holds true at the provincial level. The only exceptions are Zeeland, Groningen and Noord-Holland where Belgium, Norway and the US are the most important sources of goods respectively. Imports from China are very important for Noord-Holland and Flevoland, while Belgium is very important for traders in Limburg and Noord-Brabant. Groningen is somewhat of an outlier with respect to its trade pattern. For imports it relies heavily on mineral products from Norway as is shown in graph 6.3.2. Its exports consist mainly of mineral products and natural gas, which is largely supplied to other EU countries. Almost 40 percent of its exports go to Germany.
There is less diversification in provincial exports. Across the board, Germany is the most important destination of Dutch exports, followed by Belgium, France and the UK. Remarkable is the relative importance of other countries for Friesland. Middle-eastern countries are well-represented in the exports of Friesland, especially in the exports of food and live animals.

Products traded

Figure 6.3.2 also shows the composition of provincial imports and exports in terms of products (on SITC 1-digit level). The full definition of the SITC categories can be found in the glossary at the end of this publication. In general, machinery and transport equipment (SITC 7), mineral fuels (3) and chemicals (5) are the most important products traded by the Netherlands. This is also the case for most provinces. However, some provinces diverge significantly from this pattern.
As mentioned, the imports and exports of Groningen mainly comprise mineral fuels (3), namely 60 percent of imports and 74 percent of exports. For Zuid-Holland, mineral fuels (3) are also relatively important. The presence of large storage units for fuel, oil and derivatives makes it possible for Zuid-Holland to trade large amounts of these products.
Chemical products (5) are important to the trade portfolio of Limburg, Overijssel and Zeeland. In these provinces, the chemical sector plays an important role in the local economy (as shown in 6.4.2) and as such this obviously also shows in the

international trade of these provinces. The exports of the three Northern provinces, Groningen, Friesland and Drenthe as well as Gelderland and Zeeland consist for a relatively large amount of food and live animals (0).

Summing up, figure 6.3.2 shows that trade partners and product portfolio vary between provinces due to specific specialisations and the presence of resources.

6.3.2 Composition of trade by partner country and SITC, 2012

Imports per partner country

Exports per partner country

Legend:
- Belgium
- China
- France
- Germany
- Italy
- Norway
- UK
- US
- Other
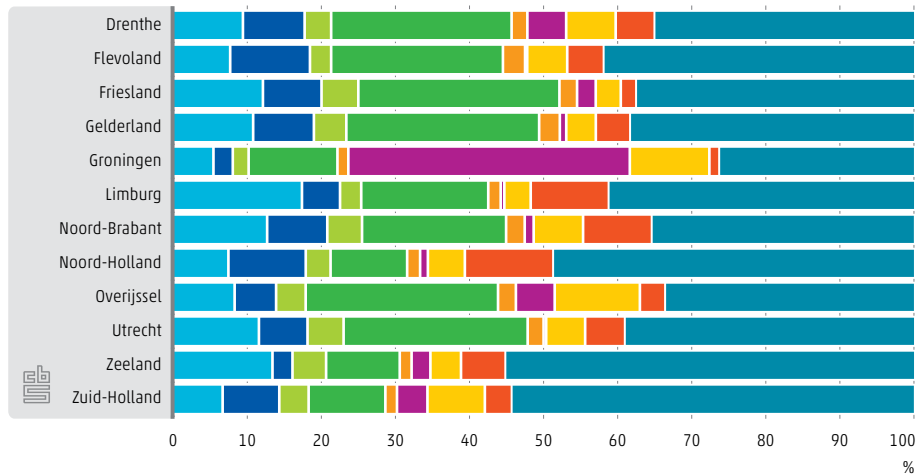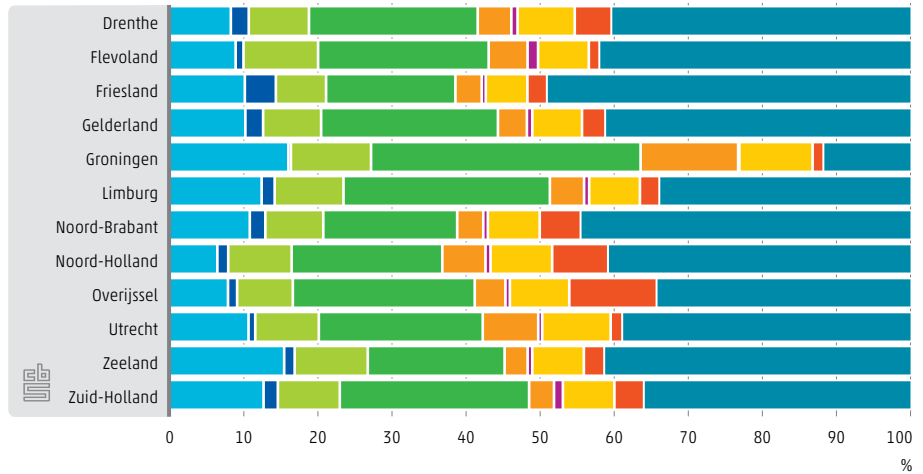
Source: Statistics Netherlands.

6.3.2 Composition of trade by partner country and SITC, 2012

Imports per SITC
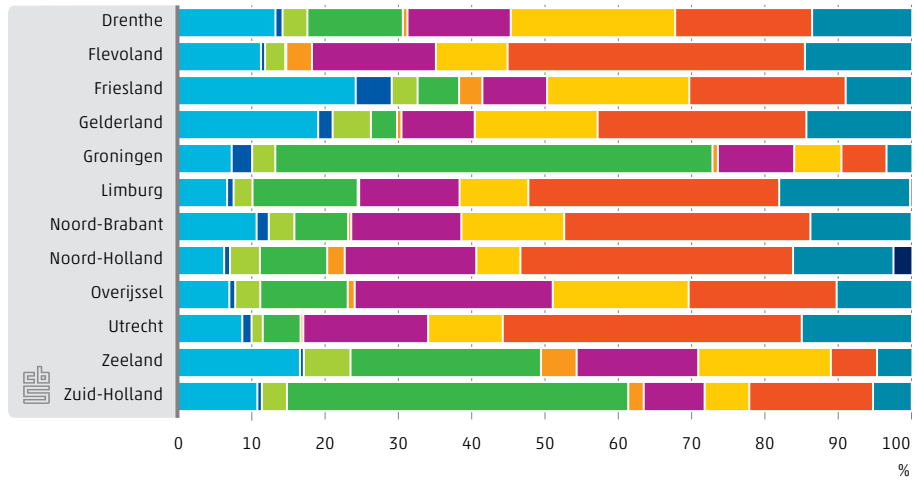
Exports per SITC
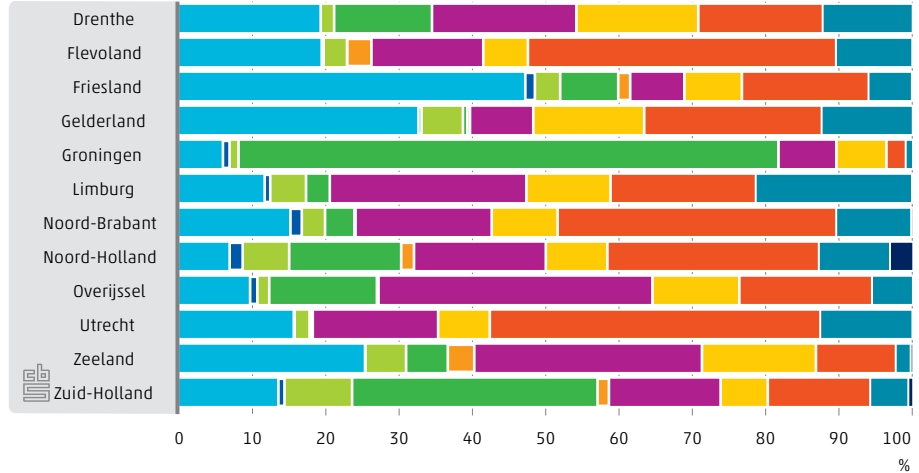
Source: Statistics Netherlands.

6.4 Characteristics of regions and their impact on trade patterns

The previous section provided an overview of the international trade pattern of Dutch provinces. In this section the characteristics of the trading enterprise, such as its size and locus of control, as well as its economic activity, which is also related to its location, are taken into account when illustrating trade flows.

Enterprise size

Graph 6.4.1 shows the concentration of Dutch trade by size of the local business unit. Size is measured in terms of employees. When a business unit has fewer than 250 employees it is characterised as a small or medium sized enterprise (SME). The province's colour in graph 6.4.1 shows to what extent business units with trade are SMEs or large. The darker the colour of the province, the larger the share of traders that are small or medium-sized. With respect to trade *value*, the two numbers in each province represent the share of a province's import value and export value that is carried out by SMEs. The black numbers shows the share of the province's export value that is carried out by small or medium-sized local business units. The white figures do so for imports.

International traders in Groningen, Drenthe and Limburg are relatively often large in terms of employees. Additionally, in Groningen the bulk of trade is carried out by large enterprises, only 37 percent of imports and 22 percent of exports are carried out by SMEs. This makes Groningen the province where large traders are most abundant (3.5 percent) and where they are responsible for the largest share of trade. Despite the relatively high share of large business units in the trader population, SMEs in Limburg and Drenthe carry out the bulk of trade in these provinces.
In Utrecht and Noord-Holland the role of small or medium sized enterprises in trade is relatively important. These provinces have the largest share of SMEs in their trader population. In addition, between 72 and 82 percent of trade is by business units employing fewer than 250 employees.
In Gelderland, Friesland, Zuid-Holland, Zeeland and Noord-Brabant the role of SMEs is also quite large, both in numbers as in trade value. In Zeeland, however, the share of trade carried out by SME business units is relatively low, which implies that the majority of traders are SMEs, but that a few very large business units dominate trade value.

6.4.1 Share of SME enterprises, imports and exports by SMEs, 2012

Share of enterprises

- 96.42 to 96.70%
- 96.71 to 96.95%
- 96.96 to 97.15%
- 97.16 to 97.35%
- 97.36 to 97.60%
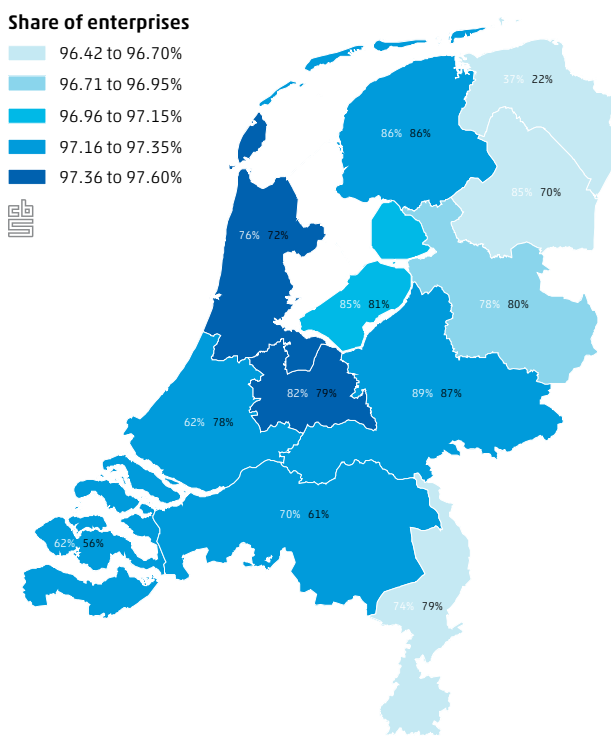
White numbers depict import value share by SME.
Black numbers depict export value share by SME.

Sector of activity

Another characteristic of the business unit that can vary is the sector in which
it is active. Since economic activity is intertwined with the region in which the
enterprise is active, it is difficult to separate the regional effect from the sector
effect merely by showing a descriptive picture. For instance, manufacturing is
a relatively important activity for enterprises in the Northern regions, Noord-
Brabant and Limburg, while Noord-Holland, Utrecht and Zuid-Holland are relatively
specialised in services (Diodato and Weterings, 2012). In section 6.5 we will tackle
this issue by entering both variables into the analysis.

The left side of graph 6.4.2 shows the sectoral composition of provinces in the
Netherlands while the right side shows the export value that can be attributed to
these sectors for 2012. Most business units in the Netherlands are active in retail
or services. Services are especially well represented in Utrecht, Noord-Holland
and Zuid-Holland. However, these sectors play only a minor role in international

trade in goods. For instance, Utrecht has the largest share of service units, over 54 percent of local units are service units, but the most international trade value is generated by wholesale traders. Utrecht also has the lowest share of manufacturing, construction, transport and retail trade units of all provinces.

As the right side of 6.4.2 shows, the bulk of exports is carried out by business units active in manufacturing (especially in Groningen, Zeeland and Friesland) and wholesale (Noord-Holland, Utrecht and Flevoland). In terms of absolute numbers, these sectors may seem relatively small, but the export value they generate makes them very important.
Logistics plays a relatively large role in the exports of Limburg. In the Northern provinces and Zeeland the manufacturing industry exports relatively a large amount, while the west often exports via wholesale. The manufacturing industry of Noord-Brabant is also relatively active in exporting. This is related to the location of the high-tech cluster/top sector in this region.

6.4.2 Sectoral composition and exports per province, 2012
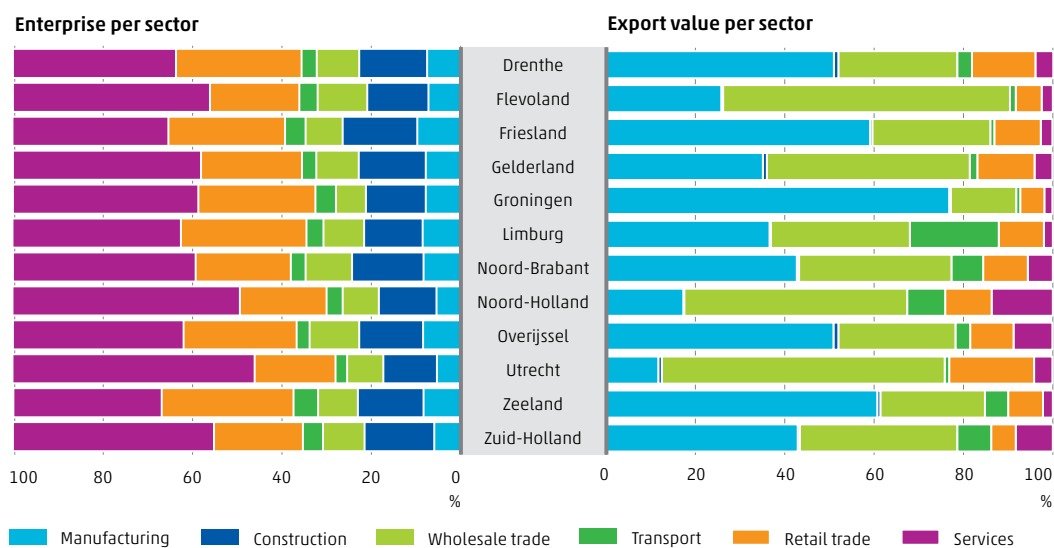
Locus of control

In the Netherlands roughly 50 percent of commodities imports and exports can be attributed to foreign controlled enterprises (see also chapter 13). Graph 6.4.3 shows how the share of imports and exports by foreign controlled firms

varies per province as well as how abundant foreign traders are. In the 2012 Internationalisation Monitor (Braams et al., 2012) we already found that Limburg has the highest concentration of foreign controlled business units. This is reaffirmed as graph 6.4.3 shows that the share of foreign owned business units is highest in Limburg (almost 3 percent) As such it is not surprising that the role of foreign controlled firms in the trade of Limburg is relatively high. Friesland and Groningen have the lowest share of foreign controlled enterprises. In terms of import value, foreign controlled firms are responsible for 70 percent of imports in Limburg, while in Groningen and Friesland this share is respectively 12 and 25 percent. Groningen and Friesland also have the lowest share of exports by foreign controlled enterprises, but Noord-Holland surpasses Limburg with 62 versus 58 percent.

6.4.3 Trade by ownership per province, 2012

Share of enterprises in foreign ownership

1%								3%
FR		GR DR GE	OV ZE UT	ZH FL NB	NH		LI	

Share of import value for foreign owned enterprises

10%							70%
GR	FR	DR GE OV ZH	NB FL	ZE UT NH		LI	

Share of export value for foreign owned enterprises

10%						70%
GR	FR	GE	DR ZH NB	FL OV UT&ZE	LI NH	
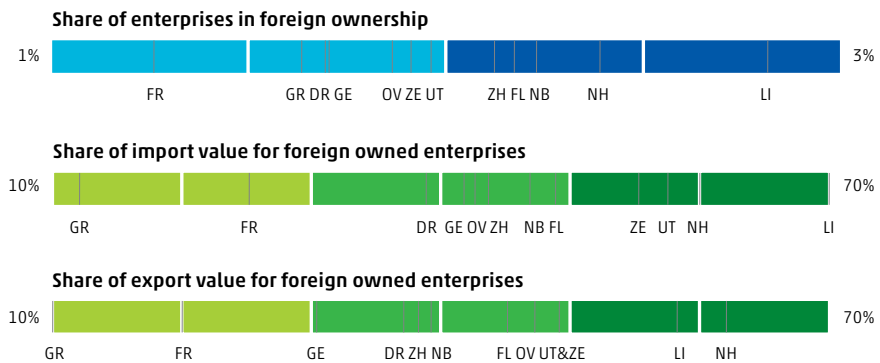
70% of goods imports in Limburg are by foreign controlled enterprises

6.5 The impact of the region on trade

The previous paragraphs illustrated the regional differences in Dutch international trade in terms of partner country and product. We also described the impact of structural and regional characteristics such as sector, enterprise size and presence of foreign enterprises on trade patterns. From these paragraphs clear patterns emerge with respect to specialisation and idiosyncrasies of provinces and regions, i.e. natural gas dominates trade in Groningen, relatively much trade by manufacturing enterprises in the North, relatively much trade by services in the middle and western part of the country, the highest absolute trade value in the west, foreign controlled enterprises important in the trade of Limburg and Noord-Holland. Now we want to isolate the effect of location on the propensity of trade and trade size. When otherwise similar enterprises are located in different parts of the Netherlands, does this have an impact on likelihood of trading and trade value? Formulated differently, is an enterprise in the North less likely to engage in trade than an enterprise in the South of the Netherlands when both enterprises are otherwise comparable? Are there regions in which otherwise similar enterprises are more likely to trade than others? And if so, does it also contribute to the size of its trade flow? Obviously, we have to take into account the heterogeneity between provinces that we observed in the previous paragraphs.

Impact of the region on the probability of trade

First we tackle the question whether, all else being equal, establishments in some regions are more likely to export or import than establishments in other regions. In order to answer this question, we ran a logistic regression in which the occurrence of exports (imports) was the dependent variable. The independent variables were the sector of economic activity, size of the enterprise to which the local business unit belongs, foreign control, turnover and number of jobs at the business unit and lastly the province in which the business unit is located.
Graph 6.5.1 shows the results of this logistic regression. All independent variables are extremely significant and the Nagelkerke R^2 in our model is high for exports and imports, respectively 39 and 38 percent. Provinces in which the probability of trading is above average are depicted darker than those where the likelihood is below average. As it turns out, the province in which a business unit is located definitely contributes to the probability that it engages in trade. All else being equal, firms in the southern and eastern provinces are more likely to export than enterprises in the northern or western provinces. This corroborates the results of the previous Internationalisation Monitor (Braams et al., 2012), namely that

especially the southern and border regions of the Netherlands are relatively internationalised. This is especially the case for Limburg where a local unit is 2.5 times more likely to import or export than a local unit in Friesland after adjusting for relevant factors. Drenthe is the only province that has an above average share of traders before correcting and a below average share after correction. This is mostly due to the overrepresentation of large enterprises in Drenthe (3.5 percent, second after Groningen) and a relatively low share of enterprises active in services. The same results were found for both the imports and exports analyses, so only one graph is displayed in 6.5.1.

6.5.1 Is the probability of trading above or below average? (2012)
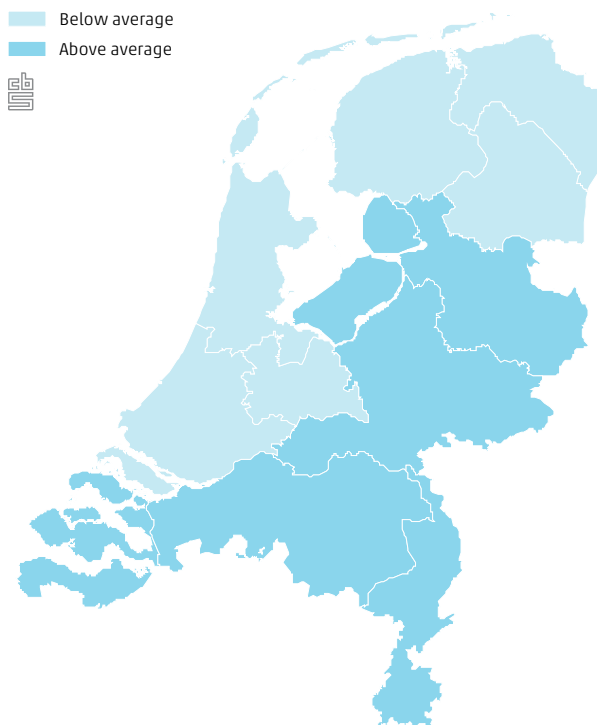
Impact region on size of trade flow

The second question we posed was whether location impacts on the size of trade. In order to answer this question we used ANCOVA techniques to determine the impact of location on export value (import value). As before we controlled for sector of economic activity, size of the enterprise to which the local business unit belongs, foreign control, number of jobs at the business unit and the province.

Turnover was not included in this analysis as it correlates highly with import and export values. Additionally the type of trader (import only, export only or two-way trader) was included as well as main trading country and product. These variables all control for the type of trader that an enterprise is and therefore could not be used in the logistic regression, as these will predict trade perfectly.

The results of these ANCOVA analyses are shown in graph 6.5.2 and table 6.5.3. If being located in a certain province causes the export (import) value to be above average after controlling for size, sector, foreign control, etc. the province is depicted darker. Again, location matters and apparently there are regional advantages for traders. These could be all sorts of advantages, ranging from proximity to borders or mainports, agglomeration or cluster advantages, benefiting from a knowledgeable workforce or (foreign) knowledge workers. Such an analysis would be interesting to conduct in the future.

In Groningen, Friesland, Zeeland and Utrecht the import and export value is lower than for the average firm with similar characteristics in other provinces. In Noord-Holland, Noord-Brabant, Overijssel and Flevoland the trade value of firms is above average. Interestingly Limburg, relatively the most internationally oriented province, has the lowest corrected import value. This may be due to the fact that importing is a more incidental activity for establishments in Limburg than exporting. One could argue that due to the shape and location of Limburg, incidental importing i.e. buying supplies from foreign neighbouring enterprises is more common than for establishments in other provinces.

As table 6.3.1 showed, Zuid-Holland is by far the largest trader, followed by Noord-Holland and Noord-Brabant. However, the results of the ANCOVA show that Zuid-Holland isn't the province with the highest average import value. After correcting for trader and enterprise characteristics, the average import value is below average. This apparent paradox can be explained by the fact that imports in Zuid-Holland are dominated by a relatively small group of very specialised traders creating the bulk of imports, the great majority still being small traders. Similar enterprises in Gelderland and Overijssel, importing the same products from the same countries, have a larger average import value than firms in Zuid-Holland. It may be that the barriers of international trade are more difficult to overcome in these provinces, and that only larger and more productive enterprises can pass them.

For Friesland one might expect the average trade value to increase as we have controlled for foreign ownership (smallest share in Friesland) and trade status. Nonetheless Friesland remains the province where the export value is the lowest and the import value is the second lowest.

6.5.2 Is the import or export value above or below average after correction? (2012)

Import value

Export value

- Below average
- Above average
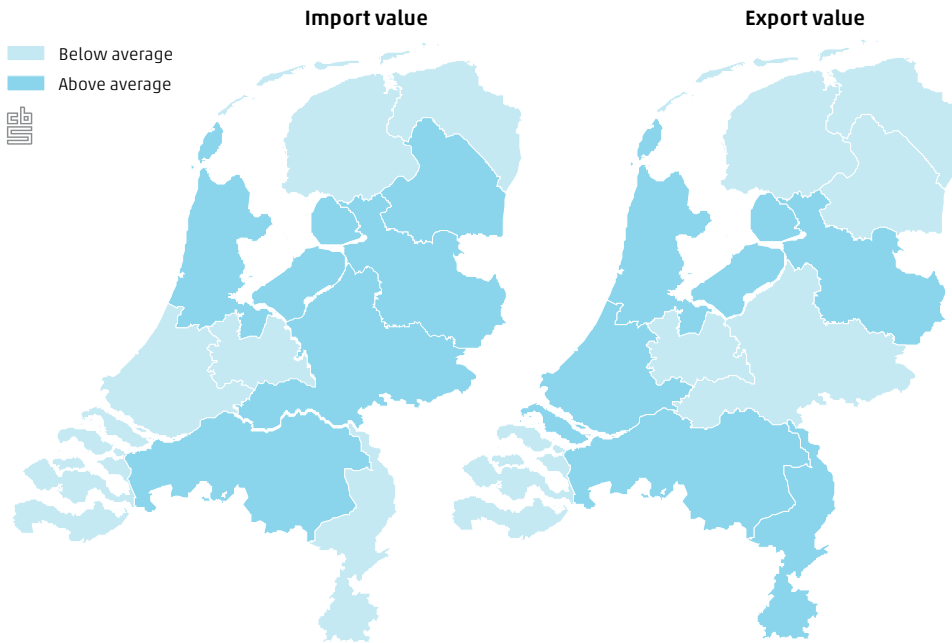
6.5.3 F-values and significance from the ANCOVA model on import and export value

	Import value	Export value
Corrected Model	1,483***	1,664***
intercept	32,497***	28,418***
province	3**	6***
sector	2,527***	840***
size class	1,912***	3,333***
UCI	1,351***	347***
type of trader	7,266***	428***
main country	919***	1,334***
main product	171***	87***
employees	10,621***	9,787***
R^2	0.455	0.531

The asterisks ***, ** and * indicate significance at the 1, 5 and 10 percent level.

Evaluating the model in 6.5.3 some things are noteworthy. First the R^2 of both models are high, as the model explains 53 percent of the variation of export value between enterprises and over 45 percent of the variation in import value. In this study we assume that the variation left after correction is due to other, unobserved,

regional characteristics e.g. cultural customs, language skills of the population, or the presence of a cluster. An agglomeration or cluster of enterprises provides urbanisation and location benefits to the enterprises in the cluster, making them more productive and innovative than other enterprises. Examples of such benefits are e.g. proximity to buyers and suppliers, the presence of universities or research facilities but also the more densely populated cities and towns (Raspe et al., 2012). In this case location has more influence on the import than on the export value as the F-value is larger.

Province has a significant influence on the trade value, but it certainly doesn't explain most of the variation in trade values. The variable explaining most in this model is the number of employees, which indicates the size of the business unit. For imports international embedding by means of a foreign parent company is a more important explanatory variable than for export value. This is understandable as enterprises that merely import quite often resemble non-traders (Jaarsma and Lemmens-Dirix, 2010) and are very dissimilar from two-way traders and foreign controlled enterprises.

6.6 Conclusion

The previous paragraphs have shown that there are substantial differences between provinces with respect to main trading partner, main trading product, distribution of size, sector of activity and locus of control. Even after taking these differences into account, the location of a business unit most certainly has an influence on its likelihood to trade and its value of international trade.

For the likelihood the regression yields similar results as the share of enterprises that import or export per province: adjusting for several characteristics doesn't change the general picture. Most local business units are international traders in the south-east of the country and particularly in Limburg. The lowest share of international traders is found in the north-west. Enterprises in Friesland have the lowest odds of being a trader, they are 2.5 times less likely to be active in international trade as are enterprises in Limburg.

In terms of value, differences arise after correcting for several characteristics. Zuid-Holland is by far the largest trader, followed by Noord-Holland and Noord-Brabant. However, looking at the results of the ANCOVA Zuid-Holland isn't the province with the highest average import value. After correction, the average import value in Zuid-Holland is below average meaning that similar enterprises in Gelderland,

Noord-Brabant or Overijssel, have a larger average import value than firms in Zuid-Holland. This apparent paradox can be explained by the fact that imports in Zuid-Holland are dominated by a relatively small group of highly specialised traders creating the bulk of imports.

Interestingly the lowest average (corrected) import value is found for Limburg. We suspect this is partly due to the large number of local business units in Limburg that are involved in international trade in commodities (40 percent) and the location of Limburg. The threshold to trade in Limburg is low as neighbouring countries are close by and so more enterprises will import only small amounts from Belgium or Germany, explaining the low average corrected import value. For exports this is not the case, as apparently more enterprises have specialised in exporting their products abroad than enterprises that only benefit from incidental exports.

Another odd duck is Groningen. International trade in Groningen is mainly done by large enterprises, 63 percent of imports and 78 percent of exports. Groningen mainly trades in natural gas with imports coming from Norway and exports largely going to Germany. After correction, Groningen has a below average incidence of international traders, import value and export value. But the least successful province in terms of international trade in commodities is Friesland. Although the absolute trade value of Friesland is larger than that of Drenthe and even though Groningen has a smaller share of exports done by foreign controlled enterprises, Friesland surpasses both after correction.

Noord-Brabant, Overijssel and Flevoland are the three provinces that score above average in all three analyses. Their likelihood of trading as well as the average trade value is above average when correcting for regional and enterprise characteristics. This implies that there are specific benefits to traders in these provinces, one of which is their location.

In general looking at the influence of location after correcting for trade and enterprise characteristics has provided new insights in the patterns of trade and trade value. The absolute trade value of a province is not necessarily a good predictor for the average trade value of an individual enterprise. Enterprises in provinces with a high absolute trade value (e.g. Zuid-Holland) are not necessarily the enterprises with the highest average trade value. Neither is the absolute number of traders indicative of a high likelihood of trading. In Noord-Holland there are many international traders, but the likelihood of trading is lower than in e.g. in Limburg.

7.

Regional differences in export dependency

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International trade in goods contributes significantly to Dutch economic growth. However, the impact of trade on regional growth differs substantially. Taking into account the value added created in the production of exports, provinces with relatively few direct exports still turn out to be relatively dependent on production for exports for their economic growth.

7.1 Introduction

"Trade and foreign investments are crucial. Crucial for our jobs and our growth."
Lilianne Ploumen, Minister of Foreign Trade and Development Cooperation

International trade is beneficial to the economy as it gives enterprises opportunities to expand to new markets and to profit from economic growth abroad. Exporting firms are more productive (Bernard et al, 2007; Wagner, 2005), generate more turnover (Jaarsma and Lemmens-Dirix, 2010), have more knowledge workers on their payroll (chapter 10) and pay higher wages (Genee et al. 2010). As such exporting is actively stimulated by the Dutch government with programmes like Starters in International Business and Partners in International Business.

Many studies established the importance of exports for the Dutch economy. For example, Kuypers et al. (2012) concluded that the exports of goods and services are responsible for about 30 percent of Dutch GDP. In Chapter 2 we show that the share of value added due to exports in total Dutch value added slowly rose during 1995–2011. The chapter also shows that the contribution of exports to total value added is higher in the Netherlands than in most countries. In short, the exports contribute a great deal to our economy, their contribution has grown over time and is relatively high compared to other EU countries.

In chapter 6 we showed that some Dutch regions are more active in trade than others. As exports are not equally distributed over the Netherlands it also seems obvious that the share of exports in Gross Regional Product (GRP) will also differ per province. But to what extent do exports influence the regional economy? Are provinces with relatively large exports automatically more sensitive to fluctuations in foreign demand or do we need to look beyond the absolute export values? An example of how exports affect economic growth was given by the latest regional economic growth figures. All provinces but Zeeland saw the volume of their GRP decrease in 2012. The accompanying press release (Statistics Netherlands, 2013b)

highlights how Zeeland's extensive chemical industry profited from the growing exports and was responsible for economic growth in this province.

We try to shed some light on these issues by adopting two different ways of looking at the contribution of exports to the regional economy and at how dependent and intertwined provinces are with international trade. We will limit ourselves to the exports of goods as data on exports of services is non-existent. In the following sections we will first look into the data used in this chapter (7.2). Then 7.3 illustrates the development in provincial export value for 2002–2012: where are the most exports and in which regions did exports grow in the past few years? In section 7.4 we divide these regional export figures into Dutch manufactured products and re-exports and use this distribution to estimate the value added of the direct exports per province. This is our first method to gauge the impact of trade on the regional economy and will be referred to as the 'export value approach'. This approach is based on the assumption that the value added of export is created in the province that ultimately exports the goods. However, since the exported commodities are often not completely produced in the province that exports them, we introduce the 'value chain approach' in section 7.5. This approach takes into account that other provinces also can contribute to the value added of a province's export. Combining both methods allows for a more realistic analysis of the impact of trade on GRP, regional economic growth and vulnerability to worldwide shocks. Section 7.6 shows the contribution of the export to the economic growth for each province. The chapter ends with conclusions and suggestions for further research.

7.2   Data and methodology

As we look at regional value added from the 'export value approach' and the 'value chain approach' we needed to make two different datasets. For the 'export value approach' a new regional dataset on international trade in goods was constructed. At the base of the time series and the distribution used in paragraph 7.3 and 7.4 lies the 2002–2012 international trade in goods data. This data includes the value of the trade per VAT-id and per year and whether it concerns exports of goods produced in the Netherlands or re-exports. In order to obtain regional trade data a match was made with the address, specifically the postal code, used by this VAT-id for tax declarations. The choice was made to ignore changes in the addresses over the years for each VAT-id. The main reason for disregarding these changes is that they tend to be merely administrative changes rather than real relocations.

Table 7.2.1 depicts the decision tree that was followed in the determination of an address for VAT-ids.

7.2.1 Steps followed in determining an address per VAT-id

	Rule	Solution	Share of VAT-id's
			%
Step			
1	Most recent VAT address is not a PO-box and is a valid Dutch address	Use last VAT address	78.53
2	A previous VAT address is not a PO-box and is a valid Dutch address	Use the most recent valid VAT address	19.75
3	There is a valid VAT PO-box address	Use PO-box address	0.05
4	The administration of the international trade statistics contains a valid Dutch address for this VAT-id	Use the address from the ITS	0.78
5		There is no valid Dutch address for this VAT-id	0.95

Since all regional data in this chapter is grouped per province it is relevant to comprehend how often ignoring the changes in address could lead to a possible misrepresentation of the province. This is shown in table 7.2.2, which illustrates that 82 percent of the VAT-id's (representing 77 percent of total exports in 2012) only had addresses in one province between 2002 and 2012. Roughly 17 percent of all VAT-id's had a change in address across the provincial border.

7.2.2 Effects of ignoring changes in address over time

	Share of VAT-id's	Share of export value in 2002	Share of export value in 2012
	%		
Sort			
no address	0.95	4.66	6.65
all addresses in same province	81.71	69.53	76.76
multiple provinces over time	17.33	25.81	16.68

This regional export data is used to compute the value added generated by the exports of a province according to the 'export value approach'. The second step in our analyses (paragraph 7.5 and 7.6) looks at the value added from exports by taking into account the value chain preceding exports. This approach aims to yield the value added from the export of a province by determining to what extent the export products also originate in this province. The value added of exporting is calculated using macro data from the National Accounts. The steps in

the calculation are not difficult in themselves, yet it is a time-consuming process. We have divided the process into four parts; 1) Determining the total production per industry for exports, 2) subtracting the imports used to make this production, 3) allotting the amount of production for exports to each regional industry and last 4) calculating the amount of value added of the production for export per regional industry.

1. First the total production for exports was derived from the input-output tables (in basic prices) of the National Accounts. These tables contain, among others, the intermediate deliveries between industries and the contribution of industries to final demand (consumption, investment, exports). Next the total value chain was constructed by taking the final exported products and step by step determining the supplying industries (and the suppliers of the suppliers and so on). Using standard input-output techniques it is easy to calculate how much the supplying industries must produce for one euro of exports by the industry they are producing for. Adding all steps of this value chain together yields how much all industries should produce for the exports of every industry. This is their production that is used for exports. It can be direct production (to be exported immediately) or indirect production for exports (when it concerns intermediates that are used in the process to be used for exports).

2. The input-output tables also show how much imports an industry needs in order to produce one euro of exports. Then the value added of one euro of exports of "Made in Holland" is one minus these imports. Similarly, the value added of one euro of re-exports is one minus the imports necessary for these re-exports. Using methods described by Kranendonk and Verbruggen (2011), Kuypers et al. (2013) calculated for 2009 that one euro of "Made in Holland" added 58.5 cents to the Dutch economy, and one euro of re-exports added 7.4 cents to the Dutch economy.

3. Dividing production for exports by total production for every industry yields the share of production for exports. We use this export share per industry for all provinces alike, thus ignoring part of the heterogeneity between provinces. Not all industries are evenly distributed over the provinces, i.e. in one province the chemical sector is well-represented while in another the food sector is very important. So when we multiply the regional production of each industry with its calculated export share, the share of production for exports will be different between provinces: provinces with industries that produce a lot for exports will have higher shares of production for exports than provinces with industries that do not produce much for exports.

4. In the last step we use data from Regional Accounts on value added created by industries per provinces to derive the value added by industry by province. For example, in 2010 the value added created by manufacturing in Noord-Brabant was 14,647 million euros. From the previous calculations it followed

that 67.79 percent of production by the manufacturing industry was for exports. Then the value added thanks to producing for exports by the manufacturing industry in Noord-Brabant is 14,647 * 0.6779 = 9929 million euros. The total value added due to production for exports in a province is the sum of the value added of the production for exports for all industries. Because the provincial data from Regional Accounts are in current market prices, they can be compared properly to the data from the trade statistics. These are also in current market prices.

In paragraph 7.6 we compare the value added of exports to the Gross Regional Product per province. The Gross Regional Product is calculated in the Regional Accounts of Statistics Netherlands. We chose to use the GRP at market prices. It is common use to use GRP in constant prices as it depicts the economic growth between two periods better. However, our aim is to compare international trade data with the GRP and those data are also in market prices. The economic growth between the years 2008, 2009, and 2010 thus includes price changes.

7.3 Exports per province

Figure 7.3.1 shows the development of the export value of goods per province for the years 2002–2012. In recent years Zuid-Holland had the largest export value. This is mainly due to a unique 10 billion euro growth in export value for the last three years. Noord-Holland had the largest export value over the 2002–2010 period and also saw its export value increase in the last three years, albeit modestly. These provinces have the two Dutch mainports, the Port of Rotterdam in Zuid-Holland and Amsterdam Airport Schiphol in Noord-Holland, which of course handle a large share of Dutch exports. The third largest exporter is Noord-Brabant with its strategic position and easy border crossings to Belgium and Germany. Nonetheless Noord-Brabant has fallen a bit behind Zuid en Noord-Holland in recent years. The provinces with the least exports, Friesland, Drenthe, and Flevoland have no main seaport or airport nor any main highway crossing the border. At first glimpse it appears that benefitting from international trade hinges mainly on locating near mainports or borders.

7.3.1 Export value per province, 2002-2012

billion euros
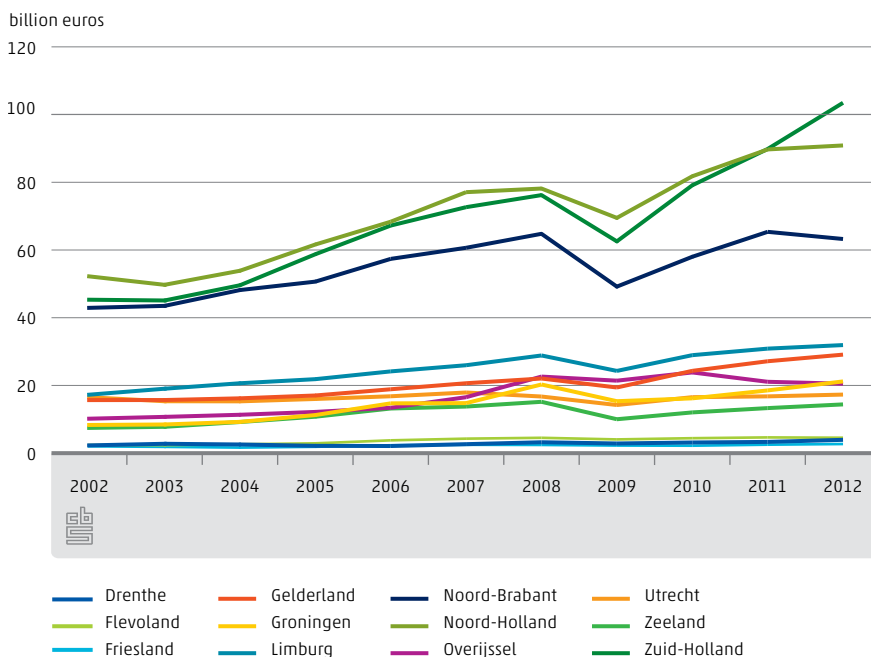
Figure 7.3.2. shows the average annual export growth per province between 2002 and 2012. Groningen has the biggest increase in export value between 2002 and 2012 with an annual growth of over 9 percent resulting in a total growth of over 150 percent in a decade. The main reason is the dominant role of the natural gas exports in the economy of Groningen. The price per unit of natural gas has risen sharply over ten years[1] which shows in the Groningen export figures (Statistics Netherlands, 2012e). Figure 7.3.2 also shows that Friesland en Utrecht have the least export growth in this decade. Utrecht lags behind with only a 5 percent growth over the entire period, which is an annual growth of 0.5 percent. This might seem surprising for the fifth largest economy of the Netherlands, but it can be explained by Utrecht's specialisation in services[2].

[1] Statistics Netherlands, Statline. Table: Consumption and producer prices by energy commodity.
[2] Statistics Netherlands, Statline. Table: Production structure.

7.3.2 Average annual growth of the regional export value, 2002-2012

Legend:
- 0 to 3%
- 3 to 6%
- 6 to 9%
- 9% or more
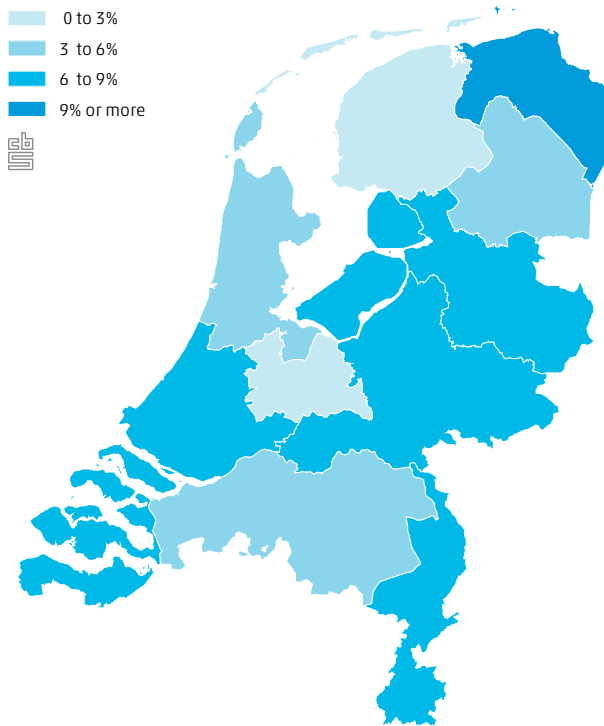
7.4 The value added of exports according to the export value approach

With the absolute export figures of section 7.3 in mind, we now want to illustrate the net contribution of exports, i.e. the value added that is created by exporting goods, to a specific region. A province can have a substantial amount of exports, but this does not necessarily mean that it generates the most value added by exporting. In other words, exports can be more important for one province than for another even if they export the same amount of goods; not every euro of exports yields the same amount of added value. Kuypers et al. (2013) showed that the value added of domestically manufactured export products is significantly higher for the Dutch economy than the added value of re-exported goods. For 2009 they estimated that the average value added of one euro in Dutch manufactured

exports was 58.5 eurocents and of one euro in re-exports 7.4 euro cents. This large difference is not surprising as re-exports are defined as goods transported via the Netherlands, which are temporarily owned by a resident in the Netherlands, without any significant industrial processing. Therefore this requires a lot less labour and capital inputs than Dutch manufactured products.

Note that we use a rough estimate in this section as the composition of the export portfolio was not taken into account. E.g. the added value of products from the mining industry is higher than the added value of industrial products. We will introduce refinements at the industry level in section 7.5. As each method creates insight and the two combined do so even more, we choose to show both.

Figure 7.4.1 shows to what extent the exports of a province consist of Dutch manufactured products. There is a lot of heterogeneity between the provinces. Groningen has by far the biggest share of domestically produced exports because of the dominant role that natural gas plays in its economy. Of the three biggest international trade provinces only Noord-Brabant exports an above average share of Dutch manufactured products. We will see in chapter 9 (Top sectors) that the top sector 'high tech' in and around Eindhoven plays a major role in this respect. Noord-Holland appears to be relatively specialised in re-exports, with a share of 56 percent of its total exports. In absolute terms, the total export value of Noord-Holland is much higher than the exports of Noord-Brabant, but the export value of Dutch manufactured products of Noord-Brabant was in fact higher than that of Noord-Holland in 2012. Looking back at 7.3.1 and extending the time series with their yearly re-export share (not shown) reveals that a huge growth of re-exports in Zuid-Holland of over 200 percent is the main reason for the more than 100 percent export growth of Zuid-Holland. The export growth of Overijssel, Gelderland and Flevoland was also mainly driven by the growth of re-exports.

Because the share of re-exports in total exports differs per province, this has to be taken into account when estimating the value added of total exports. For each province we multiplied the domestically produced exports by 55 euro cents and the re-exports by 8.5 euro cents (the estimates for the year 2011, since those for 2012 were not yet available). This yields a rough estimate of the total value added of export per province (export value approach).

7.4.1 Distribution of regional exports, 2012

Drenthe
Flevoland
Friesland
Gelderland
Groningen
Limburg
Noord-Brabant
Noord-Holland
Overijssel
Utrecht
Zeeland
Zuid-Holland

0   20   40   60   80   100
%

■ Exports of Dutch manufactured products   ■ Re-exports
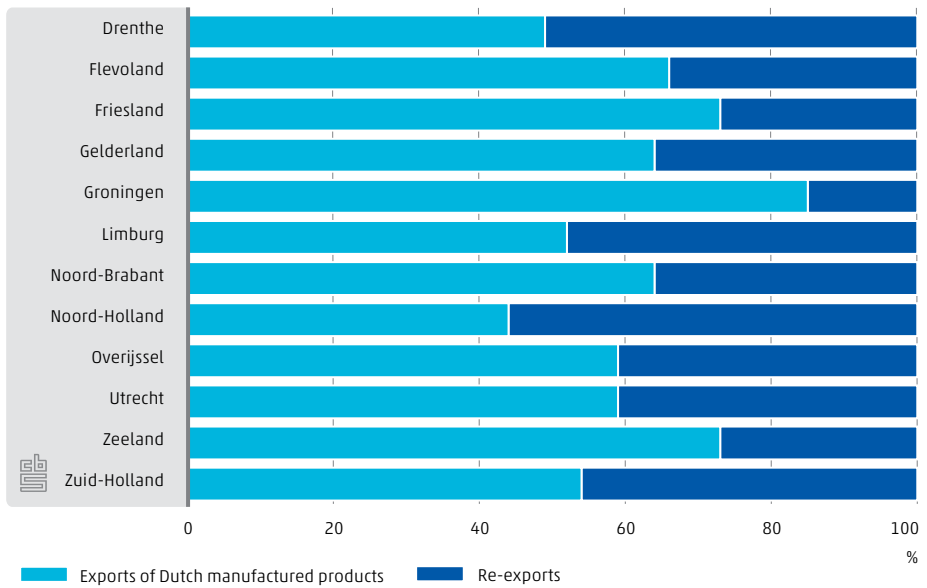
56% of the exports of
Noord-Holland consist of re-exports

Figure 7.4.2 shows the share of each province in total Dutch value added created by exporting. Keeping in mind that Zuid-Holland had the highest export value in 2012 (figure 7.3.1), the pie chart shows that it also had the highest share in Dutch value due to exports. The three provinces with the largest economies, as expected, also have the largest export and the most added value from the export. Note that Noord-Brabant is no longer as far behind to Noord and Zuid-Holland as in 7.3.1. This is due to the 64 percent share of the high value adding Dutch manufactured products in the exports of Noord-Brabant.

7.4.2 Share of province in value added due to exports, 2012
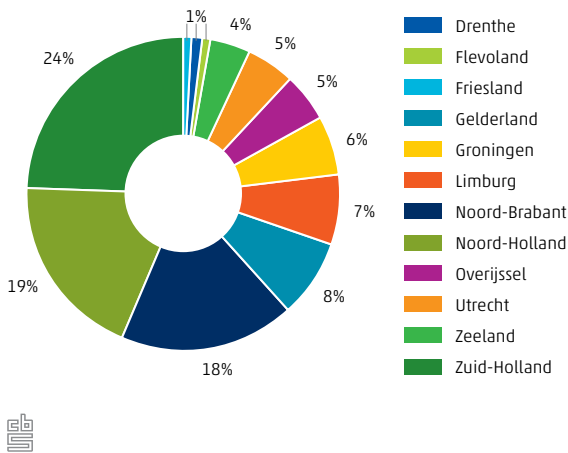
7.5 The value added of exports according to the value chain approach

Almost all products are made in a so-called value chain or supply chain. This means that the final product is the result of a series of intermediate steps in which each step creates added value (see e.g. figure 2.1.1 in chapter 2). If a product is exported by Limburg it does not automatically follow that the added value of that product is completely created in Limburg. Other provinces or even imports may be involved in its manufacturing. E.g. the car parts needed to assemble a new car at Nedcar in Limburg are not exclusively manufactured in Limburg. To estimate the amount of value added a province earns from producing for the exports of goods, it is better to look at the production of goods and intermediate products for goods that will ultimately end up in exports instead of looking at absolute exports. In this value chain approach the value added of exports per province is calculated as described in section 7.2 and shown in table 7.5.1.

The second column of table 7.5.1 shows the value added per province of production destined for exports. According to the value chain approach, Zuid-Holland again creates the largest absolute amount of value added by export production. However, Noord-Holland is now surpassed by Noord-Brabant in terms

of value added. This implies that a large share of the production of export goods takes place in Noord-Brabant.

The third column shows the value added generated by re-exports per province. The provinces that are active in re-exporting (see 7.4.1) also have a large amount of value added from re-exports (Noord-Holland and Zuid-Holland top the list).

The total value added of exports calculated using the value chain approach is shown in the fourth column. Roughly the same pattern emerges as before, only less pronounced. Noord-Holland and Noord-Brabant are in the same league in terms of value added created by exports, even though Noord-Holland has a far larger export value (7.3.1). In terms of absolute export value, Limburg was the fourth largest exporter (7.3.1) but some of the value added is created elsewhere as Limburg is sixth on the value added ranking. Both Gelderland and Groningen create more value added for exports than Limburg.

7.5.1 Value added due to exports, by province, 2010

	Value added from production for the export*	Value added from re-exports	Value added total exports	Share value added exports in GRP
	million euros			%
Drenthe	2,638	136	2,775	22
Flevoland	1,879	145	2,025	21
Friesland	3,737	44	3,782	21
Gelderland	10,403	762	11,166	19
Groningen	9,995	213	10,208	36
Limburg	7,635	1,258	8,893	25
Noord-Brabant	18,126	1,867	19,993	23
Noord-Holland	16,402	4,051	20,453	19
Overijssel	6,971	1,191	8,162	23
Utrecht	7,193	580	7,773	15
Zeeland	3,165	251	3,416	27
Zuid-Holland	21,821	2,549	24,370	20

* Market prices.

When we confront the value added created by exports with the Gross Regional Product (GDP broken down by province) we gain insight into the relative export dependency of provinces. This is done in the fifth column of table 7.5.1. Interestingly the share of exports in GRP does not vary as much as might be expected from the absolute differences in export value. The relatively high degree of export dependency of Groningen is not surprisingly due to its position on the energy market (the economic bureau of ING comes to similar findings (2012)). Also the relatively low export dependency of Utrecht is as expected, since Utrecht

is mainly a service providing province. In general, for services most of the value added will be generated in the local instead of the global market.

It also becomes apparent that in provinces with high export values the value added from these exports constitutes a relatively small part of the GRP. This is due to the size of the regional economy. As Zuid-Holland has a GRP which is over twelve times the GRP of Flevoland, it is not surprising that Zuid-Holland exports far more. But the economy of Zuid-Holland is not driven by exports alone; it also has large services industries. This is not necessarily the case for the smaller provinces. Their share of value added from the exports in their GRP is in mostly higher than for the larger, more economically diverse provinces.

Figure 7.5.2 compares the results of the value chain approach to those of the export value approach. Where the export value approach comes to a higher value added than the value chain approach the province is coloured green and we conclude that this province exports more than it produces. When this difference is large, the colour is darker, indicating that the province exports far more than it produces for exports.

If the export value approach leads to a lower value added than the value chain approach the province is coloured blue and we conclude that this province produces more (intermediate) export products than it exports itself. Again, dark blue indicates that the two approaches diverge significantly in outcome; in this case, a dark blue province produces many (intermediate) export goods and generates substantially more value added in the region than one would have assumed from merely looking at the absolute exports of the province.

It turns out that the country is split in half. The northeast produces more for exports than it actually exports and as such it is the (national) starting point of the value chain for many export products. And this national value chain then often ends in the south or west of the Netherlands where the product is finished and subsequently exported.

When we look back at the absolute export values in 7.3.1, the provinces of Drenthe and Friesland appeared to have only little to do with exports as they have less than 1 percent of the total export value and (according to the export value approach) they each contribute about 1 percent to the total added value from exports. But looking at the added value from a value chain approach, their contribution to the total Dutch value added from exports more than doubles to 2.4 percent for Drenthe and 3.4 percent for Friesland. These provinces are much more involved with foreign demand than expected from the export approach. This is a result of their large share of industries which produce products that are not exported immediately, but ultimately end up in exports. For example, agriculture, mining and manufacturing.

7.5.2 Differences between value chain approach and export approach in determining value added, 2010

Production intensive
Moderate production
Moderate exports
Exports intensive
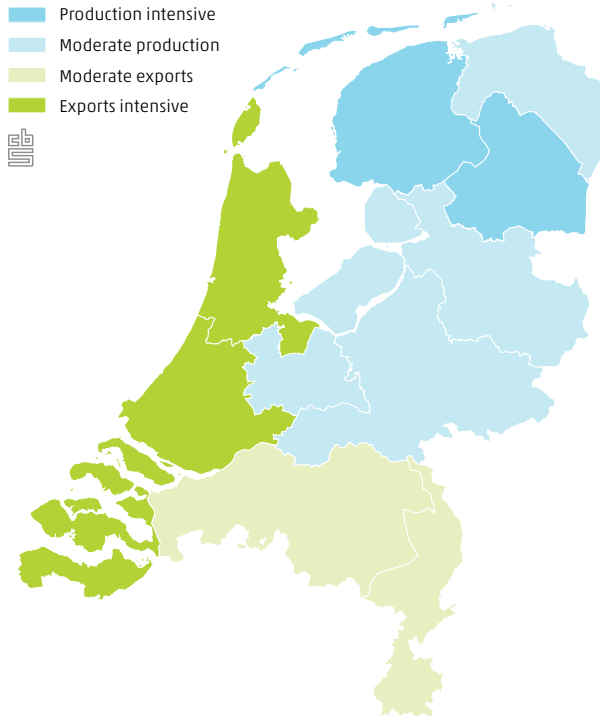
7.6 Regional dependency on export of goods and vulnerability to shocks

The value chain approach to exports has shown that differences between provinces in terms of foreign dependency are smaller than previously assumed. Money is not only earned in exports, but throughout the entire value chain. Hence, more provinces benefit from growth in foreign demand than we expected based on the regional export figures. The other side of the coin is that these provinces are also affected when foreign demand declines. This happened in 2009 when Dutch export value contracted 16.5 percent on 2008 because of the worldwide financial crisis. In 2010 exports bounced back with a strong 20 percent growth rate. In this paragraph we illustrate the impact of this contraction and recovery in foreign demand on the regional economy. The leading questions: Were the provinces

with larger export dependency actually hit harder, and how did their value added recover?

7.6.1 Economic growth per province between 2008 and 2010

	2008–2009			2009–2010			2008–2010		
	GRP growth*	growth value added due to exports	growth GRP excl. exports	GRP growth*	growth value added due to exports	growth GRP excl. exports	GRP growth*	growth value added due to exports	growth GRP excl. exports
	%								
Drenthe	−5.1	−14.8	−1.9	−0.9	6.5	−3.0	−6.0	−8.8	−5.1
Flevoland	−5.0	−9.0	−3.9	2.5	14.3	−0.3	−2.6	2.8	−4.1
Friesland	−2.7	−10.9	−0.1	1.6	8.0	−0.1	−1.1	−3.9	−0.3
Gelderland	−1.7	−8.5	0.0	1.4	10.3	−0.5	−0.3	3.1	−1.2
Groningen	−11.9	−25.6	−1.1	7.7	18.2	1.8	−5.1	−12.6	0.9
Limburg	−4.5	−13.2	−1.2	4.4	18.6	0.6	−0.3	2.4	−1.3
Noord-Brabant	−2.8	−13.8	1.2	3.2	13.6	0.4	0.3	−1.9	1.1
Noord-Holland	−1.6	−9.4	0.5	4.6	13.8	2.9	2.9	2.3	3.0
Overijssel	−1.1	−8.3	1.4	2.8	11.5	0.6	1.7	1.5	1.8
Utrecht	1.8	−7.0	3.6	1.1	9.9	−0.4	2.9	2.3	3.1
Zeeland	−5.8	−22.5	2.1	5.0	20.6	−0.0	−1.0	−6.4	1.5
Zuid-Holland	−4.0	−14.1	−1.2	2.7	13.4	0.4	−1.4	−1.7	−1.3

* Market prices.

First we compare the year 2009 to 2008. All provinces but Utrecht experienced economic decline, as table 7.6.1 shows. We saw earlier that Utrecht is not very active in the export of goods nor in the production of goods destined for exports, which is backed by these findings. Utrecht was the best performing province in the Netherlands in terms of economic growth, both including and excluding exports, indicating that it is relatively invulnerable to shocks in trade. This is confirmed by a report of the ING Economisch Bureau (2012). Diodato and Weterings (2013) also found that regions that are more specialised in services (i.e. Utrecht, Noord-Holland, Zuid-Holland) are somewhat less sensitive to worldwide export crises than regions specialised in manufacturing (Noord-Brabant, Limburg, Groningen). As expected, exports have a profound influence on the economic growth of Groningen. In part due to the dip in natural gas prices Groningen saw its added value of the exports decline by almost 26 percent. This and the relatively large dependency on exports resulted in a 12 percent decline of the Gross Regional Product in Groningen between 2008 and 2009. Not considering the exports, the rest of the Groningen economy also declined but by just 1.1 percent. Zeeland is also relatively dependent on foreign demand, as 27 percent of the GRP originates from exporting goods (7.5.1). This is reflected in the almost 6 percent decline of the regional economy in 2009, for which the export is fully accountable as added

value of the export fell by 22.5 percent. In fact, the rest of the economy in Zeeland managed to grow between 2008 and 2009, i.e. by 2.1 percent.

In short, the huge decline of the exports during the crisis had a major influence on regional economic growth. Not only on the regions directly involved in exporting but also on the provinces that mainly produce for exports in other provinces.

When we compare 2010 to 2009 we find that world trade recovered and so did Dutch exports. Looking at the 2009–2010 growth figures in table 7.6.1 we see that the situation is the opposite of the 2008–2009 figures. Just as for total Dutch GDP growth (chapter 1), almost all economic growth in the provinces is due to the growth of the value added of the exports. Only in Noord-Holland and Groningen does the economy grow on its own. Drenthe is the only province with negative economic growth in 2010, even including the value added of the exports. Also Utrecht performs below average. The value added from the exports does have a positive influence on the GRP of Utrecht, but its role is small. The hard hit exports of Zeeland benefit the most from the upswing in 2010, as the value added of exports grew by almost 21 percent. As a result, the economy of Zeeland grew by 5 percent, whereas the non-export sector in Zeeland still declined somewhat.

When we examine the total economic growth over the whole period (2008–2010), we see that not all regional economies recovered from the financial crisis in 2009. Drenthe and Groningen have the worst overall outcome of the period. The causes are partly similar and at the same time very different. For Drenthe the 6 percent loss in GRP between 2008 and 2010 had little to do with the turbulence in the world market. The loss is mainly caused by an 11 percent decline of the mining and manufacturing industry (predominantly mineral extraction for domestic use), resulting in a 3 percent loss of GRP. In Groningen the loss of over 12 percent of the value added from exports, also mainly due to less mineral extraction, caused a 6 percent decline in the GRP. When excluding the exports from the GRP of Groningen, GRP grew between 2008 and 2010.

The best overall outcome is found in Utrecht and Noord-Holland. Utrecht has a good overall outcome as it kept a positive GRP growth during the crisis and therefore had effectively nothing to recover from. Noord-Holland on the other hand saw its GRP decline by 2.1 percent due to the drop in exports in 2009, but had a very good year in 2010 as the GRP grew by 1.7 percent from the recovering exports and by 2.9 percent from domestic growth. As such, the two best performing provinces are both in the top three of the most export-independent provinces.

The most export dependent provinces, Groningen Zeeland and Limburg, suffered large losses in 2008–2009 and made the greatest recovery in 2010. It seems that being very dependent on exports makes a province more vulnerable to dips and more receptive to the recovery of foreign demand. It seems that the product

portfolio and the local economy are of far greater influence to the GRP growth than the small differences in export dependency.

7.7 Conclusion

We started this chapter wondering how exports influence regional economies in the Netherlands. Which provinces depend the most international trade and are most vulnerable to fluctuations in foreign demand. We concluded that the absolute export value of a province is not indicative for its export dependency since most large regional economies not only have large export values, but their other, domestically oriented activities as services or retail trade are also important. We found that smaller, less exporting provinces often are very dependent on exports. They may not export much directly, but they produce goods and services that other provinces ultimately use in the exports of goods. This explains why they can still have value added due to exports without exporting much. We also see that being more dependent on the value added by exports makes a province more vulnerable to fluctuations in foreign demand.

In terms of absolute figures, Zuid-Holland, Noord-Holland and Noord-Brabant are by far the largest exporting provinces. As a result, they yield the most value added from exporting, according to the export value approach that attributes all value added to the province of exports. However, since export products are not wholly produced in the province that exports them, we switched over to the value chain approach. This approach takes the per province production of goods and services used in exports into account. Therefore it is a more accurate way to model the value added created by exports.
From the value chain approach it became apparent that the export dependency of provinces (the share of value added due to producing for exports in GRP) is much more uniform than the absolute export values suggest. Utrecht is the least export dependent, with only 15 percent of its GRP coming from exporting goods. Groningen on the other hand, with its specialisation in mineral resources, is extremely dependent on the exports (36 percent of its GRP).
By comparing the export value approach to the value chain approach we uncovered that provinces that do not export much can still contribute a great deal to total Dutch value added due to exports by producing intermediate goods and services for exports. So these provinces, Drenthe and Friesland for example, are also influenced by the export fluctuations. We found that the southwest exports

more than it produces and the northeast produces more value added for exports than it exports.

Looking over the turbulent crisis years (2008–2010) shows that the fluctuations in foreign demand greatly influenced the growth of the regional economies. The sensitivity to fluctuations in foreign demand occurs in the entire value chain and not only where the final exporting takes place. But the degree to which a province suffers from these fluctuations is not the same, since being relatively dependent or very independent of exports greatly influences regional economic developments. Relatively dependent provinces such as Groningen, Zeeland and Limburg saw their value added dip in 2009, when trade worldwide collapsed. But in 2010 they experienced a greater recovery when international trade soared again. However the best 2008–2010 GRP development was for Utrecht and Noord-Holland, the least export dependent provinces. Provinces with an above average export dependency seem to base their GRP growth more on their export portfolio and local economy than on their export dependency.

Further research could include exports of services, in order to take into account all trade relations of a province. Using constant rather than current prices, the volume growth of the provincial economy can be broken down into a part that is due to exports and a part due to domestic growth of the economy. The results can be benchmarked against regional input-output tables, to refine the estimates. And using these tables would also show in more detail how the provinces are related: who produces the inputs for which exporter? Another option is to study how exactly the effects of exporting (benefits to growth when the world economy is booming, risk of contagion when it is affected) are reflected in the value chain. Are the effects delayed, magnified, or maybe dampened downstream in the value chain?

8.

Regional differences

in economic

performance

in the context of the

financial crisis

Authors
Roos Smit
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Macroeconomic developments can mask heterogeneity between enterprises or regions within a country. At the macroeconomic level the Dutch business economy seemed to have found its way out of the crisis of 2009, but the developments at the micro level show that the revival is not broad-based. Growth in international trade and turnover after 2009 is mainly carried by a small group of large (two-way) traders while the average firm has not yet recovered. Likewise, there are regions in the Netherlands that suffered more from the crisis than others. In general, provinces in the south of the Netherlands were hit the hardest by the crisis while Groningen and Flevoland fared best. To determine whether region had a specific impact on turnover development, we tested an ANOVA model where we combined enterprise characteristics and region. We found that location has a small but significant influence on turnover growth. Firms in Zeeland had a greater positive turnover growth between 2007 and 2012 than comparable firms the other provinces while firms in Noord-Holland and Utrecht had the largest loss in turnover all else being equal.

8.1   Introduction

In the past five years the Dutch economy was on a roller coaster ride. Real GDP reached its highest point in 2008 but contracted severely due to the global financial crisis that started later that year. The Dutch international trade in commodities collapsed and decreased by almost 20 percent in the following year. In 2010, the dust settled somewhat on the financial markets and trade bounced back with almost similar growth rates. Unfortunately the European economy was plunged into a new crisis by the euro debt crisis. On top of that the Netherlands was faced with uncertainty on the housing market, and all-time low consumer confidence levels combined with unrest about private wealth (e.g. pensions, social security and health care). The Dutch economy buckled under the pressure. As of the third quarter of 2012 the Dutch GDP volume continues to decrease compared to the previous quarter.

These macroeconomic facts and figures paint a turbulent picture, for the Netherlands as well as for many other EU countries. On closer inspection there is a lot of heterogeneity in terms of the impact of the crisis and recovery between countries (Groot et al, 2011; Lane and Milesi-Feretti, 2010). This raises the question whether the macroeconomic developments also mask heterogeneity between different enterprises and regions within the country. Do all enterprises suffer equally from the crisis? Are there regions in the Netherlands that suffered more

than others during the financial crisis, and vice versa, recovered better than others? This is similar to chapter 9 of last year's edition of the Internationalisation Monitor that studied enterprise dynamics during the financial crisis (Statistics Netherlands, 2012b). But this year we will shift our focus to two main questions: How did the crisis develop in 2012 and is the course of the crisis as heterogenic as we assumed last year? And how did the different regions fare between 2007 and 2012?

Section 8.2 starts with an overview of the resources that were used to construct the dataset on which the analyses in this chapter are based. We then continue by updating last years macroeconomic overview adding GDP and the 2012 data on turnover, international trade and jobs. By comparing the macro figures to median growth figures we can determine to what extent the overall developments resonate with the microeconomic practice. This is one of the major contributions of this chapter: by using an approach at the enterprise level it is much closer to the everyday perception of the economy. In section 8.4 the regional developments in terms of turnover growth are presented for four time periods, namely the pre-crisis years, the crisis, the recovery years and the double dip. We also investigate whether these findings hold for the average local firm as well. In section 8.5 all variables (region, international trade, foreign control, size and sector) are combined in an ANOVA to explain turnover developments. This also conclusively shows whether location has a separate and significant impact on turnover growth. The chapter concludes with a summary of the main findings.

8.2 Data and methodology

Construction of the dataset

A broad dataset was created allowing insight into the dynamics of the crisis. The starting point of this dataset is the General Business Register for the years 2007–2012. To this data we matched additional information from the international trade in goods statistics, data on turnover as obtained from the Dutch tax authorities, number of jobs per enterprise from the Linked Employer-Employee Database (LEED), data on foreign ownership from the Foreign Affiliate Statistics (FATS) and the breakdown of the enterprise to its local units. Our analysis will include five enterprise characteristics: location (province), economic activity of the enterprise, ultimate controlling institute, international trade status and the number of employees.

Economic activity is a variable from the General Business Register and is clustered in the same way as described in section 7.2. Disaggregating enterprises to the level of local business units provides information on the geographical location of an establishment. Locus of control is determined based on the location of the ultimate controlling institute (UCI) of an enterprise, which is the product of the FATS. In this chapter only 2 categories of ownership are used, namely Dutch versus foreign controlled. Unfortunately the sources of the UCI are not comprehensive and if no information is available Dutch ownership is assumed. Since the quality of the UCI variable has improved, some enterprises switch from Dutch to foreign ownership over time, not due to a merger or acquisition but due to improved sources. Since these are not real changes we decided to update earlier years with the improved information. Ownership can still change from foreign to domestic controlled or vice versa due to mergers and acquisitions. For 2012, a preliminary locus of control was created mainly based on the 2011 FATS.

Information on jobs per enterprise is obtained from the LEED database. Jobs are assumed to be exhaustive. If there is no information the enterprise employs only the owner. The LEED database provides data up to 2011. Since the other data in this chapter does contain 2012, a preliminary jobs figure was created for 2012 based on crude source material.

The international trade status of an enterprise is derived from the international trade statistics and is grouped in four categories: non-trader, importer only, exporter only and two-way trader. Two-way traders are often large and generate large amounts of turnover. But some enterprises are two-way traders one year, importers the year after and non-traders the year after that. Since most analyses in this chapter follow clusters of enterprises over several years it is important that all characteristics are constructed similarly. In an effort to improve similarity and comparability over time, the decision was made to compose one status for all years for sector of activity and international trade. By creating one international trade status we can look at the dynamics of the target variable instead of looking at the dynamics of international traders. We decided to prefer the most complicated international trade activity over the years (1) two-way trade, (2) export only, (3) import only, (4) non-trader. So an enterprise is a non-trader if no trade activities were found for the 2007–2012 period.

Many changes in sector of activity for enterprises are due to administrative changes rather than changes in activity. Deciding on one sector of activity per enterprise (the sector of activity in 2012 or last year before termination) bypasses those administrative changes and improves the comparability between years.

Linking the information on jobs and trade resulted in a dataset of 2,238,077 enterprises for the 2007–2012 period. All the analyses in this chapter exclude the government, education and health care sector. As such they are based on enterprises in the private sector (NACE Rev. 2 section B to N, excluding K). The

remaining dataset on jobs and trade contains 1,498,815 of those enterprises for the six year time period with an average of 896,929 active enterprises per year.

International trade and turnover, which are collected on VAT ID-number, are notoriously difficult to link to enterprises in the General Business Register. Having no international trade value for an enterprise could be due to a linking problem. Since there is no way of determining which of the missing values are due to linking problems, and the fact that for almost all enterprises in the business economy their international trade value is linked, we will treat the international trade data as if it is exhaustive.
For turnover, considerations are different. All enterprises in the General Business Register should have turnover. No turnover generally indicates a linking problem. Analyses on turnover therefore can only be successfully done when considering a panel of enterprises with turnover for each year of its existence. This restriction results in a panel consisting of 362,668 enterprises that existed between 2007 and 2012 and reported turnover for each year. By excluding the births and deaths this dataset can be used for our descriptive analyses as well as our in depth ANOVA analyses. Although this approach creates some bias by excluding dynamics of entry and exit, it does not change the general picture.

Analysis

In all analyses a total of 15 enterprises were excluded as they distorted the figures with dynamics caused by linking problems. For each of the ANOVA analyses half a percent of outliers was excluded.

8.3 Overall dynamics during the financial crisis

Echoing last year's chapter (Statistics Netherlands, 2012b), our analysis of the regional differences during the financial crisis starts by looking at the overall picture of the crisis. Figure 8.3.1 shows the growth (or decline) between 2007 and 2012 of the jobs, international trade value (divided into import and export value), turnover and GDP. In 2012 we concluded that the crisis hit the economy of the Netherlands hard in 2009. In the space of one year enterprises in the Dutch business economy saw their turnover decline by 11 percent, their exports

by 16 percent and their import value by 19 percent. For the first time since 1982 the year-on-year GDP volume did not grow, but decreased by over 3 percent. In the next two years turnover, international trade values and GDP recovered almost as fast and extensively as the downfall was for 2009. The jobs in the business economy show a different dynamic. The 2009 decrease is the smallest of all variables under concern. This may be due to enterprises trying to keep their valuable personnel, in the hope of a quick recovery of the economy, as well as the cost involved in letting people go (De Jong, 2012). But there was no recovery from the crisis.

8.3.1 Indexed turnover, jobs, imports, exports and GDP (in market prices), 2007 = 100
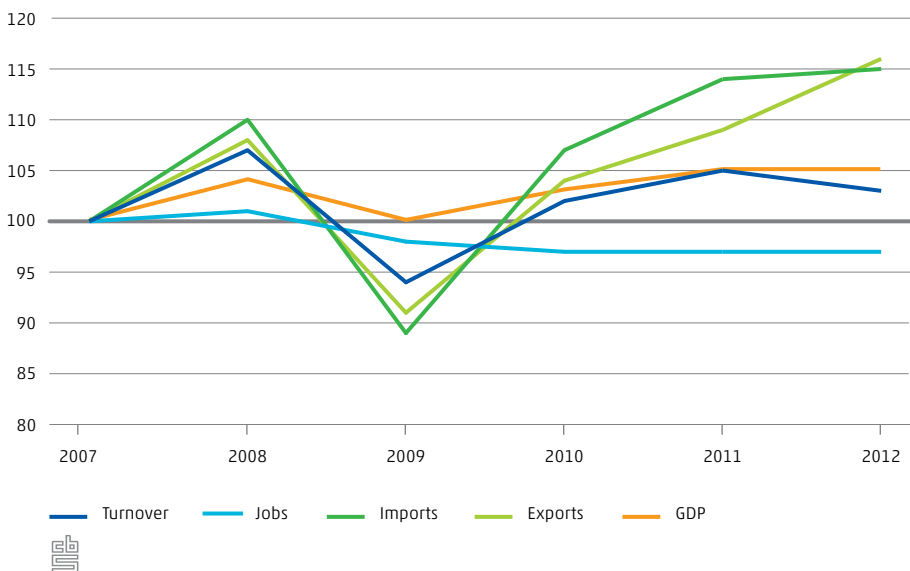
Adding 2012 to the overall picture instantly makes the feeling of a steady recovery falter, as the Dutch economy went into another recession. Although import and export values still increased, turnover and GDP accompany jobs in the downward trend. The "double dip" as it is labeled by policy makers and media alike seems apparent and there are no signs yet of a quick recovery. Taking this into consideration a complex image looms. International trade, turnover and GDP are closely linked as the trading surplus makes up 8 percent of the GDP and over 80 percent of turnover in the business economy is on behalf of trading enterprises. How come international trade (and especially exports) is flourishing while turnover and GDP decrease?

Median growth

We start by taking a closer look at crisis recovery. For 2010 and 2011 it seems most enterprises had their things back in order. But a closer look at our panel in table 8.3.2 sheds a different light. Instead of looking at the total value, we want to highlight the median year-on-year growth for turnover, jobs, import value and export value. Although the total value of turnover, imports and exports grew from 2009 on (which was shown in 8.3.1), in fact more than 50 percent of the enterprises in our panel, which consists of close to 900,000 enterprises a year, have a negative year-on-year turnover and trade growth from 2008 on. To be precise over 60 percent of the traders had a decrease in trade value in 2010 compared to 2009. This is an even larger share than in the previous crisis year when "only" 57 percent had a fall in import value and 58 percent of traders saw a decrease in export value.

How does this fit in with the indexed value growth of 8.3.1? The main answer is that there is a small group of large enterprises that were hit hard by the crisis, but recuperated at nearly the same rate. In fact, excluding the top 1 percent enterprises from the turnover, import value and export value completely eliminates the 2010 recovery. After 2010 international trade value stabilizes at about a 20 percent loss in value for the median enterprise!

8.3.2 Share of enterprises with diminishing turnover, imports or exports

	2008	2009	2010	2011	2012
	%				
Turnover	39	57	50	46	58
Imports	45	58	59	53	53
Exports	45	57	60	50	51

Graph 8.3.3 shows the median growth in turnover, jobs and trade for our panel of enterprises in the business economy. By 2010, the median enterprise had lost about 20 percent of its trade value and this has not improved since. Turnover development for the median enterprise shows a different pattern than the international trade value. The 2009 dip is extensive for many enterprises but not nearly as large as for their trade value. That year the median enterprise lost over 4 percent of its turnover and 57 percent of the enterprises in our panel lost at least some of their turnover. Complying with 8.3.1 turnover growth is much more influenced by the "double dip" in 2012 than international trade growth.

The 2012 decrease in turnover of the enterprises in our panel just trumps the 2009 dip. The median decrease in 2012 was 5.2 percent and roughly 58 percent of the panel lost turnover between 2011 and 2012.

8.3.3 Developments of turnover, jobs, imports and exports based on median growth, 2007 = 100
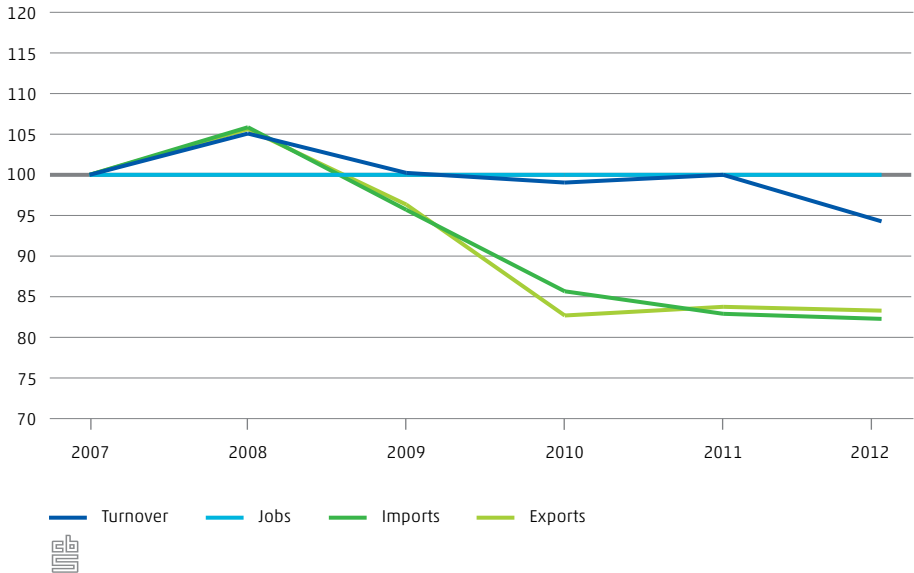
The most apparent difference between the macroeconomic developments and those at the micro level is in the pattern of the international trade values. As the value recuperates fully and international trade seems to be one the few redeeming feature of the crisis, the median growth paints an entirely different picture. From 2008 to 2010 the median exporting and/or importing enterprise lost over 10 percent of its trade value two years in a row. In 2009 the median dip was a little smaller than the absolute one. But in 2010 the total trade value increased by well over 10 percent even though the median dropped over 10 percent. Taking all this into account it is apparent that not all traders are the same. Excluding the top 10 exporters halves the export growth in figure 8.3.1, excluding the top 65 (less than 1 in 650 exporting enterprises) completely obliterates the growth. The revival of the export value (and imports alike) is therefore not due to a hugely positive trend in trading, but to a few very large and very influential enterprises that saw their trade value bounce back almost instantly in 2010. For most enterprises their import and export values did not recuperate.

For turnover it stands out that the enormous 2009 dip and the 2010 recovery are not apparent in 8.3.3. The dip and recovery turn out to be caused by a small

number of large enterprises (less than 0.03 percent of our panels population). These enterprises saw their trade value and turnover recuperate due to the recovery in foreign demand. Smaller and less international enterprises that are linked more to domestic demand continued to suffer as consumption remains low.

It might be an unexpected finding that median job growth is stable. This can be explained as follows: the large majority of enterprises employ less than 3 people, hence firing somebody means downsizing the workforce by at least a third. In practice, it is often impossible to continue the same business with such small staff. These enterprises may cut working hours but not the number of people they employ. So although unemployment rises, still close to 65 percent of all enterprises employ the same number of people in each year, and year-on-year only 20 percent of the enterprises have a change in the number of employees. Graph 8.3.1 showed that at the macro level the number of jobs at enterprises in our panel decrease but at the micro level we see that for the median firm the number of jobs is stable. Approximately the number of enterprises that see their jobs increase is about the same as the number that see the jobs decrease. This implies that the average growing enterprise grew less than the average shrinking enterprise shrank.

On a macroeconomic level the business economy seems to have found its way out of the crisis in 2010 and 2011. However, considering the patterns at a micro level, the revival is not broad-based. Already in 2011 household consumption and government investment turned negative again which impacted on economic growth. As such, the 2012 double dip in the turnover and GDP looks a lot less out of place in this perspective. After the initial 2009 blow to the economy most enterprises did not recover. The international trade values did flourish at the macro level, but only a few enterprises benefit from this recovery. And when in 2012 overall investment and consumption bottomed out, the modest international trade growth was no longer enough to compensate. Chapter 1, table 2.4 shows that the recession deepened in the first quarter of 2013, mainly due to the fact that international trade is stagnating while public and private consumption as well as investments contracted even further.

Type of trade

Since the median enterprise had 5 percent less turnover and over 20 percent less import and export value in 2012 than in 2007, last year's results that being a trader sees you better through the crisis seems contradictory. Figure 8.3.4, the median turnover growth for type of international trade, provides insight in how these two findings accompany each other. As most enterprises are non-traders

the median turnover growth for non-traders mirrors the overall median growth as seen in 8.3.3. Similar to our findings last year, international traders and specifically exporters and two-way traders have the best recovery. However, two-way traders are the only group with median turnover growth from 2007 to 2012, which makes them have the best overall outcome. Interestingly figure 8.3.4 also shows that enterprises that only import and non-traders are actually quite alike in terms of turnover growth (see also chapter B2 in Statistics Netherlands, 2011a). The median non-trader and the median enterprise with only imports both experienced a more or less steady decline of turnover from 2009 on and have lost over 5 percent of turnover by 2012. Enterprises that only export mimic the pattern of two-way traders but the median turnover growth is far less than that of the median two-way trader since 2009.

8.3.4 Developments of median turnover growth by type of trade, 2007 = 100

8.4 Regional impact of the financial crisis

The previous section shows that the macroeconomic pattern can diverge substantially from the situation at the micro level. Building on the overall pictures of the crisis, we wonder if the crisis had the same effects on the different regions of the Netherlands. More specifically, are there differences between provinces in the impact of the crisis on the local economy? How well did the local economy recover? And what was the overall outcome between 2007 and 2012. Keeping the findings of the previous paragraph in mind we will start by describing the differences in values and subsequently look at the median development. We discuss both scenarios because they have different implications. The macro approach (looking at the total values) resembles economic growth and benchmark values of the Netherlands used by policy makers. Whereas the more micro approach (in our case the median growth) sheds light on the level of crisis penetration on the enterprise level and is closer to the everyday perception of the economy.

Economic crisis at the macro level

To shed some light on the regional difference during the crisis figure 8.4.2 shows the turnover changes for the pre-crisis (2007–2008), crisis (2008–2009), recovery (2009–2011) and double dip years (2011–2012). First of all it stands out that turnover increased for all provinces in the pre-crisis and recovery years. Contrariwise the crisis spared no province and all turnover growth was negative. This is the same for the imports and exports (not shown) although the losses and gains are far larger. The losses in Zeeland during the crisis of 43 percent of export value and 46 percent of import value were immensely larger than the "mere" 14 percent of turnover lost. In the recovery Zeeland's trade also recovers with large numbers, contrary to Zuid-Holland that lost minimal imports and exports with respectively 18 and 10 percent, but also recovered with close to the same percentages as Zeeland, 47 and 24 percent growth of Zuid-Holland's import and exports versus 58 and 34 percent for Zeeland. Looking only at the international trade in goods, Zuid-Holland shows by far the best recovery of all provinces.

Moving back to the turnover analysis in 8.4.2. The south of the Netherlands was hurt the most in 2009 with an average turnover decrease of 13 percent versus 8.5 percent in the rest of the Netherlands. Groningen and Flevoland fared best with a turnover decrease of approximately 7 percent.

Although in the first three charts turnover growth of all provinces moves uniformly, the double dip (2011–2012) chart is different. Most provinces see their turnover decrease except for Noord-Holland, Groningen, Drenthe en Flevoland. These provinces also had a relatively small decrease in turnover in 2009 which indicates that they might be better equipped to handle turbulences in the economy. In a study on the resilience of Dutch regions to economic shocks, Diodato and Weterings (2012) find similar results. They argue that when a province has a large portion of the supply chain located in its territory (i.e. an 'embedded' region), it is less vulnerable to external shocks in demand (measured as a decrease in output). Examples of such embedded regions are Utrecht and Noord-Holland. The opposite holds true for export-oriented regions. These regions are more manufacturing oriented and very vulnerable to worldwide shocks. This explains why manufacturing regions, such as Noord-Brabant or Limburg, absorb the shock least successfully. Similar results are found by Groot et al. (2011). They concur with our finding that Groningen is relatively insensitive to the business cycle. For more information on value chains and economic growth in the region see chapter 7.

This is also apparent in 8.4.1 which shows per time slot the province with the best and worst turnover growth. It turns out that the best and worst performers pre-crisis switch places in 2009. Zeeland had by far the largest turnover growth in 2008, over 20 percent, but also lost the most in 2009 (14 percent). Groningen only gained 4.8 percent for 2008, but also only lost 7 percent. As Zeeland still saw turnover grow by close to 10 percent from 2007 to 2009, they are a good candidate for the best overall growth. They only miss the gold by inches due to a very good performance of Flevoland during the recovery and double dip years, as they both had 23 percent more turnover in 2012 than in 2007. On the other hand, the less fortunate provinces are headed by Noord-Brabant, with a 1 percent lost in six years. Since 2007 Noord-Brabant has struggled through the years: A relatively small pre-crisis growth, a big loss in the crisis, a median recovery and another significant loss suffered between 2011 and 2012. Noord-Brabant is closely followed by Friesland, gaining 2 percent overall, losing 8 percent in the last year.

8.4.1   Provinces with best and worst macro outcome per period

	Best	Worst
Pre-crisis (2007–2008)	Zeeland	Groningen
Crisis (2008–2009)	Groningen	Zeeland
Recovery(2009–2011)	Zeeland	Friesland
Double dip (2011–2012)	Flevoland	Noord-Brabant
Overall (2007–2012)	Flevoland	Noord-Brabant

8.4.2 Turnover growth per province for the pre-crisis, crisis, recovery and double dip years

Pre-crisis (2008-2009)

Crisis (2008-2009)

Legend:
- -15 to -10%
- -10 to -8%
- -8 to -3%
- -3 to -0%
- 0 to 6%
- 6 to 9%
- 9 to 12%
- 12 to 23%

Recovery (2009-2011)

Double dip (2011-2012)
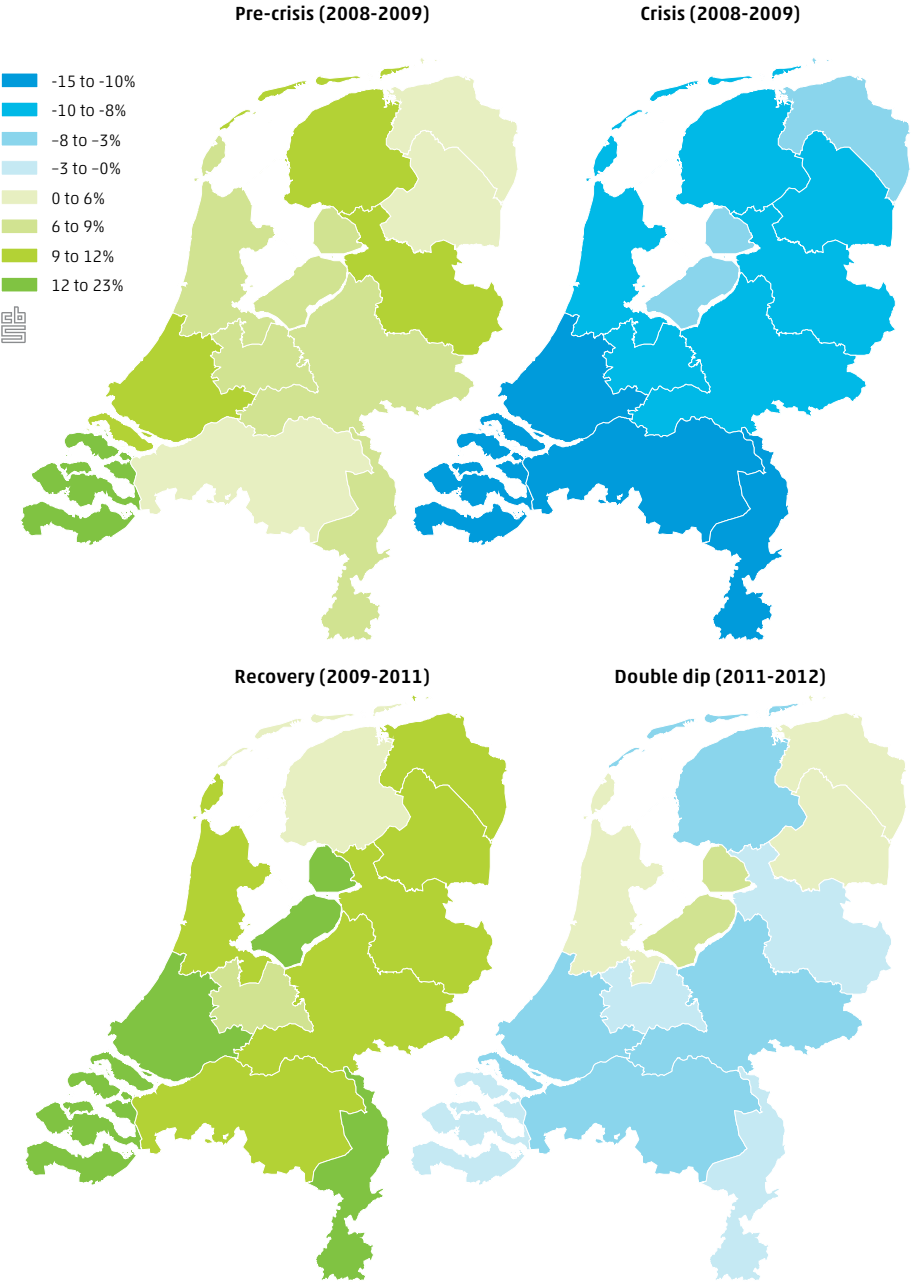
Economic crisis at the micro level

In this section we illustrate how the crisis, recovery and subsequent recession of 2012 impacted on the turnover of the median firm in each province. The median year-on-year turnover growth seems relatively stable (8.4.2). None the less some trends stand out. Zeeland and Flevoland have the best outcome as 8.4.1 shows. But interestingly the median firm in Zeeland doesn't start out strong.
The median firm in Groningen is an average performer but loses the most in the double dip and ends up at the bottom. The macro analyses in Groningen is of course very distorted due to the large influence of the natural gas extraction.
Interestingly Limburg performs a lot worse when we look at the median firm, especially in the crisis and recovery years. The total turnover has been influenced greatly by a couple larger enterprises, but at the micro level most enterprises perform below average.
Noord-Brabant was the province with the worst overall performance in terms of turnover growth between 2007 and 2012. This picture is in accordance with 8.4.3, which also shows that the median growth was one of the lowest of all twelve provinces.

8.4.3 Median year-on-year turnover growth per province, 2007=100

8.5 Statistical analysis

In the previous paragraphs we showed that the overall economic developments since 2007 had a very different impact on individual regions in the Netherlands. In addition, most enterprises still experience the negative fallout of the crisis, which goes undetected if we only look at the macro growth figures. In this section, we combined enterprise characteristics and regional characteristics with internationalisation traits in order to determine which characteristic has the largest impact on turnover development (of: whether region *ceteris paribus* has an impact on turnover development). Looking at the ANOVA model in 8.5.1 we can definitively say that location, in this case province, is connected to the turnover growth. The associated F-value for location, however, is small. This means that the difference in turnover growth[1] between enterprises is only explained for a very small part by the province where they are located. The sector, type of trade and the number of employees have a much greater influence on the individual differences in turnover growth than location. That being said, location has statistical relevance for each year under review. As could be expected correcting for sector, type of trade, ownership and jobs mixes up the previous results somewhat, but not the general outcome. In both the analysis of the absolute value and of the median growth one province continuously stood out, Zeeland. Zeeland has a greater positive turnover growth from 2008 on than any of the other provinces and this is confirmed by the ANOVA model. As the ANOVA is a micro analysis, the results can best be compared to figure 8.4.3, the median growth. The four lowest province are the same: Groningen, Limburg, Noord-Holland and Utrecht. But correcting the turnover growth for sector, type of trade, ownership and jobs changes the overall outcome. Groningen and Limburg had the largest median decrease in turnover, but after correction Noord-Holland and Utrecht both have a larger loss of turnover from 2007 on. Another interesting change is the position of Flevoland. Flevoland has the largest 2007–2008 turnover growth in both analysis. But decrease of turnover between 2008 and 2012 is smaller for the median than for the corrected turnover.

For the other independent variables it stands out that two-way traders outperformed non-traders, importers and exporters for each year except for the 2008–2009 decrease as the crisis hit, when only importers saw an 8.3 percent dip in turnover versus 9.3 for two-way traders between 2008 and 2009. This concurs with the median growth per type of trade (8.3.4). Two-way traders and partially

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[1] Turnover growth is included in the analyses as an natural log and has been calculated back to the turnover growth for 8.5.1.

export-only enterprises performed well on a whole and for most years better than only importers and non-traders, but in 2009 they were hit harder as well. Also, each year enterprises under foreign ownership have a higher corrected turnover growth (or shrank less) than Dutch controlled enterprises. In fact, turnover at Dutch controlled firms has not grown in four years and 2012 shows a decline as large as in 2009. Combining these two findings affirms last year's conclusions. Internationalisation, even when controlled for location, is positively related to turnover growth and these enterprises are better able to keep their turnover up during the crisis.

Sector-wise most patterns are quite similar to last year's model, when we did not control for location. But adding 2012 does bring some interesting insights. The construction sector was looking up in 2011 after years of decline. The corrected year-on-year growth was the highest of all sectors with 5.6 percent. The government stepping up infrastructure programmes is an explanation for this deferred contraction in turnover (Statistics Netherlands, 2013c). Unfortunately the 2012 double dip, the restricted rules for mortgage lending and the continuing uncertainty on the housing market hit the construction harder than any other sector. Although all sectors saw their turnover decrease, the loss of 12.6 percent in construction stands out. The transport sector on the hand shows a very different picture. Having the second largest corrected turnover growth right behind the construction in 2011, the turnover in transport had the smallest decrease of all sectors in 2012.

Noord-Holland and Utrecht saw the largest loss in turnover after the crisis

8.5.1 Year on year (corrected) mean turnover growth

	2008	2009	2010	2011	2012	2007–2012
	%					
Province						
Drenthe	16.7	−8.9	1.6	0.5	−8.6	−1.8
Flevoland	17.6	−9.8	0.4	−0.7	−8.2	−2.9
Friesland	15.7	−9.6	1.8	0.3	−7.8	−3.4
Gelderland	14.9	−9.3	2.0	1.1	−8.0	−2.7
Groningen	14.5	−10.1	2.2	0.8	−9.3	−4.8
Limburg	12.1	−10.0	2.3	1.7	−8.6	−4.5
Noord-Brabant	15.1	−10.1	1.9	1.2	−7.7	−2.8
Noord-Holland	13.2	−11.0	2.4	0.1	−8.3	−6.1
Overijssel	15.2	−10.0	2.5	1.9	−8.2	−2.1
Utrecht	14.7	−10.8	1.8	0.5	−7.9	−5.2
Zeeland	13.0	−7.5	2.8	1.8	−7.1	−0.7
Zuid-Holland	15.5	−9.8	1.2	0.6	−7.7	−3.9
Sector of activity						
Manufacturing	14.2	−10.6	1.0	1.3	−7.2	−4.6
Construction	19.1	−9.1	−2.0	5.6	−12.6	−5.2
Wholesale trade	10.2	−11.1	1.6	−1.7	−9.0	−10.1
Transport and storage	16.3	−14.6	8.4	4.2	−5.6	4.4
Retail trade and hotels and restaurants	12.4	−3.9	2.6	−1.0	−6.0	1.1
Services	17.2	−8.8	0.2	−3.1	−8.3	−5.4
Type of trade						
Non trader	11.7	−9.7	−1.6	−1.1	−9.1	−9.8
Importer only	15.5	−8.3	0.4	−0.5	−9.1	−4.9
Exporter only	14.1	−11.6	3.4	2.1	−7.4	−2.6
Two-way trader	18.1	−9.3	5.6	2.8	−6.9	4.1
Ownership						
Dutch	12.2	−9.8	−0.1	−0.1	−9.9	−9.6
Foreign	17.5	−9.7	4.0	1.7	−6.4	3.2
	F-value					
Corrected Model	107***	72***	84***	87***	69***	64***
Intercept	1192***	621***	32***	2	476***	8**
Province	11***	7***	3***	4***	2*	7***
Sector	123***	239***	119***	285***	141***	94***
Type of trade	122***	25***	233***	76***	26***	220***
Ownership	31***	0	31***	6*	24***	73***
Employees	1196***	40***	50***	36***	186***	158***

The asterisks ***, ** and * indicate significance at the 1, 5 and 10 percent level.

8.6 Conclusion

Even though the macro-economic outlook for the Netherlands looked promising in 2010 and 2011, it hid a lot of problems at the micro level. The growth in trade and turnover after the economic crisis of 2009 is mainly carried by a small group of large (two-way) traders that were able to reap the benefits of renewed global trade growth. The median firm, however, has not yet recovered from the crash in 2009. Almost 60 percent of the panel under consideration lost trade and turnover in 2009. In fact, as of 2012, their performance only worsened. Turnover of the median firm decreased even stronger in 2012 than in 2009 and again 60 percent of the panel lost turnover in the new recession. Employment is relatively stable for our panel of enterprises as 65 percent employ the same number of employees from year to year. However, the median firm is still struggling to recover its lost turnover and trade. So it is not surprising that when international trade growth slumped in 2012 and investment and consumption contracted again, the economy went into another recession.

Since the overall macroeconomic figures can differ substantially from the situation at the micro level, we also expected to find significant differences in regional performance during the past five years. We found that provinces in the south of the Netherlands were generally hit the hardest by the crisis while Groningen and Flevoland fared best. At the time of the double dip most provinces saw their turnover decrease again, except for Noord-Holland, Groningen, Drenthe en Flevoland. Due to their specific traits, these provinces might be relatively well equipped to handle shocks to the economy. In fact, Flevoland is the province with the best overall performance in terms of turnover between 2007 and 2012. When we look at turnover growth for the median firm per province, the picture changes somewhat. In this case, Flevoland is surpassed by Zeeland, as the median turnover growth there decreased less. As such, in Zeeland the decrease in turnover is spread more evenly over the firm population than in other regions.

To determine whether region had a specific impact on turnover development, we tested an ANOVA model where we combined enterprise characteristics such as size and sector, internationalisation traits, namely trade and foreign control, and lastly region. We found that location has a small but significant influence on turnover growth. When we control for sector, size, trader type and foreign control, firms in Zeeland had a greater positive turnover growth between 2007 and 2012 than comparable firms in the other provinces. Alternatively, after correction firms in Noord-Holland and Utrecht had, all things being equal, the largest loss in turnover. The ANOVA model also shows that two-way traders outperform non-

traders, importers and exporters in terms of turnover growth for each year except between 2008 and 2009, when they were hit harder by the financial crisis than the other traders and non-traders. This is not surprising: international trade fared far worse than spending by consumers or enterprises in the Netherlands, and this is reflected in the performance of traders and non-traders. Enterprises under foreign control have a higher corrected turnover growth (or shrank less) for each year then do Dutch controlled enterprises. Combining these two findings affirm last year's conclusions. Internationalisation, even when controlled for location, is positively related to turnover growth and these enterprises are better able to keep their turnover up during the crisis.

9.

Internationalisation

of top sectors

in a regional dimension

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This chapter presents the international orientation of top sectors and their regional distribution. Top sectors are closely linked to certain regions. The provinces Noord-Holland, Zuid-Holland and Noord-Brabant are responsible for more than 60 percent of total goods exports by top sectors. The high-tech sector excels around Eindhoven and the energy and logistics top sectors do so in Noord- and Zuid-Holland.

9.1 Introduction and background

The Dutch government is reforming its policies for the business sector to face the opportunities and challenges arising from globalisation, such as establishing trade and investment links with emerging countries and boosting innovative activities. One approach is to focus on nine areas of excellence in the form of a top sector approach (OECD, 2012). The top sectors are sectors, which are knowledge intensive and export oriented, often have specific rules and legislation. They may contribute substantially to the solution of a number of social problems. Export orientation contributes to a stronger position on the world market. Globalisation is pushing companies to become more innovative and to search for new activities.

Decentralised governments often pay special attention to the top sectors. From a regional perspective, top sectors are often clustered and agglomerated. The assumption is that firms in clusters and agglomerations tend to benefit from urbanisation and location so they become more productive and more innovative than other firms (Raspe et al, 2012).

The nine top sectors are agro & food, chemicals, the creative industry, energy, high-tech, horticulture, life sciences, logistics and water (see box 1). Each sector has its own challenges and opportunities. Take for instance the port of Rotterdam and Schiphol airport, both working hard to stay ahead of other ports and airports competing in the global logistics sector. Businesses in the creative industry excel in designing and producing art, music, buildings and games. But there is unexplored potential in marketing these products. The food and horticulture sectors aim to expand their international positions. The energy sector sees opportunities in the development of renewable energy sources (Ministry of Economic Affairs, Agriculture and Innovation, 2011).

Definition of top sectors

Definitions of the top sectors were drawn up by Statistics Netherlands together with the Ministry of Economic Affairs. See Monitor topsectoren Methodebeschrijving en tabellenset (Statistics Netherlands, 2012c) for details of the definitions.

Agro & food: The top sector agro & food includes arable and cattle farming and the manufacture of food products.
Chemicals: The top sector chemicals includes the manufacture of petroleum, chemical, rubber and plastic products
Creative industry: The top sector creative industry includes sectors that focus on design, meaning or symbolic value, e.g. art, cultural heritage, media and entertainment and creative commercial services.
Energy: The top sector energy includes generation of energy and natural gas and electricity supply.
Horticulture: The top sector horticulture comprises the entire horticultural chain from greenhouse construction, seed cultivation to auctioning vegetables, fruit and flowers.
High-tech: The top sector high-tech largely includes the manufacture of metal products, mechanical engineering and software development.
Life sciences: The top sector life sciences includes pharmacy, medical instruments and research and development.
Logistics: The top sector logistics includes transport and storage of goods and auxiliary services.
Water: The top sector water includes the maritime manufacturing industry, water and delta technology.
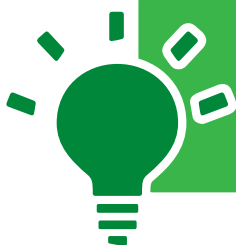
Top sectors generated 55% of the total export value of goods in 2011

Figure 9.1.1 and 9.1.2 give a brief overview of the economic interest of top sectors in the Netherlands. The top sectors encompass more than 290 thousand

local business units, i.e. 30 percent of all local business units in the Netherlands. Together, they account for a quarter of total value added. With 1.4 million jobs, the top sectors contribute 28 percent in employment. A key feature of the top sectors is their export orientation, which is also reflected in their relatively high export value. With 175 billion euros, the top sectors generate 55 percent of total export value of goods in the Netherlands. Foreign controlled local units in top sectors generate almost half of total exports. The nine top sectors accounted for more than 80 percent of total R&D expenditures. The high-tech sector has a significant share; almost half of total R&D expenditures are generated in this sector.

With 110 thousand local units, the creative industry is the largest sector, but its share in jobs and total value added is limited. But although its economic interest is limited, the creative industry has an important crossover function between the top sectors. Energy, life science and chemicals are the smallest top sectors in terms of the number of local units, but their export value and R&D expenditure are large. The high-tech sector accounted for 21 percent of total value added, 30 percent of total employment and 30 percent of total exports in the Netherlands. It is characterized by its innovative character. Almost half of the R&D expenditures are generated in the high-tech sector. It is the largest top sector in terms of value added, export value, jobs and R&D expenditures.

9.1.1 Share of top sectors by various characteristics, 2011
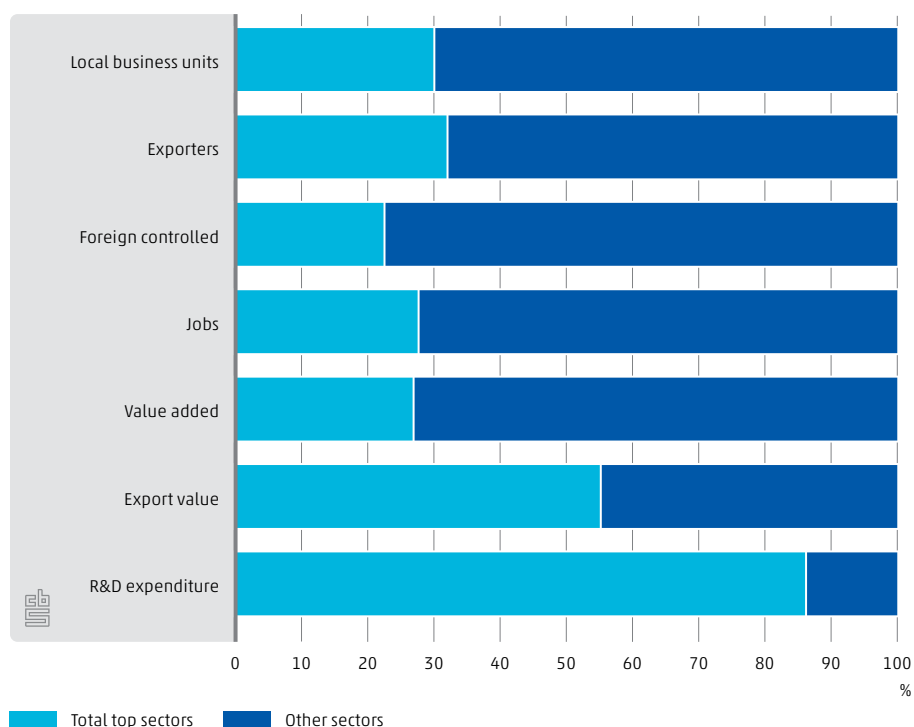
9.1.2 Various economic characteristics by top sector, 2011
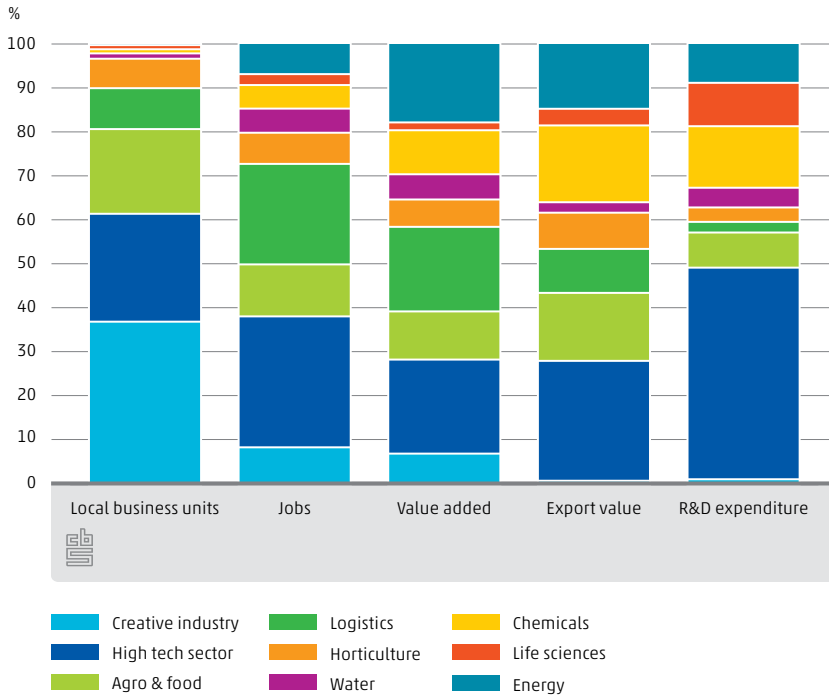
Because of the export orientation and the regional economic benefits of the top sectors, we are interested in presenting some facts and figures related to the internationalisation of top sectors and their spatial distribution. This chapter is arranged as follows. First of all, information is presented about the spatial distribution: where are the top sectors concentrated in the Netherlands? This will be illustrated in section 3. Secondly, international orientation also plays a role. The selection of the top sectors was based on their export orientation and their importance to the international competitive position. Therefore it is interesting to have information about the international orientation of top sectors. This is the topic of section 4. These two elements should be considered in relation to one another. We use a regression analysis to explore the relationship between the trade value of top sectors and some explanatory variables (section 5). The chapter ends with conclusions.

9.2 Data and methodology

In order to place the role of top sector enterprises in a regional perspective, it is necessary to analyse at the level of the local unit. We integrated several datasets. The General Business Register (GBR) identifies almost every local unit of all active enterprises in the Netherlands. We know the address, zip code, economic activity and size class.

Information of local units is linked to data on the concept of Ultimate Controlling Institute (UCI) to see whether a local unit is under foreign control, the number of jobs (Statistics Employment of Wages) and data on international trade in goods (exporters and trade value). Trade value is distributed proportionately, based on the number of employees in each of the local units of an enterprise. The dataset is created for 2011.

This paper focuses on the role of enterprises in top sectors relative to the Netherlands and to their specific regions and on their impact on internationalisation levels. The results of the Netherlands in total are based on the sectors of the business economy (NACE Rev. 2 section A-N, excluding K). This means that we excluded financial intermediation, public governance, education and health care from the analysis.

9.3 Top sectors in a regional dimension

Top sectors are not distributed evenly through the Netherlands. Location quotients are useful for identifying whether a sector is concentrated in a region and therefore has a competitive advantage. In this section we look at the location quotient that compares the share of local employment in a top sector to the share of national employment in that top sector.

$$Location\ quotient\ =\ \frac{(Regional\ top\ sector\ employment\ |\ Total\ regional\ employment)}{(National\ top\ sector\ employment\ |\ Total\ national\ employment)}$$

Three general outcomes are possible: location quotient <1.0; location quotient = 1.0 and location quotient >1.0. A location quotient that is less than 1 suggests that there is relatively less local than national employment in a top sector. A location quotient that is equal to 1 suggests that local and national employment in a top

sector are equally concentrated, and a value greater than 1 indicates that local employment in a top sector is more concentrated than the national employment in that top sector. The location quotient is calculated for each top sector and total top sectors.

Figure 9.3.1 shows the location quotient for the total top sectors per COROP region. Top sectors are less concentrated in the North and the East of the Netherlands and more concentrated in the South and the West. With a location quotient greater than 1.5, Westland and Delfzijl have the highest location quotient. This means that jobs in these regions are concentrated more than 1.5 times. We might expect that the urban area near Amsterdam and Utrecht is highly concentrated because of the presence of the creative industry in this region. Surprisingly the location quotient of these regions is less than 1. Typical of the creative industry are the small firm sizes and the high share of self-employment (not counted in the number of jobs), which means a low share of jobs in this region. This is why the location quotient is less than 1.

9.3.1 Location quotient of total top sector per COROP region, 2011

- less than 0.95
- 0.95 to 1.05
- 1.05 or more
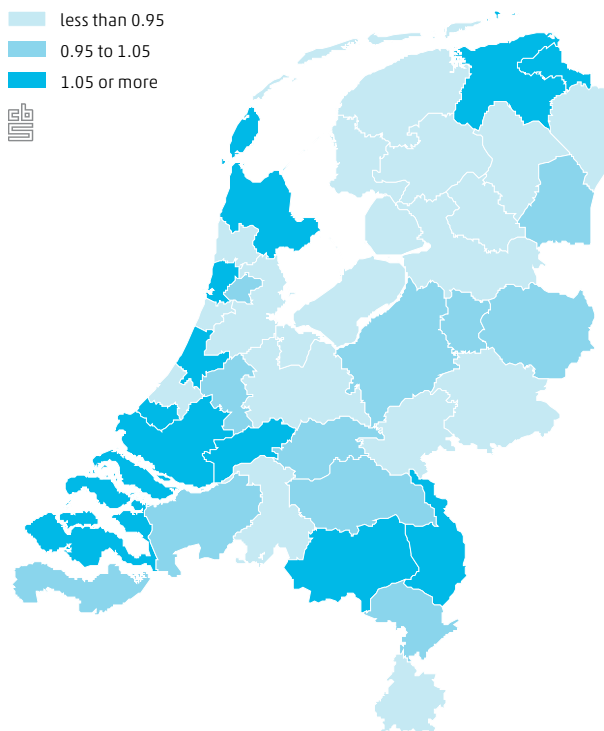
There are differences in the regional distribution between the nine top sectors. We give a brief overview of the top sectors.

Agro & food. In contrast to the regional distribution of the top sectors in total, the concentration of jobs in the agro & food sector is above the national average in the North, East and South of the Netherlands. With a location quotient greater than 2, Noord-Limburg, Zaanstreek, Noord-Friesland and Westland have the highest concentration of jobs in agro & food.

Chemicals. The top sector chemicals is a more traditional manufacturing industry concentrated outside urban areas. The regions with the highest concentration of jobs are Delfzijl and Zeeuwsch-Vlaanderen, followed by Zuidoost-Drenthe and Zuid-Limburg. Although Delfzijl and Zeeuwsch-Vlaanderen have a high concentration of jobs, the number of local units is limited.

Creative industry. Compared with the other top sectors, the concentration of jobs is particularly high in the creative industry. Only seven regions have more jobs than the national average. The creative industry is most concentrated in the four major cities, particularly in Amsterdam.

Energy. A quarter of the regions has local employment in the energy top sector above the national average. This top sector has the highest concentration of jobs in Zuid-Holland and Overig Groningen.

High-tech. With a location quotient greater than 2, IJmond and Zuidoost-Noord-Brabant have the highest concentration of jobs in the high-tech sector. The brain port activities in this top sector are mainly concentrated in the Eindhoven region.

Horticulture. Only a quarter of the regions has local employment in horticulture above the national average. This top sector is mainly concentrated in the province of Zuid-Holland. There is also a high concentration of jobs in Kop van Noord-Holland, Noord-Limburg and Zuidwest-Gelderland, although Westland stands out the most.

Life sciences. The highest location quotient in the life sciences is seen in the Agglomeratie Leiden en Bollenstreek, with 4.5 times as many jobs as the national average. With a location quotient of 3, Agglomeratie Haarlem and Noordoost-Noord-Brabant also have a high concentration of jobs in this sector.

Logistics. Although jobs in the logistics top sector are found throughout the Netherland, jobs are mainly concentrated in and around the main ports of

Rotterdam and Amsterdam. The number of jobs in Utrecht and Delfzijl also exceeds the national average.

Water. The top sector water has the highest concentration of jobs in the southern part of Zuid-Holland and in the west of Friesland.

Tables with detailed information on these findings can be found on the website of Statistics Netherlands. See also Raspe et al. (2012) for the spatial distribution of top sectors. This study looks at the spatial concentration of top sectors and which regions are important for top sectors.

9.4 Top sectors in an international perspective

The top sectors are very important to the international competitive position of the Netherlands. They are export-oriented. Figure 9.1.1 already showed that they accounted for more than half of the total export value in the Netherlands in 2011. This section gives some more detailed information about the international orientation of top sectors, such as foreign controlled enterprises and international traders. It is an extension of chapter 5 in the Internationalisation Monitor 2012, which provided information on this subject for all local units in the Netherlands, top sector and non-top sectors together (Statistics Netherlands, 2012b).

Figures 9.4.1, 9.4.2 and 9.4.3 show the geographical pattern of the international orientation of the top sectors in the Netherlands in 2011. The percentage of local business units in top sectors that are under foreign control is shown in figure 9.4.1. On average, 1.7 percent of all local units in the top sectors in the Netherlands are foreign controlled. Looking at the level of COROP regions, Zaanstreek, Groot-Rijnmond, Zuid-Limburg, Noord-Limburg and West-Noord-Brabant have the highest shares, with percentages above 2.6 percent. Foreign controlled local units are relatively often found in major Dutch cities, near important border crossings with Germany and Belgium as well as near airports and sea ports.

Figure 9.4.2 shows the share of establishments in top sectors engages in exports. In 2011, on average 15.5 percent of all local business units in the top sectors in the Netherlands exported goods. There is a big difference between regions. The share of local business units that export is highest near the borders with Germany and Belgium. The region with the largest share of traders is Zeeuwsch-Vlaanderen, followed by the three regions in Limburg. Limburg has the largest share of exporters: 26 percent. Region Noord-Friesland has the smallest share of exporters.

9.4.1 Share of local business units under foreign control per COROP region, 2011
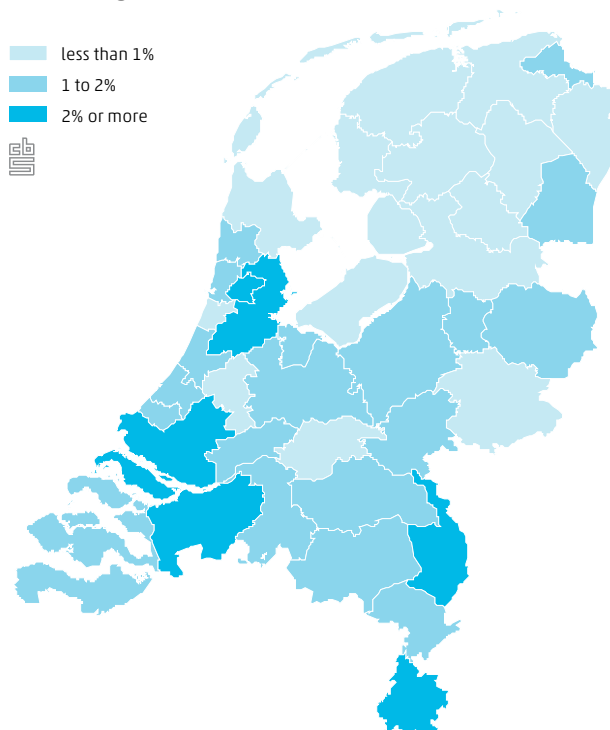
9.4.2 Share of exporting local business units per COROP region, 2011

less than 12%
12 to 16%
16 to 18%
18% or more
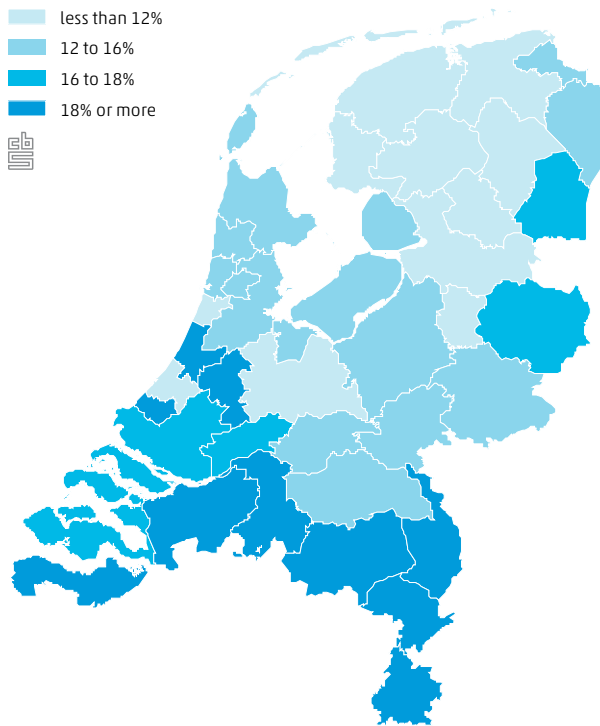
The share per region in the total export value is shown in figure 9.4.3. Although the share of exporters is highest in border regions, the export values of firms in the West are larger. The provinces Noord-Holland, Zuid-Holland and Noord-Brabant are responsible for more than 60 percent of total exports by top sectors. These are the regions where the top sectors excel. The region with the largest share in Dutch exports is Groot-Rijnmond with 15 percent. Proximity to an airport or sea port has a positive influence on the export value. Zuidoost-Noord-Brabant (high-tech sector) and Groot-Amsterdam (where Schiphol Airport is located) are each responsible for 10 percent of total Dutch exports.
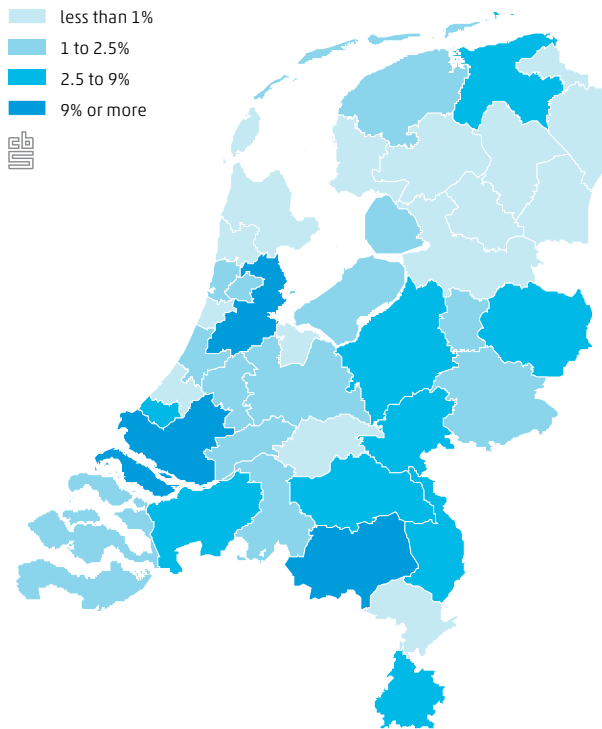
Figure 9.4.4 gives information about the international orientation of the nine top sectors. It presents the share of goods exporters on the x axis, the share of foreign controlled local business units (y axis) and the commodities' export value of firms (size of the bubble) in the top sectors for 2011. There are great differences between the nine. Chemicals and energy are the most internationally oriented. They have the largest share of exporters and foreign controlled local units, but not the highest export value. With 48 billion euros, the high tech sector has the highest export value, but the share of exporters and foreign controlled establishments is limited. Although the share of exporters and foreign controlled establishments is lowest in agro & food, the sector accounted for 16 percent of total exports of all top sectors. The creative industry is the least internationally oriented: the share of exporters, foreign controlled local units and export value is very limited.

9.4.4 International orientation of top sectors, 2011

foreign control %
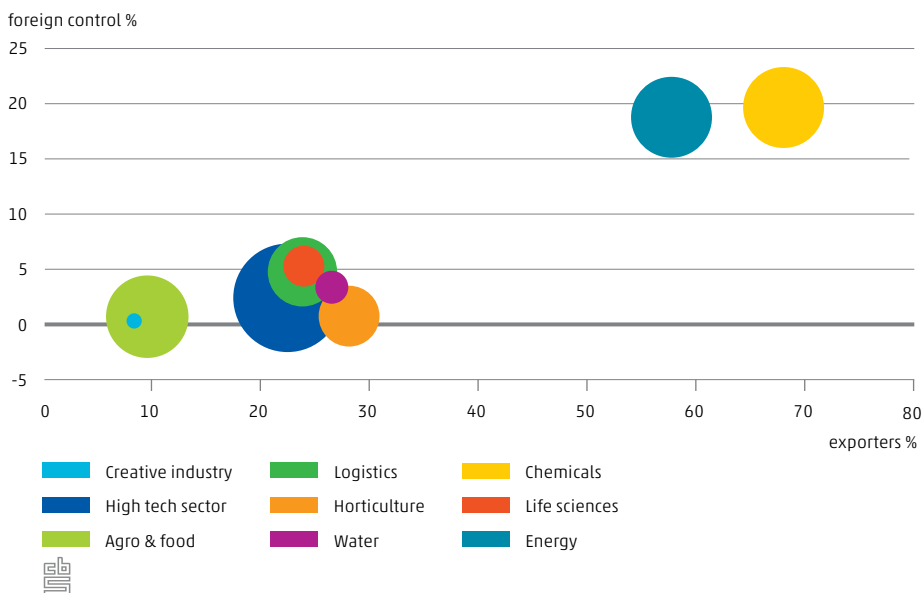
If we look at the share per region in the export value of each top sector, we see that several top sectors are linked to certain regions. Zuidoost-Noord-Brabant not only has 31 percent of the export value in the high-tech sector but also the highest concentration of jobs in this sector (see section 9.3). The region with the largest share in the export value of the chemicals sector is Groot-Rijnmond, followed by West-Noord-Brabant and Zuid-Limburg. Groot-Rijnmond and Overig Groningen are responsible for more than 60 percent of the exports in the energy sector. The provinces Noord-Holland and Zuid-Holland are responsible for a large share of the exports in horticulture. Two thirds of the exports in life sciences are generated in Noordoost- and Zuidoost-Noord-Brabant. Proximity to an airport or sea port has a positive influence on the export value, for that reason Groot-Amsterdam and Groot-Rijnmond accounted for two third of total exports in logistics.

9.5 Regression analysis

Being part of a top sector and the region where the enterprise is located might have an impact on its export value. In section 4 we found differences in export values among regions and top sectors. In order to investigate the relationship

between internationalisation, top sector membership and location, we ran several regression analyses. The results are presented in table 9.5.1. Model 1 tests whether commodities export value is higher for enterprises in a top sector when we control for foreign control, firm size (number of jobs) and location. Model 2 builds on model 1 by testing whether being in one top sector has a bigger impact on export value than being active in another top sector.

Model 1: ln(export value)=
$\alpha + \beta_1(foreign\ control) + \beta_2(ln(jobs)) + \delta(provinces) + \beta_3(top\ sector) + \varepsilon$

Model 2: ln(export value)=
$\alpha + \beta_1(foreign\ control) + \beta_2(ln(jobs)) + \delta_1(provinces) + \delta_2(top\ sector) + \varepsilon$

The findings reported in section 4 are generally confirmed by the regression results. As expected, both models show that the effect of firm size on export value is positive. In addition, we see that foreign control is an important determinant of export value. We can calculate from the results that if a local business unit is under foreign control, the average export value increases by a factor (exp (0.868) = 2. The effect of being part of a top sector is also positive. The average export value of local business units in a top sector is three times higher than that of local business units that are not part of a top sector. The regression results also point to the relevance of the region in which an enterprise is located. We found that firms in Flevoland have the highest export value, followed by Noord-Brabant. The average export values for firms in Flevoland are 60 percent higher than for firms in Friesland (reference group). Firms in the North of the Netherlands have the lowest export value.

Being part of a top sector has a positive impact on the export value. We have seen in section 9.4 that there are differences between the nine top sectors. In model 2 we added the nine top sectors. It turned out that the highest average export values are found for local business units in chemicals and horticulture. The export value of local units in chemicals is 12 times higher than for business units that are not part of a top sector. Local units in the creative industry have the lowest export value. Their export value is 15 percent lower than for firms that are not part of a top sector. However, note that the analyses in this chapter only concerns exports of commodities. The creative industry tends to exports services. So the value of their total exports may be higher than that of firms outside the top sectors.

9.5.1 Regression results (dependent variable ln_export value)

	Model 1	Model 2
Constant	8.22***	8.266***
Foreign control	0.686***	0.685***
ln_jobs	0.583***	0.573***
Provinces[1]		
Drenthe	−0.146	−0.179*
Flevoland	0.516***	0.475***
Gelderland	0.325***	0.317***
Groningen	−0.147	−0.158
Limburg	0.351***	0.298***
Noord-Brabant	0.437***	0.425***
Noord-Holland	0.246***	0.294***
Overijssel	0.198**	0.196**
Utrecht	0.233***	0.270***
Zeeland	0.084	0.028
Zuid-Holland	0.349***	0.332***
Top sector[2]	1.102***	
Agro & food		1.084***
Chemicals		2.479***
Creative industry		−0.477***
Energy		0.859***
High tech sector		0.854***
Horticulture		2.017***
Life sciences		0.875***
Logistics		0.252***
Water		0.546***
R^2	0.121	0.141
F	972***	735***
N	145,200	145,200

[1] Reference group: Friesland.

[2] Reference group: Not in top sector.

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

We also tested whether the combination of top sector and location is important for export value, e.g. if being active in top sector A in province X is associated with higher exports than being active in top sector A in province Y. We found that the province in which an enterprise is located is relevant for its export value. We give some examples of the results below. Firms in the top sector horticulture in Zuid-Holland have a significant higher export value than those in the Northern provinces. Raspe et al. (2012) found a cluster of this top sector in the province of Zuid-Holland. Export value of firms in the high tech sector is highest in Limburg, followed by Zeeland and Noord-Brabant. As mentioned in section 3 the creative

industry is concentrated in Noord-Holland. Although the export value of firms in the creative industry is very low, we found a significant higher export value in Noord-Holland than in the other provinces.

9.6 Conclusions

In this chapter, we presented the facts and figures related to the internationalisation of top sectors and their regional distribution.

A key feature of the top sectors is their export orientation, reflected in their relatively high export values. The top sectors generated 55 percent of total exports in the Netherlands in 2011. The share of exporting local units is highest near the borders with Germany in the east and Belgium in the south, yet firms in the west generate higher export values. Top sectors are closely linked to the provinces Noord-Holland, Zuid-Holland and Noord-Brabant. These regions are responsible for more than 60 percent of total Dutch exports by top sectors. The top sectors excel in particular around Eindhoven (high-tech) and in Noord- and Zuid-Holland (energy and logistics). Although the creative industry is also linked to Noord-Holland (Amsterdam in particular), its international orientation is limited as it contributes only 0.5 percent to total exports.

We used a regression analyses to explore the relationship between export value and several explanatory variables such as region and top sector. Local business units in a top sector have a three times higher average export value than local business units in any other sector. The region in which an enterprise is located is also relevant. Firms in the top sector horticulture in Zuid-Holland have a significant higher export value than those in the Northern provinces. The export value of firms in the high tech sector is highest in Limburg, followed by Zeeland and Noord-Brabant.

In this chapter we looked at the international trade in goods and found that the creative industry is the top sector with the lowest export value. The creative industry probably mainly exports services. Therefore in further research it would be interesting to look to the role of the international trade in services of top sectors.

10.

Foreign

knowledge workers

in the Netherlands

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This chapter deals with the distribution of foreign knowledge workers across different types of firms and regions. Our findings are that they are more likely to work in foreign and in internationally operating firms than native Dutch knowledge workers. They are also very unevenly spread across the country, working mostly in cities and agglomerations, most prominently in Amsterdam and other Randstad cities. The 'love for agglomeration' can largely be explained by the types of firms in a region, but also by economic density, proximity to Amsterdam Airport Schiphol and agglomeration characteristics. Our conclusion therefore is that policies to attract foreign knowledge workers should incorporate spatial elements in their strategies.

10.1 Introduction

The international migration of highly skilled personnel is increasing rapidly and has become a central aspect of globalization. Policy makers and business leaders are looking with above average interest at these talent flows, not least because todays knowledge-based economies rely more on people with higher skill levels than in the past (OECD, 2001). It has been argued that economies that are better able to attract international knowledge workers are better able to respond to cyclical labour market shortages, increase the stock of human capital, encourage the circulation of the knowledge embodied in highly skilled workers and promote innovation (OECD, 2001).

Many countries have therefore placed attracting foreign knowledge workers high on their political agenda. Since many aim to attract highly skilled workers from the same pool one can argue that the global competition for talent is growing (OECD, 2008) which, with a certain flair for drama, has been labelled 'the war for talent' (Chamers et al. 1998, Beechler and Woodward 2009).

The Netherlands also focuses on its capacity to attract, develop, motivate and retain international knowledge workers. This has been formulated in recent policy documents by the Ministries of Economic Affairs (2011) and Infrastructure and the Environment (2011): the ambition is to be in the top ten of most competitive economies, offering an excellent environment for businesses and knowledge workers. So-called human capital agendas per assigned top sector elaborate on specific policy goals in attracting international knowledge workers. Also the Ministry of Education, Culture and Science aims to attract and retain international talents (students).

Although the importance of international knowledge workers has been much emphasised, many labour market aspects of foreign knowledge migration are

poorly understood. In this paper we try to contribute to a better understanding of foreign knowledge workers in The Netherlands. How can 'foreign knowledge workers' be characterized, and are they economically different from non-knowledge workers and from their domestic counterparts?

We focused on their international dimensions. What is their origin? Where do they work, in foreign or domestic firms, in internationally operating of nationally focused firms, in what sectors? We especially focused on where they work geographically, combined with the dimensions of internationalisation. We found that foreign knowledge workers are very unevenly spread across the Netherlands. Agglomerations play a crucial role, especially the most internationally operating ones like Amsterdam, The Hague, Rotterdam and Brainport Eindhoven. This means that policy makers focusing on attracting knowledge workers must incorporate a spatial economic vision when offering them 'an excellent environment'.

10.2 Data and methodology

A number of datasets have been merged to analyse foreign knowledge workers in this chapter. The basis is a large fiscal dataset that includes employer-reported wages and hours worked of all employees in the Netherlands (Dutch: *Polisadministratie*). This dataset has been merged with census data that include age, gender, country of birth, and all past and present addresses of individuals (Dutch: *Gemeentelijke Basisadministratie*). For information on firms in particular sector, we rely on the business register of Statistics Netherlands (Dutch: *ABR*). As these three datasets are exclusively taken from registers, the resulting data set includes all tax paying employees with a current address in the Netherlands. However, it excludes cross-border commuters who work but do not live in the Netherlands and the self-employed. We rely on two data sources pertaining to work location. First: for employees who work for firms that concentrate all their activities in one Dutch municipality – which we know through the regional firm register (Dutch: *ABR-Regiobase*) – we take that municipality as the location. For firms with establishments in multiple regions, we use the most likely work location as determined by Statistics Netherlands in the municipality of work register (Dutch: *Gemeente Standplaats*). Employees who work through employment or pay-roll agencies are registered in the location of these agencies. They are excluded from our analyses as their actual work location is simply unknown. The observation in our analyses is at the job level. An employee can have several jobs a year. We have removed all jobs lasting less than one month, jobs of less than 12 hours a week,

and jobs earning less than the minimum wage. Also, we only included employees between 18 and 65.

A key element in this chapter is how we define a foreign knowledge worker. As the level of education of foreign employees is not well known, let alone the actual contents of their work, it is problematic to use a definition based on such criteria. The education register – which contains data on Dutch diplomas and degrees – omits people with degrees from foreign institutions. This leaves the labour force survey (Dutch: *EBB*) as our alternative. However, employees with high positions and foreign workers who have migrated to the Netherlands relatively recently are not well represented in the labour force survey. So we have to take an indirect approach to define a foreign knowledge worker.

We used the labour force survey to distinguish between knowledge and non-knowledge workers and to analyse the relationship between level of education and wages for groups of workers in various age brackets. And, paying no attention to country of birth, we defined knowledge workers as those workers of a certain age with wages above a certain threshold. These thresholds are set in such a way that at least 50 percent of even the lowest paid workers (e.g. those with wages just above the threshold) are higher educated. Overall, the resulting classification has a very strong overlap with the level of education and the classification of highly qualified jobs. Around two thirds are college (hbo) or university graduates. Appendix 10.a (to be published on the website) provides an extensive elaboration on our methodology.

Next, we determined which knowledge workers are foreigners. We define a foreign knowledge worker as someone born outside the Netherlands, who did not immigrate before the age of 18. The latter is important for two reasons: first, many foreign born individuals were born while their Dutch parents temporarily lived abroad; second, foreign born individuals who immigrated to the Netherlands as children were mostly educated in the Netherlands and tend to be very similar to native Dutch individuals.

When we compare foreign to Dutch knowledge workers, it is important to bear in mind that even though the latter group consists almost exclusively of native Dutch people born in the Netherlands, it also includes a few people who lived abroad when they were children with their Dutch expat parents, and some non-native people who immigrated as young children and not for work-related reasons. We use the term Dutch knowledge workers for convenience. Finally, if someone is considered a knowledge worker in at least one year, he or she is also considered as such in all other years even if while earning a lower wage.

10.3 General characteristics of foreign knowledge workers

As table 10.3.1 shows, over 600,000 foreigners are employed in the Netherlands. Only a sixth are knowledge workers. For comparison: over one third of the Dutch workers can be considered knowledge workers. In comparison with their Dutch counterparts, foreign knowledge workers are younger, work more hours a week and work less often on a part-time basis. Their hourly wage is substantially higher: there is a 15 percent average wage differential. This may imply that even though their share is relatively small they are overrepresented in high-profile jobs. Women make up about a third of all knowledge workers. The share of foreign female knowledge workers is 3 percentage points higher than that of Dutch knowledge workers, but much lower than for foreign born and native non-knowledge workers. The relatively low share of female foreign knowledge workers probably helps explain why there is a low incidence of part-time employment. Their relatively high average wages could imply that they hold higher positions in the internal hierarchy of organisations than part-time employees are likely to hold, which are characterized by a relatively lower share of women.

About 4 percent of all knowledge workers in the Netherlands is foreign. The share of foreigners is higher among non-knowledge workers, namely 11 percent. So the Netherlands attracts more low skilled foreign labour than knowledge workers. The group of foreign non-knowledge workers differs greatly from foreign knowledge workers: they are younger, more often female, more often part-timers and they earn much lower hourly wages. The average annual wage of foreign non-knowledge workers is slightly over a third of that of foreign knowledge workers.

1/6 of foreign employees are knowledge workers

The contrast between foreign knowledge- and non-knowledge workers becomes also visible when the country of birth is considered. The non-knowledge workers come from all over the world. Nearly half of the knowledge workers come from the European Union, against a quarter of the non-knowledge workers. A third of the non-knowledge workers come from Turkey, Morocco and Poland. The origin of knowledge workers is much more diverse than that of non-knowledge workers. Knowledge workers in the Netherlands mainly come from the United Kingdom, Germany and Turkey.

10.3.1 General characteristics of knowledge workers, 2010

	Unit	Knowledge workers		Non-knowledge workers	
		foreign	Dutch	foreign	Dutch
Employees	x 1	100,645	2,400,762	500,238	3,970,457
Average age		40.5	42.2	38.6	40.4
		(9.3)	(10.1)	(10.7)	(12.4)
Hours per week		36.8	35.6	31.2	30.6
		(6.4)	(6.9)	(9.3)	(9.3)
Hourly wage	euros	31.4	28.3	13.7	15.8
		(31.9)	(16.7)	(4.0)	(4.6)
Annual wage [1]		60,920	52,581	22,579	25,213
		(65.502)	(33.359)	(9.716)	(10.402)
Share of women	%	34.5	31.2	46.2	53.1
Share of part-time		24.0	31.5	55.2	57.6

Source: Statistics Netherlands/PBL.

Standard deviation is in parentheses.

[1] Normalized at 1 fte.

10.3.2 Foreign workers by country of birth, 2010

	Foreign knowledge workers		Foreign non-knowledge workers	
	x1	%	x1	%
European Union	45,312	45.0	143,872	28.8
Germany	8,861	8.8	29,979	6.0
Belgium	4,871	4.8	11,987	2.4
France	4,051	4.0	5,654	1.1
Spain	1,882	1.9	5,991	1.2
Italy	3,454	3.4	10,586	2.1
Portugal	1,173	1.2	7,325	1.5
United Kingdom	9,665	9.6	12,406	2.5
Poland	3,413	3.4	39,915	8.0
Other EU, Eastern Europe	3,099	3.1	10,737	2.1
Other EU (excluding Eastern Europe)	4,843	4.8	9,292	1.9
OECD countries (excluding EU)	17,956	17.8	86,698	17.3
United States	3,758	3.7	4,468	0.9
Canada	1,103	1.1	3,033	0.6
Australia	1,122	1.1	3,516	0.7
Turkey	7,735	7.7	67,040	13.4
Other OECD	4,238	4.2	8,641	1.7
Other countries	37,375	37.1	269,416	53.9
Brazil	981	1.0	4,725	0.9
China	2,261	2.2	12,158	2.4
India	3,860	3.8	5,887	1.2
Russia	3,293	3.3	11,378	2.3
Morocco	4,320	4.3	55,970	11.2
Rest of the world	22,660	22.5	179,298	35.9
Total	100,645	100.0	500,238	100.0

Source: Statistics Netherlands/PBL.

10.4 Characteristics of firms that employ foreign knowledge workers

We find that foreign knowledge workers are much more likely to work for an internationally oriented firm than any other type of employee included in figure 10.4.1. One aspect of international orientation is foreign control. In the Netherlands about 2 percent of the local business units are under foreign control. Their share in total Dutch employment is slightly below 12 percent. Nearly 30 percent of the foreign knowledge workers work in these firms. This figure is twice as high as for Dutch knowledge workers. From previous research (Statistics Netherlands, 2011b, page 90) we know that many labour immigrants, especially from non-EU countries, work for a company from their home country. More than half of the Japanese immigrants start to work for a Japanese company. This phenomenon can be also observed, though to a lesser degree, in Chinese and American firms. Apart from direct links of workers with the country where the parent company is located, the stronger international orientation of foreign firms is likely to result in greater employment opportunities for foreign workers at these firms, which are probably less focused on the Dutch language and business culture, and require more knowledge about foreign markets.

Another aspect of international orientation is international trade. Foreign knowledge workers work in firms where the average share of goods exports amounts to 15 percent of total turnover. That share is over 50 percent higher than for Dutch knowledge workers. When it comes to imports of intermediaries, the picture is less pronounced, but still the firms with foreign knowledge workers have the highest share of imports in total turnover.

The higher share of foreign knowledge workers is likely to be related to the fact that exporting firms operate in a more international environment. It is, however, also explained to some extent by other characteristics of trading firms: for example, traders tend to be much larger than non-traders and larger firms tend to employ more foreign and more knowledge workers.

Still over half of the foreign knowledge workers work in firms that do not export goods or that have a less than 1 percent share in exports. In figure 10.4.2 one of the reasons for this becomes clear. More than half of the foreign knowledge workers work in financial and commercial services, government, education, health care and other services. These are not known for their goods exports. We could not investigate to what extent these organisations participate in trade in services due to a lack of data. This is an area for further research.

10.4.1 Share of employees that work at a foreign firm and average share of exports (imports) in total turnover (intermediairies) of the firms where employees work, 2010

Source: Statistics Netherlands/PBL.
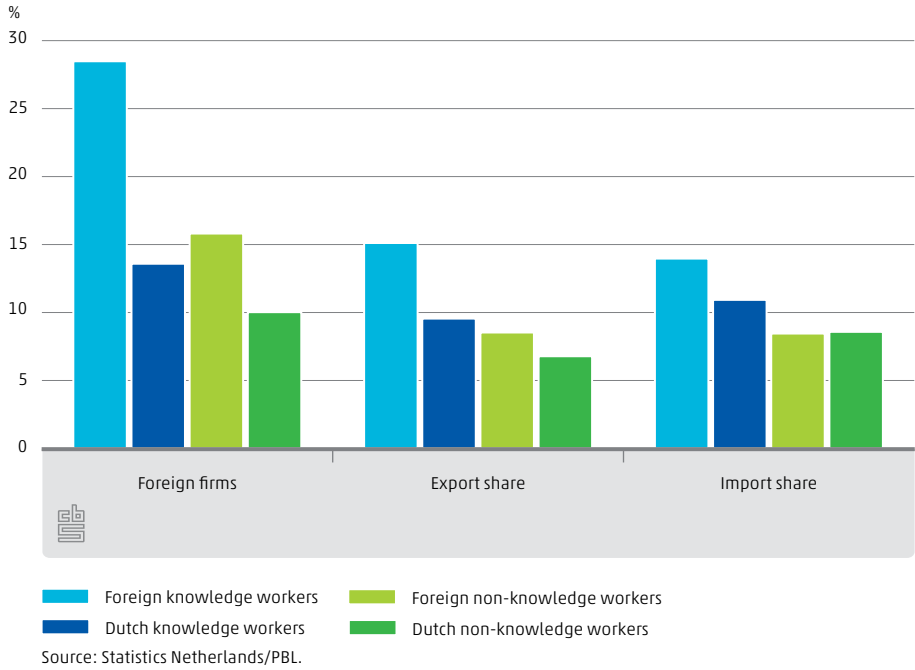
10.4.2 Distribution of knowledge workers across industries

Source: Statistics Netherlands/PBL.
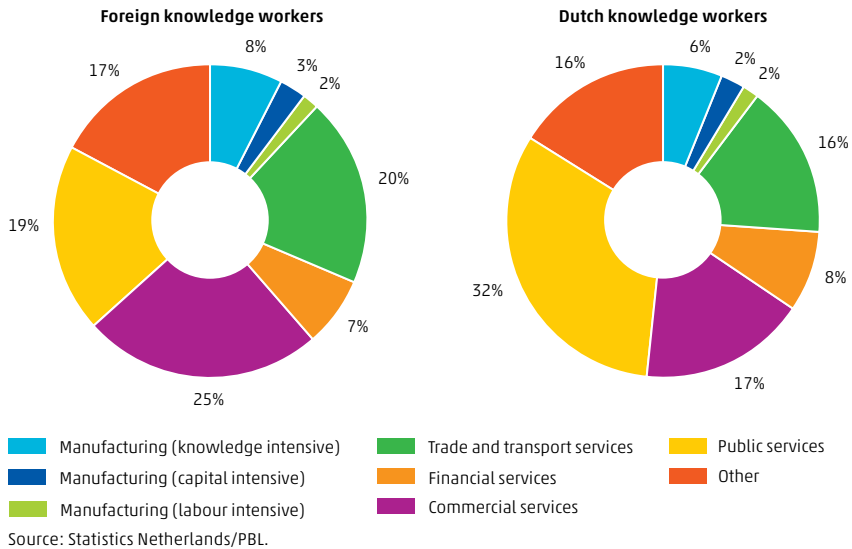
Compared to Dutch knowledge workers, the foreign knowledge workers are overrepresented in the commercial services sector and in trade whereas Dutch knowledge workers are more concentrated in knowledge intensive manufacturing, government, education and health care. Foreign knowledge workers are also overrepresented in employment agencies. Workers with a contract in this flexible and dynamic sector can be employed in all other sectors in the Dutch economy, which may foster flexibility, knowledge diffusion and international orientation (Statistics Netherlands, 2011b, page 87).

10.4.3 Stylized facts of foreign knowledge workers by industry sectors, 2010

	Foreign knowledge workers			
	number	share in total knowledge workers	average hourly wage	wage differential other knowledge workers[1]
	x1	%	euro	%
Mining and quarrying	630	9.90	51.82	33.50
Employment agencies	7,794	7.50	21.61	−5.60
Hotels and restaurants	1,504	6.50	19.03	−19.80
Commercial services	25,022	5.70	36.20	9.20
Trade	13,873	5.30	32.50	16.10
Manufacturing (knowledge intensive)	7,666	4.90	30.63	4.50
Manufacturing (capital intensive)	2,802	4.60	25.56	−8.90
Transport	5,887	4.30	29.86	11.50
Other services	3,979	3.80	34.41	6.90
Agriculture	633	3.80	18.95	−18.70
Manufacturing (labor intensive)	1,574	3.70	20.99	−18.30
Financial services	7,084	3.40	36.02	11.10
Education	7,610	3.10	28.10	1.60
Healthcare	8,776	3.00	32.49	8.10
Utilities	329	1.90	32.29	9.50
Construction	2,327	1.80	22.81	−10.30
Government	3,119	1.20	29.45	−1.70

Source: Statistics Netherlands/PBL.

[1] Wage differential corrected for age (linear and quadratic) and gender by estimating a Mincereian wage regression.

In table 10.4.3 the sectors are sorted in order of the share of foreign knowledge workers in the total number of knowledge workers. They are represented in all industries, but their share varies from 1 percent in government to 10 percent in mining. An interesting sector for foreigners is the commercial services sector which employs a quarter of all foreign knowledge workers (see figure 10.4.2). The ratio of foreign to total knowledge workers in commercial services is relatively high at 6 percent (see table 10.4.3). Their average hourly wage was € 36 in 2010 which is the second highest wage rate after mining. They earn 9 percent more than the

Dutch knowledge workers in the same sector. Apparently foreign knowledge workers are relatively attractive for the sector. This is perhaps because well qualified personnel is hard to come by or because the specific type of knowledge that foreign knowledge workers have is much in demand. Perhaps foreign controlled enterprises decide to transfer well-paid employees to their Dutch subsidiary. The same goes for other sectors such as trade and health care.

An extraordinary sector is mining and quarrying. This sector is small, but it has the highest share of foreign knowledge workers, the highest average hourly wage and the greatest wage differential of all sectors.

Employment agencies often provide work for foreign workers, but they have to accept lower wages than Dutch knowledge workers.

Typical sectors with a small share of foreign knowledge workers are government, construction and utilities. Knowledge of Dutch society is very important for government employees.

10.5 Regional aspects

After discussing the general characteristics of foreign knowledge workers, the firms where they work, and their differences from Dutch employees, it is interesting to investigate in which parts of the Netherlands they work. The link with internationally oriented firms is shown in the preceding paragraph. Major towns and border regions have a high concentration of foreign-owned firms and firms involved in international trade (Statistics Netherlands, 2012b, chapter 5 International enterprises in a regional context). Are these regions also attractive for foreign knowledge workers? Does the choice of the region play a role in the relative share of foreign knowledge workers? To answer these questions, we need to know in which municipality the establishment of the firm is located. Then we can show a map with knowledge workers by region.

Both in absolute and in relative terms, many foreign knowledge workers are found in Amsterdam, Rotterdam, The Hague, Utrecht and Eindhoven, and also in Haarlemmermeer where Amsterdam Airport is located. The share of foreign knowledge workers in local employment is particularly high in Amsterdam and neighbouring municipalities. A high share is also found in Petten, where the ECN research facility is located.

10.5.1 Regional and sectoral shares of foreign knowledge workers[1]
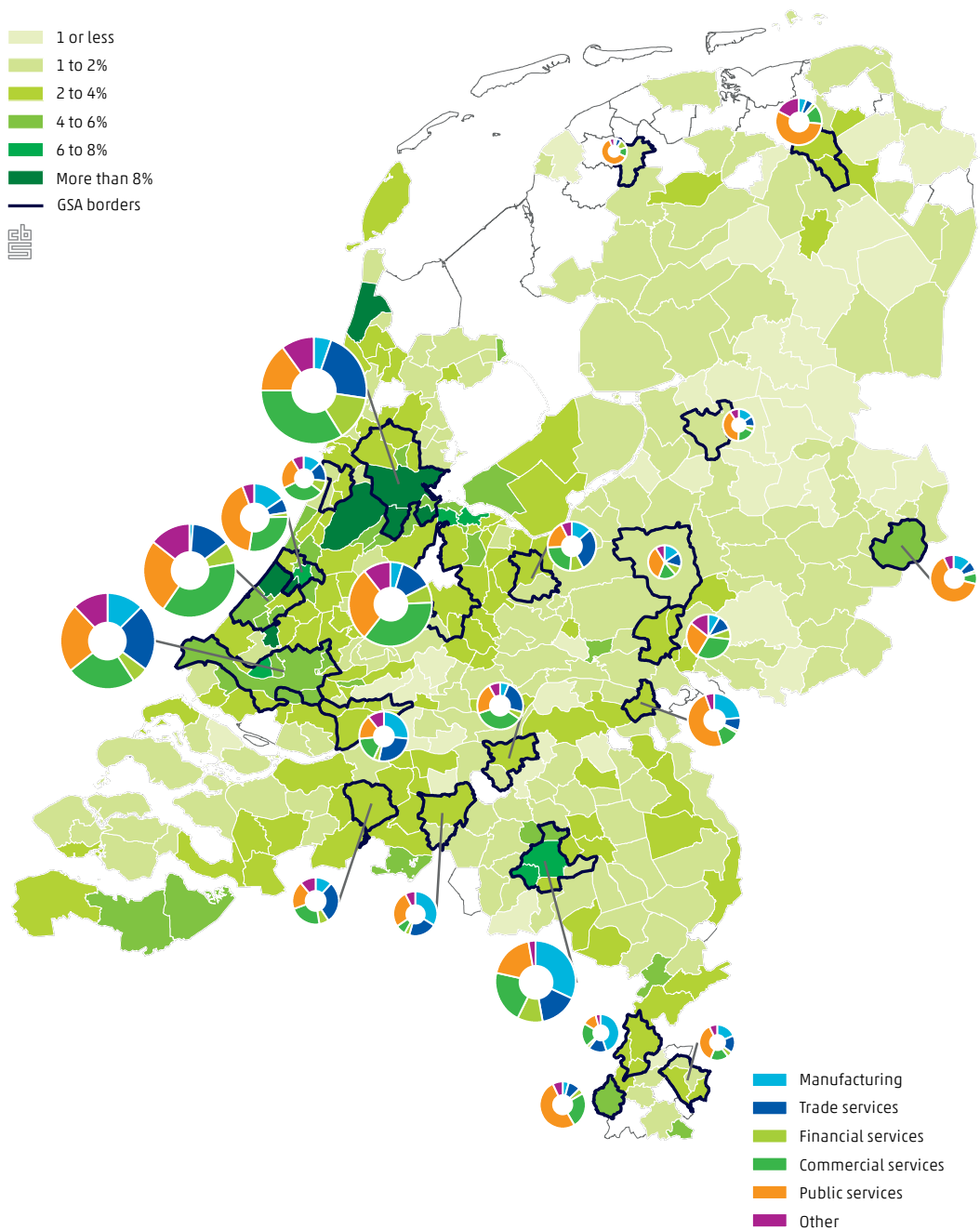
Legend:
- 1 or less
- 1 to 2%
- 2 to 4%
- 4 to 6%
- 6 to 8%
- More than 8%
- GSA borders

- Manufacturing
- Trade services
- Financial services
- Commercial services
- Public services
- Other

Source: Statistics Netherlands/PBL.

[1] Map colors (in green): share of foreign knowledge workers in total number of knowledge workers by municipality. Pie diagrams: share of foreign knowledge workers employed at six different industries in the 22 agglomerations (GSA) as defined by Statistics Netherlands. Size of the pie diagrams relates to the total number of foreign knowledge workers in each agglomeration.

Figure 10.5.1 shows the ratio of foreign to the total number of knowledge workers by municipality. This varies from less than 1 percent to 9 percent or more. Two thirds of all foreign knowledge workers work in the 22 Dutch urban regions that have been defined by Statistics Netherlands. Such urban agglomerations consist of several urbanized municipalities (Dutch: *Grootstedelijke Agglomeratie*). They are outlined on the map. For each urban agglomeration we also show a pie-diagram. The pie sizes relate to the total number of foreign knowledge workers in each agglomeration. That is why the largest agglomerations have the largest circles. The pie also shows the share of foreign knowledge workers employed in six different industries. In Amsterdam, The Hague and Utrecht the highest share of foreign knowledge workers works in commercial services. By contrast, many foreign knowledge workers in the high-tech cluster around Eindhoven work in manufacturing. In agglomerations with transportation hubs (the seaports of Rotterdam and Amsterdam and Schiphol airport) a substantial share of the foreign knowledge workers is employed in trade. Public services play their part in agglomerations where a university is situated: Enschede, Maastricht, Nijmegen, Leiden, Utrecht, Rotterdam and Amsterdam. Delft and Wageningen also have universities, but they are not part of one of the 22 agglomerations. These municipalities are recognizable on the map through their high share of foreign knowledge workers. The Hague, with its many international institutions, has also a major public sector involvement of foreign knowledge workers.

Foreign knowledge workers are more urban than other foreign workers. About two out of five of this latter group work in the periphery. Nevertheless the agglomerations with a lot of foreign knowledge workers, also have large numbers of non-knowledge foreign workers. In Amsterdam 20 percent of all non-knowledge workers come from elsewhere. It is a melting pot for foreign knowledge and non-knowledge workers (table 10.5.2).

10.5.2 Stylized facts of foreign workers in 22 Dutch agglomerations, 2010

	Foreign knowledge workers		Foreign non-knowledge workers	
	number of employees	share in total knowledge workers	number of employees	share in total non-knowledge workers
	x1	**%**	**x1**	**%**
Groningen	775	2.2	3,621	5.8
Leeuwarden	223	1.2	1,445	4.5
Zwolle	324	1.3	2,581	6.0
Enschede	792	4.4	4,094	10.3
Apeldoorn	356	1.3	3,156	6.9
Arnhem	675	2.1	4,519	8.8
Nijmegen	1,062	3.9	3,913	8.3
Amersfoort	860	2.5	4,066	9.3
Utrecht	4,318	3.7	17,445	13.9
Amsterdam	20,291	8.3	57,178	20.8
Haarlem	709	2.9	4,085	10.9
Leiden	2,053	5.7	5,784	10.7
's-Gravenhage	7,015	5.8	22,979	16.0
Rotterdam	8,135	4.5	36,185	14.7
Dordrecht	880	2.7	4,860	9.1
Breda	782	2.6	4,303	9.3
Tilburg	681	2.3	4,840	8.3
's-Hertogenbosch	753	2.0	3,743	7.0
Eindhoven	3,781	5.8	11,006	11.3
Geleen/Sittard	489	2.8	2,222	6.8
Heerlen	421	2.0	3,243	7.1
Maastricht	765	4.6	3,551	10.6
Periphery	36,711	3.0	199,105	8.3

Source: Statistics Netherlands/PBL.

10.5.3 Internationalisation of firms where foreign knowledge workers are employed[1]
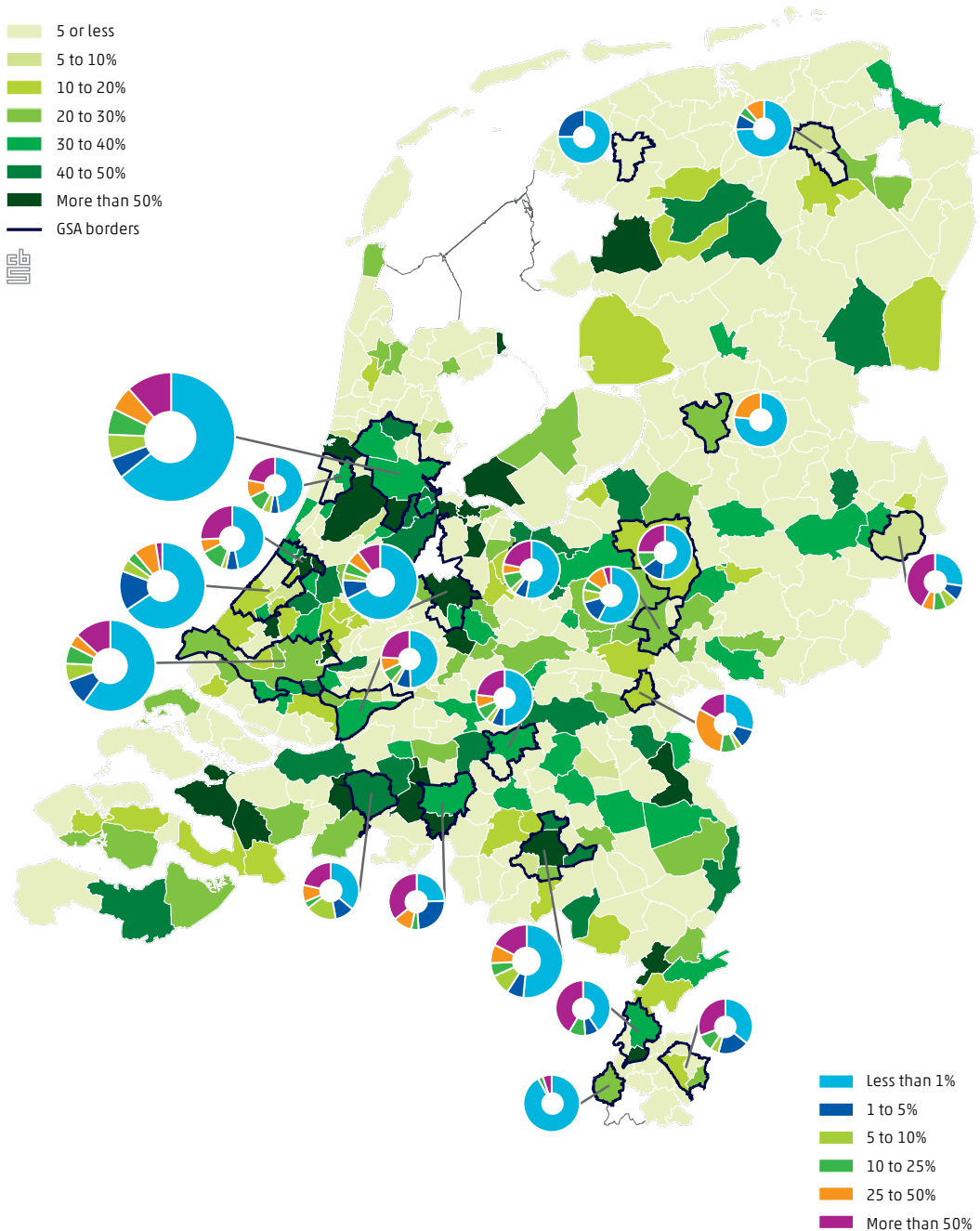
Map colours (green):
- 5 or less
- 5 to 10%
- 10 to 20%
- 20 to 30%
- 30 to 40%
- 40 to 50%
- More than 50%
- GSA borders

Pie diagrams:
- Less than 1%
- 1 to 5%
- 5 to 10%
- 10 to 25%
- 25 to 50%
- More than 50%

Source: Statistics Netherlands/PBL.

[1] Map colors (in green): share of foreign knowledge workers that work at a foreign firm in the total number of knowledge workers.
Pie diagrams: share of foreign knowledge workers employed at firms that differ by exports as a percentage of turnover. Sizes of pie diagrams relate to the total number of foreign knowledge workers in each agglomeration.

In paragraph 10.4 we concluded that firms with an international orientation are attractive for foreign knowledge workers. Foreign firms employ about a quarter of all foreign knowledge workers. And firms with foreign knowledge workers have a higher share of exports in their turnover. In figure 10.5.3 we take a closer look at the regional aspects of this conclusion. The share of foreign knowledge workers in a foreign firm in total number of foreign knowledge workers by municipality differs widely from zero to over 50 percent. The greater the share of foreign firms in local employment of foreign knowledge workers, the darker the shade of green on the map. In small municipalities with a high share it is possible that nearly all foreign knowledge workers are employed in a single or just a few firms under foreign control. That is why municipalities with a high share of foreign knowledge workers in foreign firms are found in all parts of the Netherlands. The municipalities with the highest shares are Amsterdam, Haarlemmermeer, Rotterdam, The Hague, Utrecht, Amstelveen and Eindhoven. But numerous medium-sized towns, such as Terneuzen and Geleen/Sittard, also have a substantial share.

The pie diagrams in figure 10.5.3 show the share of foreign knowledge workers employed at firms by how important their exports are. In line with figure 10.5.2, the size of the circles represents the total number of foreign knowledge workers in each agglomeration. Enschede is an example where a high share of foreign knowledge workers is employed at firms with high export levels (more than 25 percent of turnover). This group includes sectors without exports, such as the University of Twente, but also firms exporting services.

In most agglomerations the majority of foreign knowledge workers are employed in firms without or with low levels of exports in goods (less than 1 percent of turnover). There are some exceptions: particularly border regions are characterized by a relatively high share of foreign knowledge workers. Evidently knowledge workers in the Randstad are employed in firms that are characterized by relatively low export levels, such as financial and commercial services, education and health care. In the border regions manufacturing plays a more important role. In general, there is a strong relationship between the share of foreign knowledge workers employed in the services sector and the average export intensity of firms where they are employed.

10.6 Exploring the geography of foreign knowledge workers

The previous paragraphs dealt with various aspects of foreign knowledge workers. We considered possible links with internationalisation of firms, and looked at differences between sectors and regions. How does the relative importance of the various aspects that have been addressed in the previous sections explain the distribution of knowledge workers across firms and regions?

10.6.1 Effects on the relative %-share of foreign knowledge workers, 2010

Results of negative binomial regression

	(I) without agglomerations		(II) agglomerations included		(III) agglomerations as only variable on regional level	
	parameter	(z-value)	parameter	(z-value)	parameter	(z-value)
Effect of on the relative share of foreign knowledge workers of:						
Foreign firm	212.9	(39.6)	192.5	(37.9)	236.6	(42.0)
Exporter	149.9	(21.2)	155.4	(22.2)	157.4	(21.9)
Doubling the share of exports	25.5	(12.4)	25.5	(12.6)	27.1	(13.0)
Importer	−9.5	(−2.0)	−7.0	(−1.5)	−9.2	(−2.0)
Doubling the share of imports	−1.7	(−0.8)	−1.3	(−0.6)	−1.6	(−0.7)
Doubling the employment density	50.2	(19.1)	16.0	(5.7)		
Doubling the distance to Schiphol	−29.9	(−23.7)	−36.7	(−24.0)		
Industry fixed effects						
Mining and quarrying	321.3	(7.1)	206.1	(5.6)	191.9	(5.2)
Manufacturing (capital intensive)	22.9	(2.3)	12.5	(1.3)	−2.0	(−0.2)
Manufacturing (labour intensive)	14.4	(1.5)	5.0	(0.6)	−7.3	(−0.9)
Manufacturing (knowledge intensive)	20.2	(2.3)	2.7	(0.3)	−3.4	(−0.4)
Utilities	121.6	(3.4)	70.8	(2.3)	58.9	(2.0)
Construction	−14.0	(−1.9)	−25.4	(−3.6)	−28.2	(−4.1)
Trade	3.5	(0.5)	−9.0	(−1.3)	−3.1	(−0.4)
Hotels and restaurants	−20.7	(−2.4)	−37.7	(−5.0)	−34.6	(−4.5)
Transport	17.2	(2.0)	−0.7	(−0.1)	8.3	(1.0)
Financial services	69.4	(6.6)	34.1	(3.7)	44.9	(4.6)
Commercial services	75.4	(7.6)	40.8	(4.6)	52.6	(5.7)
Government	−43.7	(−4.7)	−51.5	(−6.0)	−57.5	(−7.0)
Education	20.7	(2.1)	−2.3	(−0.3)	−3.6	(−0.4)
Healthcare	6.7	(0.8)	−13.4	(−1.8)	−12.9	(−1.7)
Other services	69.7	(6.7)	28.4	(3.1)	32.8	(3.5)
Agglomerations						
Groningen			68.1	(5.2)	−11.0	(−1.2)
Leeuwarden			19.4	(1.2)	−30.0	(−2.3)

10.6.1 Effects on the relative %-share of foreign knowledge workers, 2010 (end)

Results of negative binomial regression

	(I) without agglomerations		(II) agglomerations included		(III) agglomerations as only variable on regional level	
	parameter	(z-value)	parameter	(z-value)	parameter	(z-value)
Zwolle			−13.2	(−1.1)	−40.1	(−3.9)
Enschede			112.0	(7.1)	14.6	(1.3)
Apeldoorn			−18.3	(−1.7)	−37.0	(−3.7)
Arnhem			74.2	(5.6)	32.3	(2.8)
Nijmegen			60.6	(4.5)	20.7	(1.8)
Amersfoort			50.0	(5.1)	60.6	(5.8)
Utrecht			39.5	(6.6)	80.6	(11.9)
Amsterdam			83.4	(17.8)	296.9	(47.5)
Haarlem			−26.8	(−3.6)	52.4	(4.8)
Leiden			25.0	(3.1)	84.6	(8.5)
's-Gravenhage			165.4	(21.7)	222.1	(26.7)
Rotterdam			118.5	(20.1)	141.7	(25.1)
Dordrecht			31.6	(3.7)	35.2	(4.0)
Breda			44.1	(4.4)	13.0	(1.4)
Tilburg			9.1	(0.9)	−11.8	(−1.3)
's-Hertogenbosch			24.8	(2.6)	2.0	(0.2)
Eindhoven			96.4	(11.2)	32.9	(4.7)
Geleen/Sittard			160.6	(9.4)	30.5	(2.6)
Heerlen			74.7	(4.9)	−17.2	(−1.6)
Maastricht			197.9	(9.9)	39.4	(3.0)
Number of observations	211,784		211,784		211,809	
Pseudo R-squared	0.31		0.3		0.3	

Source: Statistics Netherlands/PBL.

Table 10.6.1 shows the results of a negative binomial regression analysis, whereby the natural logarithm of the number of foreign knowledge workers in an establishment of a firm is related to a set of control variables, several dimensions of internationalisation, and a number of regional characteristics. Because total employment at the firm and the firm establishment, as well as total employment of *Dutch* knowledge workers were included as explanatory variables, the results are to be interpreted as the effect on the relative presence of foreign knowledge workers in a firm establishment. Furthermore, the parameter estimates that are presented in table 10.6.1 have been converted to percentages. For example, the estimated effect of being a foreign firm in column (I), which is 212.9 percent, implies that if we compare two establishments of firms that are the same on all accounts (also in terms of employment at the firm and the firm establishment), we estimate the share of foreign knowledge workers to be 3.129 times the share of

foreign knowledge workers we would expect if the establishment would be part of a Dutch owned firm.[1]) The z-value indicates the extent of significance. The higher the z-value the stronger the relation between the variable and the relative share of foreign knowledge workers.

The share of foreign knowledge workers in a firm depends greatly on foreign control and exports of goods. A high employment density and a close distance to the Schiphol airport come to the fore as key factors while trying to 'explain' share of foreign knowledge workers.

In preceding paragraphs Amsterdam turned out to be the most attractive agglomeration for foreign knowledge workers. In column (II) we add fixed effects for each agglomeration to the specification of column (I), to measure whether foreign workers are still more attracted to certain cities in the Netherlands after controlling for the characteristics of the firms located in those regions. In this regression, we excluded density and distance of Schiphol so that all regional effects are captured by the agglomeration fixed effects. The estimated parameters have to be interpreted relative to firm establishments located *outside* the 22 Dutch agglomerations. The results show that even when we control only for firm characteristics, the relative share of foreign knowledge workers in Amsterdam remains the highest of all Dutch agglomerations.

In column (III) we have added economic density and distance to Schiphol airport as additional control variables. The results show that an important part of the overrepresentation of foreign knowledge workers in Amsterdam is explained by its closeness to Schiphol airport and its high density. Even though we still see a relatively high share of foreign knowledge workers in Amsterdam, it is higher in The Hague and Rotterdam, and also some agglomerations in the border regions: Maastricht, Geleen/Sittard, Enschede and Eindhoven are attractive locations.

10.7 Conclusions

By combining several unique micro datasets this chapter contributes to a better understanding of the labour market aspects of foreign knowledge workers in the Netherlands. Even though they are more likely to work in foreign firms than native Dutch workers (30 percent works for a foreign controlled firm), they mainly exploit their 'talents' in domestic firms. Also, they are highly productive: there is

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[1] Parameters of the negative binomial model can be converted to percentages via the formula: *exp(parameter)*100%–100%.* An increase of 100% implies that the share is twice as high. An increase of 212.9 percent implies the share is 3,129 times as high.

a 15 percent average wage differential in favour of foreign knowledge workers. Furthermore, they are often employed at internationally operating (trading) firms; firms that are important for the international competitiveness of the very open Dutch economy.

Even though they play an important role in the Dutch economy, the total number foreign knowledge workers is still relatively small: about 4 percent of all knowledge workers in the Netherlands. And only a minority of one sixth of all foreigners employed in the Netherlands are knowledge workers. Over one third of the Dutch workers can be counted as knowledge workers. To attract more international knowledge workers, it is important to understand the characteristics of this human capital factor. One key finding in this paper is that foreign knowledge workers tend be strongly overrepresented in the largest agglomerations. The greater Amsterdam region alone employs 22 percent of all foreign knowledge workers. But also agglomerations like Rotterdam, The Hague, Utrecht and Eindhoven attract many foreign knowledge workers. In an effort to 'explain' this unequal distribution of foreign knowledge workers we found that even after controlling for the fact that foreign knowledge workers tend to work in foreign firms, certain sectors and exporting firms – and that these firms are also unequally divided over the country – there are strong effects of agglomeration economies for foreign knowledge workers. Regions with a high employment density, and particularly the metropolitan area of Amsterdam attract significantly more foreign knowledge workers than more peripheral regions. Even though the high share in Amsterdam is partially explained by high density and its proximity to Schiphol airport.

The findings of this chapter are highly relevant for policy making. They do not only contribute to a better understanding of the characteristics of foreign knowledge workers, but also show that a macro-economic approach that neglects the importance of agglomerations does not fit the very strong link between foreign knowledge workers in the Netherlands and certain regions with a strong international orientation. We highly recommend incorporating this spatial dimension in a strategy to become an attractive country in this 'global war for talent'. Clearly, spatial policy that aims to attract foreign knowledge workers is not space-insensitive and will have very different implications for different regions.

11.

Internationalisation and firm productivity: firm and regional level effects

Authors
Stefan Groot (PBL)
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This study analyses the relationship between several dimensions of internationalisation – foreign firms, exports as a share of turnover, imports as share of the total use of intermediaries, and the presence of foreign (knowledge) workers – and total factor productivity (TFP) at the firm and at the regional level. We find that foreign-owned firms and trading are related to higher levels of TFP, while there is no relationship between the presence of foreign workers and TFP. Even though there is substantial heterogeneity in regional productivity, we found no evidence for externalities[1] from internationalisation.

11.1 Introduction

Many national and local governments aim to increase the internationalisation of their economy by attracting investments of foreign firms and welcoming talented foreign workers, and by stimulating domestic firms to become actively involved in international trade. Governments attempt to attract foreign firms by lowering taxes and relaxing regulations – which some fear may result in a 'race to the bottom'. The measures taken in the global 'race for talent' are described in Chapter 10. The Dutch government follows suit as is shown by recent policy incentives and the installation of a Minister for Foreign Trade and Development Cooperation.

The rationale is that internationalisation stimulates economic growth and development. Firms with an international orientation are assumed to be more productive. Because of their worldwide access to capital, knowledge and labour, they can perform the tasks required to manufacture goods and services at locations with a comparative cost advantage, and therefore more efficiently (Groot, 2013). The presence of internationally oriented firms in a region may also increase the productivity of other local firms through positive spill-overs (Sourafel et al., 2008). Local firms can learn from internationally oriented firms how to improve their productivity through interactions or competition effects. The aim of this chapter is to estimate the direct and indirect effects of internationalisation on the productivity of firms.

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[1] Externalities are positive or negative side effects that affect other parties who are otherwise uninvolved. For example, a neighbour who maintains an attractive house may increase the value of surrounding properties.

Despite the widespread belief in the positive effects of internationalisation on firm productivity, the empirical evidence for this is mixed. Several studies have shown that foreign firms and firms involved in international trade are more productive (e.g., Girma et al., 2008, Parotta et al., 2011). However, other studies have shown that this effect disappears after controlling for firm-specific characteristics, suggesting that the distinctive characteristics of internationally oriented firms makes them more productive rather than internationalisation (Rojas-Romagosa, 2010). Empirical evidence for the existence of regional spill-overs from internationalisation is also far from conclusive: positive and negative effects have been found (Görg and Greenaway, 2003).

Empirical insight in the effect of internationalisation on firm productivity in the Netherlands is still very limited due to a lack of data at the firm level. Only a few very recent studies address the issue (Möhlmann, 2013; Smit et al., 2013). In this chapter, we examine how total factor productivity of firms in the Netherlands is linked to four dimensions of internationalisation: foreign ownership, exports, imports and foreign workers. For this we use detailed data on firm productivity derived from Dutch tax declarations. Furthermore, we examine the effects of these four dimensions at the firm and the regional level, allowing us to test whether there is evidence for spill-over effects.

11.2 Theoretical background

Foreign-owned and exporting firms are known to be more productive than non-exporters and native Dutch firms. This is perhaps because they can learn from their interactions with foreign markets. However, the higher productivity level of foreign-owned and exporting firms is also often attributed to selection effects (Bernard et al., 2007; Wagner, 2011). Only the most productive firms are able to successfully invest abroad or export. Firms trying to enter a foreign market have less information about the specifics of that market than domestic firms. They are also confronted with fixed costs for establishing distribution networks and learning about specific regulatory arrangements (Görg and Greenaway, 2003). Successfully entering a foreign market requires firm-specific assets such as a superior production technique, know-how or management strategy, compensating for these costs and the liability of being foreign (Dunning, 1998). Selection effects imply that there is no causal relationship between exporting or foreign ownership and productivity, but rather that foreign or exporting firms were already more productive *before* they entered the foreign market.

Importing is also often associated with higher levels of productivity, as firms can benefit from relative comparative cost advantages. International sourcing is likely to increase the productivity of firms if outsourcing enables them to lower their production costs below the additional external transaction costs involved in obtaining intermediates from abroad (Möhlmann, 2013). For instance, when foreign suppliers can produce the imported intermediaries cheaper than the firm itself because of lower wages or economies of scale (Abraham and Taylor, 1996).

The effect of hiring foreign employees on firm productivity is less straightforward (Groot, 2013; Möhlmann, 2013). Internationally oriented firms can gain from hiring employees with relevant country-specific knowledge (Rauch and Casella, 2003). Their understanding of the market can help the firm invest in or export to that country. Diversity of the workforce may also increase the likelihood of innovation because foreign employees are likely to bring new knowledge and production techniques to the firm (Saxenian, 2007). However, problems with communication and trust among employees may lower a firm's productivity.

Productive firms with an international orientation may not be able to keep their firm-specific assets from other firms in the region. Three mechanisms may trigger spill-overs: competition effects, labour mobility, and buyer-supplier links (Görg and Greenaway, 2003). A productive internationally active firm means more competition for others in the field. This may trigger the competitors to imitate its production process or management strategies, or to become more efficient by improving their own technology, production process or management strategy. Competitors can also get access to firm-specific assets by hiring former employees with detailed knowledge about the specificities of the production process or management strategy that gave the internationally oriented firm the competitive edge (Görg and Greenaway, 2003).

Buyer-supplier links with internationally oriented firms lead to regular, repeated interactions from which both benefit by sharing insights in firm-specific assets (Girma et al., 2008). The internationally active firm may stimulate local suppliers to improve their production processes and increase the quality of the supplies or provide higher quality supplies to local buyers.

But the presence of internationally active firms may also lead to negative spill-overs (Girma et al., 2008). Increased competition could result in negative effects when the foreign firm 'steals clients' from the domestic firms. Likewise buyer-supplier links may turn sour if internationally active firms have more bargaining power that results in unfavourable contracts.

Spatial proximity between firms is not necessary for spill-overs but it does increase their likelihood, because proximity allows for continuous monitoring and comparing (Bathelt et al., 2004). Firms active in the same region operate under similar conditions, and can effectively compare their performances. Also, most people in the Netherlands change jobs without moving to another town. Consequently, labour mobility is more likely to lead to spill-overs between firms located in the same region. Despite the increasing globalisation of buyer-supplier networks, certain relations require frequent interactions to ensure that the supplies match the buyer's requirements (Neffke and Nedelkoska, 2013). Spatial proximity between buyer and supplier facilitates such interactions, and greater intensity of interactions makes positive spill-overs more likely.

There is no consensus about why firms may benefit from the presence of foreign employees in a region (Groot, 2013; Möhlmann, 2013). A diverse labour force may increase productivity because interactions of people with a variety of backgrounds increases the potential for innovation, creativity and problem solving (Ottoviano and Peri 2005, 2006). But diversity can have a negative effect on productivity because a society with a higher diversity of cultures may face higher communication costs and costs associated with a lack of trust between different groups (Putnam, 2007).

11.3 Data and methodology

To estimate the effects of different dimensions of internationalisation on the productivity of firms, we employed a two-stage approach. In the first stage, we estimated the annual total factor productivity (TFP) of firms. Subsequently, we used TFP by firm and year as the dependent variable in our second stage regressions, where the independents are firm and regional level variables including exports, imports, foreign ownership of firms, and the presence of different types of foreign workers.

Stage I – Estimating total factor productivity

The starting point of our empirical analyses is to estimate separate production functions for 9 different industries, taking into account that there is great

heterogeneity in production processes between sectors.[2] To estimate productivity, we adopt the methodology developed by Levinsohn and Petrin (2003) and Petrin et al. (2004). Their methodology is designed to avoid a number of pitfalls when estimating production functions and should provide us with consistent estimates of the different production function parameters.

In our productivity estimates, we assume the following (Cobb-Douglas) structure of a firm level production function:

$$v_t = \beta_0 + \beta_l l_t + \beta_k k_t + \beta_m m_t + \omega_t + \eta_t \,, \tag{1}$$

where v_t is the natural logarithm of value added of the firm in year t, l_t the use of labour, k_t the use of capital and m_t the use of intermediary inputs. There are two error terms in equation (1): ω_t is a transmitted productivity component which is correlated to the use of inputs (see Petrin et al., 2004), while η_t captures our level for TFP of each firm in each year. TFP is thus defined relative to the productivity of other firms within the same industry. table 11.3.1 provides a detailed description of the variables that are included in our first stage regressions.

11.3.1 Variables used to estimate total factor productivity

Variable	Description	Source	Definition
v_t	(log) value added	Company tax return (WIA)	total turnover -/- costs of raw and auxiliary inputs -/- non-monetary personnel costs -/- other operating costs[1]
m_t	(log) intermediary inputs	Company tax return (WIA)	total turnover -/-value added
l_t	(log) labour	Monthly wage bills	sum of all pre-tax wages paid by firm
k_t	(log) capital	Company tax return (WIA)	fixed-capital stock * 8%-discount rate +/+ total depreciation -/- depreciation on goodwill, concessions, permits and intellectual property

[1] Examples of other operating costs are energy, transport and housing costs, costs of machinery, inventory, installations, sales, communication and service costs.

[2] Separate production functions are estimated for capital intensive industry (SBI 1993 codes 15, 16, 21, 26 and 26), labour intensive industry (17–20, 28, 36 and 37), knowledge intensive industry (22–24, 27 and 29–35), construction (45), trade (50–52), hotels and restaurants (55), transport (60–64), financial services (65–67), and commercial services (70–74). Agriculture, mining and quarrying, utilities, the public sector, and employment agencies have been excluded for various reasons (see Groot and Weterings, 2013).

The data used in this chapter were provided by Statistics Netherlands (CBS), and are available for the years 2007 to 2010. They include value added, turnover, capital stock and depreciation. Source of these data are tax return statements (WIA) supplied by the fiscal authority. To obtain our capital measure, we multiplied the total stock of material assets with an 8%-discount rate that is constant across time, industries and firms and add depreciation of the capital stock (excluding depreciation on immaterial assets).[3] The use of total labour is derived from monthly wage bills, by aggregating all monetary and non-monetary compensations paid by the firm. In addition to the variables described above, we used the industry of the firm as described in the General Business Register (ABR).

We applied a number of selection criteria to our data. We removed all firms with a total annual wage bill of less than 20,000 euros. Also we removed all firms where the total share of labour in value added exceeded 100 percent; where total imports were negative; where the share of imports in the total use of intermediaries exceeded 100 percent; and firms with negative exports or a share of exports in total turnover exceeding 100 percent. Finally, we removed firms for which we could observe all variables in only one year, as the estimation strategy of Petrin et al. (2004) relies on time variation. A total of 82,344 firms were included in our first-stage estimates. These firms are somewhat larger than the average Dutch firm and account for almost one fifth of total Dutch value added. Descriptive statistics are presented in table 11.3.2.

11.3.2 Descriptive statistics productivity estimates

Variable	Unit	Average	St. dev.
Value added	x 1000 euros	644.9	440
Total wages paid		310.7	1,659
Value of intermediaries		2,249.6	67,600
Value of capital		102.6	1,493
#Firms	x 1	82,344	
#Observations (firms × years)		293,287	

[3] The use of capital as measured by a fiscal definition may differ significantly from the actual use of capital, because firms will attempt to report the maximum allowed depreciation to minimize profits before taxes which is likely to result in an underestimation of the actual use of capital.

Stage II – Relating total factor productivity to characteristics of firms and regions

In the second stage of our analyses, we related TFP to a large set of independents on the level of firms and 40 NUTS-3 regions (known in the Netherlands as COROP regions). While the second stage regressions are the topic of the next section, this section will describe the data and present a number of stylized facts. The use of capital and value added of different firm establishments is unknown, therefore we need to make the assumption that the total factor productivity – which can be interpreted as the total amount of money a firm makes at a given use of inputs – is the same across all firm establishments. As a consequence, the level of TFP of firms with establishments in multiple regions is attributed to all regions. To analyse the impact of this assumption, we also estimated regression models that only include firms with all establishments in the same region.

We included four different types of firm level measures for internationalisation. First, a dummy variable that indicates whether the Ultimate Controlling Institutional Unit (UCI) of the firm is Dutch or foreign, using a CBS dataset on foreign ownership. Small Dutch owned firms are often not included in this dataset. When the country in which the UCI resides is unknown, we assume that we are dealing with Dutch firms. Data about imports and exports of goods follow from matching trade information with the General Business Register (see chapter 13 for more information). If no import or export value was reported, we assume it was zero. To determine the regional import and export shares, we allocate the value of imports and exports of firms with establishments in multiple NUTS-3 regions to the different regions based on the share of wages paid by the firm to employees working in each region (see Groot and Weterings, 2013, for an in-depth discussion of our methodology). As we will include logs of shares in our regressions in the next section while the log of a zero share is undefined, we included a dummy for these variables that indicates shares that are at least positive. If the actual shares equal zero (and thus the dummy for that share is zero), we set the log share to zero.

To obtain more information on the employees working for a firm in a specific region, we merged our matched employee–firm–NUTS-3 dataset to census data, which includes country of birth, as well as year and month of birth. Together with the total number of hours worked from the monthly wage bills, we calculated total employment (FTE) by firm and NUTS-3 region, the share of foreign born employees,

the shares of foreign and other knowledge workers[4], and the average age of the employees. Using the same data as those used to construct firm-region level data, we determined employment, as well as the shares of foreign born employees, foreign knowledge workers and other knowledge workers in total regional employment.

Figure 11.3.3 presents maps on three dimensions of internationalisation: the share of foreign firms in regional employment, regional exports and imports. Foreign firms are relatively overrepresented in the Randstad, in particular in Amsterdam and near Schiphol airport, the port of Rotterdam, and in the south of the country. Goods exports have less regional variation, but tend to be somewhat lower in the north-east and higher in the south-east. The same goes for imports. These regions have a larger share of manufacturing which is more involved in international trade than services. The spatial dispersion of foreign labour is the topic of Chapter 10.

11.3.3 Internationalisation of Dutch firms

Foreign firms
(% share in FTE)

Exports
(as % of total turnover)

Imports
(as % of intermediaries)

less than 10%	15 to 20%	25 to 30%	35 to 40%
10 to 15%	20 to 25%	30 to 35%	40 or more
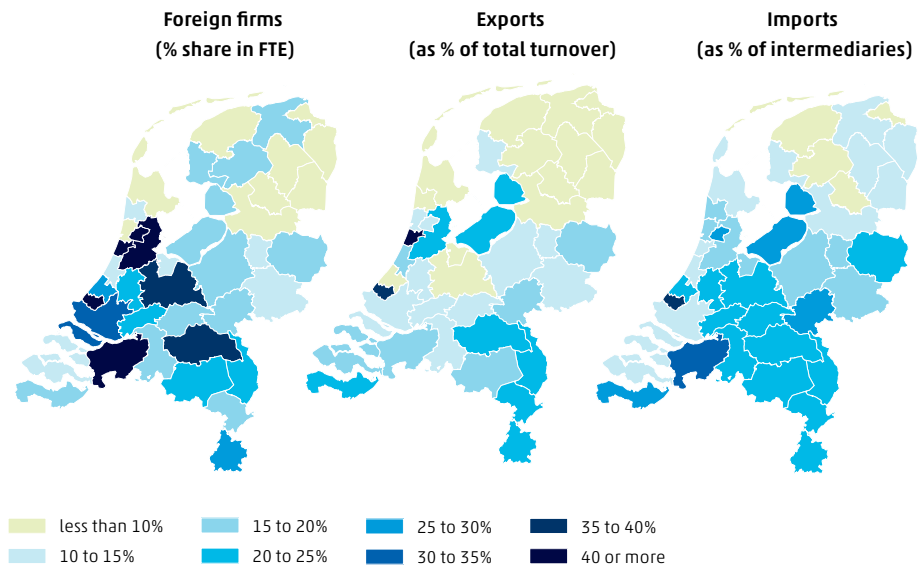
Source: Statistics Netherlands/PBL.

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[4] Knowledge workers are defined in the basis of their wages compared to employees in similar age groups. Foreign knowledge workers were born outside the Netherlands and immigrated after the age of 18. See Chapter 10 for a more detailed discussion of our definition of knowledge workers.

11.4 Empirical results

Direct effect of internationalisation

To determine the direct effects of internationalisation (e.g. the firm level of internationalisation) on the productivity of firms we estimated two different specifications: one *with* and one *without* firms that have establishments in multiple regions. The results are presented in the columns (I) and (III) of table 11.4.2. To estimate the relevance of regional conditions for differences in firm productivity, we have included fixed effects for each NUTS-3 region. Specifications (II) and (IV) – discussed later in this section – are similar to (I) and (III), but include regional level variables to capture spill-over effects rather than region fixed effects.

In line with what is commonly found, larger firms are more productive than their smaller competitors. Doubling the firm size results in an 11 percent rise in TFP levels, independent of the selected econometric specification. Foreign-owned firms in our sample have a substantially higher TFP than Dutch owned firms. The model including all firms in our sample shows that foreign-owned firms are 49 percent more productive than domestic firms and 29 percent more than firms with all establishments in the same region.

Foreign-owned firms are 49% more productive than domestic firms

Also, we find that exporting firms have a substantially higher level of TFP – about 18 percent higher than non-exporting firms. In addition to this, we find that doubling the share of exports results in a 6 percent increase of TFP. Firms who use imported intermediaries rather than domestically produced inputs are more productive than firms that do not import intermediary goods. This is consistent with, for example, the work of Möhlmann (2013) who shows that outsourcing results in a higher level of productivity. Firms importing intermediary goods seem to benefit from the comparative cost advantages in different countries.

The presence of foreign workers is generally negatively related to TFP. The share of foreign *knowledge* workers (defined as highly paid foreign workers, see Chapter 10) has a no strong effect on the productivity of firms, and it is also somewhat inconsistent across specifications. In contrast, the share of Dutch knowledge workers is positively related to productivity in all specifications. Together, the included variables explain much of the variation in TFP, as the high R^2 indicates.

11.4.1 Regional total factor productivity after correcting for firm heterogeneity

All firms

All establishments in the same NUTS-3 region

less than −4%
−4 to −3%
−3 to −2%
−2 to −1%
−1 to 0%
0 to 1%
1 to 2%
2 to 3%
3 or more
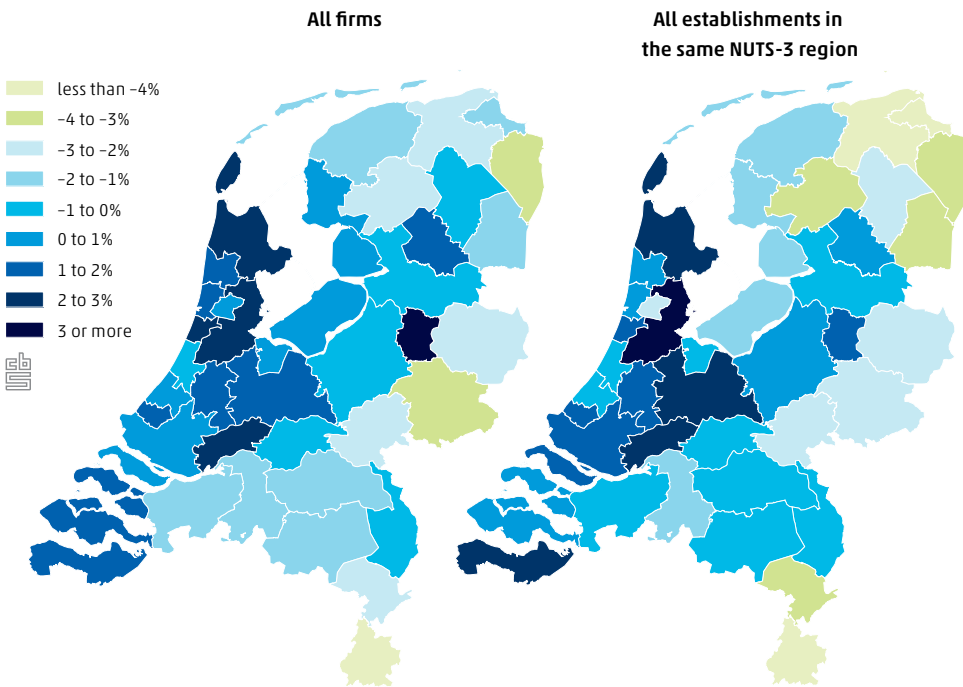
Source: Statistics Netherlands/PBL

The region fixed effects that were included in the specifications in table 11.4.2 can be interpreted as the spatial component of TFP, after controlling for heterogeneity in firm characteristics including sectoral structure. Figure 11.4.1 presents regional TFP, whereby the estimates were converted to percentage deviations to the productivity of the average Dutch firm. The general picture that emerges from Figure 11.4.1 is that TFP is somewhat higher in the western and central parts of the country. This finding is comparable to the usual findings in the literature estimating productivity on wage data (see, for example, Groot and De Groot, 2013).

The regional dispersion in productivity of all firms looks very similar to that of productivity of firms with all establishments in the same region.

Indirect effects of internalisation

Firm productivity is not only directly affected by internationalisation at the firm level. It may be related to how internationalised the region is due to how international the firms in the region are. Therefore, we also estimated productivity regressions that include explanatory variables that vary by region and year. Columns (II) and (IV) of table 11.4.2 show the results. It is important to note that the regional level independent variables are the same across all specifications.

The firm level parameters are very similar when we include region level variables rather than region fixed effects, therefore we do not discuss them again. At the regional level, we find that firms in regions with a higher employment density do not have higher levels of TFP.

We hardly found any relation between internationalisation of other firms in a region and TFP. All parameters estimated for the presence of exporting firms, foreign-owned firms, and the share of foreign workers and foreign knowledge workers are close to zero and never statistically significant. The presence of importers in the region is even slightly negative. The presence of foreign firms in a region is consistently associated with a somewhat lower TFP level. The presence of foreign knowledge workers – in contrast – has a positive and statistically significant relation with firm productivity. Overall, regional characteristics explain a relatively small part of firm productivity. The evidence presented in this section is thus inconsistent with theories that predict positive externalities from internationalisation on a regional level.

11.4.2 Regression results

Dependent: TFP by firm and year	All firms		All establishments in same region	
	(I)	(II)	(III)	(IV)
#Observations	294,813	294,813	270,606	270,606
Firm specific variables				
Log employment (in FTE)	0.109***	0.109***	0.110***	0.110***
	(38.8)	(38.8)	(58.2)	(58.4)
Foreign firm	0.488***	0.488***	0.289***	0.289***
	(10.9)	(10.9)	(23.7)	(23.7)
Exporter	0.181***	0.179***	0.209***	0.207***
	(12.0)	(12.0)	(19.7)	(19.6)
Log share of export in turnover	0.058***	0.058***	0.068***	0.067***
	(8.4)	(8.4)	(13.1)	(13.0)
Importer	0.166***	0.166***	0.158***	0.158***
	(11.0)	(11.0)	(21.0)	(20.9)
Log share of import in intermediaries	0.056***	0.056***	0.061***	0.061***
	(8.3)	(8.3)	(16.6)	(16.6)
Log average age	−0.087***	−0.089***	−0.080***	−0.082***
	(7.1)	(7.3)	(15.3)	(15.8)
Minimum of 1 foreign employee	−0.003	−0.003	−0.007	−0.006
	(0.5)	(0.4)	(1.1)	(1.2)
Log share foreign employees	−0.018***	−0.018***	−0.017***	−0.017***
	(7.4)	(7.3)	(7.6)	(7.5)
Minimum of 1 foreign knowledge worker	−0.010	−0.009**	0.036*	0.037**
	(0.5)	(0.5)	(2.5)	(2.6)
Log share foreign knowledge workers	−0.024***	−0.024*	−0.011*	−0.011*
	(3.7)	(3.7)	(2.3)	(2.3)
Minimum of 1 Dutch knowledge worker	0.124***	0.125***	0.130***	0.131
	(20.4)	(20.7)	(30.1)	(30.3)
Log share Dutch knowledge workers	0.035***	0.036***	0.039***	0.040***
	(11.1)	(11.2)	(20.3)	(20.5)
Region specific variables				
Log employment NUTS-3		−0.009***		0.000
		(3.3)		(0.1)
Log export share NUTS-3		0.001		0.004
		(0.2)		(1.2)
Log import share NUTS-3		−0.020***		−0.020***
		(4.6)		(4.6)
Log share of foreign firms NUTS-3		−0.002		−0.006
		(0.8)		(1.8)
Log share of foreign employees NUTS-3		0.019		0.008
		(1.9)		(0.8)

11.4.2 Regression results (end)

Dependent: TFP by firm and year	All firms		All establishments in same region	
	(I)	(II)	(III)	(IV)
Log share of foreign knowledge workers NUTS-3		−0.004		0.001
		(0.5)		(0.1)
Log share of other knowledge workers NUTS-3		0.070***		0.072***
		(4.7)		(4.8)
NUTS-3 fixed effects	40	No	40	No
Sector fixed effects	9	9	9	9
Year fixed effects	4	4	4	4
Adjusted R-squared	0.711	0.711	0.722	0.722

Notes: t-values are in parentheses. Significance levels of 0.05, 0.01 and 0.001 are denoted by * ** and *** respectively.

11.5 Conclusions

Our analyses show that differences in firm productivity are related to different dimensions of internationalisation, but also that internationalisation matters mainly at the firm level. We hardly found evidence for spill-over effects from internationalisation.

Foreign-owned and trading firms in the Netherlands are more productive than domestic firms, even after controlling for firm heterogeneity. Because firms with a high level of productivity tend to pay higher wages and more corporate taxes, attracting foreign firms may bring substantial benefits to regions. The positive relationship between trading and productivity, however, does not necessarily imply that governments should stimulate trading. It is very well possible that market forces have resulted in an optimal amount of trading. However, the measured effect could reflect selection effects if exporting firms are exporting *because* they are more productive rather than the other way around. The fourth dimension of internationalisation, the presence of foreign employees in firms, seems less relevant for total factor productivity, even at the firm level. In all specifications

we estimated, their presence is either completely unrelated to productivity or the effect is very small.

After controlling for the unequal distribution of internationally oriented firms across regions, we still find evidence of regional differences in total factor productivity. Nevertheless, regional heterogeneity in total factor productivity is relatively small compared to the heterogeneity in labour productivity (Groot and De Groot, 2013). Furthermore, contrary to labour productivity, TFP is found to be almost completely unrelated to differences in economic density. A likely explanation for this difference is that the higher level of productivity in agglomerated areas is completely offset by higher wages and higher land rents. This finding is consistent with the new economic geography (NEG) literature, which predicts that in market equilibrium all regions should be equally attractive to firms at the margin.

We found no evidence for spill-over effects from internationalisation. While the presence of foreign firms, exporting firms, and foreign (knowledge) workers in a region are almost completely unrelated to TFP, we found a negative – albeit small – effect of the presence of importing firms. The present study has treated the extent of possible spill-over effects in different regions as homogeneous. Future research could test whether there are interaction effects with characteristics of firms and regions: do foreign firms in some regions benefit more from a higher share of foreign firms than firms in other regions? Perhaps firms close to Schiphol airport benefit more from high levels of internationalisation than firms in other regions. Also, high spill-over effects may be larger in more agglomerated areas because the closer proximity of firms to other firms fosters sharing knowledge.

12.

International trade and job termination in the Netherlands

Authors
Bart Loog
Wendy Smits

In this chapter we relate the probability of job termination to several international trade measures at the firm and at the sector level. The results indicate that the effects of internationalisation on the probability of experiencing job termination are relatively small. We do not find evidence that the effects of the trade variables on the probability of job termination differ systematically between employees across different provinces. However, the effects of trade measures on the probability of job termination differ for different skill levels. A higher import penetration ratio is particularly related to job losses in the lower wage categories. Also, low paid workers employed in export intensive sectors are slightly more likely to see their job end than highly paid workers.

12.1 Introduction and background

The effects of international trade on local labour markets are subject to on-going debate. Increasing international trade is expected to reduce labour demand in sectors facing international competition and increase it in exporting sectors. Trade with low income countries is expected to increase labour demand for highly skilled workers and decrease the demand for low skilled workers in the home country (Cuyvers et al., 2010).

The empirical evidence of the relation between international trade, labour demand and wages is ambiguous. Several studies find that firms engaged in international trade employ more highly educated workers and pay higher wages (Feliciano and Lipsey, 1999; Griffith and Simpson, 2003). Cuyvers et al. (2010) show that imports from low income countries reduce demand for low skilled workers but increase demand for highly skilled workers in Belgium. The effects of exports are less straightforward, however. The effects depend on the destination of exports. Lurweg and Uhde (2012) find that 'trade affects labour market outcomes in Germany, but only to a comparatively small extent'. Görg and Görlich (2012) found that German service sector workers are more likely to lose their jobs in sectors with a higher export intensity. Pryor (1999) finds no evidence that international trade has any impact on the employment of low-skilled workers in the US. Kriechel et al. (2013) study job security of employees of international traders in the Netherlands and conclude that although these employ more workers on temporary contracts and show a higher excess reallocation of workers than firms not engaged in international trade, the differences are small. The sector of industry and firm size have a much bigger impact.

Other studies show that foreign controlled enterprises employ more highly educated workers and pay higher wages (Fortanier and Korvorst, 2009; Korvorst, 2012). Furthermore, foreign controlled enterprises located in the Netherlands engage in international trade far more often than domestically controlled enterprises (Genee, Korvorst and Fortanier, 2010). In general, traders pay slightly higher wages than non-traders (Fortanier, Jaarsma and Korvorst, 2011).

The literature reveals several approaches to assess the impact of international trade on employment. First, it is possible to relate international trade to changes in net employment (Klein et al., 2002). The problem with this approach is that changes in employment hide a substantial amount of job creation and job destruction in the economy, causing workers to switch jobs or become unemployed. The second approach is to consider labour market flows, either at the firm level (job flows) or at the individual level (worker flows). The advantage of looking at worker flows is that it gives insight in the impact of international trade from the perspective of the individual workers. In this contribution we apply the second approach and relate the probability of job loss to several measures of international trade.

We investigate two measures of international trade. First, we look at the actual goods trade activities of the employers. We distinguish firms that engage in international trade and those who do not. Within the group engaging in international trade, we distinguish importers, exporters and two-way traders. Second, we calculate the export ratio and import penetration ratio as a measure of trade exposure at the industry level (2-digit SBI). Firms engaging in international trade and firms operating in trade sensitive industries are not evenly distributed across the Netherlands, so it is to be expected that labour market effects of international trade are not evenly spread either. Some regions may gain by increased international trade while others may be more vulnerable and suffer employment losses. We therefore investigate to what extent the effects of internationalisation on the probability of job loss differ per region.

This chapter is organised as follows. In section 2 we introduce the data used and cover the applied methodology. Section 3 presents the descriptive statistics. Results are presented and discussed in Section 4. Section 5 summarizes and concludes.

12.2 Data and methodology

The units of analysis in this study are private sector employees working in the Netherlands on 1 January 2008. Information on their main jobs is extracted from the Social Statistical Database (SSB). This administrative database provides us with information on jobs and wages at the individual level. For employees who had more than one job on 1 January 2008 we only consider the main job, which is the job providing the highest income. The database also includes a unique enterprise identifier, which allows us to match the vast majority of these jobs with survey information at the firm level.

The dependent variable in our analysis indicates whether or not an employee who had a job on 1 January 2008 still had that job on 31 December 2008. If the job had ended by 31 December, the individual who worked in that job did not return in our sample in later years. If the job still existed it was also included in the analysis in the following year. Note that we do not observe whether the job is ended by the worker (quit) or by the firm (lay-off), so we cannot distinguish actual job loss from voluntary worker moves, nor can we identify retirees.

In the complete database, after excluding employees in the public sector, there are about 5,066 thousand main jobs of employees in the Netherlands. About 24 percent of these jobs ended during 2008. Then 14 percent of the remaining jobs ended in 2009, and 11 percent of the jobs that continued ended in 2010. The weighted average of job ending in the database is 17 percent. For the regression analysis we start out with the complete database on 1 January 2008 of 5 million employees in main jobs, exclude all individuals working in the public sector and take a 7.5 percent sample of the remainder.[1] This set of selected individuals will be followed through time in the regression analysis.

We model the probability that an employee's job was terminated by the end of the year by a so-called discrete time logit-model. In this model every time-person combination is treated as a separate independent observation. (Allison, 1982; Yamaguchi 1991). We relate the probability of job ending to several measures of international trade, the skills level of the worker, the region of residence and interactions of these and a number control variables for employee and firm characteristics.

The first measure of international trade involvement we consider is the trade in goods at the enterprise level. For each enterprise in our data we observe whether or not it is engaged in international trade. If so we observe whether it is an

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[1] These operations, which yield a total sample of over 800 thousand observations on which the logit estimations will be run, are necessary as the computing power of the software does not permit us to perform the analysis on the full database.

importer, an exporter, or a two-way trader. There is no information available on the trade in services at the enterprise level and we therefore restrict ourselves to the international trade in goods.

Firms that are not engaged in international trade in intermediaries or final products themselves, but who are active in a trade sensitive sector, might still be affected by changes in the world economy. As an additional measure of internationalisation, we therefore make use of the input/output tables of Statistics Netherlands to calculate the import penetration ratio of each sector on the 2-digit SBI level. We use the 'narrow' import penetration ratio proposed by Feenstra and Hanson (1999), which only takes into account the inputs used from the same sector i in which an enterprise is active. This narrow version of the ip-ratio is calculated as $IR^j_{jt} = I^{fj}_{jt} /$ $(I^{fj}_{jt} + I^{dj}_{jt})$. This ratio gives the imported inputs by sector j from sector j in year t as a share of the total inputs used by sector j from sector j in year t: $I^{fj}_{jt} + I^{dj}_{jt}$, where superscripts f and d indicate foreign and domestic origin from the inputs. Next to the ip-ratio, we also include the export-ratio in our model: $ER_{jt} = E_{jt} / (E_{jt} + Y_{jt})$. The export-ratio gives the total amount of goods and services exported by sector j in year t (E_{jt}) as a share of total output produced in sector j in year t (Y_{jt}).

We do not have information on the business location of the specific establishment for which the employee works. In order to investigate to what extent the effect of internationalisation differs per region, we rely on the province of residence of the employee as a proxy. Part of the Dutch labour force lives abroad, mainly in the border area of Belgium and Germany, but we do not have any information on the country of residence to check this. In the analysis we include a separate dummy for employees living abroad.

Information on the education level is only available for young employees and for a small fraction of older employees. We include a dummy for those with missing information on educational attainment. Because the information with respect to the education level of the individuals in the database is imperfect, we also include the monthly wages, corrected for part-time work, as a proxy for skill level.

Controls included in the analyses are individual characteristics (gender, age, ethnic background and tenure) and firm characteristics (firm size, sector of industry, foreign or domestic ownership and shares of female, older (over 50 years of age), and high and low-paid employees as controls. The Appendix provides more detailed information.

12.3 Descriptive statistics

In this section we present some descriptive statistics of the data used in the regression analysis. For the descriptive analysis we used the complete 2008 database, excluding workers employed in the public sector.
Table 12.3.1 presents the number and percentage of employees working for an importer, an exporter and a two-way trader.[2] We see that almost two thirds of all employees work in a firm engaged in international trade. The vast majority (44.5 percent) is employed by a two-way trader. Relatively few workers are employed at an exporter. The table also reveals that 37.4 percent of the employees outside the public sector work for a firm that is not engaged in international trade.

12.3.1 Number and share of employees working at importing and exporting enterprises, two-way traders and non-traders

	N	%
Importers	814,576	16.1
Exporters	101,701	2.0
Two-way trader	2,255,342	44.5
Non-trader	1,894,663	37.4

In Table 12.3.2 we present the percentages discussed in Table 12.3.1 for each of the provinces. The highest share of employees working for importers is found in Limburg and Noord-Holland (18.5 and 17.9 percent respectively), whereas in Overijssel relatively many employees (2.4 percent) work for a firm only engaged in exporting. The share working for two-way traders is highest in Limburg (50.5 percent) and lowest in Friesland (37.7 percent).

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[2] The figures presented here differ from figures published in earlier versions of the Internationalisation Monitor. In the current chapter we only include employees' main job in the analysis.

12.3.2. Share of employees working at importing and exporting enterprises, two-way traders and non-traders, 2008 by province of residence

	Importer	Exporter	Two-way trader	Non-trader
	%			
Drenthe	14.4	2.0	44.3	39.3
Flevoland	16.3	2.2	45.7	35.8
Friesland	16.2	1.8	37.7	44.3
Gelderland	14.8	2.3	44.0	38.9
Groningen	14.8	1.5	43.6	40.1
Limburg	18.5	2.1	50.5	28.9
Noord-Brabant	14.5	2.2	49.0	34.3
Noord-Holland	17.9	1.6	42.7	37.8
Overijssel	15.6	2.4	44.8	37.2
Utrecht	15.9	1.9	42.2	40.0
Zeeland	17.7	1.5	47.1	33.7
Zuid-Holland	16.3	2.0	43.0	38.7

In Table 12.3.3 we present two measures of internationalisation at the sector level. For the country as a whole as well as for each province we calculated the share of people employed in a sector (2-digit SBI) with an above average import penetration or export ratio. Especially in Noord-Brabant many employees work in sectors with an above average import penetration ratio (34.3 percent). This percentage is about a fifth smaller in Groningen (26.6 percent). Relatively many employees in Limburg work in sectors with above average export ratios.

12.3.3 Share of employees working in an industry with an above average import penetration or export ratio, 2008 by province of residence

	Import penetration ratio (IR) above average	Export ratio (ER) above average
	%	
Drenthe	29.2	37.1
Flevoland	33.2	36.6
Friesland	30.1	36.1
Gelderland	32.0	37.3
Groningen	26.6	35.6
Limburg	31.6	40.8
Noord-Brabant	34.3	40.1
Noord-Holland	31.6	35.6
Overijssel	32.9	37.2
Utrecht	29.5	34.2
Zeeland	30.9	39.9
Zuid-Holland	28.9	36.0
Netherlands (total)	31.1	37.0

12.4 Regression results

Table 12.4.1 displays the results of the estimation of the probability of job termination. This first model only includes individual and firm characteristics. Its shows that, relative to workers educated at the intermediate level, the probability of an employees' job ending during the year is lower for more highly educated workers and higher for less educated workers. The estimated odds ratio (henceforth OR) of 1.2 indicates that, keeping other background characteristics unchanged, the probability of experiencing a job termination is approximately 1.2 times higher for less educated employees than for employees with intermediate educational attainment.[3] Similarly, the OR of 0.8 for more highly educated employees indicates that the probability on having a job ended is lower than for the reference category. Workers in the lower wage categories face a significantly lower probability of job termination during the year than workers in the higher wage categories. For those employees earning between 5 and 10 thousand euros a month the probability of a job ending is about twice as high as for those in the reference category. Perhaps this result reflects higher voluntary job mobility of better paid workers rather than a higher probability of becoming unemployed (i.e. job loss).

We find some differences in the probability of job termination between employees living in different provinces. In Overijssel and Zeeland employees face a lower probability of job ending than in Utrecht. For employees living in Groningen the probability is significantly higher. It is highest for workers living abroad, for whom the probability is about 30 percent higher (OR = 1.3) than for employees living in Utrecht.

Almost **45%** of Dutch employees works for two-way traders

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[3] Given the skewed distribution of the dependent variable in the current analysis, 17 percent 'ones' versus 83 percent 'zeros', it is convenient to interpret the estimates of the odds ratio like this.

12.4.1 Probability of experiencing a job ending[a]

	Model 1	Model 2	Model 3	Model 4
	odds ratio's			
Low education	1.175***	1.175***	1.177***	1.176***
High education	0.780***	0.780***	0.787***	0.787***
Education unknown	0.679***	0.679***	0.679***	0.679***
Salary < €1,000	0.714***	0.714***	0.715***	0.716***
€1,000 ≤ Salary < €2,000	0.736***	0.736***	0.737***	0.737***
€3,000 ≤ Salary < €4,000	1.285***	1.285***	1.288***	1.288***
€4,000 ≤ Salary < €5,000	1.622***	1.622***	1.619***	1.619***
€5,000 ≤ Salary < €10,000	2.003***	2.002***	2.000***	1.999***
Salary ≥ €10,000	3.740***	3.739***	3.745***	3.743***
Groningen	1.068***	1.068***	1.074***	1.074***
Friesland	0.968	0.968	0.973	0.974
Drenthe	1.025	1.025	1.031	1.031
Overijssel	0.941***	0.941***	0.949***	0.949***
Flevoland	1.033	1.033	1.038	1.038
Gelderland	0.976	0.976	0.982	0.981
Noord-Holland	0.985	0.985	0.986	0.987
Zuid-Holland	0.990	0.990	0.992	0.992
Zeeland	0.946**	0.946**	0.956	0.955*
Noord-Brabant	0.981	0.981	0.991	0.990
Limburg	1.017	1.018	1.029	1.028
Lives abroad	1.305***	1.305***	1.312***	1.312***
Province unknown	1.511	1.510	1.503	1.502
Importer		0.994		0.991
Exporter		0.955**		0.966
Two-way trader		1.002		1.026***
Import penetration ratio			1.000**	1.000*
Export ratio			0.995***	0.995***
Constant	0.260***	0.261***	0.273***	0.273***
Individual characteristics	Included	Included	Included	Included
Enterprise characteristics	Included	Included	Included	Included
Number of observations	821,360	821,360	820,582	820,582
R² (Nagelkerke)	0.21	0.21	0.21	0.21

[a] The asterisks ***, ** and * indicate significance at the 1-, 5- and 10-percent level. Odds ratio's are reported. In all regressions we include dummies to control for year-specific effects on the probability of a job ending. We use the following reference groups: Intermediate education; Salary between €2,000 and €3,000 per month; Province of Utrecht; Non-trader.

The probability of job termination by the end of the year is about 5 percent lower for employees working for exporters (OR = 0.955) than for employees in firms that do not trade internationally (Model 2 in Table 12.4.1). For people employed at two-way traders and firms that are only engaged in importing, the probability is not significantly different from non-traders. The import penetration ratio has a statistically significant effect on the probability of job termination during the year (Model 3). However, the effect is economically small, as indicated by the OR which is only marginally larger than 1.[4] The export ratio is negatively related to the probability of job ending. However, the size of the OR again indicates this effect is economically insignificant. The differences in the probability of a job ending between skills levels and between regions do not alter once trade variables are included in the analysis, suggesting that highly skilled individuals are not concentrated specifically in sectors where the import penetration ratio is relatively high (or low). Also, it suggests that the differences between regions presented earlier are not explained by differences in the import penetration and export ratios across these regions. Once we control for the import penetration rate and the export intensity rate of the sector of industry (Model 4), there is an effect of trade involvement of the firm: employees of two-way traders have a higher probability of job termination. The effect for people employed by exporters turned just insignificant (p-value = 0.13), which is possibly due to correlation between the export-ratio and the exporter dummy.

In the last four models (Models 5 to 8) we investigate to what extent the measures of internationalisation effect different skill levels and different regions. In Model 5 (Table 12.4.2) we interact the import-penetration ratio (IR) and export ratio (ER) with the monthly income dummies and we find that effect of the trade sensitivity of the sector differs between wage categories. A higher import penetration ratio is related to job ending for workers of the lower wage categories. Low paid workers employed in export-intensive sectors have a higher chance of job termination than highly paid workers. The effect of the import penetration ratio on the probability of a job ending also differs for different skill levels. While the probability of facing a job ending for the reference group does not seem to be affected by a change in the import penetration ratio (IR), a higher IR is associated with a higher probability of experiencing a job termination for the lowest paid employees. A ten-percentage point increase in the import penetration ratio above the average is associated with an increase in the probability of facing a job ending of at most 5 percentage points. In Model 6 (Table 12.4.3) we interact the same measure of international orientation of the sector with region dummies. The results indicate that the effect

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[4] An increase in the IR of 10 percentage points above the average reduces the chance of job ending by at most one-fifth of a percentage point, depending on the values of the other explanatory variables.

of the import penetration ratio on the probability of job ending is insignificantly different from the reference category (Utrecht) for all provinces, except for employees living in Drenthe, where a higher IR is associated with a slightly lower probability of a job ending (OR = 0.995). This effect is negligible, however.

12.4.2   Probability of experiencing a job ending[a]

	Model 5
	odds ratio's
Import penetration ratio (IR)	1.000
IR*Salary < €1,000	1.011***
IR*€1,000 ≤ Salary < €2,000	1.002***
IR*€3,000 ≤ Salary < €4,000	0.999**
IR*€4,000 ≤ Salary < €5,000	0.999**
IR*€5,000 ≤ Salary < €10,000	0.998***
IR*Salary ≥ €10,000	1.000
Export ratio (ER)	0.995***
ER*Salary < €1,000	1.005***
ER*€1,000 ≤ Salary < €2,000	1.004***
ER*€3,000 ≤ Salary < €4,000	0.998***
ER*€4,000 ≤ Salary < €5,000	0.999
ER*€5,000 ≤ Salary < €10,000	1.001
ER*Salary ≥ €10,000	1.000
Constant	0.271***
Individual characteristics	Included
Enterprise characteristics	Included
Number of observations	820,582
R² (Nagelkerke)	0.21

[a]   The asterisks ***, ** and * indicate significance at the 1-, 5- and 10-percent level. Odds ratio's are reported. In all regressions we include dummies to control for year-specific effects on the probability of a job ending. We use the following reference groups: Intermediate education; Salary between €2,000 and €3,000 per month; Province of Utrecht; Non-trader.

12.4.3 Probability of experiencing a job ending[a]

	Model 6
	odds ratio's
Import penetration ratio (IR)	1.000
IR*Groningen	1.000
IR*Friesland	1.002
IR*Drenthe	0.998**
IR*Overijssel	1.000
IR*Flevoland	1.000
IR*Gelderland	1.000
IR*Noord-Holland	1.000
IR*Zuid-Holland	1.000
IR*Zeeland	1.000
IR*Noord-Brabant	1.000
IR*Limburg	1.000
IR*Lives abroad	0.998*
IR*Province unknown	1.004
Export ratio (ER)	0.993***
ER*Groningen	1.002
ER*Friesland	1.001
ER*Drenthe	1.007***
ER*Overijssel	1.003**
ER*Flevoland	0.999
ER*Gelderland	1.003**
ER*Noord-Holland	0.999
ER*Zuid-Holland	1.001
ER*Zeeland	1.002
ER*Noord-Brabant	1.005***
ER*Limburg	1.003*
ER*Lives abroad	1.001
ER*Province unknown	0.998
Constant	0.279***
Individual characteristics	Included
Enterprise characteristics	Included
Number of observations	820,582
R^2 (Nagelkerke)	0.21

[a] The asterisks ***, ** and * indicate significance at the 1-, 5- and 10-percent level. Odds ratio's are reported. In all regressions we include dummies to control for year-specific effects on the probability of a job ending. We use the following reference groups: Intermediate education; Salary between €2,000 and €3,000 per month; Province of Utrecht; Non-trader.

In Model 7 (Table 12.4.4) we interact the income dummies with trade variables at the firm level. The effect of working for a firm engaged in international trade differs between low and highly paid workers. The lowest paid workers have a greater chance of job termination in a firm that imports, exports or does both, relative to those in the reference group with an income of 2 to 3 thousand euros per month working for such firms. Especially low paid workers employed at two-way traders face a higher probability of a job ending, about 1.5 times as large as people earning 2 to 3 thousand euros per month employed by two-way traders. People with a higher income than the reference group also face a higher probability of job ending. The highest income group working at two-way traders ends a job 1.4 times more often than those in the reference category. In Model 8 we perform the same analysis as in Model 7, but instead of interacting the trade variables with the income dummies, we interact them with the set of region dummies. The results indicate that the effects of working at an importer are different in Drenthe and Zuid-Holland than in the rest of the country. In these provinces the probability of facing a job ending is relatively lower when working for an importer than when working for a non-trader. The effect of working for an exporter does not differ between provinces. That is, the effect of working for an exporter on facing job termination is insignificant for all provinces. Finally, the effect of working at a two-way trader positively affects the probability of a job ending. However, this is not the case for those provinces of which the interaction term is shown in Table 12.4.5.

12.4.4 Probability of experiencing a job ending[a]

	Model 7
	odds ratio's
Low education	1.174***
High education	0.777***
Education unknown	0.678***
Salary < €1k	0.593***
€1k ≤ Salary < €2k	0.684***
€3k ≤ Salary < €4k	1.271***
€4k ≤ Salary < €5k	1.527***
€5k ≤ Salary < €10k	1.687***
Salary ≥ €10k	2.975***
Groningen	1.071***
Friesland	0.971***
Drenthe	1.029
Overijssel	0.946***
Flevoland	1.035
Gelderland	0.979
Noord-Holland	0.985
Zuid-Holland	0.991

12.4.4 Probability of experiencing a job ending[a] (end)

	Model 7
Zeeland	0.948**
Noord-Brabant	0.983
Limburg	1.021
Lives abroad	1.302***
Province unknown	1.503
Two-way trader	0.921***
Two-way*Salary < €1k	1.571***
Two-way*€1k ≤ Salary < €2k	1.122***
Two-way*€3k ≤ Salary < €4k	1.003
Two-way*€4k ≤ Salary < €5k	1.080***
Two-way*€5k ≤ Salary < €10k	1.303***
Two-way*Salary ≥ €10k	1.418***
Exporter	0.871***
Exporter*Salary < €1k	1.356***
Exporter*€1k ≤ Salary < €2k	1.338***
Exporter*€3k ≤ Salary < €4k	1.029
Exporter*€4k ≤ Salary < €5k	1.092
Exporter*€5k ≤ Salary < €10k	1.073
Exporter*Salary ≥ €10k	1.014
Importer	0.906***
Importer*Salary < €1k	1.227***
Importer*€1k ≤ Salary < €2k	1.110***
Importer*€3k ≤ Salary < €4k	1.082***
Importer*€4k ≤ Salary < €5k	1.177***
Importer*€5k ≤ Salary < €10k	1.285***
Importer*Salary ≥ €10k	1.340***
Constant	0.272***
Individual characteristics	Included
Enterprise characteristics	Included
Number of observation	820,582
R^2 (Nagelkerke)	0.21

[a] The asterisks ***, ** and * indicate significance at the 1-, 5- and 10-percent level. Odds ratio's are reported. Interaction effects with province of residence are only presented when significant at the 10-percent level.

12.4.5 Probability of experiencing a job ending[a]

	Model 8
	odds ratio's
Low education	1.174***
High education	0.780***
Education unknown	0.679***
Salary < €1,000	0.714***
€1,000 ≤ Salary < €2,000	0.736***
€3,000 ≤ Salary < €4,000	1.286***
€4,000 ≤ Salary < €5,000	1.623***
€5,000 ≤ Salary < €10,000	2.003***
Salary ≥ €10,000	3.743***
Groningen	1.123***
Friesland	1.022
Drenthe	1.090**
Overijssel	0.977
Flevoland	1.071*
Gelderland	0.998
Noord-Holland	1.045
Zuid-Holland	1.069***
Zeeland	0.978
Noord-Brabant	1.004
Limburg	1.078**
Lives abroad	1.471***
Importer	1.051
Importer*Drenthe	0.872*
Importer*Zuid-Holland	0.902**
Importer*Lives abroad	0.848*
Exporter	0.950
Two-way trader	1.096***
Two-way*Friesland	0.919*
Two-way*Drenthe	0.902*
Two-way*Gelderland	0.941*
Two-way*Noord-Holland	0.891***
Two-way*Zuid-Holland	0.866***
Two-way*Limburg	0.899**
Two-way*Lives abroad	0.798***
Constant	0.248***
Individual characteristics	Included
Enterprise characteristics	Included
Number of observation	820,582
R^2 (Nagelkerke)	0.21

[a] The asterisks ***, ** and * indicate significance at the 1-, 5- and 10-percent level. Odds ratio's are reported. Interaction effects with province of residence are only presented when significant at the 10-percent level. In all regressions we include dummies to control for year-specific effects on the probability of a job ending. We use the following reference groups: Intermediate education; Salary between €2,000 and €3,000 per month; Province of Utrecht; Non-trader.

12.5 Conclusion

In this chapter we relate several measures of internationalisation at the firm and at the sector level to the probability of a job ending. We also investigate to what extent the effects of these international trade measures differ across provinces and individuals with different skill levels.

A job termination is defined as starting a year as an employee, and ending that year without or with a different job. At the firm level we measure whether or not an enterprise is engaged in international trade in goods. If so we distinguish between enterprises that only engage in importing goods ('Importers'), only engage in exporting goods ('Exporters') and enterprises that engage in both ('Two-way traders'). At the sector of industry level we calculate the share of the intermediate inputs used in the production process in a certain sector that is imported ('import penetration ratio') and the share of the output of a sector that is exported ('export ratio').

The job termination probability for individuals working at a two-way trader is less than three percent larger than for people working for a firm that is not engaged in international trade. Individuals employed for exporters or importers do not face a higher probability of job termination. The effects of internationalisation of the sector of industry on the probability of experiencing a job termination are also slight. A ten percentage point increase in the import penetration ratio on the sector level above the mean is associated with an increase of less than one percentage point in the probability of experiencing a job termination. An increase in the export ratio of a sector is associated with a lower probability of experiencing a job termination. An increase in the export ratio of ten percentage points above the average reduces the probability of a job termination by less than three percent, compared to the reference group consisting of employees at enterprises not engaging in the international goods trade.

We found no evidence that the effects of the trade variables included in the analysis presented here differ systematically between employees across different provinces. We did, however, find that the effects of trade measures on the probability of job termination differ for different skill levels, as proxied by the monthly income. A higher import penetration ratio particularly is related to job ending for workers of the lower wage categories. Also, low paid workers employed in export-intensive sectors have a slightly higher chance to see their job end than highly paid workers.

Appendix

Apart from several measures capturing the extent of globalisation of the sector and enterprise an individual works, we control for individual and enterprise-specific background characteristics. At the individual level we control for the following background characteristics:

- *Age*. In the analysis we distinguish five age categories and include dummy variables to control for the effect of age on the probability of a job ending: 15–24; 25–34; 35–44 (reference category); 45–54; 55–65.
- *Gender*.
- *Ethnicity.* We include two dummy variables in the regression indicating whether or not an individual is a western or non-western migrant. An individual is viewed as a migrant if at least one of the parents was born outside the Netherlands.
- *Monthly income.* From the SSB we are supplied with an estimate of the gross monthly income belonging to an individual's main job. In order to make this income measure between individuals we standardize it by multiplying the estimated monthly income by one over the part-time factor of the job it belongs to. That is, for an individual earning €2,000 gross per month in a part-time job consisting of a half full-time equivalent, we multiply this individual's income by 1/0.5. In our estimations we make use of seven income categories: €1,000 or less; €1,000 – €2,000; €2,000 – €3,000 (reference category); €4,000 – €5,000; €5,000 – €10,000; €10,000 and more.
- *Education level.* High (hbo; university education); intermediate (havo years 4 or 5; vwo years 4, 5 or 6; mbo diploma levels 2, 3 and 4,)
- *Tenure.* We measure the number of years an individual is working in a job and add this as a control variable.
- *Province.* We control for the province of residence.

We include the following employer characteristics in the analysis:

- *Number of employees.* We control for the number of employees in an enterprise. We distinguish three categories: less than 50 employees (reference category); 50–250 employees; 250 employees or more.
- *Share of female employees.* The share of positions/jobs at an enterprise filled by female employees.
- *Share of older employees.* The share of positions/jobs at an enterprise filled by employees aged 50 and over.
- *Share of low and high-paid employees.* All jobs at companies in the Netherlands are sorted (ascending) on the basis of the annual pre-tax income and are divided low, middle and high-income jobs. Jobs belonging to the first 30 percentiles of the distribution are defined as low-income jobs, while jobs

belonging to the last 20 percentiles of the distribution are defined as high-income.

— *Sector.* We use information on the sector (1-digit SBI) to which an enterprise belongs.

— *UCI.* We have information on whether the ultimate controlling institute an enterprise belongs to is based inside or outside the Netherlands. In 2008 the ultimate controlling institute of 97 percent of the enterprises (and 56.1 percent of the individuals in our dataset) is unknown. It is assumed that the ultimate controlling institute for these enterprises is situated in the Netherlands.

13.

International trade in goods by enterprises

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13.1 Introduction

This chapter describes the pattern of the international trade in goods by enterprises active in the Netherlands during the period 2002–2012. Data on international trade flows are enriched with Dutch enterprise characteristics, such as economic activity, size class and country of ownership, domestic or foreign control. The results presented here are preliminary, because integrating data from international trade statistics and the General Business Register (GBR) is still in its early stages.

Statistics on the international trade in goods comprise the value and volume of goods crossing the Dutch border. Statistics Netherlands distinguishes almost 9,500 commodity types and almost 250 trading partners. To obtain these data, Statistics Netherlands conducts a monthly survey on intracommunity trade and obtains information on extra-EU trade flows mainly from customs.

Around 71 percent of the import and 69 percent of the export flows in 2012 could be attributed to enterprises registered in the GBR. There are four main reasons why part of the total Dutch import and export value cannot be assigned to enterprises in the GBR:
1. Foreign companies result in a mismatch as these companies are not registered in the GBR (total trade value missed: approximately 148 billion euros in 2011)
2. For some customs declarations the actual trading enterprise is unknown at Statistics Netherlands (total trade value missed: approximately 25 billion euros in 2011)
3. Small traders such as natural persons result in a mismatch as they are not identifiable in trade statistics (total trade value missed: at least 5 billion euros in 2011)
4. Some VAT numbers are unknown and therefore no match is possible with enterprises registered in the GBR (total trade value missed: approximately 2 billion euros in 2011).

Methodology

Over the years, the methodology of enriching international trade data with enterprise characteristics has changed and improved. Furthermore, new information sources have become available, which has been of great value in the matching process. This resulted in a higher number of matches as of 2009.

The GBR, the main source of enterprise information, has undergone major changes in 2006. This also resulted in significant improvements in the quality of matching traders to enterprises in the GBR from reference year 2007.

The procedure to determine whether an enterprise is Dutch or foreign controlled changed in 2005. As of 2006, company control is based on the concept of the Ultimate Controlling Institute (UCI), as defined by the FATS Regulation. For the enterprises of 2012, the UCI is based on the data from 2011, since the data on 2012 is not yet available.

13.2 Overview of international trade in goods by origin of the parent company

Total Dutch imports and exports have grown gradually since 2002 in terms of trade value. However, as a result of the economic and financial crisis starting in September 2008, Dutch trade performances deteriorated drastically in 2009 as compared to 2008: import and export values decreased by 18 and 16 percent, respectively. Fortunately, in 2010, trade values returned to 2008 levels.

In terms of numbers, foreign controlled companies account for approximately 5 percent of the Dutch trader population. This implies that the vast majority of traders are Dutch controlled, but also that the relatively low number of foreign controlled traders account for considerable sums.

The dramatic decline in international trade in 2009 and the remarkable recovery afterwards had no significant impact on the composition of importing enterprises, with respect to the origin of their parents. Since 2005, foreign controlled enterprises have slightly dominated when it comes to their share in total import value, ranging from 51 to 56 percent of total value (55 percent in 2012). In 2002, 2003 and 2004 Dutch controlled enterprises dominated Dutch imports.

Dutch export value, contrary to imports, has been dominated by domestically controlled firms, ranging from 51 percent in 2012 to 60 percent in 2002. The exception is 2010 with a slight dominance for foreign controlled enterprises. Apparently, these enterprises contributed more to the strong export recovery in 2010 compared to 2009. But in general, as was the case for imports, the

turbulent years since 2009 had no major impact on the share of trade carried out by foreign controlled firms. In 2011 and 2012 Dutch dominance in export value returned to 2009 levels.

13.2.1   International trade in goods; Dutch versus foreign controlled enterprises[1]

	Import value	Import value	of which		Import value	Export value	Export value	of which		Export value
	total	control known	Dutch controlled	foreign controlled	control unknown	total	control known	Dutch controlled	foreign controlled	control unknown
	billion euros		%		billion euros	billion euros		%		billion euros
2002	205.6	174.3	60	40	31.3	232.7	186.6	60	40	46.1
2003	206.9	171.5	58	42	35.4	234.2	182.1	60	40	52.1
2004	228.2	181.9	56	44	46.3	255.7	191.6	59	41	64.1
2005	249.8	201.5	49	51	48.3	281.3	210.9	54	46	70.4
2006	285.4	225.8	49	51	59.6	319.0	234.5	53	47	84.5
2007	307.3	235.8	48	52	71.5	347.5	245.3	54	46	102.2
2008	335.9	266.2	46	54	69.7	370.5	277.8	51	49	92.7
2009	274.0	219.0	47	53	55.0	309.4	232.9	51	49	76.5
2010	331.9	259.3	44	56	72.6	371.5	256.4	49	51	115.1
2011	364.9	274.3	48	52	90.6	409.4	275.8	52	48	133.6
2012*	389.9	277.4	45	55	112.5	431.4	297.6	51	49	133.8

[1] Enterprises without employees are excluded.

13.3 International trade in goods by size class

SMEs and large enterprises jointly contribute to Dutch import and export values. Since 2002 the two have shown different developments in trade value. In terms of import value, the group of large enterprises has grown much faster (+80 percent) than imports carried out by SMEs (+47 percent). In terms of export value it is the other way around. The group of SMEs had higher export growth (+70 percent) than large enterprises (+45 percent).

Looking at the origin of the parent companies of both SMEs and large enterprises, some differences are noteworthy. First of all, large enterprises are more frequently foreign controlled than SMEs. In 2012, 61 percent of large importing enterprises

was foreign controlled, compared to 51 percent for importing SMEs. For exports, differences are smaller (51 to 48 percent).

Second, foreign controlled SMEs are rapidly gaining ground on Dutch controlled SMEs, whereas the same cannot be said for large enterprises. In 2002 only 30 percent of importing and 28 percent of exporting SMEs had foreign parent companies. Ten years later these figures had increased to 51 and 48 percent. Large enterprises have only a slightly increasing share of foreign controlled importers and even a decreasing share of foreign controlled exporters.

13.3.1 Import and export value of goods by size class and origin of the parent company[1]

	Total	SMEs	of which Dutch controlled	foreign controlled	Large enterprises	of which Dutch controlled	foreign controlled	Size unknown
	billion euros		%		billion euros	%		billion euros
Import value								
2002	205.6	109.2	70	30	65.1	41	59	31.3
2003	206.9	108.4	70	30	63.1	42	58	35.4
2004	228.2	114.9	66	34	67.0	40	60	46.3
2005	249.8	125.6	57	43	75.9	39	61	48.3
2006	285.4	138.4	57	43	87.4	45	55	59.6
2007	307.3	135.6	59	41	100.2	40	60	71.5
2008	335.9	151.2	56	44	115.0	37	63	69.7
2009	274.0	129.3	54	46	89.7	36	64	55.0
2010	331.9	151.7	49	51	107.6	35	65	72.6
2011	364.9	153.5	56	44	120.8	38	62	90.6
2012*	389.9	160.4	49	51	117.0	39	61	112.5
Export value								
2002	232.7	106.5	72	28	80.1	41	59	46.1
2003	234.2	108.0	72	28	74.1	42	58	52.1
2004	255.7	114.3	69	31	77.3	42	58	64.1
2005	281.3	131.5	62	38	79.4	42	58	70.4
2006	319.0	139.3	60	40	95.2	47	53	84.5
2007	347.5	140.0	63	37	105.3	46	54	102.2
2008	370.5	157.2	58	42	120.6	46	54	92.7
2009	309.4	142.2	55	45	90.7	45	55	76.5
2010	371.5	160.0	51	49	96.4	46	54	115.1
2011	409.4	164.9	56	44	110.9	47	53	133.6
2012*	431.4	181.4	52	48	116.2	49	51	133.8

[1] Enterprises without employees are excluded.

These developments seem connected. Because the share of foreign controlled

SMEs was very low in 2002, there was more potential for it to rise significantly as compared to the already high share of large foreign controlled enterprises. Despite the rapidly growing importance of foreign controlled SMEs, large enterprises are still more often foreign controlled than SMEs.

13.4 International trade in goods by activity

Manufacturing and wholesale trade are by far the most important economic activities in the international trade in goods. In 2012 they contributed 72 percent to the import value and 74 percent to the export value that could be allocated to sectors. Slightly more than half of the trade value generated by these two sectors can be linked to enterprises under foreign control. Other sectors are strongly dominated by enterprises under domestic control (agriculture, fishing, mining, energy, water and waste, construction, real estate, business and other services and the rest category, e.g. education, health and culture) or strongly dominated by enterprises under foreign control (transport and storage and professional, scientific and technical activities).

Table 13.2.1 already showed that the share of foreign controlled enterprises in total Dutch imports and exports steadily increased during the time period 2002–2012. In general, this reflects on activity level. Five sectors are much more foreign controlled in 2012 than they were ten years earlier: wholesale trade, retail trade, repair, accommodation and food, transport and storage, information and communication and professional, scientific and technical activities. On the other hand, there are two sectors that are now much more Dutch oriented than they were before: agriculture, fishing, mining, energy, water and waste and real estate, business and other services.

13.4.1 Import and export value of goods by economic activity and origin of the parent company[1]

	2002			2011			2012*		
		of which			of which			of which	
	total value	Dutch controlled	foreign controlled	total value	Dutch controlled	foreign controlled	total value	Dutch controlled	foreign controlled
	billion euros	%		billion euros	%		billion euros	%	
Import value	205.6	60	40	364.9	48	52	389.9	45	55
Economic activity (NACE Rev.2)									
Agriculture, fishing, mining, energy, water and waste (SBI: A, B, D, E)	3.4	69	31	9.1	87	13	11.2	84	16
Manufacturing (SBI: C)	53.8	41	59	85.0	43	57	94.5	45	55
Construction (SBI: F)	0.7	83	17	1.5	66	34	1.4	77	23
Wholesale trade (SBI: G46)	70.1	67	33	95.7	50	50	106.5	45	55
Retail trade, repair, accomodation and food (SBI: G45, G47, I)	18.2	64	36	26.5	47	53	25.7	43	57
Transport and storage (SBI: H)	16.7	56	44	41.2	43	57	19.2	33	67
Information and communication (SBI: J)	1.2	82	18	2.2	54	46	2.4	51	49
Finance and insurances (SBI: K)	0.9	–	–	1.2	–	–	1.2	–	–
Professional, scientific and technical activities (SBI: M)	6.5	85	15	9.5	49	51	12.6	25	75
Real estate, business and other services (SBI: L, N, S)	2.1	59	41	1.9	78	22	2.0	72	28
Rest category (SBI: O, P, Q, R, T, U)	0.6	90	10	0.5	94	6	0.6	86	14
Economic activitity unknown	31.3	–	–	90.6	–	–	112.5	–	–
Export value	232.7	60	40	409.4	52	48	431.4	51	49
Economic activity (NACE Rev.2)									
Agriculture, fishing, mining, energy, water and waste (SBI: A, B, D, E)	8.6	87	13	20.1	96	4	23.5	95	5
Manufacturing (SBI: C)	82.5	45	55	113.5	47	53	116.7	48	52
Construction (SBI: F)	0.4	76	24	0.8	88	12	0.9	84	16
Wholesale trade (SBI: G46)	64.8	64	36	99.0	53	47	105.0	51	49
Retail trade, repair, accomodation and food (SBI: G45, G47, I)	7.3	84	16	8.1	62	38	8.4	64	36
Transport and storage (SBI: H)	12.6	64	36	16.7	26	74	19.5	32	68
Information and communication (SBI: J)	1.2	75	25	1.9	52	48	2.0	48	52
Finance and insurances (SBI: K)	0.6	–	–	1.1	–	–	1.2	–	–
Professional, scientific and technical activities (SBI: M)	7.3	85	15	12.6	45	55	18.6	31	69

13.4.1 Import and export value of goods by economic activity and origin of the parent company[1] (end)

	2002			2011			2012*		
		of which			of which			of which	
	total value	Dutch controlled	foreign controlled	total value	Dutch controlled	foreign controlled	total value	Dutch controlled	foreign controlled
Real estate, business and other services (SBI: L, N, S)	1.2	49	51	1.6	73	27	1.4	70	30
Rest category (SBI: O, P, Q, R, T, U)	0.2	98	2	0.3	98	2	0.3	93	7
Economic activity unknown	46.1	–	–	133.6	–	–	133.8	–	–

[1] Enterprises without employees are excluded.

13.5 International goods traders in the Netherlands

There were 1.1 million enterprises with employees in 2012, 8 percent more than in 2011. The highest absolute increase in the number of enterprises was observed in real estate, business and other services with an additional 23 thousand enterprises.

Importers constituted 15 percent of the total Dutch population of enterprises, while 10 percent exported in 2012. For exporters, this is a slight increase compared to 2011. In line with their crucial impact on total Dutch trade value, wholesale trade and manufacturing have the largest shares of traders in their population. Enterprises in wholesale trade comprise 50 percent importers and 42 percent exporters. For manufacturers this is 36 percent importers and 29 percent exporters.

15% of the Dutch enterprise population imported goods in 2012

Although the largest share of enterprises can be found in real estate, business and other services, relatively few of these enterprises imported (8 percent). But the propensity to export was similar to the overall average (9 percent). This pattern has been quite stable over time. International trade in goods is least important in finance and insurances and in the rest category, with only 5 percent of the enterprises involved in importing activities and even fewer in exporting, namely 4 and 3 percent, respectively. It was to be expected that enterprises in these service industries have a low propensity to export goods.

Note that the numbers in this table for 2010 and 2011 differ from those in the Internationalisation Monitor 2012. This year we chose to exclude enterprises without employees (often holdings or special purpose entities), because we do not want to include these entities in our SME figures.

13.5.1 Share of importers / exporters of goods in the enterprise population by economic activity[1]

	2010			2011			2012*		
	total	importers	exporters	total	importers	exporters	total	importers	exporters
	number	%		number	%		number	%	
Total	982,660	15	9	1,036,339	15	9	1,120,356	15	10
Economic activity (NACE Rev.2)									
Agriculture, fishing, mining, energy, water and waste (SBI: A, B, D, E)	63,665	11	9	62,824	12	9	63,458	13	10
Manufacturing (SBI: C)	47,197	37	29	47,863	37	29	50,479	36	29
Construction (SBI: F)	119,031	8	3	122,662	9	3	133,224	8	4
Wholesale trade (SBI: G46)	64,124	49	41	65,017	50	40	67,162	50	42
Retail trade, repair, accomodation and food (SBI: G45, G47, I)	154,172	25	6	159,608	26	7	168,209	26	7
Transport and storage (SBI: H)	27,765	14	15	28,636	14	15	30,693	14	16
Information and communication (SBI: J)	43,310	14	13	47,365	15	14	53,428	15	15
Finance and insurances (SBI: K)	53,902	5	3	58,309	5	4	58,860	5	4
Professional, scientific and technical activities (SBI: M)	115,638	7	3	123,054	8	4	134,011	8	4
Real estate, business and other services (SBI: L, N, S)	171,074	8	8	186,894	8	8	210,107	8	9
Rest category (SBI: O, P, Q, R, T, U)	122,782	5	2	134,107	5	3	150,725	5	3

[1] Enterprises without employees are excluded.

14.

International
trade in services
by enterprises

Authors
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14.1 Introduction

The statistics on international trade in services (ITS) provide information about the trade values of services from the Netherlands to a foreign country and vice versa. Statistics Netherlands uses the business survey to collect data on a quarterly basis for the following services: transportation, communication services, construction services, insurance services, financial services, computer and information services, royalties and licence fees, other business services and personal, cultural and recreational services. International trade in government services and travel are not available for the analyses presented here. Information on these two sectors is obtained by other data collection methods.

The business survey held by Statistics Netherlands is based on two groups. The first group consists of enterprises with a significant share in the total value of the international trade in services. These approximately 350 enterprises are integrally observed at the enterprise group level. The second group includes enterprises with a lesser share in the total value of the international trade in services. This group is questioned based on a sample survey of approximately 5,000 companies at the enterprise level.

Except from section 14.2, all data for the annotated tables in this chapter are based on an integration of the micro data from the business survey, the General Business Register (GBR) and the Ultimate Controlling Institute (UCI). Statistics Netherlands determines the UCI on an annual basis by combining enterprise information from various sources. Although the integrated dataset does not include all services, it represents 50 percent of the total import value and 64 percent of the total export value.

This chapter kicks off with an overview of the international trade in services by origin of the parent enterprise, followed by a breakdown by economic activity. The last section will discuss the product extensive margin of services.

In 2012 Dutch controlled firms carried out 55% of the exports of services

14.2 Overview of international trade in services by origin of the parent enterprise

The overall Dutch imports and exports of services[1] in 2007–2012 are shown in figure 14.2.1. This figure shows that the Netherlands exports more services than it imports. In 2012 services exports amounted to 102 billion, whereas the value of services imports was 92 billion euros. The services trade balance of approximately +10 billion euros applies for most years between 2007 and 2012. The only exception is the year of the economic downturn (2009). In that year the exports of services declined with 4 billion euros, while the imports of services even increased by 1.5 billion euros compared to the year before. This resulted in a trade balance of 'only' +4 billion euros.

After the economic downturn, the annual growth rates of services exports were higher than those of services imports. Especially 2011 showed a remarkably high growth rate (11.6 percent) for services exports. However, in 2012 it was the other way around: imports of services were 5.6 percent higher in value, while exports only grew by 2.8 percent compared to the year before.

Table 14.2.2 shows the shares of Dutch and foreign controlled enterprises in our integrated dataset. In 2007 and 2008, approximately 55 percent of the import value was attributed to Dutch-controlled enterprises and 45 percent to foreign-controlled ones. In the following years these import shares almost equalled. In 2012 the share of Dutch-controlled enterprises was 51 percent.

As far as exports are concerned, 58 percent of the export value could be ascribed to Dutch-controlled enterprises in 2007 and 2008. After an increase to 60 percent in 2009, this share decreased to 56 percent in 2010. In 2011 and 2012 the exports carried out by Dutch-controlled enterprises remained relatively stable (55 percent).

Overall, Dutch-controlled enterprises are represented slightly more in exports than in imports of services.

[1] The total imports and exports of services in this section are based on data in the *StatLine database* of Statistics Netherlands. The breakdown by origin of the parent enterprise is based on the integrated dataset of micro data from the business survey, the GBR and the UCI (see section 14.1).

14.2.1 Total Dutch imports and exports of services

billion euros
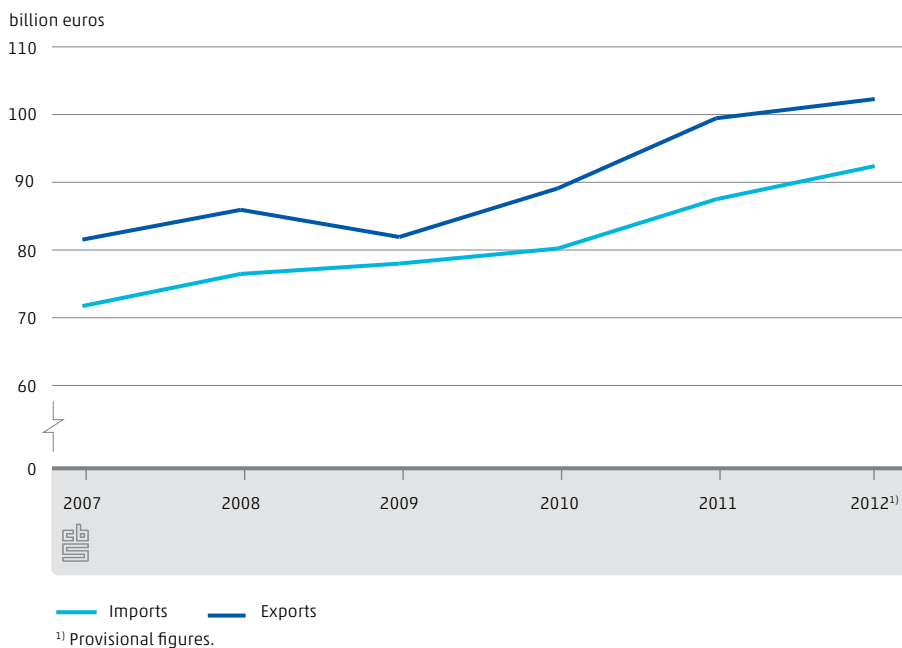
Imports ——— Exports ———

14.2.2 International trade in services by origin of the parent enterprise

	Imports			Exports		
	total	Dutch controlled	foreign controlled	total	Dutch controlled	foreign controlled
	billion euros	%		billion euros	%	
2007	71.7	56	44	81.5	58	42
2008	76.5	55	45	85.9	58	42
2009	78.0	53	47	81.9	60	40
2010	80.2	50	50	89.1	56	44
2011	87.5	51	49	99.5	55	45
2012*	92.4	51	49	102.3	55	45

* Provisional figures

14.3 International trade in services by economic activity

Figure 14.3.1 shows the contributions of five sectors to the international trade in services. In 2012, enterprises in the agriculture, mining and manufacturing sector accounted for 29 percent of the import value of services. The second largest shares, 26 percent, were carried out by enterprises in the sectors transport and storage and communication, financial intermediation, real estate and business activities. These three sectors were also the most important ones in exports,. They accounted for 25, 40 and 24 percent of the total services export value, respectively.

In table 14.3.2, we divide the import value of services by economic activity and the origin of the parent enterprise. In 2011 as well as in 2012, the Dutch-controlled enterprises dominated most of the sectors when it comes to importing services. Especially in the sector public administration, education, health and other services a large share of the import value was held by Dutch-controlled enterprises. In 2012 the only sector in which foreign-controlled enterprises dominated the imports of services was construction, trade and accommodation (74 percent). In the transport and storage sector the influence of Dutch and foreign-controlled enterprises was equivalent in both 2011 and 2012.

The distribution of the total services export value by economic activity and the origin of the enterprise is shown in table 14.3.3. We see that construction, trade and accommodation is the sector in which foreign controlled enterprises contributed the most (64 percent) to services exports in 2012. One year before, this share was only 57 percent. The other sector in which foreign-controlled enterprises dominated was transport and storage; 55 percent of the export value in this sector was attributable to these enterprises. The sector in which Dutch-controlled enterprises dominated the exports of services the most in 2012, was public administration, education, health and other services (86 percent), followed by agriculture, mining and manufacturing (70 percent). The first sector showed a big leap in terms of influence of Dutch controlled enterprises compared to 2011. However, this a relatively small sector (see figure 14.3.1), where minor changes have large effects.

14.3.1 International trade in services by economic activity, 2012[1]

Import value

29%
18%
26%
26%
1%

Export value

25%
10%
40%
24%
1%

- 🟦 Agriculture, mining and manufacturing
- 🟦 Construction, trade and accommodation
- 🟩 Transport and storage
- 🟩 Communication, financial intermediation, real estate and business activities
- 🟧 Public administration, education, health and other services
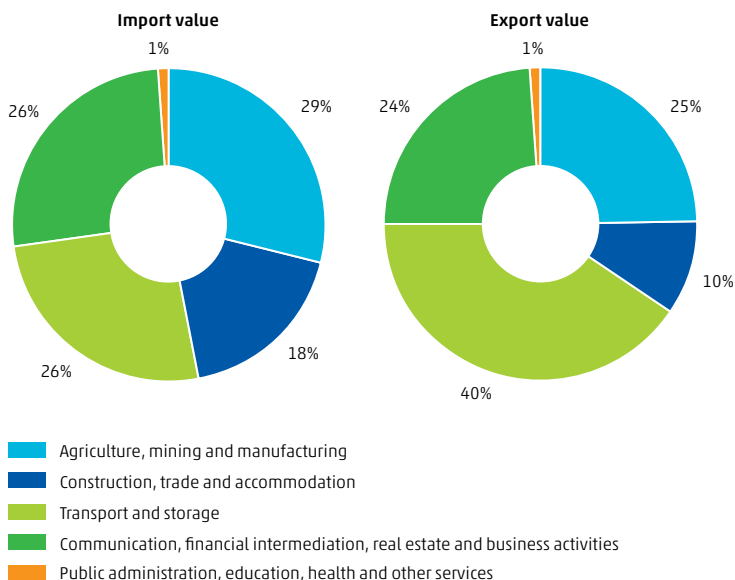
[1] Provisional figures.

14.3.2 Imports of services by economic activity and origin of the parent enterprise

		2011		2012*	
		Dutch controlled	foreign controlled	Dutch controlled	foreign controlled
		%			
Economic activity (NACE Rev 2)					
A + B + C + D + E	Agriculture, mining and manufacturing	64	36	63	37
F + G + I	Construction, trade and accommodation	28	72	26	74
H	Transport and storage	50	50	50	50
J + K + L + M + N	Communication, financial intermediation, real estate and business activities	52	48	54	46
O + P + Q + R + S	Public administration, education, health and other services	78	22	88	12

* Provisional figures

14.3.3 Exports of services by economic activity and origin of the parent enterprise

		2011		2012*	
		Dutch controlled	foreign controlled	Dutch controlled	foreign controlled
		%			
Economic activity (NACE Rev 2)					
A + B + C + D + E	Agriculture, mining and manufacturing	71	29	70	30
F + G + I	Construction, trade and accommodation	43	57	36	64
H	Transport and storage	46	54	45	55
J + K + L + M + N	Communication, financial intermediation, real estate and business activities	58	42	63	37
O + P + Q + R + S	Public administration, education, health and other services	70	30	86	14

* Provisional figures.

14.4 The product extensive margin of services

Table 14.4.1 shows for numbers of services imported or exported[2] the share of traders with this number of services in the total number of traders, and their share in the total import or export values. For example, 19 percent of importers traded in three to five services, and the import value of the services they traded was 15 percent of total services imports in 2012. The number of services traded is sometimes called the 'product extensive margin' (Bernard *et al.*, 2007).

The large majority of enterprises traded only one or two services in 2012. For imports, this was four fifths, and for exports it even was 91 percent. However, there are also enterprises that trade even more different kinds of services: 1 percent of all importers imported at least ten in 2012. For exporters, this share was only

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[2] We considered only the 19 different services from the business survey for small and medium-sized traders. These are: *sea transport services, air transport services, other transport services, postal and courier services, telecommunication services, construction abroad, construction in the Netherlands, insurance services, financial services, computer services, information services, franchises and similar rights, other royalties and license fees, merchanting and other trade-related services, operational leasing, miscellaneous business, professional and technical services, audio-visual and related services, other personal, cultural and recreational services* and *government services not included elsewhere.*

0.1 percent. The latter was to be expected, because it is much easier to use different services than to provide them.

The value is also less concentrated in imports than in exports. The enterprises that import one or two services, accounted for 'only' 30 percent of the total services import value in 2012. This share was much higher for exports (59 percent). Consequently, the enterprises that imported many services were of more importance for imports. In 2012, importers of at least 10 different services accounted for 32 percent of the total services import value. For exports this share was only 14 percent.

The product extensive margin of services shows a skewed distribution, and the distribution of exports is more skewed than that of imports. This is also the case for the product extensive margin of commodities. For example, Bernard *et al.* (2007) found that more than half of US exporters exported only one or two products in 2000, and only one quarter of the firms exported five or more products. Jaarsma and Fortanier (2011) described similar results for Dutch importers and exporters.

14.4.1 Product extensive margin of services, 2012*

Number of services traded	Share of			
	importers in total number of importers	exporters in total number of exporters	importers in total import value	exporters in total export value
	%			
1–2	80.0	91.1	30.0	58.8
3–5	14.5	8.3	19.0	18.3
6–9	4.4	0.6	18.7	9.4
10–19	1.0	0.1	32.2	13.5

* Provisional figures.

15.

Foreign direct investments

Author
Fintan van Berkel

15.1 Introduction

The patterns in Dutch foreign direct investment (FDI) are the topic of this chapter. It kicks off with a comparison of Dutch investment to FDI worldwide. Next the values of flows and stocks and their shares in GDP are presented. It ends with a description of the Dutch FDI by country and by economic sector. The reference year for the data is the year 2000. The data cover the period up to 2011 and 2012 was included where possible. The Special Purpose Entities (see Chapter 3) are excluded here.

FDI is defined as a cross-border investment made by a resident in one economy (the *direct investor*) with the objective of establishing a lasting interest in an enterprise (the *direct investment enterprise*) that is resident in an economy other than that of the direct investor. The 'lasting interest' is in evidence when the direct investor owns at least 10 percent of the voting power of the direct investment enterprise (OECD, 2008). Note that the direct investor is not necessarily the ultimate controlling institutional unit (UCI). For example, if a Dutch enterprise controls a German enterprise that controls an Austrian enterprise, the UCI of the Austrian enterprise is Dutch, but the direct investor in Austria is German.

We distinguish inward FDI and outward FDI. *Inward FDI* is the foreign direct investment in the reporting economy. *Outward FDI* is the direct investment of the reporting economy made abroad.

We also distinguish between flows and stocks. *Flows* of foreign direct investment consist of the annual changes in share capital, reinvested profits and other investments, including loans. *Stocks* of foreign direct investment are measured at the end of the year and consist of capital participations, loans (including trade credits, intra concern loans), and other liabilities. The difference between stocks at the end of two subsequent years is equal to the flow of FDI plus reassessments as a result of changed exchange rates, changed prices and other causes such as goodwill write-downs.

De Nederlandsche Bank (DNB) is the leading authority on measuring FDI in the Netherlands. It collects and compiles the data in line with the Balance of Payments Manual (IMF, 1993). According to the directional principle in this manual, DNB nets out the transactions of a subsidiary enterprise to the parent enterprise with those of the parent to the subsidiary.

15.2 The Dutch share in worldwide FDI

The share of the Netherlands in the global stock of inward FDI was 2.5 percent in 2012 (see 15.2.1). This percentage was 0.3 percentage points lower than in 2011. In most EU-15 countries the shares were comparable to the year before. Only Belgium (−0.4 percentage points) experienced a bigger drop than the Netherlands in 2012.

Outside the EU-15, China managed to increase its share in total worldwide inward FDI by 0.3 percentage points. It was the fifth successive year in which this country experienced an increase. This reflects the growing interest to invest in China. Its economic growth is far higher than those of most developed countries and thus creates opportunities for enterprises. The United States remained the biggest player regarding the global stock of inward FDI in 2012, followed by the United Kingdom.

Concerning worldwide outward FDI stock, the shares of most EU-15 countries were also relatively stable compared to 2011. The Netherlands stood out in a negative way and lost the most of its share (−0.5 percentage points) in 2012, while France was the EU-15 member with the biggest increase (+0.4 percentage points).

Of the other important countries outside the EU-15, the United States and China increased their shares in global outward FDI stock by 1.0 and 0.2 percentage points respectively. The share of China had also grown in previous years, together with its own economy. In 2012 the United States' share in the global stock of outward FDI remained the largest by far (22 percent).

Figure 15.2.2 provides a closer look at the Dutch share in EU-15's total worldwide inward FDI stock. Back in 2005, the Netherlands accounted for 10.8 percent of the EU-15 inward FDI stock. With that percentage it came in third place of all EU-15 countries. However, in 2012, the Dutch share had dropped to 8.1 percent, resulting in only a sixth place.

Concerning outward FDI stock, the Netherlands was the fourth most important EU-15 country from 2005 up to and including 2010, after which it was overtaken by Belgium (see figure 15.2.3). In 2012 the Netherlands accounted for 10.1 percent of the EU-15's total worldwide outward FDI stock. This share was 1.1 percentage points lower than in 2005.[1]
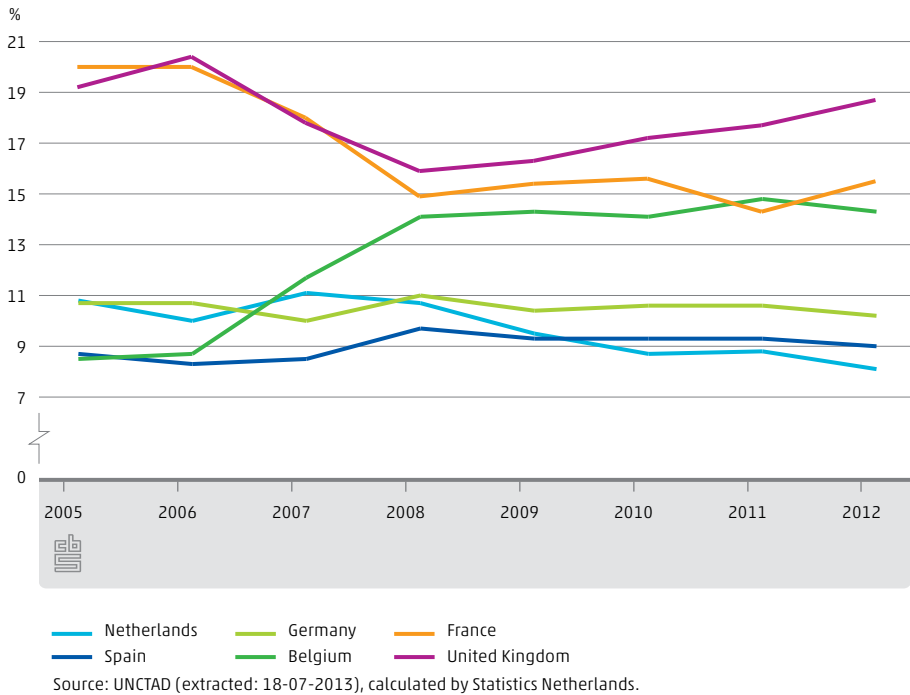
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[1] The Netherlands does not generally include SPEs in FDI, but most other countries do. If we include SPEs in Dutch FDI, the share of the Netherlands in worldwide FDI would be higher.

15.2.1   Shares in worldwide FDI (stocks)

	2000	2005	2009	2010	2011	2012
	%					
Inward stocks						
World	100	100	100	100	100	100
EU-15	29.8	38.0	36.9	33.1	32.1	30.9
Netherlands	3.2	4.1	3.5	2.9	2.8	2.5
Austria	0.4	0.7	0.9	0.8	0.7	0.7
Belgium	2.6	3.2	5.3	4.7	4.8	4.4
Denmark	1.0	1.0	0.9	0.7	0.7	0.6
France	5.2	7.6	5.7	5.2	4.6	4.8
Germany	3.6	4.1	3.8	3.5	3.4	3.1
Italy	1.6	2.0	2.0	1.6	1.6	1.6
Spain	2.1	3.3	3.5	3.1	3.0	2.8
Sweden	1.2	1.5	1.8	1.7	1.6	1.6
United Kingdom	6.2	7.3	6.0	5.7	5.7	5.8
Switzerland	1.2	1.5	2.7	3.0	3.1	2.9
Brazil	1.6	1.6	2.2	3.3	3.3	3.1
China	2.6	2.3	2.6	2.9	3.4	3.7
India	0.2	0.4	0.9	1.0	1.0	1.0
Russian Federation	0.4	1.5	2.1	2.4	2.2	2.2
Australia	1.6	2.1	2.3	2.5	2.6	2.7
Canada	2.8	2.9	3.0	2.9	2.8	2.8
Japan	0.7	0.9	1.1	1.1	1.1	0.9
United States	37.1	24.1	16.4	16.7	16.8	17.2
Outward stocks						
World	100	100	100	100	100	100
EU-15	43.6	45.8	46.2	43.4	42.5	41.1
Netherlands	3.8	5.1	4.9	4.5	4.6	4.1
Austria	0.3	0.6	0.8	0.8	0.9	0.9
Belgium	2.2	3.8	4.8	4.4	4.7	4.4
Denmark	0.9	1.0	1.1	1.0	1.0	1.0
France	11.5	9.8	8.1	7.2	5.9	6.3
Germany	6.8	7.4	7.2	6.9	6.9	6.6
Italy	2.1	1.9	2.5	2.3	2.4	2.4
Spain	1.6	2.4	3.2	3.1	3.0	2.7
Sweden	1.5	1.7	1.8	1.8	1.8	1.7
United Kingdom	11.5	9.7	8.1	7.7	7.9	7.7
Switzerland	2.9	3.4	4.4	4.9	5.0	4.8
Brazil	0.6	0.6	0.8	0.9	0.9	1.0
China	0.3	0.5	1.3	1.5	2.0	2.2
India	0.0	0.1	0.4	0.5	0.5	0.5
Russian Federation	0.3	1.2	1.6	1.7	1.7	1.8
Australia	1.2	1.7	1.8	2.0	1.8	1.8
Canada	3.0	3.1	3.1	3.0	3.1	3.0
Japan	3.5	3.1	3.8	3.9	4.5	4.5
United States	33.6	28.9	22.0	22.6	21.0	22.0

Source: UNCTAD (extracted: 18-07-2013).

15.2.2 Shares in EU-15 inward FDI (stocks)

%

Legend:
- Netherlands
- Spain
- Germany
- Belgium
- France
- United Kingdom

Source: UNCTAD (extracted: 18-07-2013), calculated by Statistics Netherlands.

15.2.3 Shares in EU-15 outward FDI (stocks)

%

Legend:
- Spain
- Netherlands
- Belgium
- France
- Germany
- United Kingdom

Source: UNCTAD (extracted: 18-07-2013), calculated by Statistics Netherlands.
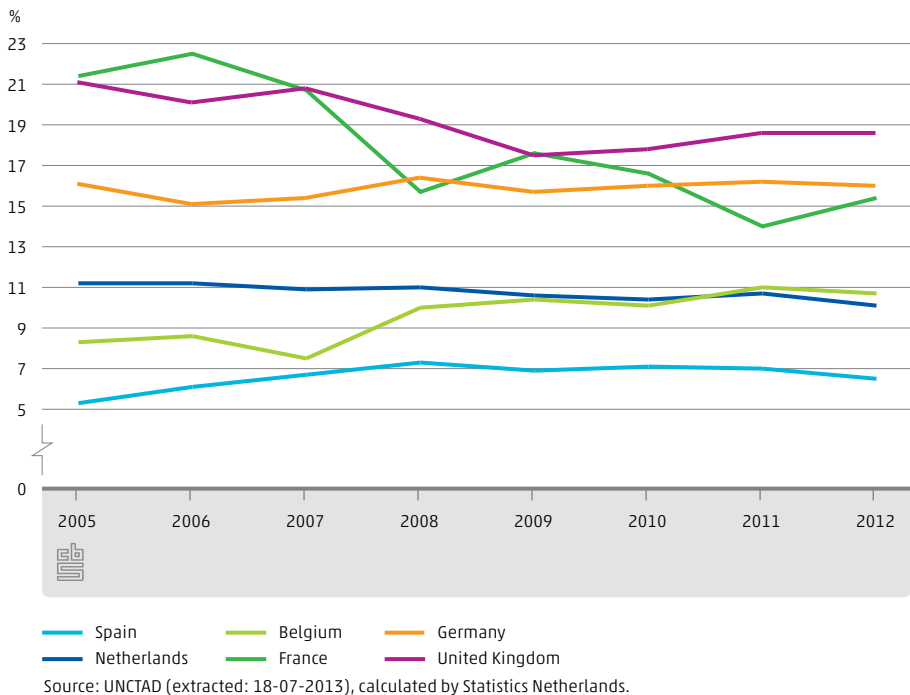
15.3 Dutch FDI: stocks and flows

From 2000 onwards the Netherlands has more outward than inward foreign direct investment (see table 15.3.1). This is common for most other developed countries, as has been noted in the Internationalisation Monitor 2011. Emerging markets have relatively favourable economic conditions and therefore, in general, more inward than outward FDI (UNCTAD, 2012).

The difference between Dutch outward and inward FDI stocks has strongly increased since 2000. In 2012 outward FDI stock accounted for 783 billion euros and inward FDI stock for 457 billion euros. These values were 3.6 and 1 percent higher than in 2011, respectively.

The ratios of inward and outward FDI stocks to GDP (in current prices) are often considered to be measures for the openness of an economy (OECD, 2008). Figure 15.3.2 shows that the openness of the Dutch economy with respect to outward FDI has clearly increased since 2008. However, the inward FDI/GDP ratio has slightly decreased compared to that year.

Following Luxembourg, Belgium and Ireland, the Netherlands was the fourth most open economy of all EU-15 countries with respect to outward FDI stock in 2012. Regarding inward FDI/GDP ratios, the Netherlands also came fourth. Again, Luxembourg, Belgium and Ireland were the most open economies in 2012.

FDI flows are more sensitive to large transactions than FDI stocks, and hence varied substantially between 2000 and 2012. An example of a large transaction is the acquisition of ABN AMRO by foreign enterprises in 2007 and the subsequent sale of the Dutch part of Belgium-based Fortis to the Dutch state in the following year. Another example is the restructuring of Shell in 2005, when the company which previously had two headquarters (one in the Netherlands and one in the United Kingdom) became an enterprise with only one headquarter in The Hague. Activities in the United Kingdom were then reclassified as foreign investments of the Netherlands abroad.[2]

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[2] The considerable fluctuations of FDI flows diminish the relevance of the indicators that compare the size of flows with GDP. These indicators used to give information about the relative attractiveness of economies, of the Netherlands and of foreign countries. However, recent fluctuations in these indicators could not be separated from sudden flows caused by large acquisitions or from the decrease in FDI caused by the economic crisis.

15.3.1   Dutch FDI (flows and stocks): value and share in GDP

	2000	2005	2007	2008	2009	2010	2011	2012
million euros								
Value								
Inward FDI, flows	69,308	31,399	87,226	3,106	27,793	−5,562	12,358	−94
Outward FDI, flows	82,094	98,964	40,628	46,650	24,814	51,594	29,421	473
Inward FDI, stocks	261,937	406,392	520,766	463,894	447,211	438,065	452,459	456,912
Outward FDI, stocks	328,276	545,828	639,960	639,425	661,281	715,362	756,548	783,461
	%							
Share in GDP								
Inward FDI, flows	17	6	15	1	5	−1	2	−0
Outward FDI, flows	20	19	7	8	4	9	5	0
Inward FDI, stocks	63	79	91	78	78	75	76	76
Outward FDI, stocks	79	106	112	108	115	122	126	131

Source: De Nederlandsche Bank (FDI) and Statistics Netherlands (GDP) (extracted: 18-07-2013), calculated by Statistics Netherlands.

15.3.2 Dutch FDI (stocks) relative to GDP
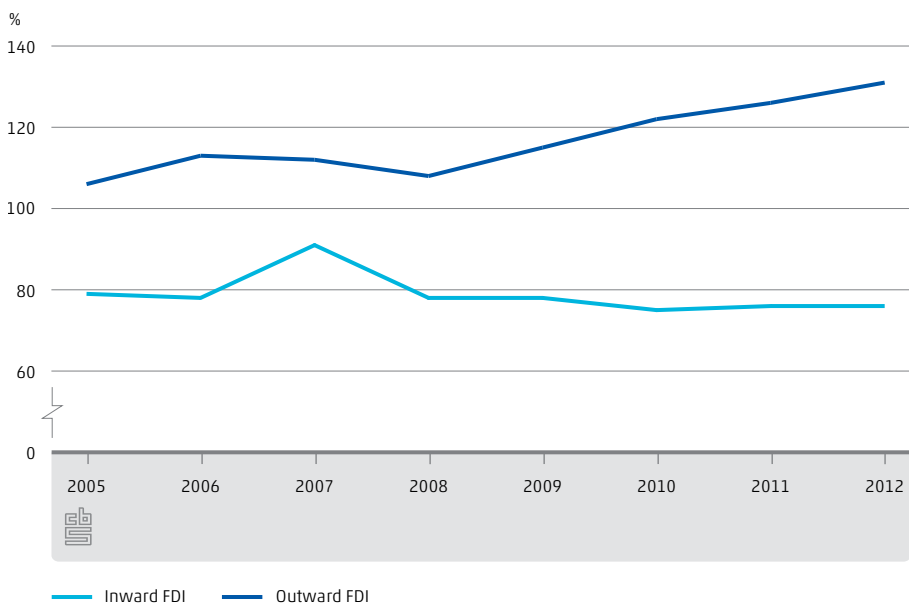
Source: De Nederlandsche Bank (FDI) and Statistics Netherlands (GDP) (extracted: 18-07-2013), calculated by Statistics Netherlands.

15.4 Dutch FDI stocks: by country

Table 15.4.1 illustrates that the United States and the EU-15 countries are the main investors in the Netherlands. Together these countries accounted for 340 billion euros, or three quarters of total Dutch inward FDI stock in 2011. Switzerland is also a big investor, while the accumulated value of investment of the BRIC countries in the Netherlands still remained relatively small.

A closer look at the EU-15 shows us that Luxembourg has taken over United Kingdom's first place regarding Dutch inward FDI in 2011. Its share represents 13 percent of the accumulated value of investments in the Netherlands. With 10 percent the United Kingdom now comes in second place, together with Belgium. Germany and France complete the top five with 9 and 8 percent respectively.

Vice versa, the Netherlands also invested a lot in the EU-15 countries and the United States. In total 63 percent (480 billion euros) of Dutch outward FDI stock was concentrated in these countries in 2011. However, note that this share is considerably lower than the combined share of the EU-15 and the United States in Dutch inward FDI (75 percent). Relatively speaking, Dutch outward FDI stock in e.g. Luxembourg, the US and the UK remained clearly behind the Dutch inward FDI stock from these countries in 2011. It was the other way around for another big investor in the Netherlands, Switzerland. This country is known for its favourable tax and financial conditions, and therefore attractive for investors (resident in the Netherlands) (Deloitte, 2011). The shares of outward FDI going to the BRIC countries were still relatively small in 2011.

63% of Dutch outward FDI stock went to the EU-15 and the United States

In figure 15.4.2 and figure 15.4.3 we categorise the origin and destination of Dutch FDI stocks by most important countries. First of all, we see that inward FDI is more concentrated than outward FDI. Concerning outward FDI, we also see that the accumulated investment value of the Netherlands in the United States has decreased gradually between 2005 and 2011. One of the causes for this decline

was the selling of American subsidiary enterprises such as US Foodservices, La Salle and Harcourt by Dutch firms in 2007 (DNB, 2008). At the same time, the Dutch investments in Switzerland have increased substantially.[3]

15.4.1 Dutch FDI (stocks), by country of origin or destination

	Value						Share (2011)
	2000	2005	2007	2009	2010	2011	
	million euros						%
Inward FDI							
World	261,937	406,392	520,766	447,211	438,065	452,459	100
EU-15	161,775	241,705	343,972	265,392	265,588	276,421	61
Belgium	40,490	38,946	59,885	35,501	29,621	45,279	10
France	13,467	28,525	42,227	43,320	43,328	34,385	8
Germany	35,867	42,666	44,633	33,021	35,075	40,885	9
Ireland	8,362	15,429	19,366	21,833	21,307	23,020	5
Italy	1,064	2,197	2,570	2,825	3,596	4,828	1
Luxembourg	8,877	34,586	50,775	49,212	53,396	59,764	13
Spain	807	9,290	24,493	8,550	4,555	3,087	1
Sweden	6,418	3,934	4,403	8,346	8,158	7,819	2
United Kingdom	41,630	57,154	86,424	53,072	56,815	46,579	10
other EU-15 countries	4,793	8,978	9,197	9,712	9,738	10,774	2
Russian Federation	3	119	240	347	328	444	0
Switzerland	12,531	18,312	17,381	21,390	29,718	37,731	8
other European countries	3,230	20,361	11,904	20,367	13,898	15,271	3
Brazil	176	837	861	−62	−102	15	0
China	33	23	96	86	268	180	0
Dutch Antilles and Aruba	7,896	7,772	8,145	9,217	8,938	9,790	2
India	26	4	8	8	162	50	0
Japan	9,187	7,428	8,630	10,888	12,740	11,330	3
United States	56,765	77,265	94,527	84,363	69,030	63,830	14
other countries	10,316	32,566	35,001	35,215	37,497	37,395	8
Outward FDI							
World	328,276	545,828	639,960	661,281	715,362	756,548	100
EU-15	165,159	314,761	391,399	368,691	381,781	404,127	53
Belgium	35,242	39,649	74,989	60,321	68,805	73,579	10
France	19,636	32,428	37,612	33,014	31,592	36,357	5
Germany	32,932	57,097	65,343	62,684	53,724	59,238	8
Ireland	11,018	12,173	12,300	12,203	11,446	13,803	2
Italy	5,846	15,017	21,419	17,706	22,311	19,019	3
Luxembourg	5,487	17,791	32,533	45,850	55,281	59,275	8
Spain	9,729	24,401	28,859	26,484	19,982	19,155	3
Sweden	2,631	7,020	5,876	4,901	5,458	4,315	1

[3] Some of the shifts, particularly in outward FDI, are caused by fluctuating exchange rates. For example, the dollar lost approximately half of its value against the euro between 2000 and 2011. So even if investments in the United States had retained their value in dollars, their value in euros would have decreased.

15.4.1 Dutch FDI (stocks), by country of origin or destination (end)

|	Value						Share (2011)
	2000	2005	2007	2009	2010	2011	
United Kingdom	34,234	99,093	93,917	87,860	94,859	104,529	14
other EU-15 countries	8,404	10,092	18,552	17,668	18,322	14,856	2
Russian Federation	1,871	5,646	9,014	6,589	7,020	6,746	1
Switzerland	15,999	35,533	42,852	54,478	71,509	72,159	10
other European countries	13,286	23,527	28,603	28,756	30,362	32,056	4
Brazil	4,886	8,229	11,562	7,647	8,224	10,694	1
China	1,800	1,827	4,367	6,510	5,738	6,070	1
Dutch Antilles and Aruba	2,110	1,886	2,393	2,133	2,730	3,156	0
India	531	1,254	2,167	2,040	2,591	2,666	0
Japan	1,248	1,577	3,338	6,100	7,683	7,834	1
United States	84,545	87,939	65,136	76,768	70,041	75,867	10
other countries	36,841	63,649	79,129	101,568	127,683	135,174	18

Source: De Nederlandsche Bank (extracted: 18-07-2013), calculated by Statistics Netherlands.

15.4.2 Origin of inward FDI (stocks) by share
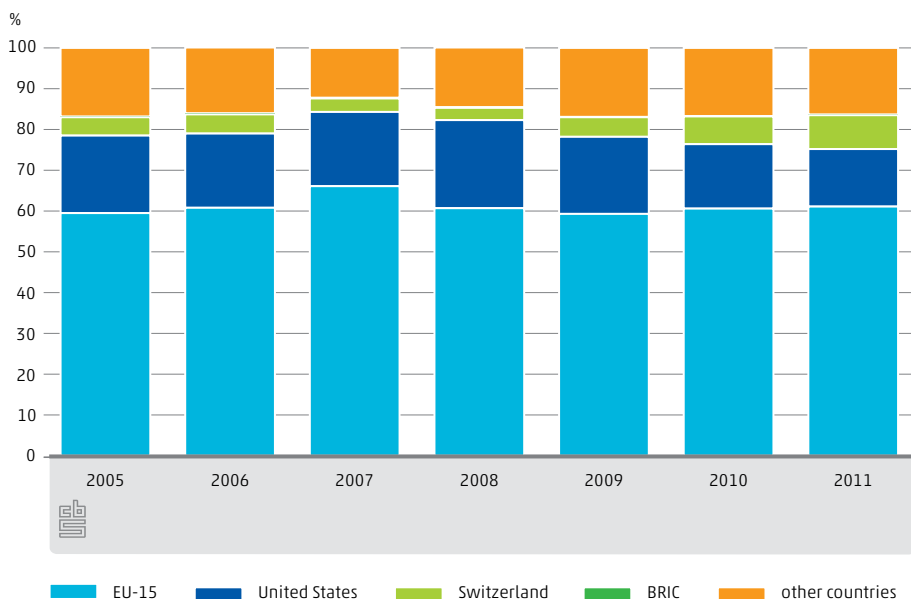
Source: De Nederlandsche Bank (extracted: 18-07-2013), calculated by Statistics Netherlands.

15.4.3 Destination of outward FDI (stocks) by share
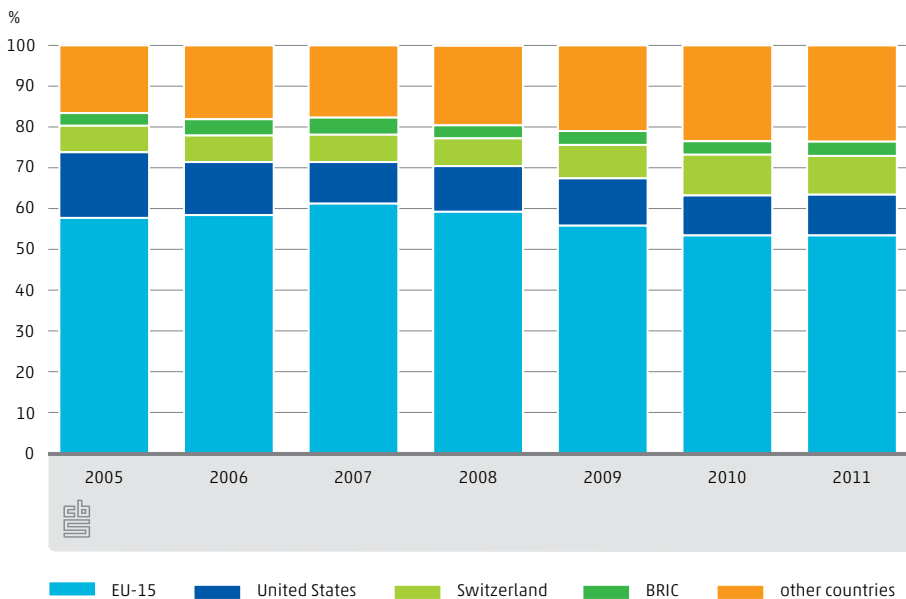
Source: De Nederlandsche Bank (extracted: 18-07-2013), calculated by Statistics Netherlands.

15.5 Dutch FDI stocks: by economic sector

In 2011 enterprises in the Dutch manufacturing sector had 15 percent more inward foreign direct investment (stock) than in the year before (see table 15.5.1). Of all inward FDI in manufacturing 48 percent focused on the *mining and quarrying, petroleum and chemical products* sector. *Electro technical and metal products* was the manufacturing sector in which the accumulated value of other countries' investments showed the strongest growth compared to 2010.

The Dutch inward FDI stock in services was 9 percent lower than in 2010. This drop was mainly due to the sectors *monetary intermediation and insurance* and *trade*. In 2011 the accumulated values of other countries' investments in these sectors decreased by 14 and 22 percent respectively. Nevertheless, *monetary intermediation and insurance* still had the biggest share (16 percent) of Dutch inward FDI stock of all services sectors.

Concerning outward FDI (stock), *mining and quarrying, petroleum and chemical products* (34 percent) and *monetary intermediation and insurance* (25 percent) were also the two most important sectors in 2011. Overall, investments of Dutch manufacturers were 12 percent higher than in 2010. This increase mainly came to the credit of the *mining and quarrying, petroleum and chemical products* sector. The accumulated value of investments by Dutch service providers abroad decreased by 1 percent compared between 2010 and 2011. Much of this was the result of a big drop (8.8 billion euros) in *monetary intermediation and insurance*.

Figure 15.5.2 shows that the United States was the main partner for manufacturers concerning Dutch inward FDI stock in 2011. For service providers, this was Luxembourg. The United Kingdom is the most important outward FDI partner for Dutch manufacturing enterprises (see figure 15.5.3). In 2011, 17 percent of the Dutch manufacturers' FDI stock was in this country, whereas services enterprises had invested most in the United States (15 percent).[4]

[4] DNB divides FDI into two categories: manufacturing (sectors A through F in NACE Rev. 2) and services (sectors G through S minus O). Besides the economic sectors in table 15.5.1, manufacturing also consists of agriculture, utilities and construction. Services also consist of real estate, renting and business activities, education, health, social work, entertainment and recreation. Public administration is not included.
Note that the economic sector for outward FDI is the sector of the Dutch enterprise investing abroad. The destination sector in the other country can differ from the economic sector of the Dutch enterprise.

15.5.1 Dutch FDI (stocks), by economic sector

|	Value						Share (2011)
	2000	2005	2007	2009	2010	2011	
	million euros						%
Inward FDI							
Total	256,787	406,392	520,766	447,211	438,065	452,459	100
manufacturing	89,702	164,503	199,406	204,813	220,924	255,131	56
electro technical and metal products	15,464	23,098	17,271	23,316	23,799	35,128	8
food, beverages and tobacco	13,321	33,299	48,298	47,705	59,126	62,518	14
mining and quarrying, petroleum and							
chemical products	47,397	84,540	108,761	111,012	108,193	121,482	27
other	13,519	23,567	25,076	22,781	29,806	36,003	8
services	167,085	241,889	321,360	242,398	217,140	197,328	44
monetary intermediation and insurance	18,774	70,460	144,706	92,515	81,872	70,580	16
trade	40,744	44,392	43,688	47,935	41,247	32,104	7
transport, storage and communication	18,284	24,948	42,249	41,313	42,325	46,262	10
other	89,283	102,089	90,717	60,635	51,696	48,383	11
Outward FDI							
Total	318,833	545,828	639,960	661,281	715,362	756,548	100
manufacturing	136,322	240,255	287,254	338,367	377,885	422,399	56
electro technical and metal products	33,137	34,858	39,946	45,375	47,762	52,559	7
food, beverages and tobacco	32,028	38,057	48,760	58,873	72,841	77,559	10
mining and quarrying, petroleum and							
chemical products	54,858	148,654	175,494	206,476	229,148	259,207	34
other	16,298	18,686	23,054	27,643	28,135	33,074	4
services	182,511	305,573	352,706	322,913	337,477	334,149	44
monetary intermediation and insurance	57,360	145,277	197,856	176,339	196,888	188,051	25
trade	29,857	42,619	39,180	33,335	32,970	30,826	4
transport, storage and communication	24,954	49,384	49,837	61,181	59,823	60,329	8
other	70,341	68,292	65,833	52,058	47,795	54,942	7

Source: De Nederlandsche Bank (extracted: 18-07-2013), calculated by Statistics Netherlands.

15.5.2 Inward FDI (stocks) by economic sector and country, 2011
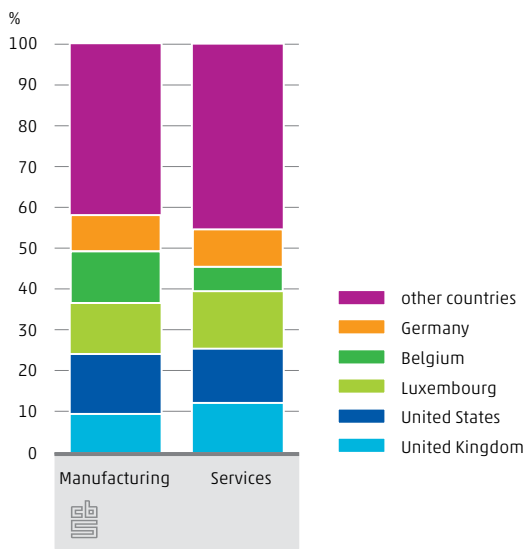
Source: De Nederlandsche Bank (extracted: 18-07-2013), calculated by Statistics Netherlands.

15.5.3 Outward FDI (stocks) by economic sector and country, 2011
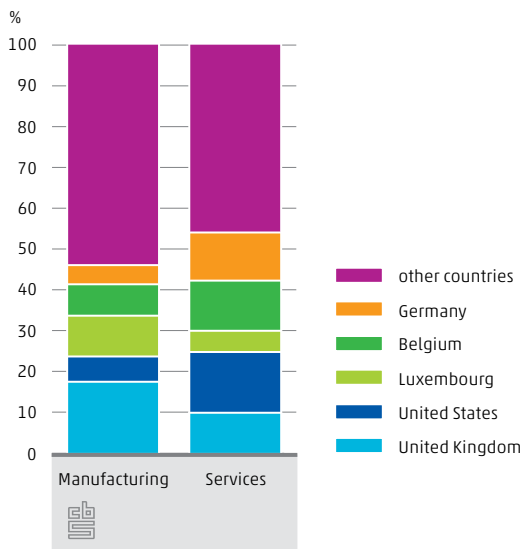
Source: De Nederlandsche Bank (extracted: 18-07-2013), calculated by Statistics Netherlands.

16.

Internationalisation

and employment

Authors
Bart Loog
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The linked employer-employee database developed at Statistics Netherlands enables in-depth analyses of the effects of internationalisation on employment in the Netherlands. In this chapter we present figures for domestically and foreign controlled enterprises, with developments of the number of enterprises and jobs, the average enterprise size, workforce composition, wage distribution and job dynamics. About 12 percent of the total number of jobs in 2010 was accounted for by foreign controlled enterprises. Furthermore, these enterprises on average provided about 110 jobs each (i.e. mostly foreign multinationals). Since 2009, the year that marked the start of the economic crisis, the number of jobs at foreign controlled enterprises has decreased for two years in a row. Domestically controlled enterprises in the Netherlands, however, showed more stable job levels between 2009 and 2010.

16.1 Introduction

The data for the annotated tables in this chapter on internationalisation and employment are based on a microdata integration of the Social Statistics Database, the business survey and the UCI (Ultimate Controlling Institute) dataset at the enterprise level.

This linked employer-employee database developed at Statistics Netherlands (see Fortanier and Korvorst 2009, Genee et al. 2010, Fortanier et al. 2012) enables in-depth analyses of the effects of internationalisation on employment. Merging enterprise information from the business survey together with registered jobs in the Social Statistical Database results in a match of more than 90 percent of all jobs in the Netherlands, for which ultimately the locus of control can be determined. A weighting procedure was subsequently developed in order to deduct the ownership status of the remaining enterprises and to scale the matched job information to the level of annually registered jobs from the Social Statistics Database.

The tables in this chapter show the differences between domestically and foreign controlled enterprises active in the Netherlands (2006–2010) with respect to economic activity, enterprise size, job dynamics, workforce composition, and relative distribution of annual wage levels.

16.2 Developments in the number of domestically and foreign controlled enterprises with employees in the Netherlands

Incoming investments by foreign multinational enterprises (MNEs) directly affect not only employment but also the concomitant wages and working conditions in the host country. In general, foreign ownership of enterprises is in most countries linked to job creation and retention, and is therefore often considered to have a positive effect on employment and welfare (Görg, 2000; Radosevic et al., 2003; Fortanier and Korvorst, 2009; Genee, Korvorst and Fortanier, 2010).

In 2006 there were 451,567 enterprises with employees in the linked employer-employee database. This number increased between 2006 and 2008. The start of the economic crisis in 2009 hampered this growth, leading to a 7 percent overall decline from 2009 to 2010 in the number of enterprises with employees in the LEED. Table 16.2.1 shows that only domestically controlled enterprises with jobs were affected by this downward trend, showing a decrease of about 36 thousand enterprises between 2009 and 2010. A decline in the number of enterprises was found among small (0–49 employees), medium (50–249 employees) and large-sized enterprises (250 and more employees). For foreign controlled enterprises, the picture is mixed for different size classes. While the number of small foreign enterprises increased (+7 percent), the number of medium-sized foreign controlled enterprises in the Netherlands decreased slightly (–3.5 percent) from 2009–2010. The number of large foreign controlled enterprises with jobs remained stable.

Domestically controlled enterprises with employees are relatively well represented in the sectors of retail trade, repair, hotels and restaurants, professional scientific and technical activities, and real estate, business and other services, see Table 16.2.2A. Foreign controlled enterprises show a different profile (Table 16.2.2B), with high prominence in sectors such as wholesale trade and manufacturing. Foreign controlled enterprises are relatively less often represented in construction and real estate.
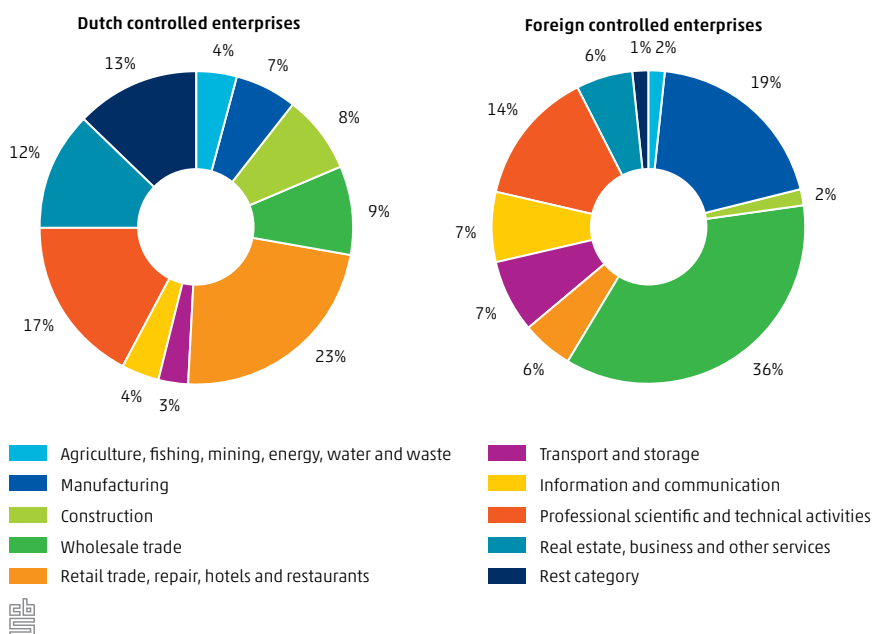
The estimates of *domestically and foreign controlled enterprises* in the Netherlands reported in this section are based on an update of the linked employer-employee integrated microdataset. Accompanying annotated tables and figures are broken down by size class and economic activity. The subsequent time series, running from 2006 to 2010, can be accessed online at our StatLine database.

16.2.1 Enterprises in the linked employer-employee database, by size class and origin of the parent enterprise, 2006–2010 (weighted)

	2006	2007	2008	2009	2010
	# enterprises				
Total	451,567	480,905	488,917	463,724	427,791
Dutch controlled	444,962	474,449	481,205	455,614	419,358
small enterprises	432,872	460,316	468,956	441,820	406,567
medium enterprises	9,588	11,266	9,674	11,080	10,223
large enterprises	2,502	2,866	2,575	2,714	2,567
Foreign controlled	6,605	6,456	7,712	8,110	8,433
small enterprises	4,437	4,126	5,355	5,541	5,930
medium enterprises	1,600	1,721	1,725	1,923	1,854
large enterprises	568	609	631	646	649

16.2.2 Distribution of enterprises with employees

Dutch controlled enterprises

4% 7% 8% 9% 23% 3% 4% 17% 12% 13%

Foreign controlled enterprises

6% 1% 2% 19% 2% 36% 6% 7% 7% 14%

- Agriculture, fishing, mining, energy, water and waste
- Manufacturing
- Construction
- Wholesale trade
- Retail trade, repair, hotels and restaurants
- Transport and storage
- Information and communication
- Professional scientific and technical activities
- Real estate, business and other services
- Rest category

16.3 Employment at domestically and foreign controlled enterprises in the Netherlands

Preceded by a period of steady growth, the number of jobs in the Dutch economy started to decline by 2009 due to the economic crisis. Jobs at Dutch-controlled firms decreased in 2008 but between 2009 and 2010 their number increased again slightly. Compared to 2008, the number of jobs provided by domestically controlled enterprises fell by 112 thousand. Relatively, the reduction in terms of registered jobs between 2008 and 2010 was stronger for foreign controlled enterprises (–2 percent) than for domestically controlled enterprises (–1.6 percent).

Table 16.3.1 also identifies differences with respect to the development in and the level of the average number of jobs. Foreign enterprises are typically about six times larger with respect to job numbers. However, the average number of jobs provided by foreign enterprises decreased over the past two years (from 123 to 110), whereas it slightly increased for domestically controlled enterprises (from 15 to 16). The reduction in the average number of jobs provided by foreign enterprises reflects the increase in the number of small-sized enterprises of 7 percent, while at the same time the number of medium-sized enterprises decreased by 3.6 percent. The increase in the average number of workers in domestically controlled enterprises reflects the fact that there was a relative stronger decrease in the number of small- and medium-sized enterprises under domestic control (about 8 percent) than in large-sized enterprises (5 percent).

Table 16.3.2 presents the average number of registered jobs at domestically and foreign controlled enterprises in 2010, broken down by economic activity. The table shows that, irrespective of economic activity, foreign controlled enterprises provide more jobs on average than domestically controlled enterprises. The largest relative differences can be found in retail trade, repair, hotels and restaurants, construction and real estate.

16.3.1 Employment situation at Dutch and foreign controlled enterprises, 2006–2010 (weighted)

	2006	2007	2008	2009	2010
Total Dutch economy					
# enterprises	451,567	480,905	488,917	463,724	427,791
# jobs	7,525,034	7,852,727	7,910,511	7,782,694	7,779,462
average # of jobs per enterprise	17	16	16	17	18
Dutch controlled enterprises					
# enterprises	444,962	474,449	481,205	455,614	419,358
# jobs	6,740,133	7,070,589	6,960,169	6,847,384	6,848,546
average # of jobs per enterprise	15	15	14	15	16
Foreign controlled enterprises					
# enterprises	6,605	6,456	7,712	8,110	8,433
# jobs	784,901	782,138	950,342	935,310	930,916
average # of jobs per enterprise	119	121	123	115	110

16.3.2 Average employment at Dutch and foreign controlled enterprises, by industry, 2010 (weighted)

	Dutch controlled	Foreign controlled
By economic activity	average number of jobs per enterprise	
Agriculture, fishing, mining, energy, water and waste	10	102
Manufacturing	25	146
Construction	13	148
Wholesale trade	11	52
Retail trade, repair, hotels and restaurants	12	343
Transport and storage	19	160
Information and communication	12	123
Professional, scientific and technical activities	7	63
Real estate, business and other services	20	235
Rest category	50	120

16.4 Workforce composition and job dynamics at Dutch and foreign controlled enterprises

Domestically controlled enterprises employ relatively more workers aged over fifty than foreign controlled enterprises. They make up about 26 and 23 percent respectively of their workforce (Graph 16.4.1). Overall, domestically controlled enterprises employ more female workers: almost one in two employees is female compared to one in three at their foreign controlled counterparts. The data also show that domestically controlled enterprises employ relatively more native Dutch workers (81 percent), compared to foreign enterprises (73 percent). The difference was about 8 percentage points in 2010.

Labour dynamics involves job changes between two enterprises and the transition from and to work. In the linked employer-employee dataset for the Netherlands (2010) a distinction can be made between new job market entrants, employees who remain at a specific enterprise, and those who change jobs between enterprises.

Table 16.4.2 provides an overview of the job dynamics at domestically and foreign controlled enterprises in the Netherlands, broken down by size class and sector of economic activity. In 2010, around 80 percent of the employees worked for the same Dutch controlled enterprise as in the preceding year. Yet, foreign controlled enterprises in the Netherlands show higher levels of job stayers than domestically controlled enterprises, namely 83 versus 80 percent of workers per year respectively. These levels are especially high in manufacturing and construction in domestic as well as foreign enterprises. Higher job stayers among foreign controlled enterprises might be related to higher wages, better options of inter-firm education and/or opportunities for job mobility.

The share of job market entrants is highest at domestically controlled enterprises, around 10 percent in 2010. The job-market entrance rate is highest among the small- and medium-sized enterprises. Among domestic enterprises the share of entrants is highest in real estate and business (20 percent), followed by retail, repair and hospitality (16 percent) and agriculture (11 percent). Among foreign firms the share of entrants to the labour force is also highest among enterprises in real estate and business (18 percent) and retail, repair and hospitality (13 percent). The *composition of the workforce at domestically and foreign controlled enterprises* in the Netherlands reported in this chapter are based on an update of the linked

employer-employee integrated micro dataset. Accompanying annotated tables and figures are broken down by size class and economic activity. Diversity at the workplace was determined by calculating the (weighted) average percentage of women in the total workforce in the Netherlands at the end of each year, broken down by enterprise control. A similar approach was taken to derive the relative share of older (50+) and native Dutch employees. In addition, separate ratios were calculated for each category of interest, i.e. size class and economic activity.

Native Dutch workers are workers whose parents were both born in the Netherlands, regardless of the country of birth of the individual. Note that definition differs from the definition used in chapter 10 where a native worker is someone who is born in the Netherlands or migrated to the Netherlands before the age of 18.

The *job dynamics* in terms of for example the share of new entrants per enterprise was calculated as the (weighted) average percentage of entrants (employees in their first jobs and new to the labour
market) in the total workforce at the end of the year. A similar approach was adopted for job switchers and stayers.

16.4.1 Share of female, older (50+) and native Dutch employees working at Dutch and foreign controlled enterprises in 2010 (weighted)
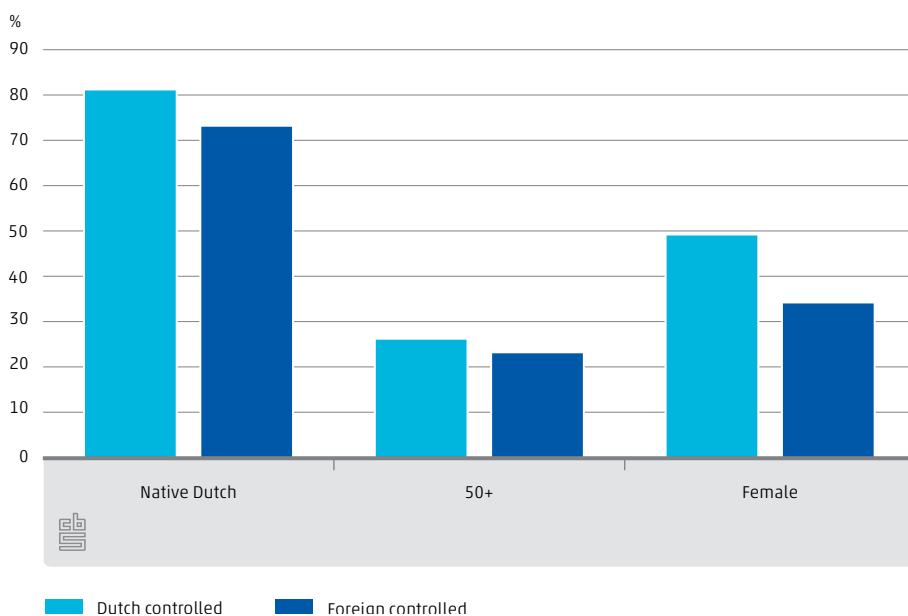
16.4.2 Job dynamics at Dutch and foreign controlled enterprises, by economic activity and size class, 2010 (weighted)

	Dutch controlled			Foreign controlled		
	new entrants	stayers	switchers	new entrants	stayers	switchers
	%					
Total	10	80	10	7	83	10
By economic activity						
Agriculture, fishing, mining, energy, water and waste	11	80	9	3	89	8
Manufacturing	5	88	7	3	92	5
Construction	4	88	8	2	92	6
Wholesale trade	7	83	10	5	87	9
Retail trade, repair, hotels and restaurants	16	72	12	13	73	14
Transport and storage	7	82	11	4	89	7
Information and communication	7	81	12	5	87	8
Professional, scientific and technical activities	8	81	11	7	83	10
Real estate, business and other services	20	61	19	18	62	20
Rest category	6	86	8	8	81	11
By size class						
Small and medium-sized enterprises	11	78	11	7	83	10
Large enterprises	8	83	9	7	83	9

16.5 Wages at domestically and foreign controlled enterprises in the Netherlands

Foreign controlled enterprises in the Netherlands have a substantially higher share of high-paid employees in their workforce than their domestically controlled counterparts: 31 percent and 17 percent respectively in 2010, as shown in 16.5.2. Differences are most pronounced for the small enterprise range of 0–49 employees. Conversely, domestically controlled enterprises have a higher share of low-paid employees: The wages of about one in three workers belonged to the lowest 30 percent of the overall wage distribution in the Netherlands.

# 31% of the workforce at foreign controlled firms is high-paid

This wage gap might be a result of FDI requiring more highly-skilled labour and therefore higher paid personnel in host countries. In addition, foreign firms are often said to pay higher wages to avoid labour migration to nearby domestic enterprises. Furthermore, foreign enterprises may be more productive in general, while operating in new, innovative sectors, thereby substantiating a higher wage level (Genee, Korvorst and Fortanier, 2010).

When comparing the ratio of high-income workers by sector of economic activity (Table 16.5.2), the differences between domestically and foreign controlled enterprises are most pronounced in the agriculture, fishing, mining, energy, water and waste, manufacturing, and wholesale trade sectors. In these sectors the differences in the shares of low-paid workers are relatively higher.

The *wages* that are annually paid to employees working *at domestically and foreign controlled enterprises* in the Netherlands reported in this chapter are based on an update of the linked employer-employee integrated micro dataset. Accompanying annotated tables and figures are broken down by size class and economic activity. Jobs are classified as high-paid if their wage is over the 81st percentile of all registered jobs in the Netherlands. Jobs are classified as low-paid if they are at or below the 30th wage percentile.

The mean share of high-paid employees was calculated as the (weighted) average number of high-paid jobs, as a percentage of the average number of total jobs registered in the Netherlands per year, by locus of control (foreign versus domestically controlled enterprises). A similar approach was taken to determine the mean share of low-paid employees. In addition, separate ratios were then calculated for each category of interest, i.e. economic activity and size class.

16.5.1 Share of high-paid employees at Dutch and foreign controlled enterprises by size class, 2010 (weighted)

Foreign controlled   Dutch controlled
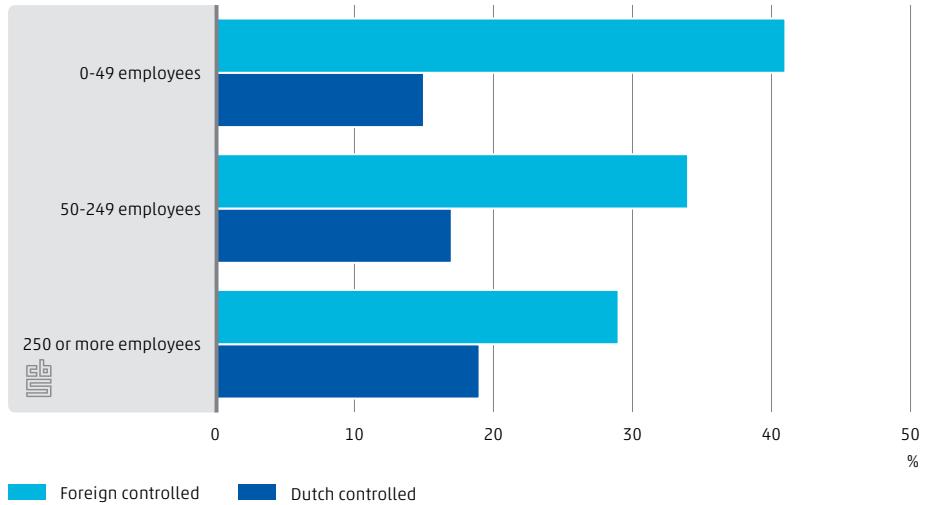
16.5.2 Share of high and low-paid employees working at Dutch and foreign controlled enterprises, by economic activity, 2010 (weighted)

	High-paid		Low-paid	
	foreign controlled	Dutch controlled	foreign controlled	Dutch controlled
	%			
Total	31	17	19	33
By economic activity				
Agriculture, fishing, mining, energy, water and waste	50	8	6	47
Manufacturing	36	16	6	28
Construction	45	16	7	18
Wholesale trade	47	25	8	26
Retail trade, repair, hotels and restaurants	18	4	34	63
Transport and storage	37	16	8	27
Information and communication	57	42	6	18
Professional, scientific and technical activities	57	47	7	19
Real estate, business and other services	32	15	16	44
Rest category	36	17	18	38

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Glossary

COROP regions

The COROP classification involves a regional level between municipalities and provinces. The Netherlands consists of 40 COROP regions.

EU-15

The composition of the European Union from 1 January 1995; Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, (the Netherlands), Portugal, Spain, Sweden and the UK.

EU-27

The composition of the European Union from 1 January 2007; Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, (the Netherlands), Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the UK.

FDI

Foreign direct investment (FDI) is defined as cross-border investment made by a resident in one economy (the *direct investor*) with the objective of establishing a lasting interest in an enterprise (the *direct investment enterprise*) that is resident in an economy other than that of the direct investor. The 'lasting interest' is in evidence when the direct investor owns at least 10 percent of the voting power of the direct investment enterprise (OECD definition).

Inward FDI refers to the foreign direct investments in the reporting economy. Outward FDI refers to the direct investments from the reporting economy abroad.

GDP

Gross Domestic Product (GDP) is the final result of productive activities of production units in the Netherlands. It equals the sum of the value added in all sectors of industry, and includes some transactions that are not classified by sector of industry.

General Business Register (GBR)

The General Business Register (GBR) is the register of all active enterprises in the Netherlands, and includes several characteristics of the enterprise such as economic activity and size class. We can identify almost each local unit of all active

enterprises in the Netherlands. We know its address, zip code, economic activity and size class.

International trade in goods

Statistics Netherlands distinguishes roughly 9,000 commodities and 250 trading partners. To obtain these data, Statistics Netherlands conducts a monthly survey on intracommunity trade and obtains information on extra-EU trade flows, mainly from customs.

International trade in services

International trade in services covers all services transactions between a country (i.e. its residents) and foreign countries or international organisations (i.e. the non-residents of that country) during a given period. The following services categories are distinguished: transportation, travel, communication services, construction services, insurance services, financial services, computer and information services, royalties and license fees, other business services, personal, cultural, and recreational services and government services (n.i.e.). In general, Statistics Netherlands uses the business survey to collect data for the international trade in services. For some services categories (e.g. government services and travel) data are obtained by other collection methods.

Job

A job is an explicit or implicit employment contract between a person and an economic unit, specifying that labour will be carried out in return for remuneration (financial or otherwise). An employed person may have more than one job at a time. Each job counts separately. Jobs of self-employed workers are excluded. Information on jobs is based on the Statistics Employment of Wages (SWL).

LEED

The LEED (Linked Employer Employee Dataset) consists of a linked dataset of enterprises and jobs, which has been enriched with detailed information on ownership (foreign versus Dutch-controlled enterprises), trade (imports and exports, and two-way traders), worker characteristics (e.g. gender and age) and job dynamics (inflow and outflow). The dataset was created by linking business and social data using the unique enterprise identifier (BEID) as matching variable.

Local business unit

A local unit (the official Eurostat definition is 'Kind-of-activity unit') corresponds to one or more operational subdivisions of an enterprise, which is situated in a geographically identified place. As such, an enterprise can consist of one or more local units, and in the latter case, each of these local units can have a different

economic activity. In most cases, an enterprise consists of only one local unit. Large enterprises, however, can consist of many local units located throughout the Netherlands.

Mainport
A mainport is a node where important transport routes merge. The term is mainly a Dutch policy term and is used to underpin the relative importance of the Port of Rotterdam and Schiphol in Amsterdam.

Private household
A collection of one or more people sharing the same living space, who provide their own everyday needs in a private, non-commercial way.

Provinces of the Netherlands
The Netherlands comprises twelve provinces, namely Drenthe, Flevoland, Friesland, Gelderland, Groningen, Limburg, Overijssel, Noord-Brabant, Noord-Holland, Utrecht, Zeeland and Zuid-Holland. The geographical location of the provinces is depicted in the following graph.

1 Provinces of the Netherlands

Re-exports
Goods transported via the Netherlands, which are temporarily owned by a resident of the Netherlands, without any significant industrial processing.

SITC
SITC stands for Standard International Trade Classification and is drawn up by the United Nations to promote international comparability of international trade

statistics. The SITC is divided into 10 sections (1 digit), 67 divisions (2 digits) and 230 groups (3 digit). The 10 sections used in this publication are:

SITC 0 – Food and live animals
SITC 1 – Beverages and tobacco
SITC 2 – Crude materials, inedible, excluding fuels
SITC 3 – Mineral fuels, lubricants and related materials
SITC 4 – Animal and vegetable oils, fats and waxes
SITC 5 – Chemicals and related products
SITC 6 – Manufactured goods classified by material
SITC 7 – Machinery and transport equipment
SITC 8 – Miscellaneous manufactured articles
SITC 9 – Commodities not classified elsewhere

SME
A small or medium-sized enterprise is an enterprises employing fewer than 250 people. A large enterprise is defined as an enterprise with 250 employees or more.

Special purpose entity (SPE)
According to De Nederlandsche Bank, SPEs, sometimes also referred to as special financial institutions (SFIs), are Dutch-based subsidiaries of foreign parent companies that "function as financial turntables for foreign components of the group to which they belong. (...) With its favourable tax climate and infrastructure, the Netherlands has always been a popular domicile for SPEs." (DNB 2008-9, pages 195 and 7).

UCI
An institutional unit, proceeding up a foreign affiliate's chain of control, which is not controlled by another institutional unit. Therefore, the centres of control of foreign controlled enterprises are outside the Netherlands, whereas those of Dutch controlled enterprises are in the Netherlands. 'Control' is defined as the ability to determine general corporate policy by appointing appropriate directors.

Value added
The income formed in the production process. The value added equals the production (in basic prices) minus intermediate consumption (in purchasing prices). Value added is the income available to reward the production factors involved.

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