

9.

Internationalisation of top sectors in a regional dimension

Authors

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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.

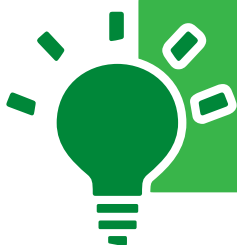
Horticulture: The top sector horticulture comprises the entire horticultural chain from greenhouse construction, seed cultivation to auctioning vegetables, fruit and flowers.

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.



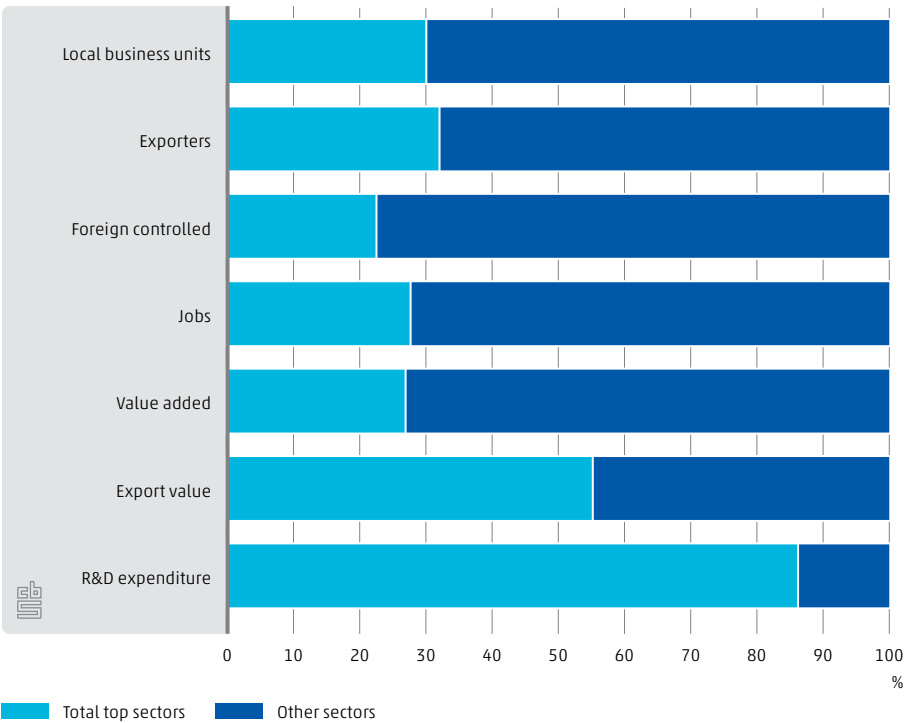
Top sectors generated **55%**
of the total export value of goods in 2011

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

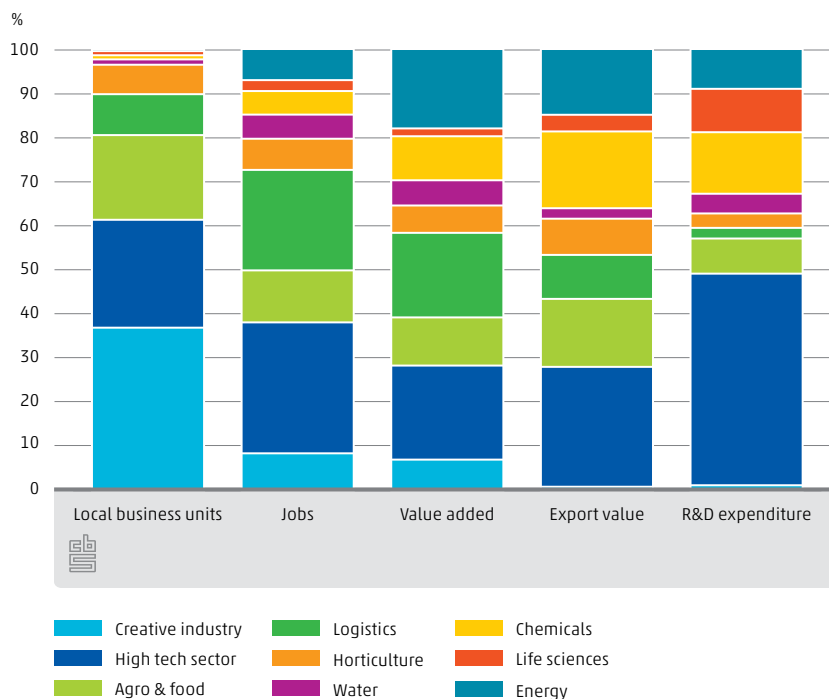
local business units, i.e. 30 percent of all local business units in the Netherlands. Together, they account for a quarter of total value added. With 1.4 million jobs, the top sectors contribute 28 percent in employment. A key feature of the top sectors is their export orientation, which is also reflected 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.

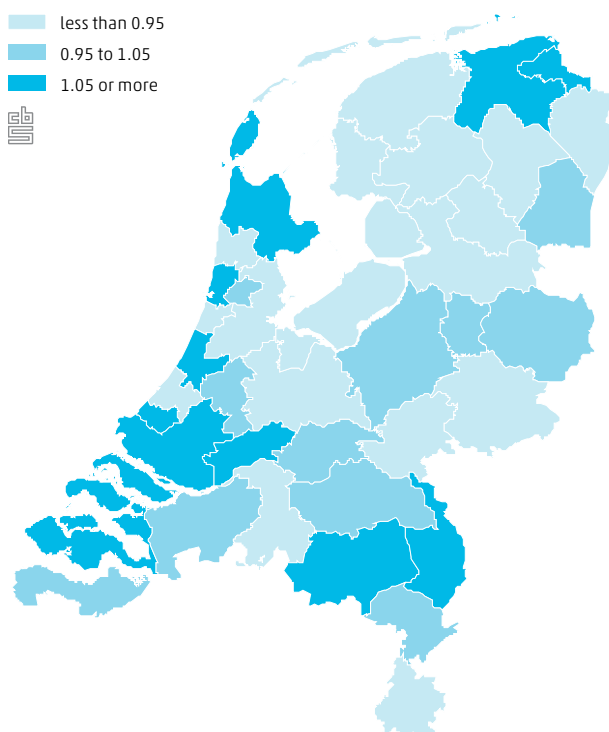
$$\text{Location quotient} = \frac{(\text{Regional top sector employment} \mid \text{Total regional employment})}{(\text{National top sector employment} \mid \text{Total national employment})}$$

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



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 Netherlands, 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.

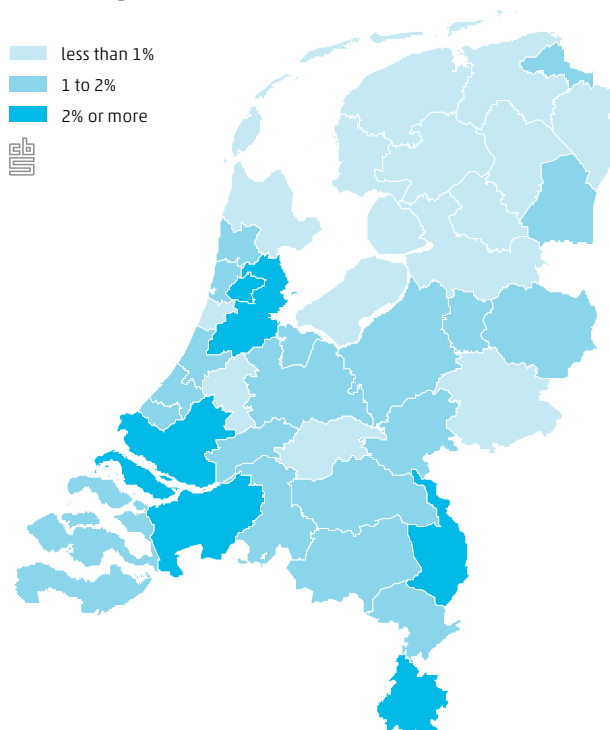
9.4 Top sectors in an international perspective

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).

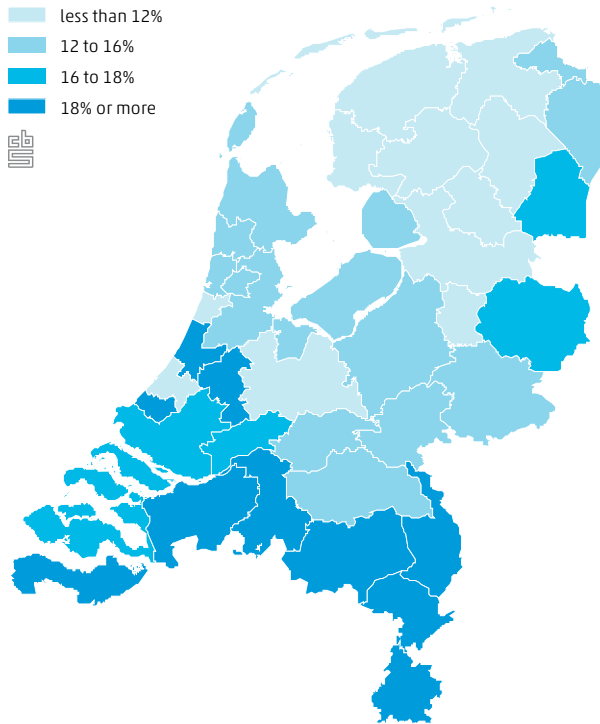
Figures 9.4.1, 9.4.2 and 9.4.3 show the geographical pattern of the international orientation of the top sectors in the Netherlands in 2011. The percentage of local business units in top sectors that are under foreign control is shown in figure 9.4.1. On average, 1.7 percent of all local units in the 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



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.

9.4.3 Share per COROP region in export value, 2011

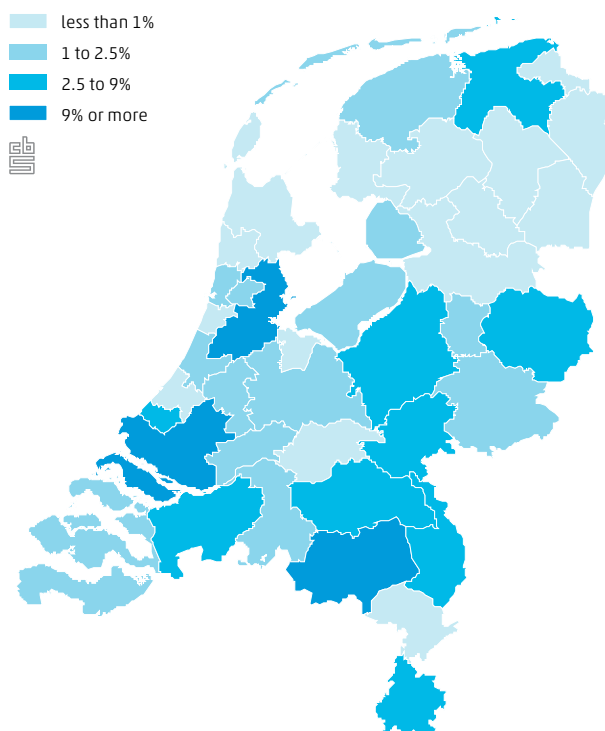
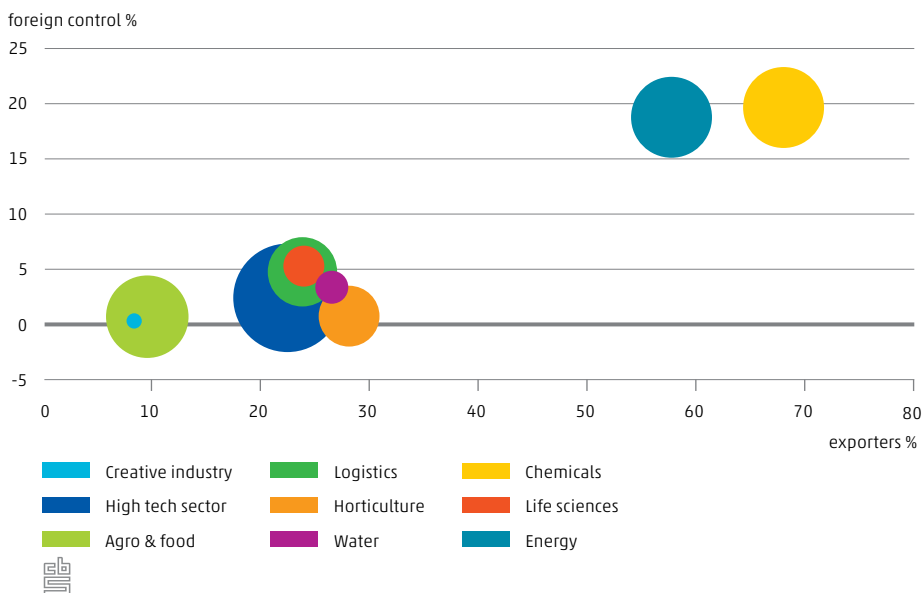


Figure 9.4.4 gives information about the international orientation of the nine top sectors. It presents the share of goods exporters on the x axis, the share of foreign controlled local business units (y axis) and the commodities' export value of firms (size of the bubble) in the top sectors for 2011. 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



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: $\ln(\text{export value}) =$

$$\alpha + \beta_1(\text{foreign control}) + \beta_2(\ln(\text{jobs})) + \delta(\text{provinces}) + \beta_3(\text{top sector}) + \varepsilon$$

Model 2: $\ln(\text{export value}) =$

$$\alpha + \beta_1(\text{foreign control}) + \beta_2(\ln(\text{jobs})) + \delta_1(\text{provinces}) + \delta_2(\text{top sector}) + \varepsilon$$

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***
Provinces¹⁾		
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 sector²⁾	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.