

Rubbrecht, Ilse; Burggraeve, Koen

**Working Paper**

## Economic importance of the Belgian maritime and inland ports – Report 2018

NBB Working Paper, No. 384

**Provided in Cooperation with:**

National Bank of Belgium, Brussels

*Suggested Citation:* Rubbrecht, Ilse; Burggraeve, Koen (2020) : Economic importance of the Belgian maritime and inland ports – Report 2018, NBB Working Paper, No. 384, National Bank of Belgium, Brussels

This Version is available at:

<https://hdl.handle.net/10419/238171>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*

# Working Paper Research

July 2020 N° 384

Economic importance of the Belgian maritime and inland ports – Report 2018  
by Ilse Rubbrecht and Koen Burggraeve



# Working Paper Research

July 2020 N° 384

Economic importance of the Belgian maritime  
and inland ports – Report 2018  
by Ilse Rubbrecht and Koen Burggraeve

---

**Publisher**

Pierre Wunsch, Governor of the National Bank of Belgium

**Statement of purpose**

The purpose of these Working Papers is to promote the circulation of research results (Research Series) and analytical studies (Documents Series) made within the National Bank of Belgium or presented by external economists in seminars, conferences and conventions organised by the Bank. The aim is therefore to provide a platform for discussion. The opinions expressed are strictly those of the authors and do not necessarily reflect the views of the National Bank of Belgium.

**Orders**

For orders and information on subscriptions and reductions: National Bank of Belgium,  
Documentation - Publications Service, boulevard de Berlaimont 14, 1000 Brussels

Tel +32 2 221 20 33 - Fax +32 2 21 30 42

The Working Papers are available on the Bank's website: <http://www.nbb.be>

© National Bank of Belgium, Brussels

All rights reserved.

Reproduction for educational and non-commercial purposes is permitted provided that the source is acknowledged.

ISSN: 1375-680X (print)

ISSN: 1784-2476 (online)

## ABSTRACT

This Working Paper provides an extensive overview of the economic importance and development of the Flemish maritime ports, the Liège port complex and the port of Brussels for the period 2013 – 2018 in terms of value added, employment and investment. Each of these ports play a major role in their respective regional economies and in the Belgian economy, not only in terms of industrial activity but also as intermodal centers facilitating the commodity flow.

In 2018, Belgian ports generated €32.1 billion in direct and indirect value added (i.e. 7% of Belgian GDP) and employed 249 612 people as full-time equivalents (FTEs) either directly or indirectly (5.9% of Belgian domestic employment including the self-employed).

While direct employment in Belgian ports grew by 1% in 2018, thanks to a significant rise recorded in the branches of the ports themselves, direct value added contracted by 2.9%, compared to the record year 2017. The decline in direct value added was particularly noticeable in the non-maritime branches of the ports of Antwerp and Liège.

Direct employment at the Belgian ports increased by 1% in 2018 on the back of a significant rise in the number of jobs registered in the cargo handling sector, part of the maritime cluster. All Flemish ports generated additional jobs. Aside from extra employment creation in cargo handling, also other branches generated supplementary jobs.

The pattern of investment is closely linked to projects and therefore highly volatile. Direct investments went up for the third year in a row; to a level of almost €6 billion in 2018. The increase was mainly explained by investment at the port of Antwerp in the context of a merger operation in the shipping companies branch.

Based on the figures of maritime traffic, the Flemish ports can be considered as real bridgeheads for trade with the UK. As the current free access for the UK to the Single Market and for EU member states to the UK will cease to apply once the transition periods ends, the shape of the future trade relationship between the EU and the UK will have an impact on the import and export volumes in terms of tonnage. This chapter will try to shed some light on the macroeconomic impact of Brexit on the Belgian economy as a whole.

The initially planned publication of this study coincided with the global outbreak of the COVID-19 crisis. Therefore, a brief chapter is devoted to the economic impact of the corona virus on the Belgian ports, more precisely on the port of Antwerp.

This report is available for download at the following address <http://www.nbb.be>.

Key words: Belgian ports, microeconomic data, direct effects, indirect effects, input-output table, employment, value added, investment

JEL classification: C13, C43, C67, C81, J21, J49, L91, L92, R11, R15 and R41.

## **Authors**

Ilse Rubbrecht, National Bank of Belgium, Boulevard de Berlaimont 14, 1000 Brussels, Belgium, e-mail: [ilse.rubbrecht@nbb.be](mailto:ilse.rubbrecht@nbb.be)

Koen Burggraeve, National Bank of Belgium, Boulevard de Berlaimont 14, 1000 Brussels, Belgium, e-mail: [koen.burggraeve@nbb.be](mailto:koen.burggraeve@nbb.be)

This paper was compiled with the technical support and expertise of Elena Gueli and Marc Van Kerckhoven. The authors would like to express their gratitude for their painstaking work on putting together the port population, preparation of tables and graphs and their thorough proofreading of the paper. Thanks to close collaboration with the Port Authority of Antwerp and Alfaport Voka, survey results on the impact of COVID-19 could be collected at short notice. Colleagues from the Microeconomic Information Department deserve thanks for their assistance and support as well as colleagues from the National and Regional Accounts Service for their input. Special thanks to François Coppens for the indirect effect calculation methods. The authors thank also Didier Muraille, Head of the Microeconomic Information Department at the NBB, Hugues Famerée, Head of the Economics and Research Department at the NBB, Saskia Vennix from the Microeconomic Information Department at the NBB and Jean-Pierre Merckx of the Flemish Port Commission for their support and their comments on this paper.

Research results and conclusions expressed are those of the authors and do not necessarily reflect the views of the National Bank of Belgium or any other institution to which the authors are affiliated. All remaining errors are ours.

## Contents

<b>Abstract</b> .....	<b>3</b>
<b>Foreword</b> .....	<b>6</b>
<b>Introduction</b> .....	<b>7</b>
<b>Objectives of the study and comments on the methodology</b> .....	<b>7</b>
<b>1 ECONOMIC IMPORTANCE OF THE BELGIAN PORTS</b> .....	<b>10</b>
1.1 National and international economic context.....	10
1.2 Traffic in the Belgian ports.....	11
1.3 Competitive position of the Belgian ports.....	12
1.4 Value added at the Belgian ports.....	15
1.6 Employment at the Belgian ports.....	18
1.7 Investment in the Belgian ports.....	20
1.8 Financial ratios in the Belgian ports.....	22
1.9 Relative importance of the components of value added.....	28
<b>2 ANALYSIS BY PORT</b> .....	<b>30</b>
2.1 Port of Antwerp.....	30
2.2 North Sea Port Flanders.....	38
2.3 Port of Zeebrugge.....	44
2.4 Port of Ostend.....	52
2.5 Liège port complex.....	59
2.6 Port of Brussels.....	65
<b>3 IMPACT OF BREXIT ON BELGIAN ECONOMY</b> .....	<b>71</b>
3.1 Introduction.....	71
3.2 Political context.....	71
<b>3.3 The macroeconomic consequences of a soft and a hard Brexit scenario</b> .....	<b>75</b>
<b>4 IMPACT OF COVID-19</b> .....	<b>78</b>
4.1 Impact on ports worldwide.....	78
4.2 Impact on Belgian ports.....	80
4.3 Impact on port of Antwerp.....	82
<b>5 SUMMARY</b> .....	<b>88</b>
<b>List of abbreviations</b> .....	<b>90</b>
<b>List of Tables</b> .....	<b>91</b>
<b>List of Figures</b> .....	<b>93</b>
<b>Bibliography</b> .....	<b>95</b>
<b>Annex 1: List of NACE-BEL branches (NACE-BEL 2008)</b> .....	<b>97</b>
<b>Annex 2: Formulae</b> .....	<b>103</b>
<b>Annex 3: Definition of the financial ratios</b> .....	<b>105</b>
<b>Annex 4: Cost approach to value added</b> .....	<b>106</b>
<b>Annex 5: Detailed tables by port area</b> .....	<b>107</b>
5.1 Port of Antwerp.....	107
5.2 North Sea Port Flanders.....	108
5.3 Port of Zeebrugge.....	110
5.4 Port of Ostend.....	111
5.5 Liège port complex.....	113
5.6 Port of Brussels.....	114
<b>NATIONAL BANK OF BELGIUM - WORKING PAPERS SERIES</b> .....	<b>116</b>

## Foreword

Since 1991, the National Bank of Belgium publishes an update of the study of the economic importance of the Belgian maritime and inland ports. Two aspects of the sector's economic impact are highlighted: the direct and the indirect effects. The former concerns the activities resulting from the presence of maritime and non-maritime enterprises and public services in or near the ports, while the latter relates to the value added and employment generated by suppliers and subcontractors serving these enterprises and based in Belgium.

The statistical data covers the 2013-2018 period. Data-gathering via annual accounts was completed in the beginning of May 2020. This study does not take into account any annual accounts information published after this date. Unless otherwise stated, the methodology remains unchanged: the criteria for selecting firms and the analysis itself are the same as in previous editions. The NACE-Bel 2008 code is used to select and classify companies by sector.

The introduction comments briefly on the methodology. In the first chapter the economic importance of Belgian ports as a unit is described in terms of cargo traffic, competitiveness, value added, employment, investment and financial ratios. The second chapter is split into six sections, each devoted to one of the ports. The third chapter describes possible scenarios after Brexit and their impact on the Belgian economy, while the fourth chapter gives a first impression on how COVID-19 will affect Belgian ports, and the port of Antwerp in particular.



# Introduction

## Objectives of the study and comments on the methodology

This study aims to estimate the changing economic importance of Belgium's ports, covering firms belonging to branches of activity which have an economic link with these domestic ports. That link is defined in relation to a dual criterion: functional and geographical. The functional dimension refers to the nature of activity and the geographical dimension refers to the boundary<sup>1</sup> defined for each port.

As such, two clusters are defined. The **maritime cluster**<sup>2</sup> contains the branches of activities specific to the ports themselves and those whose existence is essential to them. There is a direct economic link between these maritime activities and the port concerned. The **non-maritime cluster**<sup>3</sup> contains segments that only have an indirect economic link with port activity due to their geographical proximity and frequent use of infrastructure. Details on the composition of the port population are extensively described in the methodology part in Annex 1 by Lagneaux F. (2006).

In a first step, the paper considers the actual activity of the companies considered in the port population, which implies calculation of the **direct effects** for three economic variables: value added, employment and investment.

- *Value added at current prices* is the value a firm adds to its inputs during the financial year via the production process. The value added of a firm indicates its contribution to the wealth of the country or region (in percentages of GDP). Since value added is linked to unbiased market transactions, operating subsidies (code 740<sup>4</sup> in annual accounts) will be deducted. In accounting terms, value added is calculated as the sum of staff costs (code 62), depreciation and value adjustments (code 630 and 631/4), provisions for liabilities and charges (code 635/7), other operating expenses (code 640/8) and the recurrent operating profit or loss (code 9901 plus code 66A<sup>5</sup> minus code 76A<sup>6</sup>), less operating costs capitalised as restructuring expenses (code 649).
- *Employment in full-time equivalents (FTE)* is the average workforce (code 9087) over the financial year. Direct employment only covers employees on the payroll of the businesses and public services concerned.
- *Investment at current prices*<sup>7</sup>: corresponds to the acquisition of tangible fixed assets during the year under consideration, including capitalised production costs<sup>8</sup>. In atypical cases like mergers and acquisitions, adjusted figures are used, in accordance with the national accounts method, based on VAT code 83.

The microeconomic data used to calculate direct effects, are mainly based on figures from the annual accounts filed with the Central Balance Sheet Office. The latest annual accounts for the year 2018 included in this study were submitted to the CBSO before the end of April 2020<sup>9</sup>. Figures for public

---

<sup>1</sup> The port areas were established by Royal Decree of 2 February 1993, defined in the Appendix to this Royal Decree, issued on 4 March 1993 in the *Belgisch Staatsblad/Moniteur belge*. Our population file, originally based on this information, was adapted according to the development of new port sites afterwards.

<sup>2</sup> Maritime branches of activity are shipping companies, shipping agents and forwarders, cargo handling, storage, shipbuilding and repair, port construction, dredging, fishing, maritime and pilotage services, locks, etc.

<sup>3</sup> The non-maritime cluster contains four segments: trade, industry, land transport and other logistic services.

<sup>4</sup> Code 740 concerns only non-product related subsidies (Eurostat, 2013), used to support employment or cover annual deficits.

<sup>5</sup> 66A are non-recurrent operating expenses.

<sup>6</sup> 76A are non-recurrent operating revenues.

<sup>7</sup> Unless otherwise stated, investment is always indicated at current prices. Developments at constant prices (by volume) are explicitly mentioned. Investment at constant prices is calculated by means of the deflator of gross fixed capital formation.

<sup>8</sup> Decommissioning of assets is not taken into account.

<sup>9</sup> Belgian companies have to submit their annual accounts to the Central Balance Sheet Office no later than seven months after the end of the financial year. On that date, there are some companies – mainly the smallest ones or those in difficulty – which have not yet met that obligation. In April 2020, the number was negligible and the impact of missing data was immaterial as statistical techniques have been used to estimate the missing figures as accurately as possible.

entities or administrations, for which no accounts are available at the Central Balance Sheet Office were obtained via surveys.

In a second step, **indirect effects** are measured for value added and employment. They are calculated on a top-down basis, meaning that the estimated indirect effects are not confined to the immediate suppliers (level1), but include the indirect effects observed over the whole upstream chain, to infinity. All these levels are aggregated in the total of the indirect effects, for value added and employment, for each year.

The estimation of indirect effects of all port activities on the Belgian economy is based on three types of data, coming from the National Accounts Institute (NAI), namely:

- the share of the port population considered in each SUT<sup>10</sup> branch at national level,
- the national levels for value added and employment per SUT branch,
- the links between branches deduced from supply and use tables (SUT 2013, 2014, 2015, 2016) and/or indicated by the input output tables (IOT) for 2010 and 2015.

In December 2019, the new IOTs for 2015 and a new SUT table for 2016 were published, while the SUT for 2015 was revised as well.

As mentioned earlier, all data series needed to calculate indirect effects come from the National Accounts Institute<sup>11</sup>. This implies that foreign companies, self-employed operators and public entities and authorities are taken into account in the estimation of indirect effects.

Moreover, indirect effects are assessed for each port separately, assuming that national technical coefficients are also valid at regional level. So, estimated indirect effect figures need to be interpreted with caution. They only give an indication for the importance of ports concerned compared to the national or local economy and they illustrate the evolution over time. The reader should not put too much attention to the absolute value itself.

Since ports have some economic linkages between them, a portion of the indirect effect calculated by port is cancelled out when the calculation is done at more aggregate level, for example for all Belgian ports together. The sum of indirect effects by port is thus larger than the total indirect effects calculated for all Belgian ports as a whole.

Some of the **figures for years up to 2015 may differ from those stated in earlier studies**. That is due to the availability of more accurate data on certain firms, information that is extrapolated into the past to ensure consistent time series. Annual accounts of newly-established enterprises can only be recorded after a certain time lag. The most important modifications, having an impact on the direct effects, are the following:

- The source to calculate value added, employment and investment levels for the Belgian National Railway Company has been adapted, partly. In the past, figures were obtained by means of a survey, as was the allocation to the different ports, since it concerns a multi-district company. From now on, data will be computed in the same way as it is done for other companies (via annual account figures), while the allocation to the various Belgian ports will be in line with the partition according to figures of the National Accounts Institute.
- Public investment by the Walloon government in the port of Liège will be included in the investment figures starting from the year 2015.
- In Brussels, a major chemicals concern was not considered in the past. The Brussels figures were corrected starting from 2015.
- For multi-district companies, the breakdown key values for the accounting year 2017 were updated in line with more accurate information of the National Accounts Institute.

---

<sup>10</sup> SUT stands for supply and use tables. Supply and use tables are published by the National Accounts Institute. These are matrices that record how supplies of different kinds of goods and services originate from domestic industries and imports and how those supplies are allocated between various intermediate or final uses including exports.

<sup>11</sup> The National Accounts Institute in Belgium consists of three institutions: FPS Economy, SMEs, Self-employed and Energy (Directorate General Statistics), National Bank of Belgium (Statistics Department, National and Regional Accounts Service) and Federal Planning Bureau.

Estimates of the indirect effects differ slightly from those in previous publications, since a new input-output table for 2015, an adapted supply and use table for 2015 and a new SUT for 2016 were used.

This study is split into four parts. The first chapter focuses on the economic importance of Belgian ports as a unit, described in terms of cargo traffic, competitiveness, value added, employment, investment, financial ratios and relative interest of the different components of value added. The second chapter is split into six sections, each devoted to one of the ports. Comments are on the main developments in direct value added, employment and investment recorded in the 2017-2018 period. A third chapter describes possible trade agreement scenarios after Brexit and their impact on the Belgian economy, while the fourth chapter gives a first impression on how COVID-19 will affect Belgian ports, and the port of Antwerp in particular.

# 1 ECONOMIC IMPORTANCE OF THE BELGIAN PORTS

## 1.1 National and international economic context

The world economy maintained its robust growth of 3.6% in 2018. High uncertainties affected economic activity to varying degrees in several countries, so that the expansion differed in the various geographical regions. While economic growth was lost in most of the advanced economies, it gained strength in the United States, due to their expansionary fiscal policy. Emerging economies were subjected to divergent developments as well, while China kept growing at a steady pace India slowed down.

In 2019, annual GDP growth declined in almost all main economies. Global annual average economic growth dropped to 2.9%. The trade dispute between the United States and China, geopolitical tensions in the Middle East and persistent uncertainty over Brexit were some of the explanatory factors. The 0.4% fall in international trade in 2019 resulted mainly from the escalating trade tensions between the United States and China and the widespread decline in manufacturing output, both closely linked (NBB, 2020).

**TABLE 1.1 GDP OF THE MAIN ECONOMIES AND OF BELGIUM**  
(percentage changes in volume compared to previous year)

	2016	2017	2018	2019
Advanced economies	1.7	2.5	2.2	1.7
<i>of which</i> United States	1.6	2.4	2.9	2.3
Japan	0.5	2.2	0.3	0.7
Euro area	1.9	2.5	1.9	1.2
<i>of which Belgium</i>	1.5	2.0	1.5	1.4
United Kingdom	1.9	1.9	1.3	1.4
Emerging economies	4.6	4.8	4.5	3.7
<i>of which</i> China	6.8	6.9	6.8	6.1
India	8.3	7.0	6.1	4.2
Russia	0.3	1.8	2.5	1.3
Brazil	-3.3	1.3	1.3	1.1
<b>World</b>	3.4	3.9	3.6	2.9
p.m. World trade <sup>(1)</sup>	1.4	4.9	3.4	-0.4

Source: International Monetary Fund, World Economic Outlook Database, Database of CPB World Trade Monitor, April 2020.

(1) Year on year growth of merchandise world trade in volume, seasonally adjusted, based on database of CPB World Trade Monitor.

In 2018, Belgium saw a small slowdown in the expansion of its economic activity with real GDP growth of 1.5%. Belgium's slower growth path was similar to the deceleration in the euro area. This development has been driven largely by the weakness in external demand, as global growth has fallen back after being exceptionally high in 2017. Domestic demand contributed too to this momentum, by a smaller growth in private consumption and by lower growth of public consumption reflecting Belgium's more restrictive fiscal spending policies in the recent past. In 2019, real GDP growth worked out at 1.4%, still feeling the pinch from a deteriorating business cycle across the world. The slowdown was more moderate than the one in the euro area as a whole.

This paper takes a look at the activity of Belgian ports in this (inter)national economic context.

## 1.2 Traffic in the Belgian ports

**All six Belgian ports together recorded a 4.9% growth in traffic in 2018.** Every port contributed to total growth, although the rise was mainly attributable to the **port of Antwerp (contribution of 3.7%)** and **Zeebrugge (contribution of 0.9%** to overall growth). Growth in 2019 was more limited (2.6%) and again mainly explained by the ports of Antwerp and Zeebrugge (contributions of respectively 0.9% and 1.7%). The focus in this report is on the change between 2017-2018.

**TABLE 1.2 CARGO TRAFFIC IN THE BELGIAN PORTS**  
(in millions of tonnes)

Ports	2013	2014	2015	2016	2017	2018	2019	Contribution to growth 2017-18 (%)	Contribution to growth 2018-19 (%)
Antwerp	191.0	199.0	208.4	214.1	223.6	235.3	238.2	3.7	0.9
Ghent*	26.0	25.9	26.4	29.1	32.5	32.6	32.5	0.0	0.0
Ostend	1.8	1.4	1.3	1.5	1.4	1.6	1.6	0.1	0.0
Zeebrugge	42.8	42.5	38.3	37.8	37.1	40.1	45.8	0.9	1.7
<i>Flemish ports</i>	<i>261.6</i>	<i>268.9</i>	<i>274.4</i>	<i>282.5</i>	<i>294.6</i>	<i>309.6</i>	<i>318.1</i>	<i>4.7</i>	<i>2.6</i>
Liège	14.9	15.0	14.6	15.5	15.9	16.0	15.9	0.0	0.0
Brussels	4.3	4.4	4.4	4.5	4.8	5.2	5.2	0.1	0.0
<i>Inland ports</i>	<i>19.3</i>	<i>19.4</i>	<i>19.0</i>	<i>19.9</i>	<i>20.8</i>	<i>21.2</i>	<i>21.1</i>	<i>0.1</i>	<i>0.0</i>
<b>Total</b>	<b>280.8</b>	<b>288.3</b>	<b>293.4</b>	<b>302.4</b>	<b>315.4</b>	<b>330.8</b>	<b>339.2</b>	<b>4.9</b>	<b>2.6</b>

Source: Mora Mobiliteitsraad "De Vlaamse havens – Feiten, statistieken en indicatoren voor 2018", port authorities.

\* The figures for Ghent refer to North Sea Port Flanders, which is the Belgian part of North Sea Port. North Sea Port was founded on 1 January 2018 as a merger between the port of Ghent and Zeeland Seaports (in itself, the result of a merger between the ports of Flessingue and Terneuzen).

In 2018, the **port of Antwerp** achieved a record volume of traffic for the sixth year running. **Containers and liquid bulk** were the **main drivers** (table 1.3). The strong growth in *container traffic* continued in 2018, to reach 131 million tonnes. All container trades experienced growth in import and export, except for supplies from the Middle East and Latin America where a slight decrease was noted. *Liquid bulk* enjoyed a strong boost, due to higher transshipment of petroleum derivatives and chemicals. *Dry bulk* transshipment grew by 7.2% to 13.1 million tonnes in 2018, mainly due to higher transshipment of fertilisers, sand and gravel and a more than twofold increase in coal transshipment. This was partly caused by a shift of maritime coal traffic destined for Germany to Antwerp due to extremely low water conditions on the Rhine in the summer and autumn of 2018. In 2019, growth in maritime traffic in Antwerp was fuelled by rising volumes of container traffic and dry bulk.

In 2018, transshipment of cargo at the **port of Zeebrugge** rebounded (+8%) as a result of a clear recovery of **liquid natural gas (LNG) traffic**, while roll-on roll-off (RoRo) traffic continued to expand in this coastal port. **RoRo traffic** rose 6.4% to a total volume of 15.9 million tonnes, with growth on destinations like the UK (+5.7%), Ireland (+16.8%) and Spain (+21.4%). The extra traffic to Spain was due to Cobelfret's new connection to Santander and Finnlines' scaling up of ships on the Bilbao route. *Liquid bulk* volume rose enormously (+63%) to 6.7 million tonnes in 2018, as a result of higher LNG volumes. LNG deliveries from Sabetta started in 2018 and LNG volumes from Qatar started rising again after several years of contraction. *Container traffic* in total tonnage dropped (-1.3%) to 15.2 million tonnes but in 2018 only 37% of the available capacity of the new container terminal CSP Zeebrugge (Cosco Shipping Ports Zeebrugge) was used. This will definitely expand in the coming years. The expansion in traffic volumes in 2019 was the result of growth in all important cargo types in Zeebrugge: RoRo, containers and liquid natural gas.

**North Sea Port Flanders<sup>12</sup>** as part of North Sea Port, is the principal Flemish **port for dry bulk**. A limited relapse is visible for the traffic of dry bulk and RoRo in 2018 (-1.1% and -0.8% respectively) and for trade in dry bulk, RoRo and conventional cargo in 2019 (-3%, -8.6% and -4.5% respectively). The RoRo traffic includes Volvo cars transported between Ghent and Göteborg.

<sup>12</sup> North Seaport Flanders refers to the port of Ghent.

Transshipment in the **port of Ostend** rose in 2018 by 9.8% mainly due to growing volumes of dry bulk (deliveries of sand and gravel from the sea for the construction industry). The port would rather profile itself as a “**blue energy port**”, a port that offers all kinds of services to offshore wind farms.

In 2018, the fastest growing segments in the maritime traffic by Flemish ports (table 1.3) were container cargo (share of 47.3%) and liquid bulk cargo (share of 28.4% in 2018), as already mentioned above. The proportion of dry bulk cargo declined slightly to 11.8% in 2018, although traffic in dry bulk increased due to a favourable construction market which affected the volume of transshipment of sand, gravel and construction materials. The share of conventional cargo (4.9% in 2018) is shrinking slowly as well, possibly because more fruit – previously transported as dry bulk – arrives at ports in container cargo. The same goes for paper pulp, paper and cardboard.

**TABLE 1.3 MARITIME TRAFFIC IN THE FLEMISH PORTS IN 2017-2018**  
(in millions of tonnes, unless otherwise stated)

	Antwerp	Ghent*	Ostend	Zeebrugge	Total	Share (%)
<b>2017</b>						
Containers	122.9	0.1	0.0	15.4	138.5	47.0
Roll-on roll-off <sup>(1)</sup>	5.1	2.4	0.0	15.0	22.4	7.6
Conventional cargo <sup>(2)</sup>	10.3	3.6	0.0	1.3	15.2	5.2
Liquid bulk	73.2	5.3	0.0	4.1	82.7	28.1
Dry bulk	12.2	21.1	1.3	1.3	35.9	12.2
<b>TOTAL 2017</b>	<b>223.6</b>	<b>32.5</b>	<b>1.4</b>	<b>37.1</b>	<b>294.6</b>	<b>100.0</b>
<b>2018</b>						
Containers	131.0	0.2	0.0	15.2	146.3	47.3
Roll-on roll-off <sup>(1)</sup>	5.3	2.3	0.0	15.9	23.6	7.6
Conventional cargo <sup>(2)</sup>	10.2	3.8	0.1	1.0	15.1	4.9
Liquid bulk	75.8	5.4	0.0	6.8	88.0	28.4
Dry bulk	13.1	20.8	1.5	1.2	36.6	11.8
<b>TOTAL 2018</b>	<b>235.3</b>	<b>32.6</b>	<b>1.6</b>	<b>40.1</b>	<b>309.6</b>	<b>100.0</b>
<b>contribution to the growth (%)</b>						
Containers	2.7%	0.0%	0.0%	-0.1%	2.7%	
Roll-on roll-off <sup>(1)</sup>	0.1%	0.0%	0.0%	0.3%	0.4%	
Conventional cargo <sup>(2)</sup>	0.0%	0.1%	0.0%	-0.1%	-0.1%	
Liquid bulk	0.9%	0.0%	0.0%	0.9%	1.8%	
Dry bulk	0.3%	-0.1%	0.0%	0.0%	0.2%	
<b>TOTAL</b>	<b>4.0%</b>	<b>0.0%</b>	<b>0.1%</b>	<b>1.0%</b>	<b>5.1%</b>	

Source: Mora Mobiliteitsraad “De Vlaamse havens – Feiten, statistieken en indicatoren voor 2018”, port authorities.

\* the figures for Ghent refer to North Sea Port Flanders, which is the Belgian part of the merged port North Sea Port.

<sup>(1)</sup> Roll-on roll-off, abbreviated as RoRo, refers to the horizontal handling of goods using wheeled equipment inside and outside the ship, in contrast to ‘lift-on lift-off’ which illustrates the vertical handling. RoRo data in the report do not take into account containerised cargo, because this is included in the line entitled “containers”.

<sup>(2)</sup> Conventional cargo is non-containerised general cargo, mainly iron and steel, fruit, paper, wood and machinery.

### 1.3 Competitive position of the Belgian ports

To analyse the competitive position of **the Belgian maritime ports**, a comparison is made between the Flemish ports and the “Hamburg – Le Havre” port range as these are European competing maritime ports serving the same hinterland. Together, they cover, from north to south, Hamburg and Bremen in Germany, Amsterdam and Rotterdam in the Netherlands, North Sea Port in the Netherlands and Belgium, Antwerp, Ostend and Zeebrugge in Belgium, Dunkirk and Le Havre in France.

The share of the four Flemish maritime ports in the “Hamburg – Le Havre” range grew from 22.6% in 2013 to 24.8% in 2018.

The port of **Rotterdam** recorded a small increase (+0.4%) in transhipped volumes in 2018. The rise was driven by the growth in container traffic (4.6%), which accounted for a third of total cargo traffic in the port in 2018. Dry and liquid bulk volumes declined by 3.2% and 1.2%, respectively. Liquid bulk accounted for 45% of total traffic in the port in 2018 and its decline is mainly explained by the lower volume of crude oil and petroleum chemicals shipped.

The port of **Hamburg**, the German rival of Antwerp and Rotterdam, saw its cargo traffic fall to its lowest level in six years (135.1 million tonnes in 2018), though its port authority considers 2018 as a stable year. Container loading fell by 2.4%. This was a far cry from the record level of 145.7 million tonnes in 2014. The ports of Antwerp and Rotterdam improved, which implies a loss in market share for Hamburg while its two main rivals steam ahead. For 2019, better projections are expected in Hamburg as a result of a transfer of several services from THE Alliance (Hapag-Lloyd, Yang Ming, and the Ocean Express Network) in the port of Bremen to Hamburg and also thanks to the long-awaited deepening of the Elbe.

**TABLE 1.4 TOTAL MARITIME TRAFFIC IN THE HAMBURG - LE HAVRE RANGE  
(INCLUDING OSTEND AND ZEELAND SEAPORTS)**  
(in millions of tonnes, unless otherwise stated)

Ports	2013	2014	2015	2016	2017	2018	Change 2013-18 (%)	Change 2017-18 (%)	Share 2013-18 (%)	Share 2018 (%)
Amsterdam*	95.7	97.8	94.9	95.1	100.8	101.8	1.2	1.0	8.1	8.1
Rotterdam	440.5	444.7	466.4	461.2	467.4	469.0	1.3	0.4	38.1	37.5
Bremen and Bremerhaven	78.7	78.2	73.4	75.2	74.2	74.4	-1.1	0.3	6.3	5.9
Hamburg	139.1	145.7	137.8	138.2	136.5	135.1	-0.6	-1.0	11.5	10.8
Dunkirk	43.6	47.1	46.6	46.7	50.3	51.6	3.4	2.6	4.0	4.1
Le Havre	67.2	66.9	68.3	66.0	72.7	71.7	1.3	-1.4	5.7	5.7
North Sea Port					66.6	70.4		5.7	1.9	5.6
of which North Sea Port Netherlands	33.0	35.1	33.1	33.2	34.2	37.8	2.7	10.6	2.9	3.0
of which North Sea Port Flanders	26.0	25.9	26.4	29.1	32.5	32.6	4.7	0.2	2.4	2.6
Antwerp	191.0	199.0	208.4	214.1	223.6	235.3	4.3	5.2	17.6	18.8
Ostend	1.8	1.4	1.3	1.5	1.4	1.6	-3.0	13.7	0.1	0.1
Zeebrugge	42.8	42.5	38.3	37.8	37.1	40.1	-1.3	8.0	3.3	3.2
<b>Total Flemish ports</b>	<b>261.6</b>	<b>268.9</b>	<b>274.4</b>	<b>282.5</b>	<b>294.6</b>	<b>309.6</b>	<b>3.4</b>	<b>5.1</b>	<b>23.4</b>	<b>24.7</b>
<b>Total 10 ports</b>	<b>1 159</b>	<b>1 184</b>	<b>1 195</b>	<b>1 198</b>	<b>1 231</b>	<b>1 251</b>	<b>1.5</b>	<b>1.7</b>	<b>100.0</b>	<b>100.0</b>
<b>Total world traffic</b>	<b>9 513</b>	<b>9 842</b>	<b>10 023</b>	<b>10 295</b>	<b>10 716</b>	<b>11 005</b>	<b>3.0</b>	<b>2.7</b>		
Share 10 ports / Total world traffic (%)	12.2	12.0	11.9	11.6	11.5	11.4				
Share Flemish ports / 10 ports (%)	22.6	22.7	23.0	23.6	23.9	24.7				
Share Flemish ports / Total world traffic (%)	2.7	2.7	2.7	2.7	2.7	2.8				

Sources: Mora Mobiliteitsraad "De Vlaamse havens – Feiten, statistieken en indicatoren voor 2018", port authorities and UNCTAD "Review of Maritime Transport 2019".

\* it concerns the whole North Sea Canal Area.

The North Sea Canal Area (**Amsterdam**) achieved its transshipment record in 2018 to a level of 101.8 million tonnes. The number of sea shipping movements increased by 7% compared to 2017. In addition, cruise ships calls increased to new heights with 180 sea cruise ships and 2 007 river cruises in 2018.

The growth in transshipment in the ports of **Bremen**<sup>13</sup> in 2018 (+0.3%) is entirely attributable to the rise in container traffic. But the German tandem still lost ground in motor vehicle traffic, after jostling for many years with the port of Zeebrugge for the leading position in the car traffic in Europe. So, its gap with Zeebrugge has kept on growing. Liquid and dry bulk (-9.3%) and non-containerised conventional cargo (-7.5%) fell significantly.

<sup>13</sup> Ports of Bremen consist of the ports in Bremen and Bremerhaven.

As for the port of **Le Havre**, its traffic reached a volume of 71.7 million tonnes in 2018, a small decline. On the one hand, the port has a steadily growing 'hinterland full container traffic', while on the other hand, there is little incentive to containerise French foreign trade with third countries, when Le Havre has a 43% share of France's foreign trade market. RoRo traffic grew in 2018 and the port welcomed more and more cruise ships, with an increasing number of passengers discovering Le Havre.

In 2018, the port of **Dunkirk** saw a slight expansion in its traffic (+2.6%). Several cargo segments expanded: ore and small solid bulk, coal, cereals, other dry bulk, gas and containers. The rise in the first two categories was due to strong activity at ArcelorMittal's plant in Dunkirk. By contrast, roll-on/roll-off traffic was down.

**North Sea Port** transhipped 70.4 million tonnes overseas, a surge of +5.7%. The growth is visible in almost all segments: dry and liquid bulk, conventional cargo and containers.

Cargo traffic in the **Belgian inland ports** (Brussels and Liège) is compared to that for the leading West European inland ports (Duisburg and Paris). All inland ports except for Duisburg experienced growing or stable cargo traffic. Port of Duisburg continued to experience declines in coal throughput due to the energy transition and suffered a long low water period.

**TABLE 1.5 CARGO TRAFFIC BY SHIP IN THE PORTS OF DUISBURG, PARIS, LIÈGE AND BRUSSELS**  
(in millions of tonnes, unless otherwise stated)

Ports	2013	2014	2015	2016	2017	2018	Change 2013-18 (%)	Change 2017-18 (%)	Share 2013-18 (%)	Share 2018 (%)
Duisburg	47.2	51.1	51.9	53.1	50.2	48.1	+0.4	-4.2	55.2	52.6
Paris	21.2	20.3	20.2	20.3	21.2	22.1	+0.9	+4.5	22.9	24.2
Liège	14.9	15.0	14.6	15.5	15.9	16.0	+1.3	+0.1	16.8	17.5
Brussels	4.3	4.4	4.4	4.5	4.8	5.2	+3.9	+7.7	5.1	5.7

Sources: Port authorities.



## 1.4 Value added at the Belgian ports

Table 1.6 gives an overview of direct and indirect value added at the Belgian ports between 2013 and 2018, while table 1.7 breaks down direct value added into its main branches of activity. The last column in both tables displays the contribution of each component to total growth of direct value added in 2017-2018. In this way, the growth in direct value added in 2018 can be broken down into the contribution of each port, on the one hand (table 1.6), and the contribution of maritime and non-maritime activities, on the other hand (table 1.7). It should be noted that the percentages in the last column are different from the growth percentage for each port or branch of activity.

**TABLE 1.6 OVERVIEW OF VALUE ADDED BY PORT**  
(in € million - current prices)

Ports	2013	2014	2015	2016	2017	2018	Contribution to growth (%)*
Antwerp	9 800.7	10 009.2	10 969.4	10 772.1	11 517.5	11 106.3	-2.1
Ghent	3 398.3	3 617.6	3 778.9	3 853.6	4 423.7	4 464.6	0.2
Zeebrugge	988.5	954.9	983.0	1 013.1	1 050.1	1 042.2	0.0
Ostend	488.3	499.5	532.6	527.0	542.3	568.3	0.1
Flemish ports	14 675.9	15 081.2	16 263.8	16 165.9	17 533.6	17 181.3	-1.8
Liège	1 235.1	1 165.5	1 070.7	1 167.9	1 149.7	975.5	-0.9
Brussels	490.4	487.9	796.2	732.2	851.7	808.4	-0.2
Inland ports	1 725.5	1 653.4	1 866.9	1 900.1	2 001.4	1 784.0	-1.1
Direct	16 401.4	16 734.6	18 130.7	18 066.0	19 535.0	18 965.3	-2.9
Indirect	14 055.4	14 006.2	12 961.2	12 545.1	13 850.4	13 106.8	
Total	30 456.8	30 740.8	31 092.0	30 611.1	33 385.4	32 072.1	

Source: NBB.

\* Contribution to growth in %: definition see Annex 2.1.

**TABLE 1.7 OVERVIEW OF VALUE ADDED BY BRANCH OF ACTIVITY**  
(in € million - current prices)

	2013	2014	2015	2016	2017	2018	Contribution to growth (%)*	Weight (%)
Cargo handling	2 025.4	2 080.5	2 130.8	2 208.6	2 319.0	2 297.5	-0.1	12.1
Shipping agents and forwarders	755.5	714.7	773.1	728.0	740.2	729.6	-0.1	3.8
Shipping companies	427.9	501.7	791.6	723.7	489.1	459.2	-0.2	2.4
Other maritime	1 155.0	1 120.7	1 215.3	1 176.1	1 196.7	1 170.2	-0.1	6.2
Maritime	4 363.8	4 417.6	4 910.9	4 836.4	4 745.2	4 656.5	-0.5	24.6
Chemicals industry	3 464.0	3 718.4	4 088.1	3 786.0	4 416.3	4 399.7	-0.1	23.2
Trade	1 955.8	2 062.7	2 077.0	2 245.7	2 350.7	2 490.3	0.7	13.1
Metal working industry	1 284.3	1 348.6	1 478.9	1 529.0	1 822.9	1 701.7	-0.6	9.0
Other non-maritime	5 333.5	5 187.3	5 575.9	5 669.0	6 200.0	5 717.1	-2.5	30.1
Non-maritime	12 037.6	12 317.0	13 219.9	13 229.6	14 789.9	14 308.8	-2.5	75.4
Direct	16 401.4	16 734.6	18 130.7	18 066.0	19 535.0	18 965.3	-2.9	100.0
Indirect	14 055.4	14 006.2	12 961.2	12 545.1	13 850.4	13 106.8		
Total	30 456.8	30 740.8	31 092.0	30 611.1	33 385.4	32 072.1		

Source: NBB.

\* Contribution to growth in %: definition see Annex 2.1.

Between 2017 and 2018, direct value added at the Belgian ports contracted, from € 19 535 million in the record year 2017 to € 18 965.3 million in 2018, a decline of 2.9%. This decline did not completely reverse the growth recorded in the previous year. The fall was particularly visible in the ports of Antwerp and Liège, with respectively a 2.1% and 0.9% contribution to the overall decline of 2.9%. The inland port

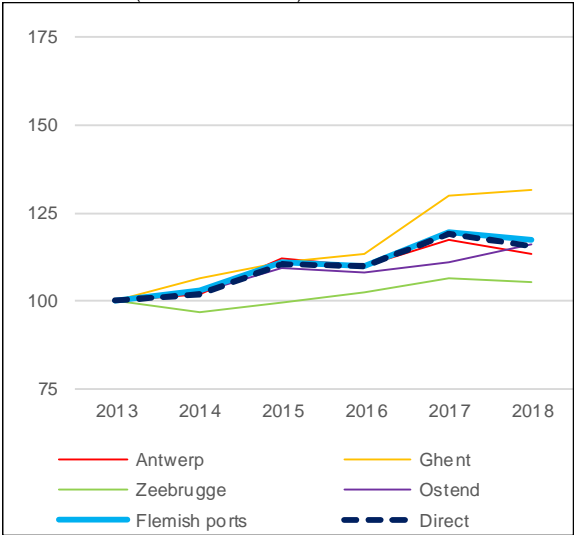
of Brussels contributed to the overall contraction as well, while the port of Ghent and Ostend enjoyed growth.

The indirect value amounted to around 69% of direct value added (2018). However, that figure needs to just be taken as a guide, because indirect value added is calculated on the basis of various estimates. The reader should bear in mind that indirect effects must be handled with caution, more as an indicator of the importance of the ports for the national and local economy than as an absolute value.

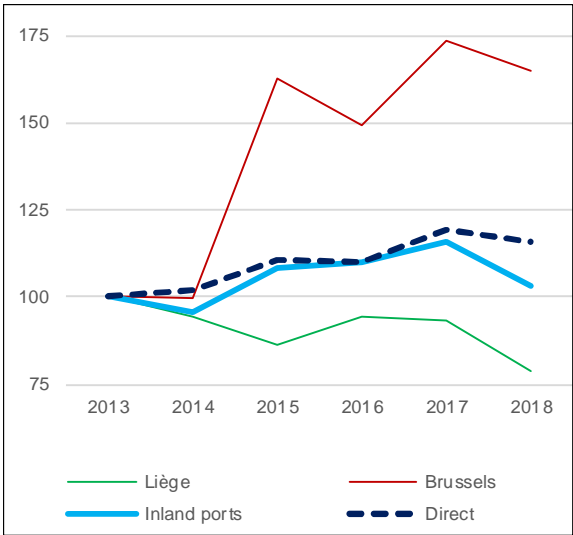
Table 1.7 shows that, for all Belgian ports taken together, the biggest branches of activity in terms of value added are the chemicals industry (23%), trade (13%), cargo handling (12%) and metal working industry (9%). The fall in direct value added in 2018 is particularly visible in the non-maritime cluster, more specifically in “other non-maritime” branches such as the energy sector and the “other logistic services” branch. More details can be found in chapter 2.

In 2018, direct value added generated by the Belgian ports accounted for 4.1% of Belgium's GDP (and 7% including indirect value added).

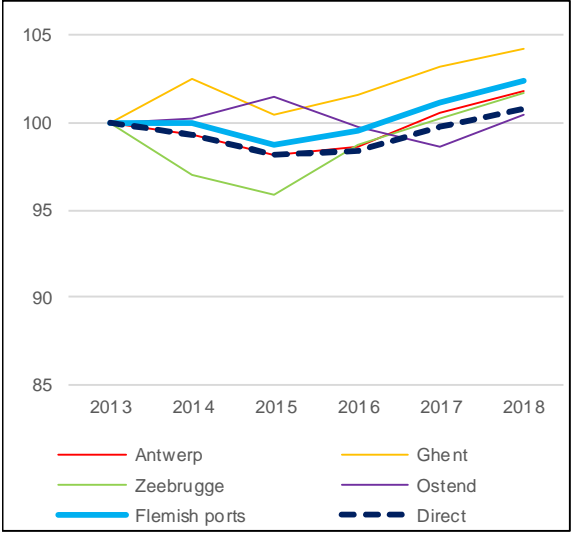
**FIGURE 1.1 VALUE ADDED AT THE BELGIAN PORTS**  
(indices 2013 = 100)



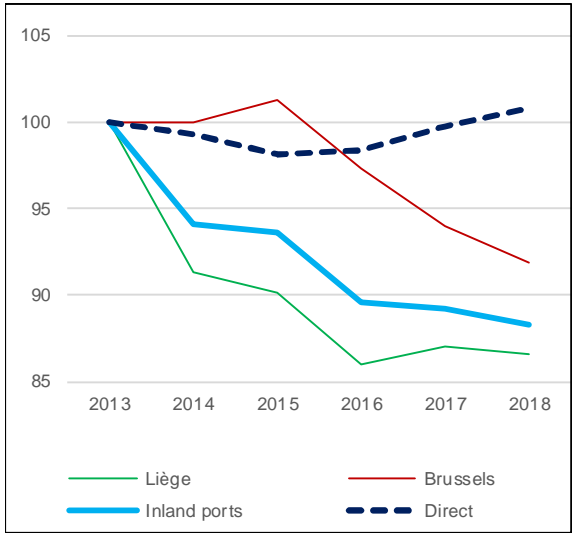
Source: NBB.



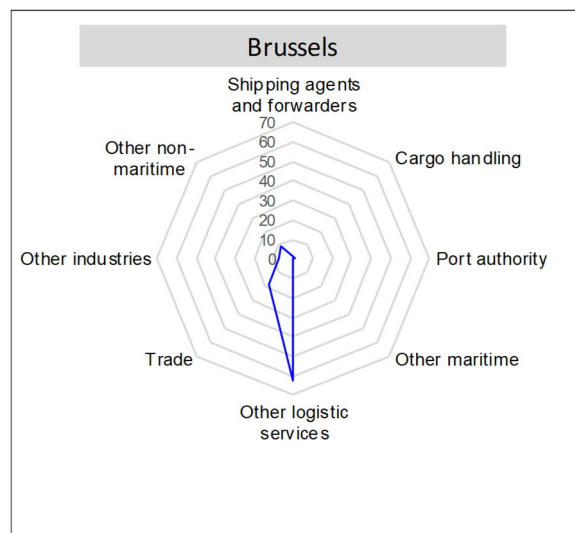
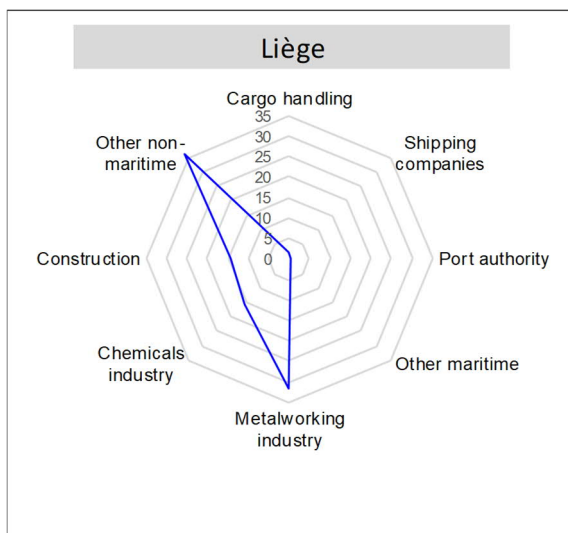
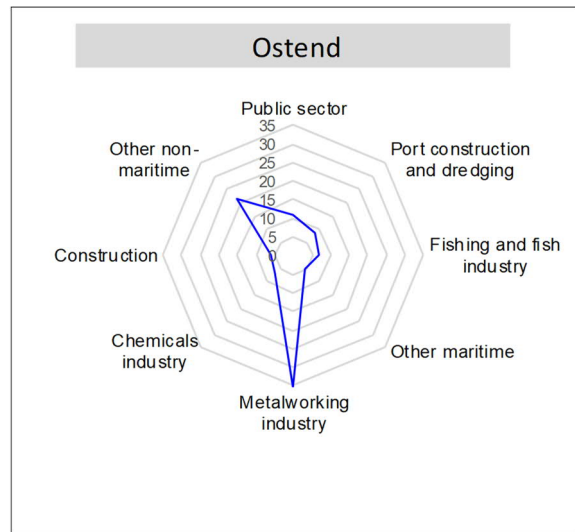
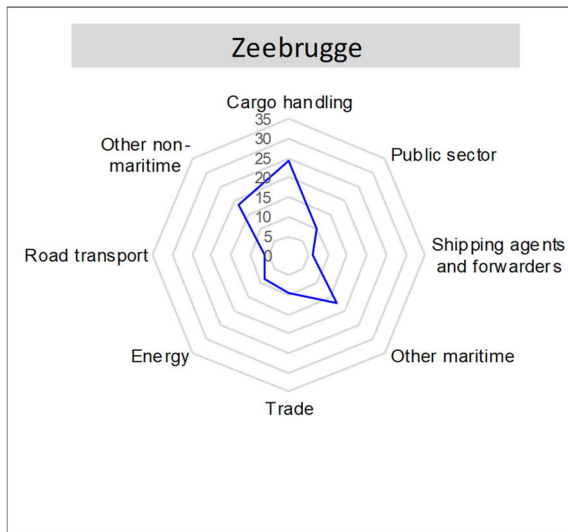
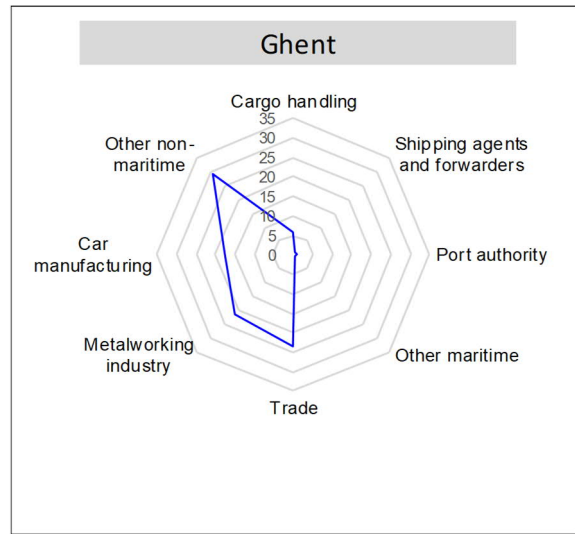
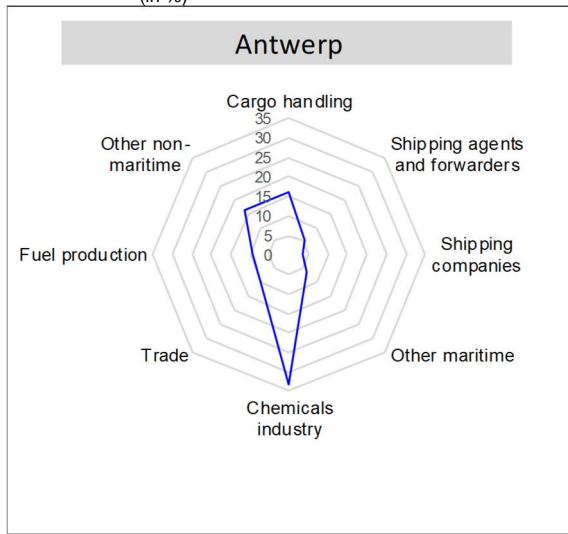
**FIGURE 1.2 EMPLOYMENT AT THE BELGIAN PORTS**  
(indices 2013 = 100)



Source: NBB.



**FIGURE 1.3 MOST IMPORTANT SECTORS AT THE BELGIAN PORTS IN TERMS OF VALUE ADDED IN 2018**  
(in %)



Source: NBB.

## 1.6 Employment at the Belgian ports

In contrast to value added, employment at the Belgian ports grew with 1% in 2018 (table 1.8). All Flemish ports generated additional jobs. With 0.6%, the port of Antwerp contributed the most to the overall growth in direct employment in 2018. Indirect employment totals around 1.1 times direct employment (2018). So, the indirect employment multiplier is larger than 1, while the value added multiplier is less than 1.

Table 1.9 breaks direct employment down into the contribution by its main branches of activity. The cargo handling segment delivered the largest part (0.8% of 1%) in job creation in the Belgian ports in 2018. The employment expansion in the chemicals industry (0.3%) made a contribution as well.

The share of port jobs in total Belgian domestic employment came to 2.8% for direct employment and 5.9% for total employment in 2018. Note that direct employment does not include self-employment or temporary agency work, with the exception of dock-workers covered by a separate regime.

**TABLE 1.8 OVERVIEW OF EMPLOYMENT BY PORT**  
(in FTE)

Ports	2013	2014	2015	2016	2017	2018	Contribution to growth (%)*
Antwerp	61 539	61 112	60 367	60 669	61 914	62 635	0.6
Ghent	27 539	28 229	27 665	27 990	28 404	28 705	0.3
Zeebrugge	9 749	9 453	9 345	9 630	9 767	9 910	0.1
Ostend	5 046	5 058	5 121	5 032	4 975	5 071	0.1
Flemish ports	103 873	103 852	102 498	103 321	105 060	106 320	1.1
Liège	9 076	8 292	8 180	7 812	7 905	7 858	0.0
Brussels	4 181	4 182	4 231	4 068	3 930	3 843	-0.1
Inland ports	13 256	12 474	12 411	11 879	11 835	11 701	-0.1
Direct	117 129	116 326	114 908	115 200	116 895	118 021	1.0
Indirect	137 929	133 792	122 351	122 443	130 750	131 591	
Total	255 058	250 118	237 259	237 643	247 645	249 612	

Source: NBB.

\* Contribution to growth in %: definition see Annex 2.1.

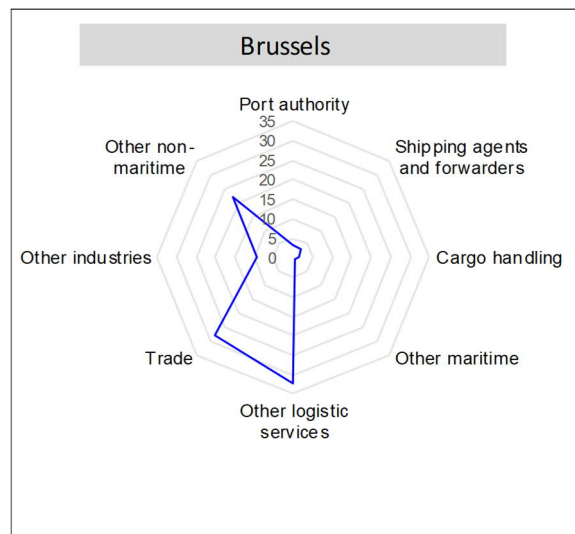
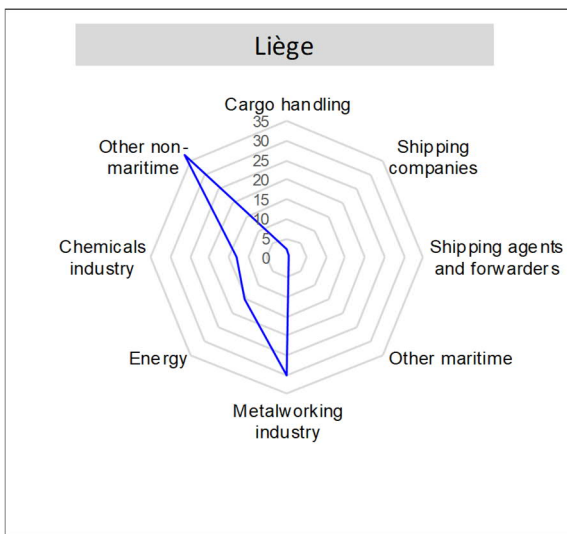
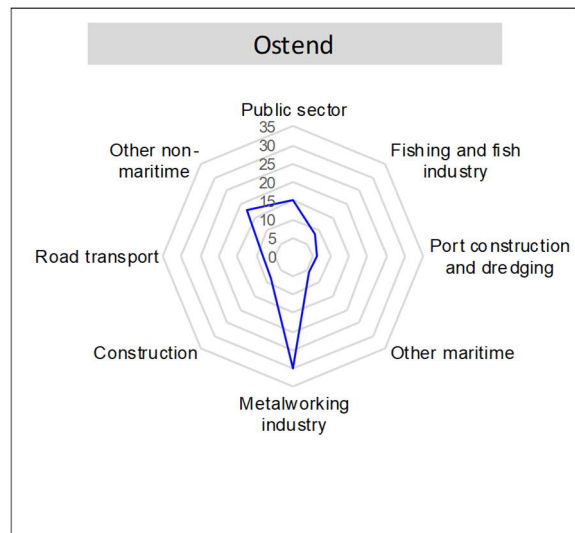
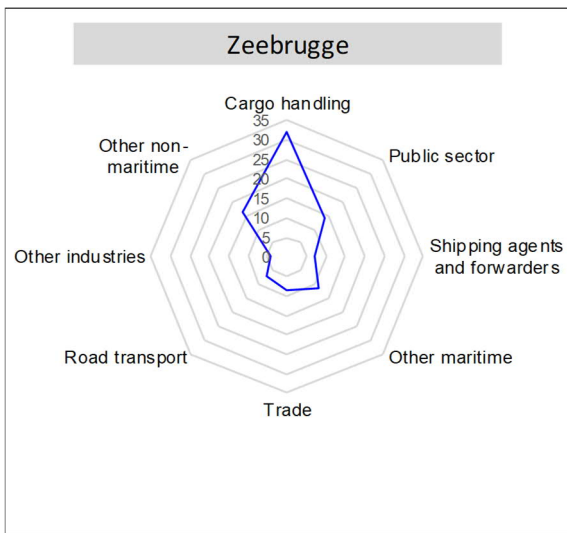
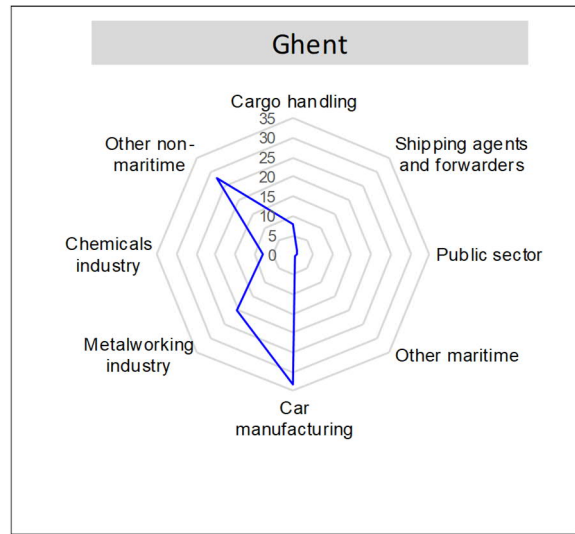
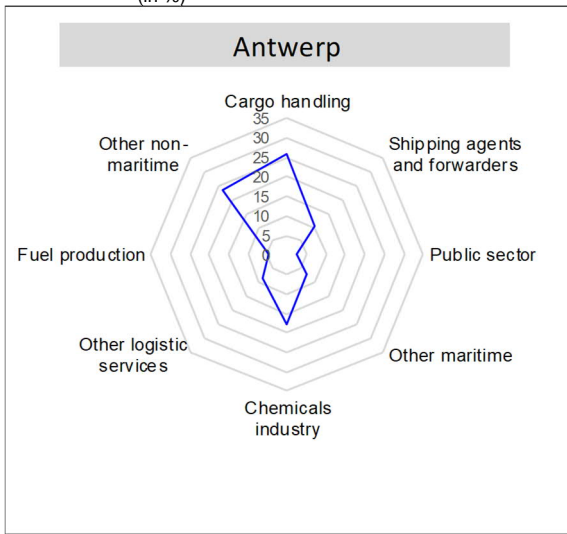
**TABLE 1.9 OVERVIEW OF EMPLOYMENT BY BRANCH OF ACTIVITY**  
(in FTE)

	2013	2014	2015	2016	2017	2018	Contribution to growth (%)*	Weight (%)
Cargo handling	19 804	19 933	19 712	20 196	20 840	21 764	0.8	18.4
Shipping agents and forwarders	8 118	7 952	7 936	7 803	7 768	7 606	-0.1	6.4
Shipping companies	4 438	4 369	4 225	4 181	4 083	3 986	-0.1	3.4
Other maritime	7 415	7 018	6 845	6 949	6 834	6 917	0.1	5.9
Maritime	39 775	39 272	38 718	39 130	39 525	40 273	0.6	34.1
Chemicals industry	14 742	14 678	14 581	14 735	14 883	15 228	0.3	12.9
Trade	14 794	14 043	13 601	13 591	13 583	12 791	-0.7	10.8
Metal working industry	10 104	10 146	10 536	10 282	10 320	10 411	0.1	8.8
Other non-maritime	37 715	38 187	37 472	37 462	38 584	39 317	0.6	33.3
Non-maritime	77 354	77 054	76 190	76 070	77 370	77 748	0.3	65.9
Direct	117 129	116 326	114 908	115 200	116 895	118 021	1.0	100.0
Indirect	137 929	133 792	122 351	122 443	130 750	131 591		
Total	255 058	250 118	237 259	237 643	247 645	249 612		

Source: NBB.

\* Contribution to growth in %: definition see Annex 2.1.

**FIGURE 1.4 MOST IMPORTANT SECTORS AT THE BELGIAN PORTS IN TERMS OF EMPLOYMENT IN 2018**  
(in %)



Source: NBB.

## 1.7 Investment in the Belgian ports

The investment considered is gross investment, i.e. all new investment in the year concerned.

Direct investment in the Belgian maritime ports increased by 21.1%, reaching the highest level ever (almost €6 billion). The biggest contribution (24.3% of the total) came from investment in the port of Antwerp, reinforced by extra investment in the port of Ostend and Brussels. The port of Ghent recorded a fall in 2018, after some additional investment in car manufacturing in 2017, due to a new CMA automobile platform in Volvo Cars Belgium. Investment declined in Zeebrugge too.

**TABLE 1.10 OVERVIEW OF INVESTMENT BY PORT**  
(in € million)

Ports	2013	2014	2015	2016	2017	2018	Contribution to growth (%)*
Antwerp	2 373.0	3 319.6	3 106.2	3 487.1	3 460.7	4 645.3	24.3
Ghent	436.2	414.1	383.4	541.9	719.8	554.6	-3.4
Zeebrugge	197.3	203.8	243.0	315.4	303.1	241.7	-1.3
Ostend	76.3	119.5	80.7	94.2	84.4	130.2	0.9
Flemish ports	3 082.9	4 057.0	3 813.3	4 438.6	4 568.0	5 571.9	20.6
Liège	215.3	198.4	219.1	196.5	242.2	236.0	-0.1
Brussels	68.5	53.0	64.1	74.3	71.8	102.7	0.6
Inland ports	283.8	251.3	279.6	262.1	305.5	335.1	0.6
Direct	3 366.7	4 308.3	4 096.5	4 709.3	4 882.0	5 910.5	21.1

Source: NBB.

\* Contribution to growth in %: definition see Annex 2.1.

**TABLE 1.11 OVERVIEW OF INVESTMENT BY BRANCH OF ACTIVITY**  
(in € million)

	2013	2014	2015	2016	2017	2018	Contribution to growth (%)*	Weight (%)	Contribution to growth excluding merger (%)*
Shipping companies	434.6	1 011.9	591.6	748.6	421.6	1 577.6	23.7	26.7	-1.8
Cargo handling	596.6	683.3	687.5	817.2	936.9	1 042.3	2.2	17.6	2.2
Port construction and dredging	16.7	75.0	73.7	39.2	340.4	237.4	-2.1	4.0	-2.1
Other maritime	415.9	320.0	304.8	356.0	279.0	320.3	0.8	5.4	0.8
Maritime	1 463.7	2 090.2	1 657.7	1 960.9	1 977.9	3 177.5	24.6	53.8	-0.9
Chemicals industry	665.1	836.5	784.7	887.8	920.6	984.1	1.3	16.6	1.3
Energy	234.8	226.1	350.7	321.5	384.4	424.1	0.8	7.2	0.8
Other logistic services	136.4	127.7	132.5	161.7	220.8	261.7	0.8	4.4	0.8
Other non-maritime	866.6	1 027.8	1 170.9	1 377.4	1 378.3	1 063.2	-6.5	18.0	-6.5
Non-maritime	1 902.9	2 218.2	2 438.9	2 748.4	2 904.1	2 733.0	-3.5	46.2	-3.5
Direct	3 366.7	4 308.3	4 096.5	4 709.3	4 882.0	5 910.5	21.1	100.0	-4.4

Source: NBB.

\* Contribution to growth in %: definition see Annex 2.1.

\* Contribution to growth excluding merger: Contribution of each branch of activity to total growth, excluding the merger amount out of the segment of "shipping companies".

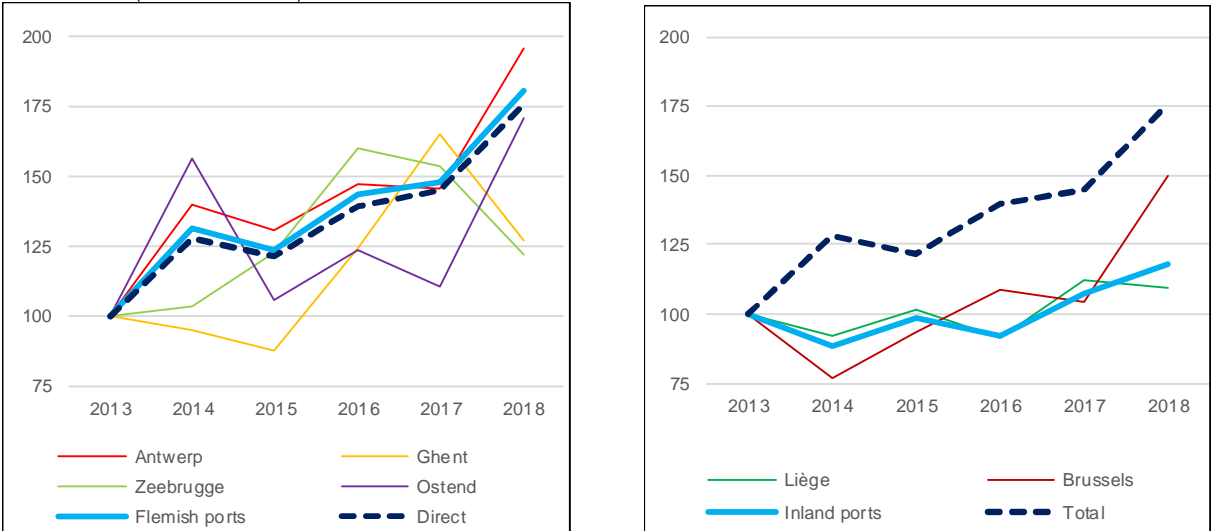
Looking at investment by branch of activity, taking all ports together, the shipping companies, the cargo-handling companies and the chemicals industry are the segments with the biggest shares in investment. The shipping companies segment fluctuated the most over time. Investing in shipping companies involves purchasing or leasing new or second-hand vessels and either operating them directly or chartering them to other operators. Investors seek either profits generated from shipping fees, capital appreciation of the vessels themselves, or both. Due to the high capital commitments involved, ship investment has tended to be limited to ultra-high-net-worth individuals. Sometimes vessels are bought from shipping companies from the same group structure. In such cases, corrections need to be applied,

otherwise investment can be double counted, once in year x and once in year y. Moreover, Euronav and Gener8 Maritime merged in 2018. This merger transformed Euronav into the leading independent large crude tanker operator in the world.

If the investment amount linked to the merger of Euronav with Gener8 Maritime is excluded from the shipping companies segment and thus from total investments in ports, the result would be a decline in 2018 compared to 2017 (-4.4%), notably explained by lower investment in the port construction and dredging segment (contribution of -2.1% of -4.4%) and by lower investment in fuel production, car manufacturing, metalworking and other industries (combined in the "other non-maritime" segment). The pattern of investment is closely linked to projects and is therefore highly volatile. This implies that changes in investment figures require a nuanced interpretation.

The investment figures cover both private and public investment. The public investment figures (1.2% of all port investment in 2018) include those compiled by the Brussels, Flemish and Walloon authorities. Public investment figures comprise only new investment. Costs linked to an Ordinance are not considered, nor are the costs related to harbour masters' services, nor expenditure on maintaining maritime access.

**FIGURE 1.5 INVESTMENT AT THE BELGIAN PORTS**  
(indices 2013 = 100)



Source: NBB.



## 1.8 Financial ratios in the Belgian ports

The ratios presented below show net return on equity after tax, liquidity in the broad sense (the current ratio), and degree of financial independence<sup>14</sup>. The return on equity illustrates the return on the capital invested by shareholders. It concerns a firm's ability to generate profits after interest and tax payments over equity. The liquidity ratio shows the firm's ability to mobilise in due time the cash resources that it needs in order to meet its short-term liabilities. The best-known measurement of solvency is the degree of financial independence, i.e. the ratio between equity and total liabilities. The greater the financial independence, the smaller the company's debt position and the bigger its equity-based buffer to repay its creditors. In other words, the degree of financial independence measures the robustness of a company's capital structure.

The ratios are calculated as globalised averages: this is the sum of the numerators of all companies divided by the sum of their denominators. Hence, the globalised ratio is the weighted average of all ratios at individual company level, while the weight is the proportion of each company in the total value of the ratio denominator. As a result, the globalised average reflects the situation of companies with the largest denominator value and the situation of companies with a small weight but with an extremely high value for the ratio.

Figures 1.6 to 1.8 distinguish these two effects. Companies are ranked in descending order of weight. On the horizontal axis, from zero to one, the cumulative weight of the first companies is presented. Zero reflects no companies, one reflects all companies. In the panel on Brussels in figure 1.6, the horizontal axis illustrates that the first company has a very large weight reflecting 76% of all summed equity of all companies in the population of the port of Brussels.

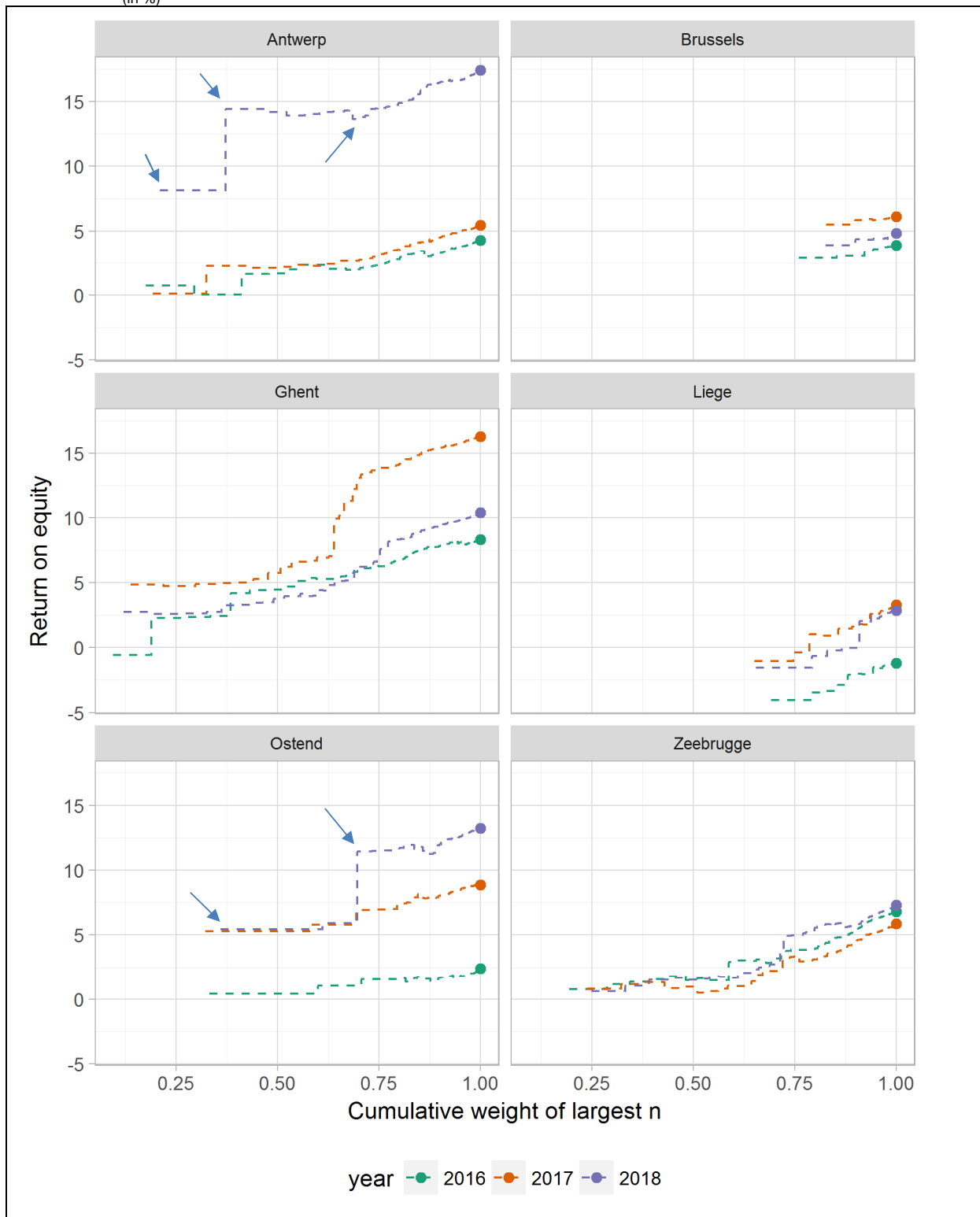
The vertical axis shows how the considered ratio changes to reach its total globalised average for the whole population, moving up with the first company (with the largest weight) and adding up the values for the extra companies that are ranked in descending order of weight. Each dotted line represents a year (2016-2018). A large shift to the right on the horizontal axis, e.g. in the panel for Ostend in figure 1.6 illustrates when a company with a large weight is added. The company with the highest weight in equity represents 36% of the aggregate equity of all companies in the port of Ostend (see first arrow). A large shift on the vertical axis occurs when a company has an extreme ratio (see second arrow).

---

<sup>14</sup> See Annex 3 for the definition of the ratios.



**FIGURE 1.6 CONVERGENCE PATH OF RETURN ON EQUITY**  
(in %)



Source: NBB.

The globalised **return on equity (ROE)** increased in Antwerp, Ostend and Zeebrugge in 2018 compared to 2017. It rose strongly in Antwerp to 17.7% in 2018 - represented by the purple dot on the right-hand side of the first panel. This growth was influenced by two large companies, one in the chemicals industry (BASF Antwerpen) and the other in the production (Exxonmobil Petroleum & Chemical). Both firms received exceptionally high dividends from their subsidiaries in 2018. Figure 1.6 (first panel) clearly visualises the big impact of BASF Antwerpen (accounting for 21% of the total equity of all firms in the port of Antwerp) on the globalised average of return on equity in Antwerp. That is where the dotted purple line starts (see first arrow). The extra contribution of Exxonmobil Petroleum & Chemical (16% of total equity in port of Antwerp) is illustrated by the purple dotted line that moves vertically up (see second arrow). The evolution of the three dotted lines (2016-2018) diverges after a cumulative weight of 68% on the horizontal axis (see third arrow), meaning that the differences are attributable to the companies with smaller weights, since all companies are ranked in descending order of weight.

At the port of Ostend, the globalised return on equity rose by 13.1% in 2018, compared to 8.9% in 2017 and 2.3% in 2016. The explanation is an extreme high ROE value of a dredging company (Baggerwerken Decloedt & Zoon) due to high financial revenues. Moreover, that company had a relatively large weight. This double effect is visible where the dotted purple line jumps up at 64% on the horizontal axis (see second arrow).

At the port of Zeebrugge, the globalised return on equity fluctuated from 6% in 2017 to 7.3% in 2018. The company with the largest weight (21%) does not account for the higher globalised ROE. The growth is actually due to companies with smaller weights.

**TABLE 1.12 RETURN ON EQUITY BY PORT**  
(in %)

	Globalised average							Total
	Antwerp	Ghent	Zeebrugge	Ostend	Liège	Brussels		
2016	4.3	8.2	6.8	2.3	-1.1	3.9	4.1	
2017	5.5	16.5	6.0	8.9	3.4	6.1	6.7	
2018	17.7	10.4	7.3	13.1	3.0	4.8	12.6	
	Median							Total
	Antwerp	Ghent	Zeebrugge	Ostend	Liège	Brussels		
2016	6.6	7.5	6.8	8.0	6.2	7.3	6.9	
2017	6.9	8.1	6.6	6.7	7.5	7.2	7.1	
2018	8.3	9.3	8.0	8.7	8.5	7.0	8.4	

Source: NBB.

Besides the globalised average, the median value can be considered. The median is the central value, with 50% of firms having a ratio above the median and 50% having a ratio below the median. Combining the global average with the median figure permits a complementary analysis, since globalised ratios are influenced by extreme values (outliers), while the median values neutralise those extremes.

Table 1.12 illustrates the reverse evolution between the globalised ratio and the median value for the return on equity of companies operating in the port of Liège. Electrabel, a company with a large weight in the globalized ratio, had a poorer return on equity in 2018 while the median company in 2017 shifted from position with a different company with a higher return on equity.

The same calculation is made for the liquidity and solvency ratios.

**TABLE 1.13 LIQUIDITY RATIO PER PORT**

Globalised average							
	Antwerp	Ghent	Zeebrugge	Ostend	Liège	Brussels	Total
2016	0.9	1.3	1.4	1.3	0.7	0.7	0.9
2017	1.1	1.3	1.3	1.2	0.6	1.2	1.1
2018	1.3	1.4	1.3	1.2	0.7	1.0	1.2
Median							
	Antwerp	Ghent	Zeebrugge	Ostend	Liège	Brussels	Total
2016	1.3	1.3	1.3	1.5	1.2	1.3	1.3
2017	1.3	1.4	1.3	1.4	1.3	1.3	1.3
2018	1.2	1.4	1.3	1.4	1.2	1.4	1.3

Source: NBB.

Table 1.13 illustrates that, in 2018, the globalised average **liquidity ratio** at the ports of Ostend, Liège and Brussels was smaller than its median level, meaning that companies with more short-term liabilities possess relatively less current assets for every €1 of current liabilities they had to redeem.

At the port of Antwerp, the opposite was true in 2018. The impact of BASF Antwerpen, as a large company, is illustrated by the arrow in the first panel of figure 1.7. BASF enjoyed a large increase in its short-term current assets in 2018 due to a shift from its fixed financial assets to its current financial assets, which caused its current ratio to shoot up to 4.2 and resulted in a higher globalised ratio for Antwerp in 2018.

At the ports of Ghent and Zeebrugge, the change in the liquidity ratio is mainly explained by the companies with smaller weights.

Overall, the liquidity ratio for a median company in the Belgian ports is 1.3 in 2018, similar to the level seen in the two previous years (respectively 1.29 in 2016 and 1.31 in 2017). This means that the median company in the Belgian ports can meet its short-term debt obligations 1.3 times over. In order to stay solvent, the company must have a ratio of at least 1.0 which means it can exactly meet its current debt obligations. In the Belgian ports, the median firm is a bit more liquid than that, since it has a little left over. At the port of Brussels, the median firm could improve its liquidity in 2018 somehow, while in the other ports it stayed quite stable or declined slightly.

**TABLE 1.14 FINANCIAL INDEPENDENCE PER PORT**

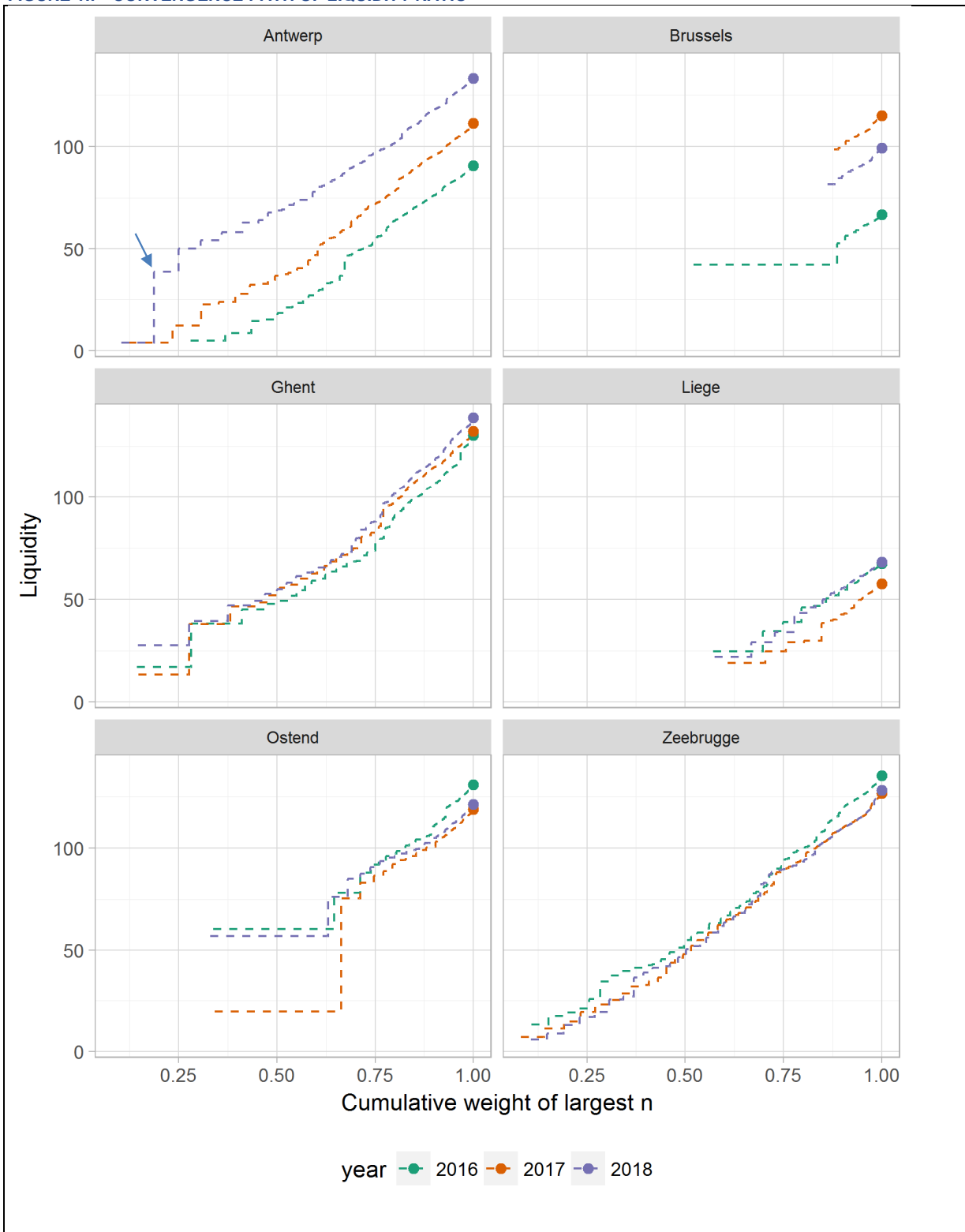
(in %)

Globalised average							
	Antwerp	Ghent	Zeebrugge	Ostend	Liège	Brussels	Total
2016	33.5	43.0	48.2	41.2	39.2	46.3	37.7
2017	33.6	44.3	46.7	39.4	37.6	56.5	38.5
2018	34.0	46.4	48.0	40.9	38.0	59.3	39.4
Median							
	Antwerp	Ghent	Zeebrugge	Ostend	Liège	Brussels	Total
2016	30.8	39.8	36.4	40.3	33.2	34.5	33.7
2017	31.0	42.8	34.9	39.2	33.9	35.8	34.3
2018	31.1	43.2	35.6	42.0	34.1	37.0	35.1

Source: NBB.

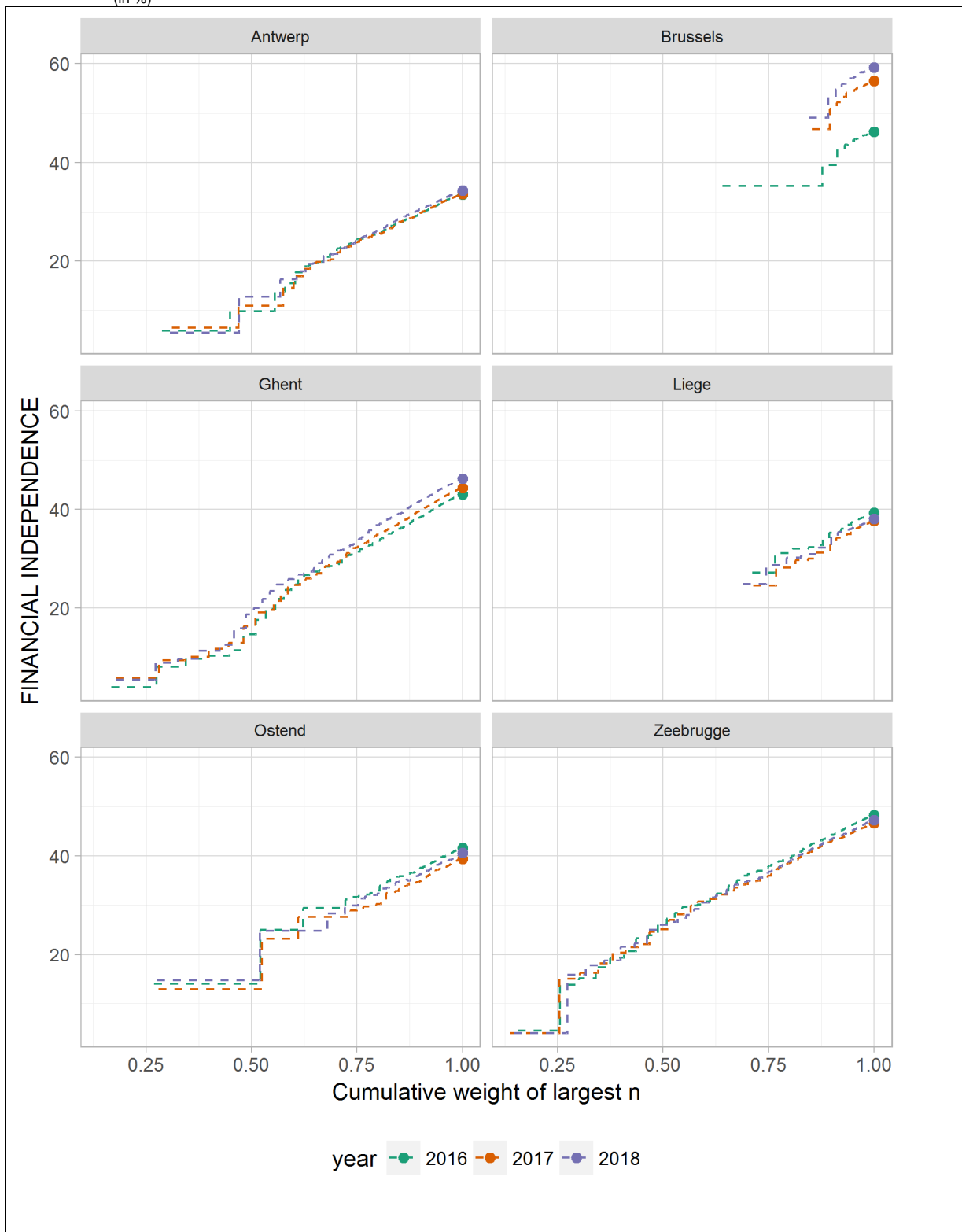
The median values, as well as the globalised average values of the **financial independence** of companies operating in the Belgian ports point to an improvement over the last few years (table 1.14). The port of Antwerp has the lowest equity ratio, explained by the fact that this port has a strong fuel industry presence and the equity ratio of that branch is quite low. The chemical companies based in Antwerp are often Belgian subsidiaries of multinationals. Group entities often have little equity because they can call on intra-group loans.

FIGURE 1.7 CONVERGENCE PATH OF LIQUIDITY RATIO



Source: NBB.

**FIGURE 1.8 CONVERGENCE PATH OF FINANCIAL INDEPENDENCE**  
(in %)



Source: NBB.

## 1.9 Relative importance of the components of value added

The value added of a company can be calculated in two different ways. According to the first approach: value added is the difference between the value of the outputs and the value of the costs of inputs required to produce the outputs. In economic terms, this is the *production approach*. As such, value added of a company indicates its contribution to the wealth of the region or the country (in % of GDP).

The second approach explains more about how value added is spent. Companies will use their added value to pay the salaries of their workers (staff costs), to cover the depreciation of their assets (depreciation), to meet charges such as provisions (other charges) and to increase the equity of the company or distribute dividends to its shareholders, make interest payments and pay corporation tax (operating profit). This is known as the *cost approach*.

When the total value added for all Belgian ports together is broken down according to the cost approach in its 4 main components: staff costs, depreciation, other charges and operating profits<sup>15</sup>, figures for 2018 illustrate that 49.6% of the value added goes to staff costs, 20.6% is used to cover depreciation costs, 17% is employed as operating profits to pay interest costs, corporation tax and dividends, while 12.8% is used to meet other charges such as provisions or restructuring costs. The shares of the four components stay relatively stable over time, although the weight of the operating profit is the most volatile one. If value added falls, the decrease will be particularly evident in the share of the operating profit.

Breaking down total value added in Belgian ports at asectoral level illustrates the various importance of the components in the different sectors of activity. Figure 1.9<sup>16</sup> shows in its upper panel the breakdown for the year 2017, in the middle panel the figures for 2018 and in the lower panel the decomposition of the change in value added.

In 2018, overall, half of the value added goes to *staff costs*, some sectors seem to spend relatively more than others: the car manufacturing sector, construction, energy, road transport and shipping agents and forwarders were branches with higher staff costs in proportional terms in 2018. As for the other components, it is not surprising to see that shipping companies have the highest *depreciation costs* in relative terms. The *other charges* are particularly evident in the trade sector, something that can be attributed to companies active in the petroleum product trade and the excise duties levied on them. The *share of operating profits* is the highest in chemical activities and fuel production.

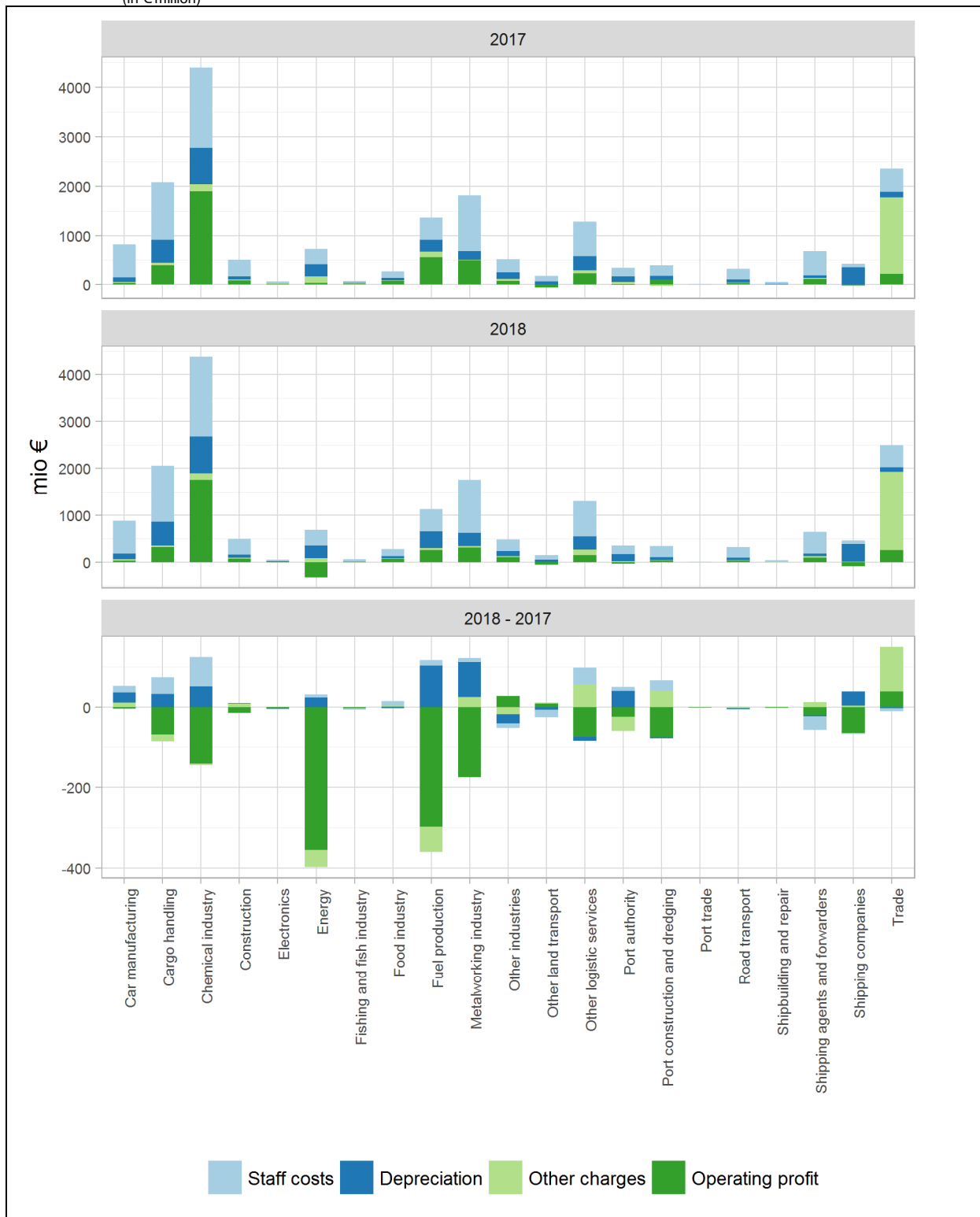
The lower value added in 2018 than 2017 originated from a lower level in operating profit, especially visible in the energy sector, fuel production, metal working and chemicals industry.

---

<sup>15</sup> The costs of temporary staff are included in services and other goods and are therefore not part of value added but belong to intermediate consumption.

<sup>16</sup> The components are calculated on the basis of data extracted from annual accounts filed with the Central Balance Sheet Office, without making estimations for the missing annual accounts.

**FIGURE 1.9 COMPONENTS OF VALUE ADDED**  
(in € million)



Source: NBB.

Notes: Other charges = amounts written down + provisions + other operating charges minus restructuring costs.  
Operating profit = operating profit minus subsidies from public authorities.  
The results of the public sector are not included in this chart.

## 2 ANALYSIS BY PORT

### 2.1 Port of Antwerp

#### 2.1.1 Port developments

In 2018, the port of Antwerp recorded a **traffic volume** of 235.2 million tonnes, a **growth of 5.2%**. Containers and liquid bulk (petroleum products and chemicals) were the main drivers: increasing respectively by 6.4% (to a total of 130.9 million tonnes) and 3.6%.

In 2019, the volume of freight loaded or unloaded in Antwerp rose by **1.3%** to 238.2 million tonnes. The growth was fuelled by growing volumes of container traffic (6%) and dry bulk (6.6%).

**TABLE 2.1 MARITIME TRAFFIC AT THE PORT OF ANTWERP**  
(in millions of tonnes)

	2016	2017	2018	2019	Change 2017-18 (%)	Change 2018-19 (%)	Share 2018 (%)	Share 2019 (%)
Containers	117.9	123.0	130.9	138.7	6.4	6.0	55.6	58.3
Roll-on roll-off	4.6	5.1	5.3	5.1	5.4	-3.8	2.3	2.2
Conventional cargo	9.8	10.3	10.2	8.3	-1.1	-18.0	4.3	3.5
Liquid bulk	69.2	73.2	75.8	72.1	3.6	-4.9	32.2	30.3
Dry bulk	12.6	12.2	13.1	13.9	7.2	6.6	5.6	5.8
Total	214.1	223.7	235.2	238.2	5.2	1.3		

Source: Mora Mobiliteitsraad "De Vlaamse havens – Feiten, statistieken en indicatoren voor 2018", port authorities.

Maritime transshipment at the port of Antwerp has grown strongly in the last three decades. Transshipment volume increased from 82 million tonnes in 1980 to more than 238 million tonnes in 2019. This rise is almost entirely due to container traffic. In 2019, container transport accounted for more than 58% of maritime transshipments in the port of Antwerp. This expansion followed a world trend. **Antwerp's market share in the container transport of the ports of the Hamburg-Le Havre range rose from 15% in 1980 to 27.9% in 2019** (Vlaamse overheid, 2019).

Ever larger ships are shipping bigger and bigger volumes. Shipowners choose which ports to use. In North-Western Europe, these are mainly the ports of Rotterdam, Antwerp and Hamburg. An important element in making this choice is the capacity of a port to generate cargo itself. The presence of industry – which generates cargo and attracts cargo itself – makes the port of Antwerp an attractive base for container shipping companies. The Flemish government therefore considers it essential that Antwerp has sufficient container handling capacity on offer.

In addition of being a **maritime hub**, the port of Antwerp is also an **important industrial cluster**. The mutually reinforcing mix between goods handling, logistics and industry makes Antwerp unique and adds value to the port complex. According to the Antwerp Port Authority, the development of new container handling capacity project can therefore not be considered separately from further expansion of industrial and logistical activities in the port area of Antwerp.

In December 2019, the **Flemish government approved a final Preferential Decision for the ECA project** (Extra Container handling capacity in port of Antwerp). The eye-catcher will be the new tidal dock (provisionally without a name) that connects to the Deurganck dock. The new dock would have a capacity of 3.7 million TEU<sup>17</sup>. Container activity will only be developed on the southern side of the new dock, which preserves the village of Doel on the north side. In addition, 3.5 million TEU of extra container capacity will be provided elsewhere in the port of Antwerp: partly via extra sea berth at the Noordzee Terminal, partly via two extra sea berths and four extra berths for entering behind the locks on the left bank, partly via a new container terminal on the Waasland canal at the west of the Kieldrecht lock. Taking

<sup>17</sup> TEU stands for Twenty Foot Equivalent Unit. TEU is the unit of a container ship or of a container terminal.



into account both mobility and the environment, measures will be taken to achieve a modal split for container transport: 43% via lorry, 15% via rail transport and 42% via inland shipping. In this context, the Antwerp Port Authority, the Antwerp Railport and Belgian railway operator Infrabel have concluded a cooperation agreement to double rail transport of sea containers by 2030.

Mid-2020 it became clear that some parties filed a request for annulment against the Preferential Decision regarding the ECA project. While study work and research around the ECA-project shall be continued, the complaints submitted shall be investigated thoroughly by the Council of State.

**The port of Antwerp is home to Europe's largest integrated chemicals and petrochemicals clusters.** Many of the market leaders have built their production facilities here. Ineos, Nippon, Sea-Mol, Oiltanking AGT (Antwerp Gas Terminal) announced they would opt for Antwerp.

Also, Austrian petrochemicals company **Borealis** will spend € 1 billion on construction of a new additional plant on its existing Borealis production site in Kallo, port of Antwerp. It concerns a propane dehydrogenation (PDH) plan, converting propane into propylene. Propylene is the raw material used to produce polypropylene (PP), which forms the base of countless industrial applications used in many sectors, including the car industry, consumer goods, energy, food packaging, healthcare and many others. This mega investment will make this plant the largest PDH facility in the world. The start-up of the new Kallo plant is scheduled for mid-2020.

**Oiltanking Antwerp Gas Terminal** will expand its site with the construction of a new propane storage tank to supply the Borealis production facility in Kallo.

British chemicals group **Ineos** plans to build a brand-new propane dehydrogenation (PDH) plant and an ethane cracker unit in Antwerp. They will respectively convert propane into propylene and ethylene as the raw materials for chemical products that will be used in many industries including car manufacturing, building construction, clothing, cosmetics, pharmaceuticals, electronics and packaging materials. The new production units are expected to be put into operation by 2024 at the earliest.

Meanwhile, the Antwerp Port Authority wants to accelerate the **transition to a low-carbon economy** by investing more in R&D into new technologies. It has set up an ambitious corporate social responsibility (CSR) project<sup>18</sup> in a bid to become a community builder and create a more sustainable future for the port.

### 2.1.2 Value added

Table 2.2 illustrates both direct and indirect value added generated at the port of Antwerp over the period 2013-2018, while table 5.1.1 in Annex 5 shows the details on a sectoral level, their respective shares and their changes over the years. Direct value added is broken down into a maritime and a non-maritime cluster, each further sub-divided into its contributing sectors. 69% of the value added created by the port of Antwerp came from the non-maritime sectors, especially in the chemicals industry (33%), trade (10%) and fuel production (9%). Cargo handling, a maritime activity, also took a sizeable share of 16%. The last column in table 2.2 shows the contribution of each segment to total growth of value added in the port of Antwerp over the 2017-2018 period.

**Direct value added in the port of Antwerp shrank by 3.6% in 2018** (table 2.2). The main reason was a strong decline in value added in the non-maritime sector (contribution of -2.8%). Explanatory factors are the **drop in the fuel production** (contribution to the growth of -2.1%), due to lower refinery margins and the **decline** in the **energy branch** due to a fall in the availability of nuclear power plants in 2018 compared to 2017 because of the outage of several units following works or inspections on the concrete in non-nuclear secondary buildings and because of various technical interventions within the framework of the extension of the power plants' lifespan.

---

<sup>18</sup> Information on their CSR project can be found at: <https://www.sustainableportofantwerp.com/en/nieuws/first-ever-international-maritime-charter-sustainable-ports-worldwide>.

**TABLE 2.2 VALUE ADDED AT THE PORT OF ANTWERP**  
(in € million)

	2013	2014	2015	2016	2017	2018	Contribution to growth (%)*
Cargo handling	1 563.3	1 604.8	1 666.0	1 701.7	1 795.0	1 766.3	-0.2
Shipping agents and forwarders	631.6	593.1	632.9	608.5	611.9	609.6	0.0
Shipping companies	368.0	438.8	737.1	662.4	431.9	399.8	-0.3
Other maritime	718.3	686.3	747.6	715.5	736.2	709.6	-0.2
<b>Maritime</b>	<b>3 281.2</b>	<b>3 323.0</b>	<b>3 783.6</b>	<b>3 688.1</b>	<b>3 575.0</b>	<b>3 485.3</b>	<b>-0.8</b>
Chemicals industry	2 944.2	3 113.2	3 427.3	3 165.0	3 671.0	3 667.1	0.0
Trade	855.1	917.0	901.7	999.0	1 077.2	1 113.6	0.3
Fuel production	806.2	824.9	1 063.4	1 066.6	1 262.7	1 020.5	-2.1
Other non-maritime	1 914.1	1 831.2	1 793.2	1 853.4	1 931.6	1 819.9	-1.0
<b>Non-maritime</b>	<b>6 519.6</b>	<b>6 686.3</b>	<b>7 185.6</b>	<b>7 084.0</b>	<b>7 942.5</b>	<b>7 621.1</b>	<b>-2.8</b>
<b>Direct</b>	<b>9 800.8</b>	<b>10 009.3</b>	<b>10 969.2</b>	<b>10 772.1</b>	<b>11 517.5</b>	<b>11 106.4</b>	<b>-3.6</b>
<b>Indirect</b>	<b>8 988.1</b>	<b>8 988.9</b>	<b>8 312.8</b>	<b>7 836.7</b>	<b>8 429.6</b>	<b>7 866.6</b>	
<b>Total</b>	<b>18 788.9</b>	<b>18 998.2</b>	<b>19 282.0</b>	<b>18 608.8</b>	<b>19 947.1</b>	<b>18 973.0</b>	

Source: NBB.

\* For definition of contribution to growth, see Annex 2.1.

Value added in maritime activities decreased as well, the fall being mainly visible in the **shipping companies** (contribution to the growth of -0.3%), because several of them were impacted by a decline in freight rates. The contribution of the **cargo handling sector** to total growth of value added in port of Antwerp was negative as well (-0.2%). In 2018, cargo handling surprisingly did not benefit from the growth of traffic in the port of Antwerp. Changes in the structure of several port groups had a negative impact on value added in this sector.

Changes in commodity and sales prices can influence the path of value added in current prices in a specific sector. Other explanatory factors are mergers, restructuring processes, bankruptcies, business relocations or the establishment of new companies. Larger depreciation values because of new investment or the recording/reversal of impairments and provisions in the annual accounts can have an impact on changes in value added as well.

Although *BASF Antwerpen* experienced higher raw material prices, energy prices and maintenance costs, and consequently a decline in its value added, it remained the leader in petrochemicals. Due to lower refinery margins, *Exxonmobil Petroleum's* value added fell in 2018 as well. Growth in traffic volume at the port of Antwerp meant that the employers' organisation *CEPA*<sup>19</sup> had to hire more dockers, and thus paid higher staff costs which in turn pushed up *CEPA's* value added figures.

The ten biggest companies in terms of value added, listed in table 2.3, represent almost 45.6% of the direct value added generated in Antwerp in 2018, while direct value added in the port of Antwerp accounts for 2.4% of Belgian GDP or 4.1% of GDP in the Flemish Region in 2018. Total value added (including indirect effects) accounted for 4.1% of Belgian GDP.

The fall in indirect value added is largely attributable to developments in fuel production and energy.

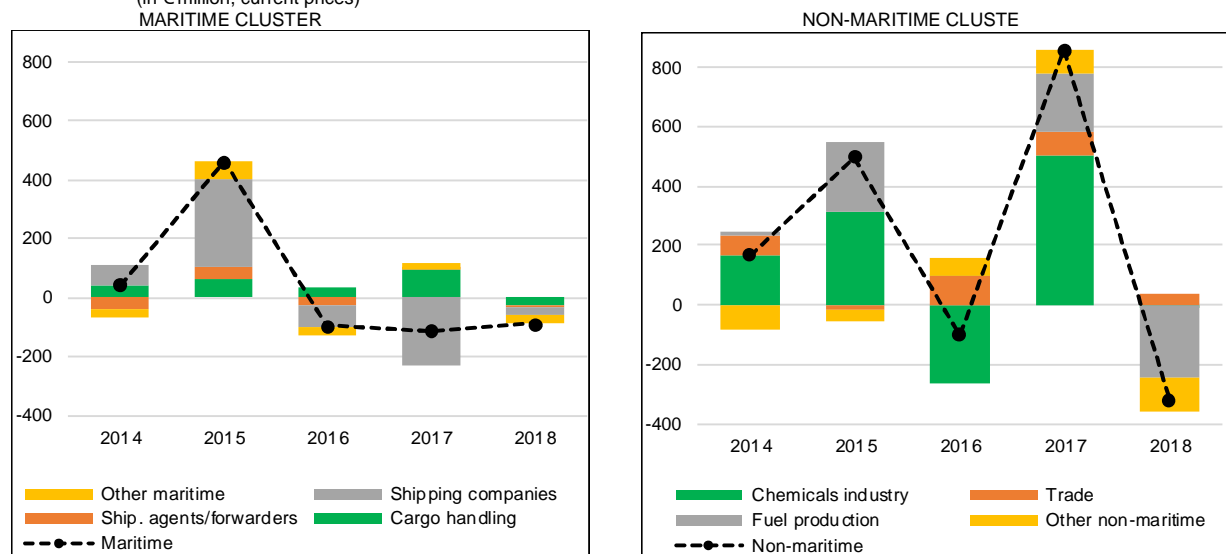
<sup>19</sup> CEPA stands for *Centrale der Werkgevers aan de haven van Antwerpen*. CEPA's main purpose is to optimise the organisation of harbour labour in the port of Antwerp. Its responsibilities are threefold: [1] represent all harbour employers during the social bargaining process and during industrial disputes, [2] being responsible for the organisation and administration concerning hirings and wages of all blue-collar dock workers in the port, and [3] acting as an umbrella organisation for the daily management of the aforementioned service organisations.

**TABLE 2.3 TOP 10 VALUE ADDED AT THE PORT OF ANTWERP**

Rank	Name	Sector
1	BASF Antwerpen	Chemicals industry
2	Kuwait Petroleum (Belgium)	Trade
3	Centrale der Werkgevers aan de Haven van Antwerpen	Cargo handling
4	Exxonmobil Petroleum & Chemical	Fuel production
5	Total Raffinaderij Antwerpen	Fuel production
6	Antwerp Port Authority	Port authority
7	Covestro	Chemicals industry
8	Total Olefins Antwerp	Chemicals industry
9	Evonik Antwerpen	Chemicals industry
10	Dredging International	Port construction and dredging

Source: NBB.

**FIGURE 2.1 CHANGE IN VALUE ADDED AT THE PORT OF ANTWERP**  
(in € million, current prices)



Source: NBB.

### 2.1.3 Employment

Table 2.4 shows direct and indirect employment<sup>20</sup> at the port of Antwerp over the period 2013-2018. While value added suffered from a fall, **direct employment went up in the port of Antwerp with 1.2%** in 2018 compared to 2017. The maritime cluster enjoyed a larger increase (+480 FTE) than the non-maritime cluster (+241 FTE). 45.3% of the workforce at the port of Antwerp is employed in the maritime segment (compared to 31.4% of value added), while 54.7% was employed in the non-maritime part (compared to 68.6% of value added).

**Cargo handling was the leading employer in 2018**, providing a quarter of direct employment. The chemicals industry followed in second place with 18%, tracked by shipping agents and freight forwarders (10.1%) and the other logistic services (8.7%). While the maritime and non-maritime clusters' shares of total employment were relatively stable in the 2013-2018 period, cargo handling and other logistic services saw their shares growing.

<sup>20</sup> Details on sectoral level, their respective shares and their changes over the years are visible in table 5.1.2 in Annex 5.

**TABLE 2.4 EMPLOYMENT AT THE PORT OF ANTWERP**  
(in FTE)

	2013	2014	2015	2016	2017	2018	Contribution to growth (%)*
Cargo handling	14 558	14 581	14 842	14 961	15 456	16 046	1.0
Shipping agents and forwarders	6 868	6 701	6 686	6 593	6 523	6 316	-0.3
Public sector	1 867	1 828	1 745	1 740	1 699	1 669	0.0
Other maritime	4 668	4 271	4 205	4 347	4 207	4 335	0.2
<b>Maritime</b>	<b>27 961</b>	<b>27 381</b>	<b>27 478</b>	<b>27 640</b>	<b>27 885</b>	<b>28 365</b>	<b>0.8</b>
Chemicals industry	10 982	10 936	10 803	10 873	10 971	11 276	0.5
Other logistic services	4 061	4 180	4 349	4 622	5 245	5 455	0.3
Fuel production	2 607	2 626	2 751	2 752	2 904	2 874	0.0
Other non-maritime	15 927	15 988	14 987	14 782	14 909	14 664	-0.4
<b>Non-maritime</b>	<b>33 578</b>	<b>33 731</b>	<b>32 889</b>	<b>33 029</b>	<b>34 029</b>	<b>34 270</b>	<b>0.4</b>
<b>Direct</b>	<b>61 539</b>	<b>61 112</b>	<b>60 367</b>	<b>60 669</b>	<b>61 914</b>	<b>62 635</b>	<b>1.2</b>
<b>Indirect</b>	<b>83 139</b>	<b>80 662</b>	<b>74 546</b>	<b>74 449</b>	<b>80 126</b>	<b>79 960</b>	
<b>Total</b>	<b>144 679</b>	<b>141 774</b>	<b>134 913</b>	<b>135 118</b>	<b>142 040</b>	<b>142 594</b>	

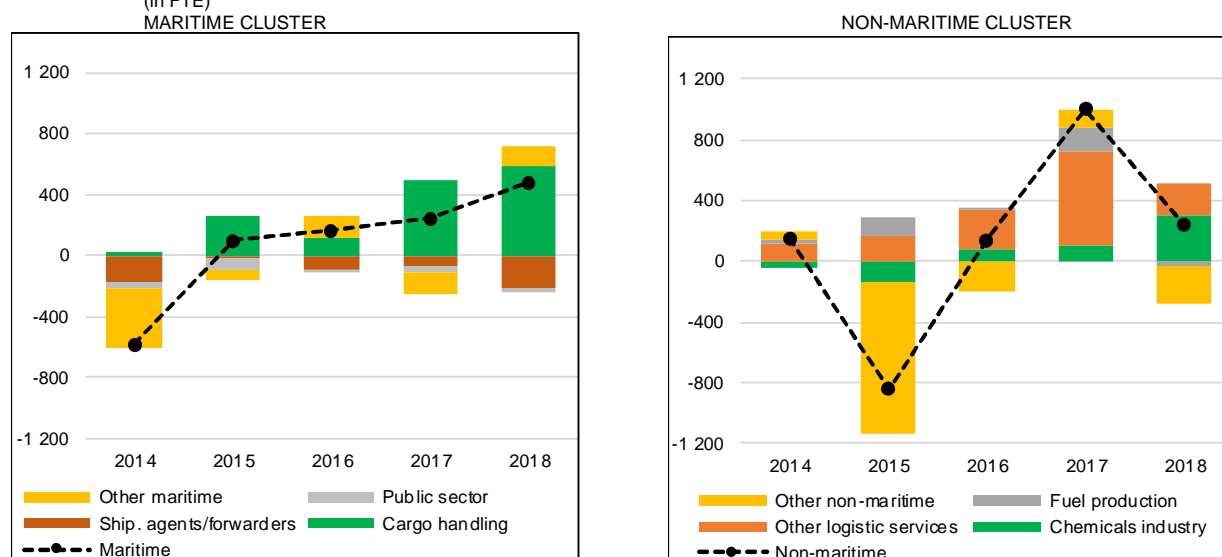
Source: NBB.

\* For definition of contribution to growth, see Annex 2.1.

The last column in table 2.4 illustrates the contribution of each branch to total growth of direct employment over the 2017-2018 period. Total direct employment growth of 1.2% in 2018 was driven by both the maritime (contribution of 0.8%) and non-maritime cluster (contribution of 0.4%). The **biggest contribution came from the cargo handling**, reflecting more recruitments of dockers by the employers' organisation *CEPA* due to the growth in the maritime traffic in the port of Antwerp in 2018 (table 2.1). Some of the dockers in Zeebrugge switched in 2018 to the Antwerp booklet, at the request of *PSA Antwerp*.

Also, other logistic services and the chemicals industry (partly due to extra jobs in *BASF Antwerpen* and *Nippon Shokubai*) enjoyed an increase in their employment in 2018.

**FIGURE 2.2 CHANGE IN EMPLOYMENT AT THE PORT OF ANTWERP**  
(in FTE)



Source: NBB.

In contrast to the sharp fall in indirect value added, indirect employment contracted slightly in 2018 despite the upward trend in direct employment. Among the explanatory factors: the metalworking and petroleum products industry recorded a drop of indirect employment.

The top 10 companies in terms of employment (table 2.5) account for 36.5% of total direct employment at Port of Antwerp in 2018.

Total direct employment in Antwerp's port accounted for 2.5% of all employment in the Flemish Region and 1.5% of Belgian domestic employment. Total employment, including indirect jobs, accounted for 3.4% of Belgian domestic employment.

**TABLE 2.5 TOP 10 EMPLOYMENT AT THE PORT OF ANTWERP**

Rank	Name	Sector
1	Centrale Der Werkgevers Aan De Haven Van Antwerpen	Cargo handling
2	BASF Antwerpen	Chemicals industry
3	Public sector	Public sector
4	Antwerp Port Authority	Port authority
5	Exxonmobil Petroleum & Chemical	Fuel production
6	Total Raffinaderij Antwerpen	Fuel production
7	BNRC Group	Other land transport
8	General Services Antwerp	Cargo handling
9	Dredging International	Port construction and dredging
10	Evonik Antwerpen	Chemicals industry

Source: NBB.

#### 2.1.4 Investment

Table 2.6 shows investment<sup>21</sup> at the port of Antwerp over the 2013-2018 period.

**TABLE 2.6 INVESTMENT AT THE PORT OF ANTWERP**  
(in € million)

	2013	2014	2015	2016	2017	2018	2018 excluding merger	Contribution to growth (%)*	Contribution to growth excluding merger (%)*
Shipping companies	432.7	1 009.8	591.0	734.4	401.8	1 573.0	328.8	33.8	-2.1
Cargo handling	493.1	578.6	607.5	675.2	730.2	930.8	930.8	5.8	5.8
Port construction and dredging	14.8	27.4	70.6	34.4	334.9	230.5	230.5	-3.0	-3.0
Other maritime	290.9	215.2	185.8	210.3	143.9	189.9	189.9	1.3	1.3
Maritime	1 231.5	1 831.0	1 455.0	1 654.3	1 610.8	2 924.2	1 680.0	38.0	2.0
Chemicals industry	576.9	737.3	690.8	791.8	804.8	818.0	818.0	0.4	0.4
Energy	74.5	108.4	167.4	142.1	249.2	280.3	280.3	0.9	0.9
Fuel production	239.0	417.8	525.3	616.7	433.6	242.9	242.9	-5.5	-5.5
Other on-maritime	251.1	225.2	267.8	282.2	362.2	379.9	379.9	0.5	0.5
Non-maritime	1 141.5	1 488.7	1 651.2	1 832.7	1 849.9	1 721.1	1 721.1	-3.7	-3.7
Direct	2 373.0	3 319.6	3 106.2	3 487.1	3 460.7	4 645.3	3 401.1	34.2	-1.7

Source: NBB.

\* For definition of contribution to growth, see Annex 2.1.

The overall investment amount in the port of Antwerp increased in 2018 with € 1.2 billion due to a huge merger in the shipping companies. *Euronav* concluded in June 2018 the merger with *Gener8 Maritime*, a US based crude oil shipping company. Integrating the *Gener8* vessels into the *Euronav* fleet turned *Euronav* into a leading independent large crude tanker operator on world level. This event explains the huge growth in investments in the port of Antwerp in 2018.

<sup>21</sup> Details on a sectoral level are visible in table 5.1.3 in Annex 5.

**If the investment amount for the merger of Euronav with Gener8 Maritime is excluded** from the total investment figures for 2018, corrected growth figures are calculated and noted in the last column in blue in table 2.6. **The adjusted year-on-year investment growth in 2018 fell to -1.7%. The biggest contribution to this drop came from the fuel production** (contribution of -5.5%) due to *Exxonmobil Petroleum & Chemical*, who was completing construction of its new (and delayed) coker unit, to produce low-sulphur transport fuel. They anticipated the new shipping regulations that came into force on 1 January 2020, banning the use of fuel with a Sulphur content of more than 0.5% in international shipping. The company started to invest in this project since 2014 with large amounts in 2015 till 2017. In 2018, when the project was almost completed, the investment was still high but reduced.

The **port construction and dredging** contributed for -3% to the total investment evolution in 2018, due to lower investment amounts by *Dredging International* and *DEME* compared to 2017.

The contribution of **shipping companies** became negative (-2.1%) after exclusion of the merger amount of *Euronav*. In general terms, the shipping companies segment has fluctuated the most over time. As mentioned earlier, investing in shipping companies involves purchasing or leasing new or second-hand vessels and either operating them directly or chartering them to other operators.

Some sectors contributed positively to the total investment evolution in 2018. **The biggest positive contribution to this development came from the cargo handling** (contribution of 5.8%), due to a several storage tank projects. The *Oiltanking Antwerp Gas Terminal* was investing in the construction of a new propane storage tank to supply the *Borealis* production facility in Kallo. *ATPC (Antwerp Terminal and Processing Company)* also invested in the construction of a 30 000m<sup>3</sup> LPG<sup>22</sup>-ethane tank storage park, to become a major player in the ARA<sup>23</sup> LPG and ethane storage market. *Sea-tank 700B*, as part of the Sea-Invest group, invested in the construction of a tank terminal for liquid chemicals in the Delwaide dock.

**The energy sector** contributed 0.9% to total investment change in 2018, due to extra investment from *Electrabel* to modernise and extend the service life of the nuclear production plants.

The **chemicals industry** contribution was just 0.4% explained by high investment by *BASF Antwerpen* and *Ineos*. *BASF Antwerpen* invested in a new ammonia tank and in projects to boost efficiency of its plants. *Ineos* invested in increasing its ethylene oxide production and storage capacity and removing a number of bottlenecks from the plant. In addition, *Ineos* took over the cogeneration plant on its site, which had previously been owned by the German energy group *RWE*.

The pattern of investment is closely linked to projects and is therefore highly volatile, so that the figures require a nuanced interpretation. *DEME* invested in vessels, including *Spartacus*, the most powerful and environmentally friendly cutter suction dredger ever. As mentioned in section 2.1.1, the *Antwerp Port Authority* invested in transition projects to obtain a circular low-carbon economy, like investing in onshore power supplies for seagoing ships and promoting alternative sustainable fuels such as LNG and hydrogen.

The top 10 companies in terms of investment in the port of Antwerp are listed in table 2.7 and account for 54.2% of all direct investment in the port.

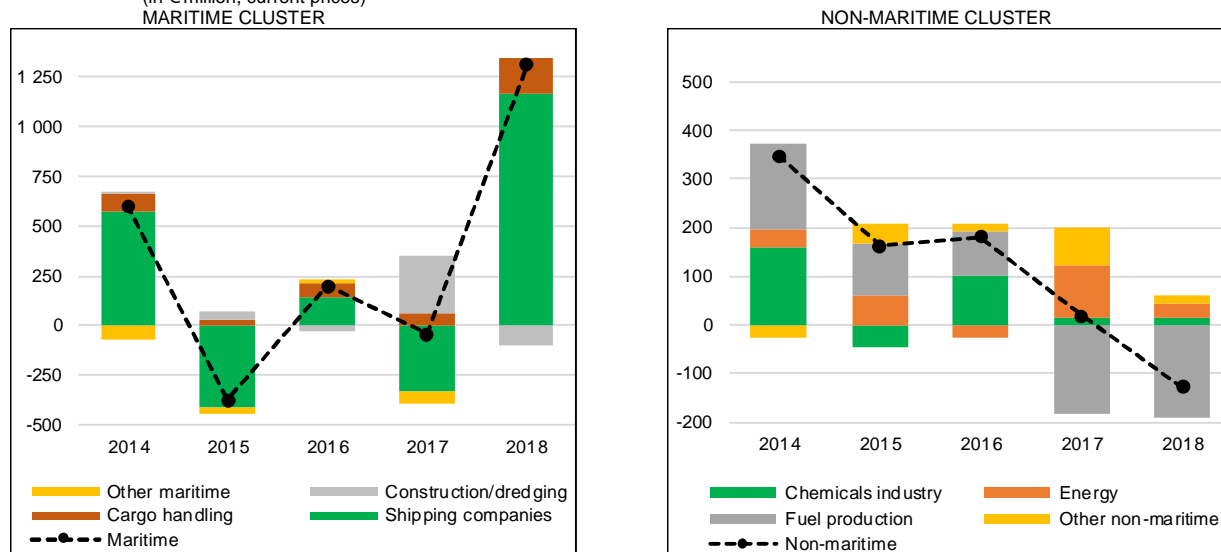
---

<sup>22</sup> LPG stands for Liquefied Petroleum Gas.

<sup>23</sup> ARA stands for Amsterdam-Rotterdam-Antwerp.

**FIGURE 2.3 CHANGE IN INVESTMENT AT THE PORT OF ANTWERP**

(in € million, current prices)



Source: NBB.

**TABLE 2.7 TOP 10 INVESTMENT AT THE PORT OF ANTWERP**

Rank	Name	Sector
1	Euronav	Shipping companies
2	Electrabel	Energy
3	BASF Antwerpen	Chemicals industry
4	Dredging, Environmental & Marine Engineering	Port construction and dredging
5	Exxonmobil Petroleum & Chemical	Fuel production
6	Bocimar Belgium	Shipping companies
7	Ineos	Chemicals industry
8	Sea-tank 700 B	Cargo handling
9	Antwerp Port Authority	Port authority
10	Total Raffinaderij Antwerpen	Fuel production

Source: NBB.

## 2.2 North Sea Port Flanders

### 2.2.1 Port developments

North Sea Port was founded on 1 January 2018 as result of a merger between the Belgian port of Ghent and the Dutch Zeeland Seaports (Vlissingen and Terneuzen). **North Sea Port is primarily a dry bulk port.** Dry bulk accounts for 48.4% of the transshipment of goods by sea-going vessels in the port. This mainly concerns deliveries of agricultural products, salt, sugar, iron ore, fertilisers, solid fuels, ferrous alloys and building materials (North Sea Port, website).

**TABLE 2.7 MARITIME TRAFFIC AT NORTH SEA PORT FLANDERS**

(in millions of tonnes)								
	2016	2017	2018	2019	Change 2017-18 (%)	Change 2018-19 (%)	Share 2018 (%)	Share 2019 (%)
Containers	0.1	0.1	0.2	0.3	52.2	62.9	0.6	1.1
Roll-on roll-off	2.1	2.4	2.3	2.1	-0.8	-8.6	7.2	6.6
Conventional cargo	3.7	3.6	3.8	3.6	4.7	-4.5	11.6	11.1
Liquid bulk	5.4	5.3	5.4	6.2	1.6	13.6	16.6	19.0
Dry bulk	17.7	21.1	20.8	20.2	-1.1	-3.0	64.0	62.3
<b>Total</b>	<b>29.1</b>	<b>32.5</b>	<b>32.6</b>	<b>32.5</b>	<b>0.2</b>	<b>-0.4</b>		

Source: Mora Mobiliteitsraad "De Vlaamse havens – Feiten, statistieken en indicatoren voor 2018", port authorities.

Table 2.8, noting the figures for the port of Ghent (North Sea Port Flanders) alone, seem to confirm that **North Sea Port Flanders is the principal Flemish port for dry bulk, with 20.2 million tonnes in 2019.** Liquid bulk and conventional cargo traffic is also important in the port of Ghent, with a respective share of 19% and 11.1%. In 2018, a limited relapse is visible for dry bulk and RoRo traffic (-1.1% and -0.8% respectively) and in 2019 for the transshipment of dry bulk, RoRo and conventional cargo (-3%, -8.6% and -4.5% respectively). RoRo traffic includes Volvo cars transported between Ghent and Göteborg.

As in previous years, the principal infrastructure project for North Sea Port Flanders in 2018 was **the construction of the new lock in Terneuzen on Dutch territory.** The new lock will be operational in 2022. It has to ensure that North Sea Port is not affected by the scaling-up in shipping and has to expand the capacity to accommodate growing shipping traffic at the lock complex in Terneuzen. In addition, the new lock will make the port of Ghent accessible for sea-going vessels up to 366 metres long, 49 metres wide and 15 metres deep.

Within North Sea Port Flanders, the **very first all-weather terminal** is being built in line with the loading dock of the ArcelorMittal steel plant. While high-quality steel can now only be loaded in dry weather, due to the all-weather terminal handling of this cargo will be possible in all weather conditions.

Steel producer ArcelorMittal, cargo handling company Euroports, North Sea Port and the Flemish investment company (PMV) joined forces to carry out this project. It concerns an investment of €50 million and will be owned by AWT<sup>24</sup> Gent NV. ArcelorMittal Gent is not involved financially, but it has concluded a long-term agreement for the use of the terminal and will pay according to the volumes handled. North Sea Port is providing the land that is needed for this in concession. The terminal was expected to be operational by mid-2020. In the 200-metre-long and 25-metre-wide covered dock, sea-going vessels with a capacity of 10 000 tonnes can be loaded and unloaded.

### 2.2.2 Value added

Table 2.9 illustrates the direct and indirect value added<sup>25</sup> at the port of Ghent over the period 2013-2018. Direct value added is broken down into a maritime and a non-maritime cluster, each further subdivided into its contributing sectors. 92% of the value added generated at North Sea Port Flanders comes from

<sup>24</sup> AWT stands for All Weather Terminal.

<sup>25</sup> Table 5.2.1 in annex 5 shows the details on sectoral level, their respective shares and their changes over the years.



the non-maritime sectors, especially in trade (23.6%), metalworking industry (21.4%) and car manufacturing (17.6%). The last column in table 2.9 shows the contribution of each segment to total growth of value added at North Sea Port Flanders over the 2017-2018 period.

**TABLE 2.8 VALUE ADDED AT NORTH SEA PORT FLANDERS**  
(in € million)

	2013	2014	2015	2016	2017	2018	Contribution to growth (%)*
Cargo handling	244.9	247.6	222.9	233.4	252.0	256.8	0.1
Shipping agents and forwarders	31.0	33.0	34.8	34.1	42.0	37.6	-0.1
Port authority	23.4	24.8	23.9	32.2	30.5	30.4	0.0
Other maritime	29.4	32.9	29.7	29.9	30.4	30.3	0.0
<b>Maritime</b>	<b>328.7</b>	<b>338.3</b>	<b>311.3</b>	<b>329.6</b>	<b>354.9</b>	<b>355.1</b>	<b>0.0</b>
Trade	771.6	805.9	822.3	906.6	978.2	1 052.1	1.7
Metalworking industry	529.3	641.0	774.3	835.6	1 056.7	957.0	-2.3
Car manufacturing	735.4	713.5	722.6	711.5	746.4	786.4	0.9
Other non-maritime	1 033.3	1 119.0	1 148.4	1 070.4	1 287.1	1 314.0	0.6
<b>Non-maritime</b>	<b>3 069.6</b>	<b>3 279.4</b>	<b>3 467.6</b>	<b>3 524.1</b>	<b>4 068.4</b>	<b>4 109.5</b>	<b>0.9</b>
Direct	3 398.3	3 617.7	3 778.9	3 853.7	4 423.3	4 464.6	0.9
Indirect	3 697.2	3 903.3	3 457.4	3 444.5	4 170.5	4 026.8	
<b>Total</b>	<b>7 095.5</b>	<b>7 521.0</b>	<b>7 236.3</b>	<b>7 298.2</b>	<b>8 593.8</b>	<b>8 491.4</b>	

Source: NBB.

\* For definition of contribution to growth, see Annex 2.1.

The port of Ghent's value added rose by 0.9% in 2018, thanks to the non-maritime cluster. The **main growth was visible in trade** (contribution of +1.7%), **car manufacturing** (contribution of +0.9%) and **"other industries"** as part of "other non-maritime sectors". Big trading companies such as *Total Belgium* and *Belgian Shell* enjoyed a substantial increase in their value added explained by higher excise duties because of a rise in excise rates. Car manufacturer *Volvo Car Belgium* and heavy goods vehicle manufacturer *Volvo Group Belgium* both recorded higher depreciation and staff costs in their annual accounts for 2018. In the "other industries", the rise in value added was essentially due to *Stora Enso Langerbrugge*, a company that produces recycled newspaper and magazine paper based on waste paper. That company posted a big rise in its value added due to recovery of selling prices of recycled paper and lower purchase prices for waste paper.

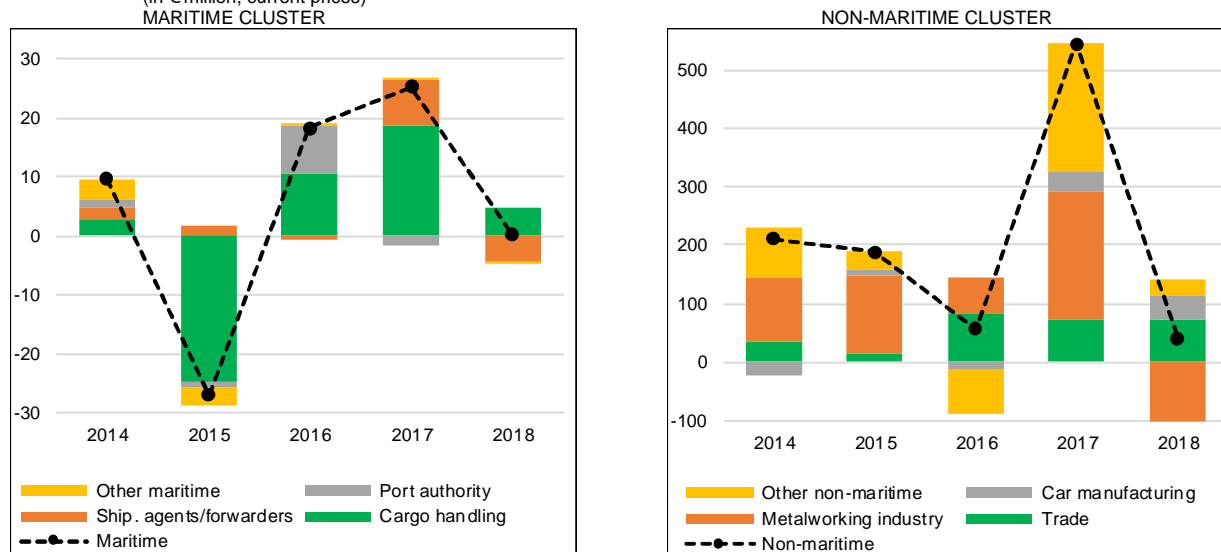
The negative contribution from the metalworking industry (contribution of -2.3%) to total growth in value added in the Port of Ghent in 2018 can mainly be explained by steel company *ArcelorMittal* that suffered lower sales prices for its steel owing to a European surplus, while *ArcelorMittal's* automobile and industrial customers cut back on their orders.

The fall in indirect value added is largely attributable to the metalworking industrial companies, generating less indirect value added.

The ten biggest companies in terms of value added, mentioned in table 2.10, represent almost two-thirds of the direct value added created at North Sea Port Flanders in 2018. The total amount of direct value added created at North Sea Port Flanders in 2018 accounted for 1% of Belgian GDP or 1.7% of the Flemish Region's GDP in 2018. Total value added (including indirect effects as well) accounted for 1.8% of Belgian GDP.

**FIGURE 2.4 CHANGE IN VALUE ADDED AT NORTH SEA PORT FLANDERS**

(in € million, current prices)



Source: NBB.

**TABLE 2.9 TOP 10 VALUE ADDED AT NORTH SEA PORT FLANDERS**

Rank	Name	Sector
1	ArcelorMittal Belgium	Metalworking industry
2	Total Belgium	Trade
3	Volvo Car Belgium	Car manufacturing
4	Volvo Group Belgium	Car manufacturing
5	Belgian Shell	Trade
6	Stora Enso Langerbrugge	Other industries
7	Taminco	Chemicals industry
8	Cri Catalyst Company Belgium	Chemicals industry
9	Kronos Europe	Chemicals industry
10	BP Europa SE	Fuel production

Source: NBB.

### 2.2.3 Employment

Direct employment<sup>26</sup> at North Sea Port Flanders grew by 301 extra jobs in 2018 (+1.1%). Table 2.11 illustrates that the rise is visible in both, the maritime and non-maritime cluster.

Most of the employment at North Sea Port Flanders is generated in the non-maritime cluster (89% in 2018). One third of the jobs came from the car manufacturing and one fifth of the metalworking industry.

**The contribution to the total rise in direct employment was the largest in the maritime cluster, namely in the cargo handling (0.7% in 2018).** In the non-maritime segments, **car manufacturing, construction and the chemicals industry** made a contribution to total growth as well, of respectively 0.5%, 0.4% and 0.2%. Truck manufacturer *Volvo Group Belgium* was able to create more than 250 extra jobs in the geographical zone of port of Ghent.

<sup>26</sup> Table 5.2.2 in annex 5 shows detailed employment figures at the port of Gent, together with the respective shares of the branches and their change over time.

In the non-maritime cluster, the metalworking industry suffered mainly on account of the lower number of orders received by the steel producer *ArcelorMittal Belgium*, which translated into a decline in the jobs.

**TABLE 2.10 EMPLOYMENT AT NORTH SEA PORT FLANDERS**  
(in FTE)

	2013	2014	2015	2016	2017	2018	Contribution to growth (%)*
Cargo handling	2 361	2 407	1 870	2 057	2 097	2 282	0.7
Shipping agents and forwarders	338	360	354	359	416	413	0.0
Public sector	242	235	228	211	214	196	-0.1
Other maritime	240	221	210	206	196	190	0.0
<b>Maritime</b>	<b>3 181</b>	<b>3 223</b>	<b>2 661</b>	<b>2 833</b>	<b>2 923</b>	<b>3 081</b>	<b>0.6</b>
Car manufacturing	9 033	9 088	9 546	9 389	9 357	9 505	0.5
Metalworking industry	5 836	6 057	6 018	6 152	6 030	5 819	-0.7
Chemicals industry	2 109	2 102	2 109	2 145	2 176	2 241	0.2
Other non-maritime	7 381	7 759	7 331	7 472	7 918	8 059	0.5
<b>Non-maritime</b>	<b>24 358</b>	<b>25 006</b>	<b>25 004</b>	<b>25 158</b>	<b>25 481</b>	<b>25 624</b>	<b>0.5</b>
<b>Total</b>	<b>27 539</b>	<b>28 229</b>	<b>27 665</b>	<b>27 990</b>	<b>28 404</b>	<b>28 705</b>	<b>1.1</b>
Direct	27 539	28 229	27 665	27 990	28 404	28 705	1.1
Indirect	34 970	35 362	31 322	32 070	34 189	34 984	
<b>Total</b>	<b>62 509</b>	<b>63 591</b>	<b>58 986</b>	<b>60 061</b>	<b>62 592</b>	<b>63 688</b>	

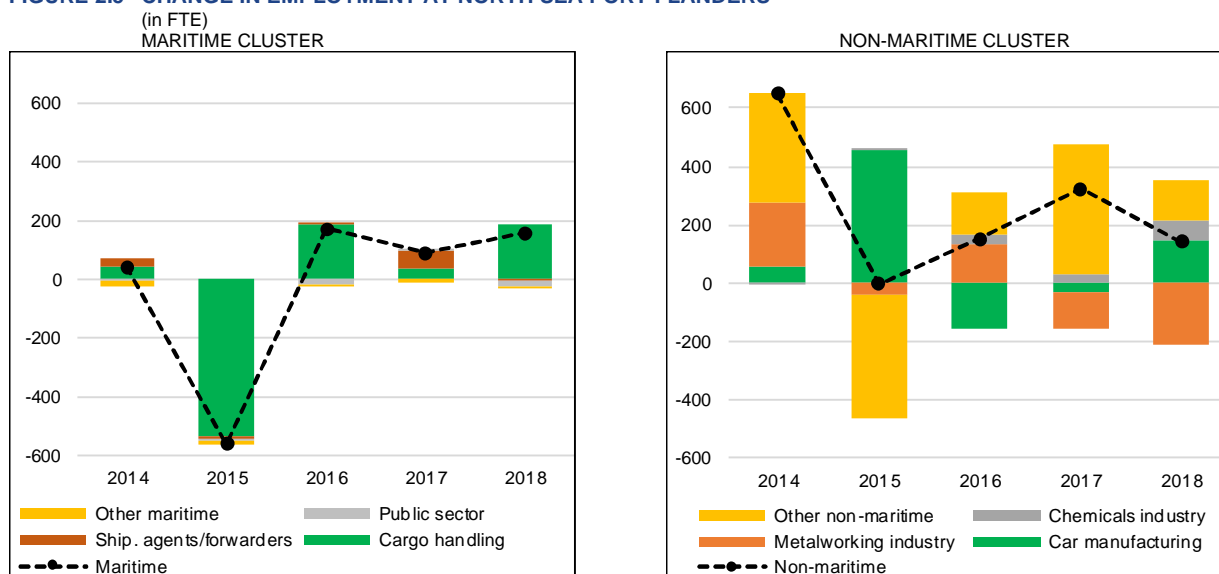
Source: NBB.

\* For definition of contribution to growth, see Annex 2.1.

Indirect employment at North Sea Port Flanders was up. Car manufacturing and cargo handling are the main branches generating extra jobs in the supplier sectors.

The top 10 companies in terms of employment account for 57% of total direct employment at North Sea Port Flanders in 2018. Total direct employment represented 1.2% of the employment in the Flemish Region and 0.7% of Belgian domestic employment. Total employment, including indirect jobs, accounted for 1.5% of Belgian domestic employment.

**FIGURE 2.5 CHANGE IN EMPLOYMENT AT NORTH SEA PORT FLANDERS**



Source: NBB.

**TABLE 2.11 TOP 10 EMPLOYMENT AT NORTH SEA PORT FLANDERS**

Rank	Name	Sector
1	Volvo Car Belgium	Car manufacturing
2	ArcelorMittal Belgium	Metalworking industry
3	Volvo Group Belgium	Car manufacturing
4	Denys	Construction
5	Centrale Betaalkassen Der Gentse Centrale Der Zee- En Binnenvaartwerkgevers	Cargo handling
6	Honda Motor Europe Logistics	Trade
7	Ghent Handling And Distribution	Cargo handling
8	Taminco	Chemicals industry
9	Stora Enso Langerbrugge	Other industries
10	Oleon	Chemicals industry

Source: NBB.

## 2.2.4 Investment

Table 2.13 gives an overview of the investment volumes at the port of Ghent<sup>27</sup> over the 2013-2018 period. Investment is broken down into a maritime and a non-maritime cluster, each further sub-divided into its contribution branches.

**TABLE 2.12 INVESTMENT AT NORTH SEA PORT FLANDERS**  
(in € million)

	2013	2014	2015	2016	2017	2018	Contribution to growth (%)*
Cargo handling	81.5	48.9	45.4	90.4	142.2	72.0	-9.7
Port authority	6.4	6.6	8.5	8.6	11.7	17.7	0.8
Shipping companies	1.3	1.0	0.2	0.7	2.2	4.1	0.3
Other maritime	13.1	5.4	12.9	22.8	11.9	4.8	-1.0
Maritime	102.2	61.8	66.9	122.6	167.9	98.6	-9.6
Car manufacturing	34.1	50.6	53.4	116.0	191.5	120.6	-9.9
Chemicals industry	56.6	70.3	52.4	54.3	70.1	109.3	5.5
Metalworking industry	67.9	75.2	84.2	122.1	159.3	73.1	-12.0
Other non-maritime	175.5	156.2	126.4	127.0	131.0	153.1	3.1
Non-maritime	334.0	352.3	316.5	419.4	551.9	456.1	-13.3
Direct	436.2	414.1	383.4	541.9	719.8	554.6	-22.9

Source: NBB.

\* For definition of contribution to growth, see Annex 2.1.

Note: The pattern of investment is closely linked to projects and is therefore highly volatile, so that figures require a nuanced interpretation.

82% of all investment at North Sea Port Flanders in 2018 went into the non-maritime cluster, especially in the car manufacturing (22%), chemicals (one-fifth) and metalworking industry (13%). Investment in the maritime cluster was mainly driven by cargo handling.

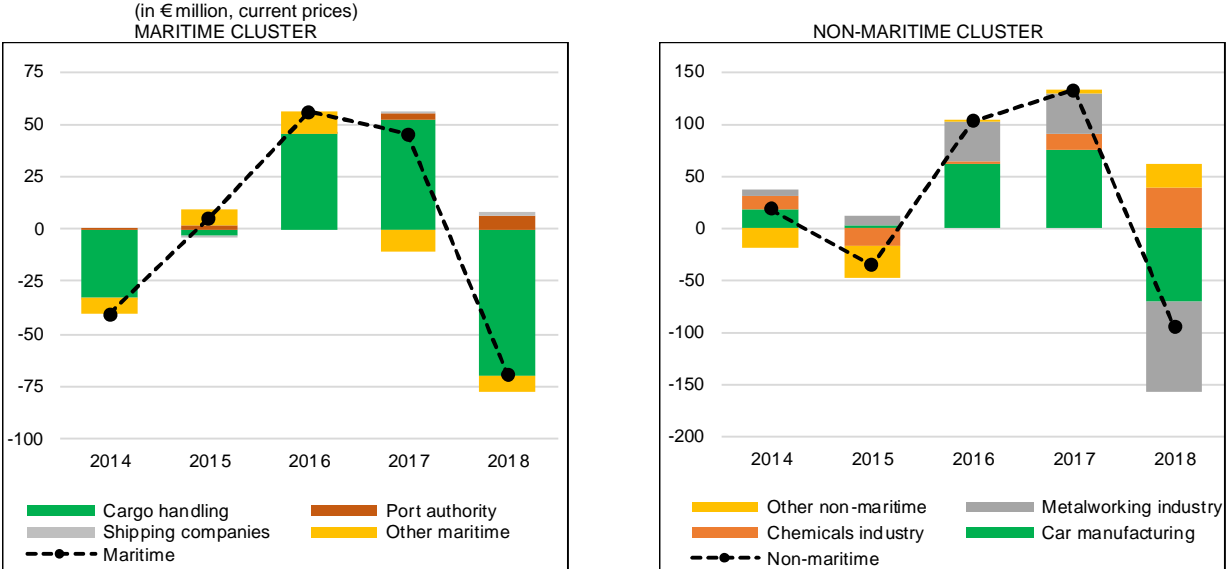
**After a high figure in 2017 (€720 million), investment bounced back to the same level as two years before. Investment at North Sea Port Flanders declined by 23%, to settle at €555 million in 2018.** The last column in table 2.13 shows the contribution of each component to the total decline in investment in the 2017-2018 period. Both the maritime and non-maritime cluster made contributions to the overall fall. **The sectors contributing the most to the total decline in investment in 2018 were the metalworking industry, car manufacturing and cargo handling.** *ArcelorMittal* invested a huge amount in 2017 in a new furnace for its galvanising line, while *Volvo Cars Belgium* invested in a new CMA

<sup>27</sup> Table 5.2.3 in Annex 5 shows investment at the port of Ghent in detail, together with the respective shares of the component economic sectors and their changes over the years.

automobile platform in 2017. Both firms' investment volumes returned to earlier levels in 2018. Several cargo-handling companies invested particularly heavily in 2017 as well, which they reverted to more normal levels in 2018.

The top 10 companies in terms of investment are listed in table 2.14 and together represent 47% of total investment at North Sea Port Flanders in 2018. *ArcelorMittal* invested in a new unloading crane to equip for the new sea lock in Terneuzen and the larger ships that will be able to reach its quay. *Sadaci*, one of the Chilean Molymet group's production site, invested in its internal development process for the production of high-purity molybdenum oxide, which is used in high-tech applications in chemicals and electronics. *Ghent port authority* invested in the first all-weather terminal at the loading dock of steel plan ArcelorMittal, as mentioned in section 2.2.1.

**FIGURE 2.6 CHANGE IN INVESTMENT AT NORTH SEA PORT FLANDERS**



**TABLE 2.13 TOP 10 INVESTMENT AT NORTH SEA PORT FLANDERS**

Rank	Name	Sector
1	Volvo Car Belgium	Car manufacturing
2	ArcelorMittal Belgium	Metalworking industry
3	C-shift	Chemicals industry
4	Sadaci	Chemicals industry
5	Ghent Port Authority	Port authority
6	Tower Automotive Belgium	Car manufacturing
7	Volvo Group Belgium	Car manufacturing
8	Taminco	Chemicals industry
9	Oiltanking Ghent	Cargo handling
10	Honda Motor Europe Logistics	Trade

Source: NBB.

## 2.3 Port of Zeebrugge

### 2.3.1 Port developments

In 2018, total transshipment at the port of Zeebrugge came to 40.1 million tonnes (+8% on 2017). The main driver for this rise was the **increase in liquid bulk traffic**: up from 4.1 to 6.7 million tonnes (+63%) due to LNG volumes that increased to 3.5 million tonnes. LNG deliveries from Sabetta (Yamal LNG project in Russia) started in 2018 while also the volume of LNG from Qatar rose again after a few years of decrease.

**Roll-on roll-off traffic grew** by 6.4% to a volume of almost 16 million tonnes in 2018. Within the RoRo segment, the volume of new cars handled reached 2.8 million, the same result as in 2017, still confirming Zeebrugge's leading position as the world's largest port for motor vehicles. RoRo traffic grew on the following destinations: UK (+5.7%), Ireland (+16.8%) and Spain (+21.4%). The rise in traffic to and from Spain may be explained by Cobelfret's new sea link to Santander, on the one hand, and Finnlines' scaling-up of ships on the Bilbao route, on the other hand. Deepsea RoRo traffic rose as well (+10%).

The volume of container, conventional cargo and dry bulk traffic declined slightly. (Maatschappij van de Brugse Zeehaven, 2019).

**TABLE 2.14 MARITIME TRAFFIC AT THE PORT OF ZEEBRUGGE**

(in millions of tonnes)								
	2016	2017	2018	2019	Change 2017-18 (%)	Change 2018-19 (%)	Share 2018 (%)	Share 2019 (%)
Containers	14.4	15.4	15.2	16.2	-1.3	7.0	37.8	35.5
Roll-on roll-off	14.4	15.0	15.9	16.5	6.4	3.7	39.7	36
Conventional cargo	1.5	1.3	1.0	0.9	-21.8	-13.6	2.6	2
Liquid bulk	6.0	4.1	6.7	10.8	63	60.8	16.8	23.7
Dry bulk	1.5	1.3	1.2	1.3	-6.1	7.7	3.1	2.9
<b>Total</b>	<b>37.8</b>	<b>37.1</b>	<b>40.1</b>	<b>45.8</b>	<b>8.0</b>	<b>14.2</b>		

Source: Mora Mobiliteitsraad "De Vlaamse havens – Feiten, statistieken en indicatoren voor 2018", port authorities.

In 2019, the port of Zeebrugge handled a total volume of 45.8 million tonnes. This 14.2% rise is the result of **growth in all important cargo types**: Roll-on roll-off (+3.7%), containers (+7%) and liquid bulk (+60.8%), the latter being due to a duplication of LNG volumes. The volume of breakbulk contracted.

Within the RoRo segment (16.5 million tonnes in 2019), 2.96 million new cars were handled, an increase of 4.6% compared to 2018. After one year of little change, 2019 was a new year of growth for the automotive sector in Zeebrugge. As a result, deepsea RoRo rose by 13.9%. Thanks to positive results on Cobelfret's Santander link and the scaling-up of Finnlines connection to Bilbao, short-sea RoRo traffic improved on destinations in Ireland (+6.3%) and Spain (+153%). On the other hand, volumes of RoRo cargo dropped on connections with Scandinavia (-2.7%) and the UK (-2.5%). The latter can be partly explained by a shift of cargo to Irish destinations.

The number of cruise ship calls in the Port of Zeebrugge rose slightly, 6 more than in 2018: totalling 149 calls in 2019.

In 2009, Zeebrugge had three container terminals, which handled more than 2.5 million containers per year at their peak. The economic crisis and consolidation trend in shipping in the following years, forced shipping companies to cut their costs. Today, only the CSP Zeebrugge (Cosco<sup>28</sup> Shipping Ports Zeebrugge) container terminal remains, good for 400 000 containers. In 2018, 37% of the container terminal's available capacity was used.

**The Chinese want to develop Zeebrugge into a strategic hub in their Silk Route.** So, Cosco is investing in raising cranes and is seeking to boost the capacity of the terminal from 1.2 to 2 million containers.

<sup>28</sup> Cosco is a billion-dollar company with headquarters in Beijing, China. It is one of the largest shipping groups in the world and is controlled by the Chinese government.

Cosco is having a suction effect in Zeebrugge. Lingang, a real estate company owned by the city state of Shanghai, decided in 2018 to invest €85 million in Zeebrugge to develop logistic infrastructure in the inner port of Zeebrugge. A 30-hectare logistics zone in the inner port that will be operational by the end of 2020 is an asset for companies that want to distribute the contents of their containers in Europe from Zeebrugge. In such a way, loads can be anchored in Zeebrugge. The revival of containers will be beneficial for many sectors in and around the port.

Many agree that a second access to the inner port is necessary as a back-up to the Pierre Vandamme lock, but also to expand the capacity of the harbour. **The Belgian Official Gazette published on 1 October 2019 the preferential decision of the Flemish government of 28 June 2019 for the old Vissart lock as a location for a new second sea lock in Zeebrugge.** A legal period of 60 days followed to lodge an appeal with the Council of State for annulment of the preferential decision. Multiple objections were submitted. The Council of State is expected to make a ruling by the beginning of 2021.

Even after Brexit, the port of Zeebrugge will remain the bridgehead for freight traffic to and from the United Kingdom with over 17 million tonnes of goods passing through this trade route every year. So, in 2019, the port authority set up the **RX/SeaPort data platform** that provides a digital connection between all stakeholders in logistics. Via this platform, they can connect to the Belgian customs authorities for import and export.

In addition, Colruyt and gas network operator Fluxys are planning to produce hydrogen from wind energy in Zeebrugge. The **Hyoffwind project** will be carried out by the Fluxys, Eoly and Parkwind consortium. Depending on when the necessary permits are obtained, construction of the hydrogen plant may start in mid-2021 and be operational by the beginning of 2023.

### 2.3.2 Value added

Table 2.16 displays direct and indirect value added<sup>29</sup> at the port of Zeebrugge over the period 2013-2018.

**TABLE 2.15 VALUE ADDED AT THE PORT OF ZEEBRUGGE**  
(in € million)

	2013	2014	2015	2016	2017	2018	Contribution to growth (%)*
Cargo handling	194.7	205.4	219.1	249.2	250.5	251.4	0.1
Public sector	109.9	107.1	103.3	103.1	103.0	102.3	-0.1
Shipping agents and forwarders	69.8	68.9	84.8	67.1	69.3	65.6	-0.4
Other maritime	159.1	160.0	172.8	173.0	178.4	177.1	-0.1
Maritime	533.5	541.4	580.0	592.4	601.2	596.4	-0.5
Trade	88.1	85.7	87.2	88.9	88.4	98.9	1.0
Energy	92.5	98.4	91.3	89.6	93.8	91.5	-0.2
Road transport	57.5	47.7	45.6	50.1	59.5	62.9	0.3
Other non-maritime	217.1	181.6	178.9	192.2	207.2	192.5	-1.4
Non-maritime	455.2	413.4	403.0	420.8	448.9	445.8	-0.3
Direct	988.7	954.8	983.0	1 013.2	1 050.1	1 042.2	-0.8
Indirect	813.2	781.6	685.2	719.4	771.6	763.6	
Total	1 801.9	1 736.4	1 668.2	1 732.6	1 821.7	1 805.8	

Source: NBB.

\* For definition of contribution to growth, see Annex 2.1

The total amount of **direct value added in the port of Zeebrugge** in 2018 was **mainly** generated in the **maritime cluster (57%)**: cargo handling accounted for almost a quarter of value added and the public

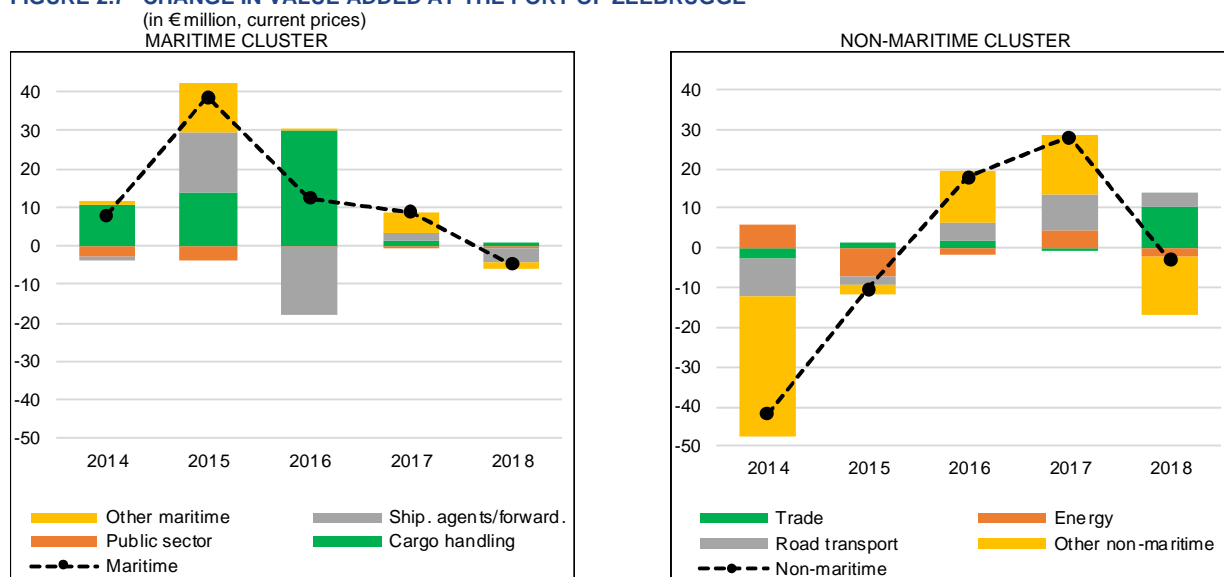
<sup>29</sup> Table 5.3.1 in Annex 5 reveals the details of the component economic sectors, their shares and changes over the years.

sector<sup>30</sup>, as the second biggest branch, represented 10%. In the non-maritime cluster, the two biggest branches were the trade and energy sector which were responsible for respectively 9.5% and 9% of direct value added in Zeebrugge.

**Direct value added** in the port of Zeebrugge **fell by -0.8% in 2018** to € 1 042.2 million. The last column in table 2.16 shows the contribution of each branch to the total decline over the 2017-2018 period. The **biggest negative contribution** is visible in **maritime branches**. **Shipping agents and forwarders** delivered an important contribution of -0.4% to the total decline, due to higher traction costs and high volatility of fuel prices. Considering the details at branch level, table 5.3.1 in Annex 5 shows more specifics. The **port construction and dredging** appears to be the biggest contributor to the total decline in direct value added (contribution of -0.7%), since that branch suffered the disadvantage of turnover only being recorded by construction companies on the basis of provisional acceptance of works. This decline was **partly countered by growing value added at the port authority** thanks to a rise in turnover because of higher port dues and more income from concessions and the use of port equipment.

**Value added in the non-maritime cluster in 2018 fell as well**, more precisely in the other non-maritime branches (contribution of -1.4%). Explanatory segments are **chemicals** and **other industries**, contributing respectively -0.5 and -0.7%. Both segments saw lower value added since some companies earned high other operating revenues<sup>31</sup> in 2017 that did not appear in 2018. The trade and road transport branches in the non-maritime cluster grew, contributing respectively 1% and 0.3% to total evolution in 2018, which helped to counter the fall in value added overall. While several large trading companies enjoyed a favourable trend, a highly loss-making trading firm closed down in 2018. Various large stakeholders in the road transport posted growth in value added terms in 2018.

**FIGURE 2.7 CHANGE IN VALUE ADDED AT THE PORT OF ZEEBRUGGE**



Source: NBB.

The top 10 companies in terms of value added are listed in table 2.17. All together, they account for 49% of direct value added generated in the port of Zeebrugge.

The fall in indirect value added is larger than the decrease in direct value added, due largely to “port construction and dredging” and “food industry”, two branches whose multiplier is higher than those of other sectors, implying that their decline in direct value added resulted in an even larger fall in indirect value added.

<sup>30</sup> The public sector consists mainly of the general government and Belgian Navy.

<sup>31</sup> An example of “other operating revenues” is compensation from insurance companies for fire damage.



Direct value added represented 0.4% of the Flemish Region's GDP and 0.2% of Belgian GDP. Total value added (including indirect effects) accounted for 0.4% of Belgian GDP.

**TABLE 2.16 TOP 10 VALUE ADDED AT THE PORT OF ZEEBRUGGE**

Rank	Name	Sector
1	Centrale der werkgevers Zeebrugge	Cargo handling
2	Belgian Navy	Public sector
3	Fluxys LNG	Energy
4	Zeebrugge Port Authority	Port authority
5	Cobelfret Ferries	Shipping companies
6	Public sector	Public sector
7	Fluxys Belgium	Energy
8	P.B.I. Fruit Juice Company	Food industry
9	International Car Operators	Cargo handling
10	Marine Harvest Pieters	Fishing and fish industry

Source: NBB.

### 2.3.3 Employment

Table 2.18 shows direct and indirect employment<sup>32</sup> at the port of Zeebrugge over the 2013-2018 period. In 2018, the maritime cluster employed two-thirds of the workforce at the port of Zeebrugge, and the non-maritime cluster one-third. The cargo handling branch is the biggest provider of employment with a share of 32% in 2018. The public sector followed in second place with 14%, tracked by trade (8%) and road transport (7%).

**TABLE 2.17 EMPLOYMENT AT THE PORT OF ZEEBRUGGE**  
(in FTE)

	2013	2014	2015	2016	2017	2018	Contribution to growth (%)*
Cargo handling	2 588	2 630	2 711	2 887	3 042	3 186	1.5
Public sector	1 600	1 563	1 478	1 443	1 399	1 357	-0.4
Shipping agents and forwarders	652	658	653	637	643	685	0.4
Other maritime	1 168	1 242	1 173	1 153	1 182	1 132	-0.5
<b>Maritime</b>	<b>6 007</b>	<b>6 092</b>	<b>6 015</b>	<b>6 120</b>	<b>6 267</b>	<b>6 360</b>	<b>1.0</b>
Trade	816	803	847	872	825	839	0.1
Road transport	806	662	581	670	683	726	0.4
Other industries	399	447	418	398	415	401	-0.2
Other non-maritime	1 721	1 449	1 484	1 569	1 577	1 585	0.1
<b>Non-maritime</b>	<b>3 742</b>	<b>3 361</b>	<b>3 330</b>	<b>3 509</b>	<b>3 500</b>	<b>3 550</b>	<b>0.5</b>
<b>Direct</b>	<b>9 749</b>	<b>9 453</b>	<b>9 345</b>	<b>9 630</b>	<b>9 767</b>	<b>9 910</b>	<b>1.5</b>
<b>Indirect</b>	<b>10 126</b>	<b>9 875</b>	<b>8 755</b>	<b>9 099</b>	<b>9 563</b>	<b>9 898</b>	
<b>Total</b>	<b>19 875</b>	<b>19 328</b>	<b>18 100</b>	<b>18 729</b>	<b>19 331</b>	<b>19 809</b>	

Source: NBB.

\* For definition of contribution to growth, see Annex 2.1.

The last column in table 2.18 illustrates the contribution of each branch to total growth in direct employment over 2017-2018. **Direct employment grew by 1.5%** to 9 910 FTE in 2018, with an increase in both the maritime (contribution of 1%) and non-maritime cluster (contribution of 0.5%). The **largest contribution** came from **cargo handling** (contribution of 1.5 %), reflecting more recruitments of dockers

<sup>32</sup> An overview of the employment figures for the component economic sectors at the port of Zeebrugge is given in table 5.3.2 in Annex 5.

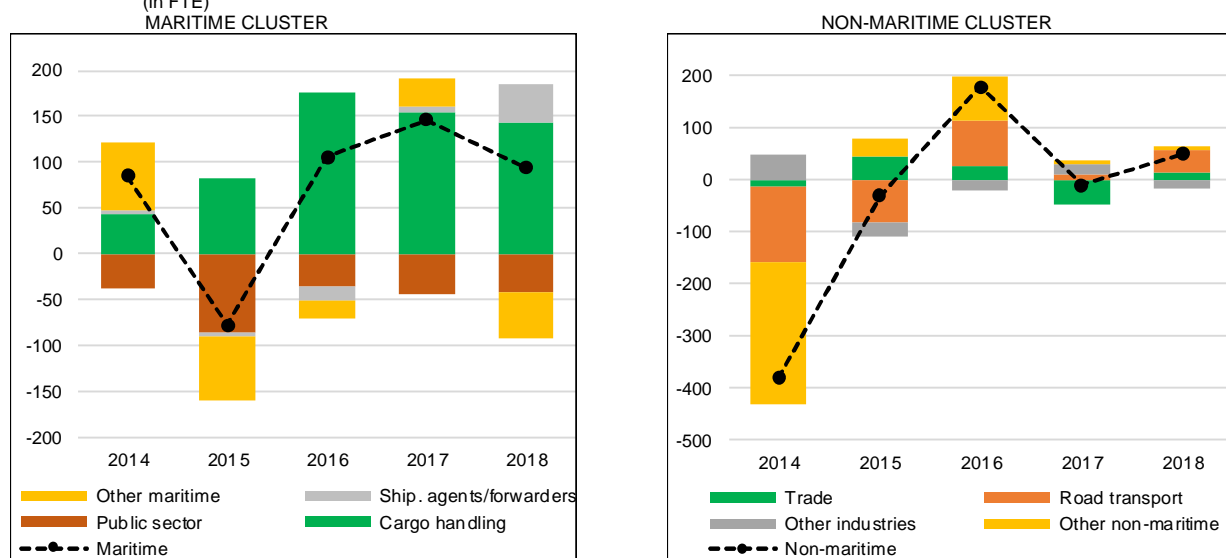
by the employers' organisation *Centrale der Werkgevers Zeebrugge* due to the growth in the maritime traffic at the port of Zeebrugge. General cargo-handling agent *ICO (International Cargo Operator)* saw an increase in volumes handled in 2018 and consequently recruited additional staff as well. **Shipping agents and forwarders** also enjoyed growth in their employment in 2018 (contribution of 0.4% to total growth) due to some mergers in the sector. In the maritime cluster, the public sector recorded a fall in employment owing to fewer jobs in the *Belgian Navy*. In the non-maritime segments, the **road transport and trade sector** both contributed positively to total direct employment growth with respective contributions of 0.4% and 0.1%. Employment in the road transport segment gained from the rise in demand.

Mergers, restructuring, business relocations, failures and the creation of new companies have an impact on the changes in jobs in a given branch. The top 10 companies in terms of employment, listed in table 2.19 represent more than half of the staff working at the port of Zeebrugge.

The increase in the number of indirect jobs in the port of Zeebrugge was driven by the growth in direct employment. The main driving force was the cargo handling segment, backed up by road transport and shipping agents and forwarders.

Direct employment accounted for 0.4% of the employment in the Flemish Region and 0.2% of Belgian domestic employment. Total employment, including indirect jobs, accounted for 0.5% of Belgian domestic employment.

**FIGURE 2.8 CHANGE IN EMPLOYMENT AT THE PORT OF ZEEBRUGGE**  
(in FTE)



Source: NBB.

**TABLE 2.18 TOP 10 EMPLOYMENT AT THE PORT OF ZEEBRUGGE**

Rank	Name	Sector
1	Centrale der werkgevers Zeebrugge	Cargo handling
2	Belgian Navy	Public sector
3	Public sector	Public sector
4	P.B.I. Fruit Juice Company	Food industry
5	Marine Harvest Pieters	Fishing and fish industry
6	Artes Depret	Port construction and dredging
7	Wallenius Wilhelmsen Logistics Zeebrugge	Cargo handling
8	I.V.B.O.	Other industries
9	International Car Operators	Cargo handling
10	ECS European Containers	Shipping agents and forwarders

Source: NBB.

### 2.3.4 Investment

Table 2.20 notes the investment<sup>33</sup> levels at the port of Zeebrugge over the 2013-2018 period. Between 2017 and 2018, **investment shrank by 20.2%**, from €303 million to €242 million.

**TABLE 2.19 INVESTMENT AT THE PORT OF ZEEBRUGGE**

(in € million)	2013	2014	2015	2016	2017	2018	Contribution to growth (%)*
Cargo handling	16.8	50.7	28.1	43.2	59.3	33.8	-8.4
Port authority	28.3	22.0	13.4	24.2	22.7	26.1	1.1
Fishing and fish industry	7.7	8.8	13.8	6.2	8.1	10.7	0.9
Other maritime	23.9	32.6	30.4	48.3	61.4	18.2	-14.3
Maritime	76.8	114.1	85.7	122.0	151.6	88.8	-20.7
Energy	44.0	31.7	85.0	105.5	65.0	59.7	-1.7
Other land transport	16.5	10.4	20.5	21.9	22.3	27.7	1.8
Road transport	12.0	10.8	16.6	35.6	18.0	14.5	-1.1
Other non-maritime	48.0	36.8	35.1	30.4	46.3	51.0	1.5
Non-maritime	120.5	89.7	157.3	193.4	151.5	152.9	0.5
Direct	197.3	203.8	243.0	315.4	303.1	241.7	-20.2

Source: NBB.

\* For definition of contribution to growth, see Annex 2.1.

Note: The pattern of investment is closely linked to projects and is therefore highly volatile, so that figures require a nuanced interpretation.

While the maritime and non-maritime cluster each contributed to about half of the investment at the port of Zeebrugge in 2017, a different share is visible in 2018: 63% came from non-maritime, 37% from the maritime cluster.

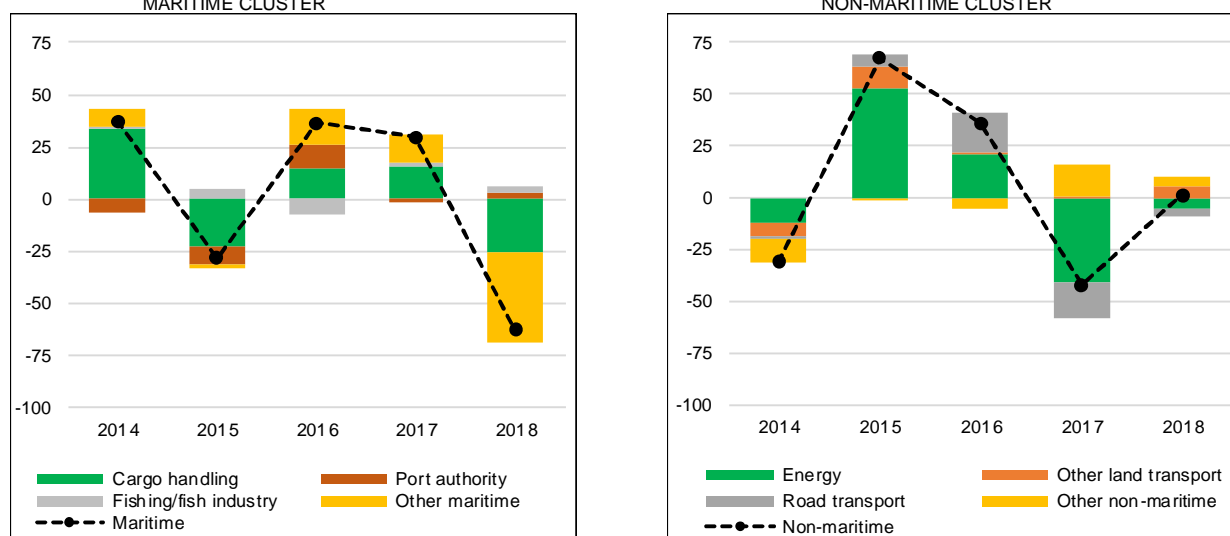
The last column in table 2.20 shows the contribution of each component to total investment growth in the 2017-2018 period. **Investment in the maritime cluster contributed negatively by -20.7%**, while conversely, investment in the non-maritime cluster contributed positively by +0.5% to total investment change in 2018. The declining investment in the maritime cluster was due to the **lower investment volumes in cargo handling** (negative contribution of -8.4%) and in other maritime sectors (negative contribution of -14.3%), although both these sectors made significant investment in the previous year. *C.Ro Ports Zeebrugge*, a cargo handling company known for the handling of various cargo types,

<sup>33</sup> More details, together with the respective shares of the component economic sectors and their changes over the years, are shown in table 5.3.3 in Annex 5.

invested heavily in 2017 by expanding its RoRo terminal to the Albert II dock in order to better handle the vessels operating there. In 2018, that investment was still ongoing for the further expansion of the terminal, although the amount invested returned to a lower level. *International Car Operators* expanded its car terminal in 2017 as well, making it possible to handle 16 vessels simultaneously. Its investment focus is now on creating a 'green' terminal via solar panels, windmills, clean electricity, cold ironing, etc. The falling investment in the other maritime sectors refers to **lower investment in the public sector and in the shipping companies** (see table 5.3.3 in Annex 5). In 2017, the Flemish Region made the necessary investment in the Pierre Vandamme lock, the Britannia and Allbert II dock. Some of these investment projects continued into 2018 but investment on that scale was not repeated. The shipping company *Cobelfret Ferries* invested a huge amount in a RoRo freight ferry in 2017, which explains the return of sums invested by shipping companies to a more normal level in 2018.

**The slow investment growth in the non-maritime cluster is explained by expanding investment in “other land transport” (contribution of +1.8%) and “other non-maritime sectors” (contribution of +1.5%), partly countered by reducing investment volumes in the energy and road transport sector (contributions of respectively -1.7% and -1.1%).** The increasing investment in “other land transport” was due to extra investment by the *Belgian National Railway Company*, while the rise in “other-non maritime sectors” was due to investment in **food and other industries**. The former is explained by additional investment by *P.B.I. Fruit Juice Company* in a new PET line for new markets and investment in elevated platforms next to the unloading quays to avoid the use of ladders when handling tankers of fresh fruit juice, and the latter because of extra investment by *I.V.B.O.* (Intergemeentelijk samenwerkingsverband voor Vuilverwijdering en -verwerking in Brugge en Ommeland). The energy and road transport sector acknowledge lower investment amounts in 2018 compared to 2017. In energy, *Fluxys LNG* still invested in a fifth storage tank and a loading station for lorries, among other things. The decline in investment in road transport services is due to various reductions rather than a single cut.

**FIGURE 2.9 CHANGE IN INVESTMENT AT THE PORT OF ZEEBRUGGE**  
(in € million, current prices)



Source: NBB.

The top 10 companies in terms of investment are listed in table 2.21 and represent 62% of all investments done in the port of Zeebrugge in 2018. The *Zeebrugge port Authority* invested in the construction of quay walls and dredging works for the RoRo and car sector, the design of the cruise terminal in the ABC Tower and the purchase of land. *Wallerienius Wilhelmsen Logistics Zeebrugge* invested in a duplication of its terminal footprint with a new concession for the 49-hectare Bastenaken West, located in the inner port.

**TABLE 2.20 TOP 10 INVESTMENT AT THE PORT OF ZEEBRUGGE**

Rank	Name	Sector
1	Fluxys LNG	Energy
2	Zeebrugge Port Authority	Port authority
3	BNRC Group	Other land transport
4	P.B.I. Fruit Juice Company	Food industry
5	I.V.B.O.	Other industries
6	International Car Operators	Cargo handling
7	Wallenius Wilhelmsen Logistics Zeebrugge	Cargo handling
8	Artes Depret	Port construction and dredging
9	C.RO Ports Zeebrugge	Cargo handling
10	Umicore Specialty Materials Brugge	Chemicals industry

Source: NBB.

## 2.4 Port of Ostend

### 2.4.1 Port developments

**In 2018, transshipment expanded by 9.8%**, to a total of 1.5 million tonnes. That is mainly due to the increase in the volume of dry bulk (deliveries of sand and gravel from the sea for the construction industry). **In 2019**, the port of Ostend handled 1.589 million tonnes, **an increase of 4%** compared to 2018. Growth took place in all cargo components, ranging from ore to gravel and sand to chemicals, agricultural products and clay products. The boom in construction in 2019 is partly responsible for the increase.

In 2019, Ostend welcomed 13 cruises with 3 782 passengers. The port is aiming at smaller cruise ships from the higher market segment.

For a new ferry link, the port waits for clarity in the Brexit story. As long as there is uncertainty, it is difficult to get interested parties to invest in it. (Port of Ostend, 2020).

**TABLE 2.21 MARITIME TRAFFIC AT THE PORT OF OSTEND**  
(in millions of tonnes)

	2016	2017	2018	2019	Change 2017-18 (%)	Change 2018-19 (%)
Total	1.5	1.4	1.5	1.6	9.8	4.0

Source: Mora Mobiliteitsraad "De Vlaamse havens – Feiten, statistieken en indicatoren voor 2018", port authorities.

**The port of Ostend wants to expand further as a “blue energy port”**, a port that offers all kinds of services to offshore wind farms. In 2010, the port authority attracted external capital to expand the port into a logistics offshore wind hub in the southern part of the North Sea. Together with PMV, DEME and Artes Group, the port authority had set up a new entity called REBO (Renewable Offshore Base Oostende). Since then, REBO<sup>34</sup> has acted as a logistics developer that invests in and rents out infrastructure (heavy-duty quay, quay walls, office buildings, etc.) on Ostend port sites. The REBO terminal has grown sufficiently in ten years to no longer need the initial investors' resources. For this reason, the port authority bought all the shares held by PMV, DEME and Artes Group in REBO in October 2019. As the sole shareholder in REBO, the port authority now wishes to maximise efforts to promote the growth of business activities at this terminal. In combination with a broadening of the activity radius, such as the circular economy or the further expansion of chemicals in the inner port in the Plassendale project, this strategy is designed to enforce the continuity of the port.

The **modular offshore grid (MOG)** was built from the port of Ostend. To get this platform up and running, Elia set up business on the REBO site.

In addition, hydraulic engineering group DEME, financier PMV and Ostend Port Authority are **planning to build the first European large hydrogen factory, Hyport**, to use offshore wind power by 2025. The main sales market for Hyport will be hydrogen as transport fuel.

In its search for innovative activities, the Ostend Port Authority has granted a concession on the ex-Beliard site to ECA Robotics Belgium which will build a 5 000-square-metre drone factory that will be operational at the beginning of 2022.

<sup>34</sup> REBO is the entity that manages the large offshore platform in the outer port from which the installation of wind farms in the Belgian part of the North Sea is carried out.

## 2.4.2 Value added

Table 2.23 reports direct and indirect value added<sup>35</sup> at the port of Ostend over the 2013-2018 period. In 2018, the non-maritime cluster generated more than two-thirds (69%) of value added. The metalworking industry was the biggest provider of value added with 35%. The maritime cluster, generating 30% of value added, is nevertheless very important, which the public sector (public administration and Belgian Navy) and the port construction and dredging segment respectively producing 11% and 8% of direct value added.

**TABLE 2.22 VALUE ADDED AT THE PORT OF OSTEND**  
(in € million)

	2013	2014	2015	2016	2017	2018	Contribution to growth (%)*
Public sector	49.9	51.7	56.0	58.0	59.0	61.1	0.4
Port construction and dredging	59.4	57.6	70.5	57.1	42.6	47.8	1.0
Fishing and fish industry	37.2	39.8	38.7	40.6	43.5	37.8	-1.1
Other maritime	24.0	23.3	23.6	22.9	23.5	27.0	0.6
Maritime	170.5	172.4	188.8	178.6	168.6	173.7	0.9
Metalworking industry	161.5	169.6	168.3	164.6	190.6	199.3	1.6
Chemicals industry	38.3	36.7	34.2	38.4	36.6	38.6	0.4
Construction	33.1	31.7	33.9	30.8	39.2	35.0	-0.8
Other non-maritime	84.9	89.0	107.5	114.5	107.1	121.7	2.7
Non-maritime	317.8	327.0	343.9	348.3	373.5	394.6	3.9
Direct	488.3	499.4	532.7	526.9	542.1	568.3	4.8
Indirect	395.7	385.0	387.6	367.2	380.2	395.4	
Total	884.0	884.4	920.3	894.1	922.3	963.7	

Source: NBB.

\* For definition of contribution to growth, see Annex 2.1.

Between 2017 and 2018, **direct value added grew by 4.8%** to €568 million, the highest amount ever. The last column in table 2.23 gives the contribution of each component to total growth in value added between 2017 and 2018. As the share of the non-maritime cluster is twice as large as the maritime cluster's, **the biggest positive contribution is visible in the non-maritime cluster (with a contribution of 3.9%)**. Explanatory segments are the metalworking industry and the "other non-maritime branches", contributing respectively 1.6% and 2.7%. The first is due to an increase in turnover with a positive impact on the operating result and value added at *Daikin Europe*. The second comes from a positive contribution by other logistic services, other industries and energy, which added respectively 1.4%, 0.8% and 0.5% to total growth. The rising value added in other logistic services was mainly explained by maintenance companies for offshore windfarms that generated more value added as more offshore windfarms became operational. Recycling industry companies becoming slowly profitable explained the growing added value in the "other industries". The rise in value added generated by the energy sector was due to extra turnover by *Biostoom* and *Biopower Oostende*.

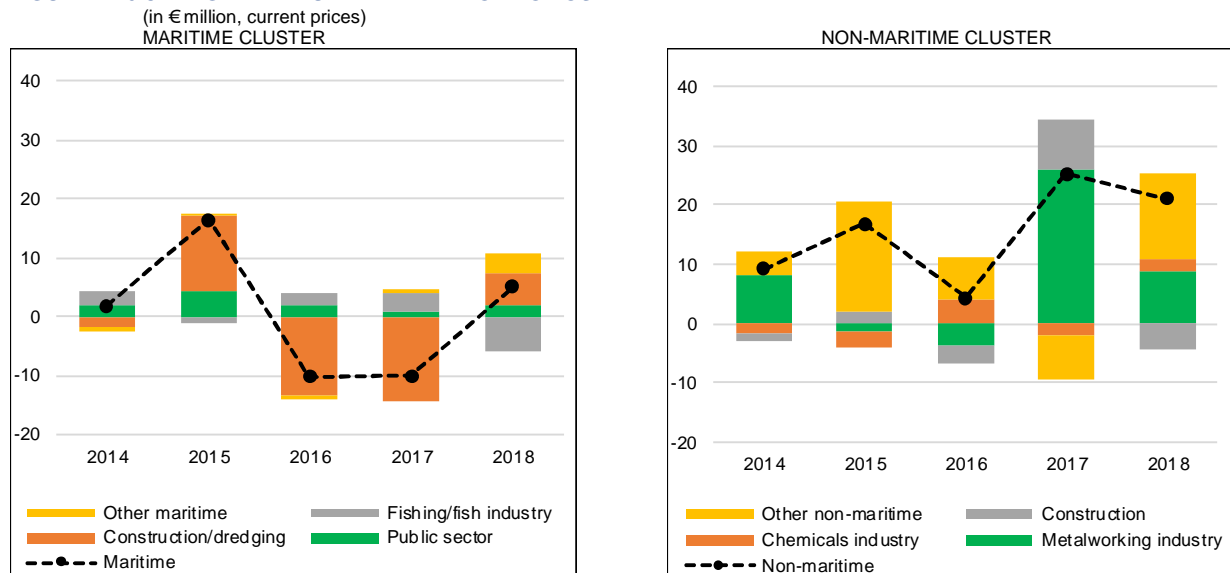
The **positive contribution from the maritime cluster (0.9%) is more modest**, resulting from a positive part of the public sector (0.4%) and a positive input (1%) from the port construction and dredging sector. The latter was due to extra value added generated by the dredging projects of *Baggerwerken Decloedt & Zoon*.

The top 10 companies in terms of value added are listed in table 2.24. Together, they account for 64% of direct value added generated in the port of Ostend in 2018.

<sup>35</sup> Table 5.4.1 in Annex 5 reveals the details of the component economic sectors, their shares and changes over the years.

The indirect value added was up by 4% and the rise was attributable primarily to the increased indirect value added generated by construction and dredging, other logistic services and metalworking industry. Direct value added represented 0.2% of the Flemish Region's GDP and 0.1% of Belgian GDP. Total value added, including indirect effects, accounted for 0.2% of Belgian GDP.

**FIGURE 2.10 CHANGE IN VALUE ADDED AT PORT OF OSTEND**



**TABLE 2.23 TOP 10 VALUE ADDED AT THE PORT OF OSTEND**

Rank	Name	Sector
1	Daikin Europe	Metalworking industry
2	Baggerwerken Decloedt & Zoon	Port construction and dredging
3	Public sector	Public sector
4	Proviron Functional Chemicals	Chemicals industry
5	Verhelst Aannemingen	Construction
6	Biostoom Oostende	Energy
7	Aquafin Nv	Other industries
8	Marine Harvest Pieters	Fishing and fish industry
9	Fides Petfood	Food industry
10	Flanders Marine Institute	Public sector

Source: NBB.

### 2.4.3 Employment

Table 2.25 shows direct and indirect employment<sup>36</sup> at the port of Ostend over the 2013-2018 period. The non-maritime cluster employed two-thirds of the workforce at the port of Ostend, and the maritime cluster one-third. The metalworking industry was the biggest provider of employment with 30%. The public sector (public administration and Belgian Navy) followed in second place with 15%, tracked by the fishing and fish industry (8.5%), the road transport (8%), the construction (8%) and port construction and dredging sector (6.5%).

The last column in table 2.25 notes the contribution of each branch to total direct employment growth over 2017-2018. **Direct employment grew by 1.9% to 5 071 FTE in 2018**, with an increase in both the

<sup>36</sup> An overview of the employment figures for the component economic sectors is given in table 5.4.2 in Annex 5.



non-maritime (contribution of 1.7%) and maritime clusters (contribution of 0.2%). The **biggest contribution came from the metalworking industry (contribution of 1.2%)**, reflecting more recruitments of workers by *Daikin Europe*. The other non-maritime sector made a positive contribution (1.1%) to total employment growth as well, explained by the **job growth in other logistic services** due to additional hires by maintenance companies for offshore wind farms, such as for example *Otary RS* and *Mhi Vestas Offshore Wind Belgium*. In the maritime segments, the **fishing and fish industry contributed positively (0.1%)** to total direct employment growth. *Revi Food*, processor of local fish to fresh and frozen food, expanded its workforce. In 2019, the company even received Flemish and European support for expansion due to its focus on local fish and sustainable fish processing.

Employment in the road transport sector went down by 11 FTE, partially due to the development of one group's activity. The New Zealand group, *Mainfreighth*, transferred part of its cross-dock operations from Ostend to Ghent, in order to save 1.5 million surplus kilometres annually. A bigger full-year effect will be visible in the 2019 figures for employment.

**TABLE 2.24 EMPLOYMENT AT THE PORT OF OSTEND**  
(in FTE)

	2013	2014	2015	2016	2017	2018	Contribution to growth (%)*
Public sector	726	740	772	786	770	764	-0.1
Fishing and fish industry	413	409	422	413	424	431	0.1
Port construction and dredging	426	381	364	345	332	328	-0.1
Other maritime	329	344	312	305	298	312	0.3
Maritime	1 894	1 875	1 869	1 849	1 824	1 835	0.2
Metalworking industry	1 391	1 450	1 431	1 388	1 446	1 505	1.2
Construction	439	413	421	432	439	420	-0.4
Road transport	418	406	419	417	416	405	-0.2
Other non-maritime	903	915	980	946	851	905	1.1
Non-maritime	3 152	3 184	3 251	3 183	3 150	3 236	1.7
Direct	5 046	5 058	5 121	5 032	4 975	5 071	1.9
Indirect	4 399	4 309	4 268	4 071	4 130	4 184	
Total	9 445	9 367	9 388	9 103	9 105	9 255	

Source: NBB.

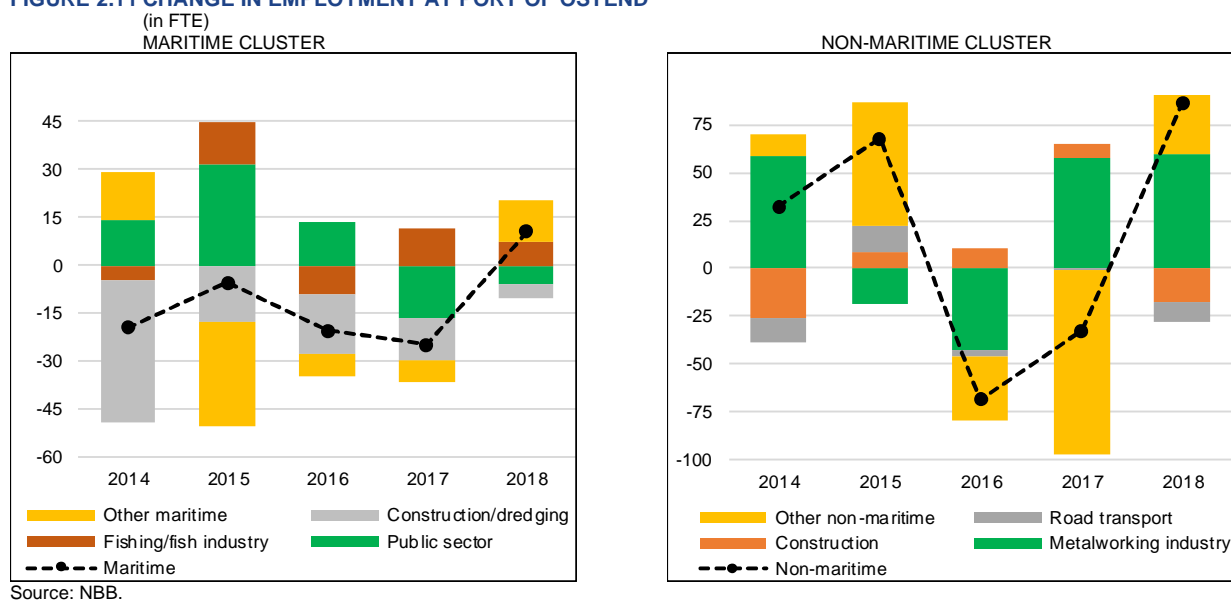
\* For definition of contribution to growth, see Annex 2.1.

The top 10 companies in terms of employment, shown in table 2.26 represent 64% of the workforce at the port of Ostend.

Indirect employment at Port of Ostend has expanded. The metalworking industry, together with "other logistic services" were the main branches generating extra jobs in the supplier sectors.

Direct employment represented 0.2% of the employment in the Flemish Region and 0.1% of Belgian domestic employment. Total employment, including indirect job creation, accounted for 0.2% of Belgian domestic employment.

**FIGURE 2.11 CHANGE IN EMPLOYMENT AT PORT OF OSTEND**



**TABLE 2.25 TOP 10 EMPLOYMENT AT THE PORT OF OSTEND**

Rank	Name	Sector
1	Daikin Europe	Metalworking industry
2	Public sector	Public sector
3	Baggerwerken Decloedt & Zoon	Port construction and dredging
4	Verhelst Aannemingen	Construction
5	Proviron Functional Chemicals	Chemicals industry
6	Mainfreight Logistic Services Belgium	Road transport
7	Algemene Ondernemingen Soetaert	Construction
8	Clemaco Contracting	Shipbuilding and repair
9	Belgian Navy	Public sector
10	Morubel	Fishing and fish industry

Source: NBB.

#### 2.4.4 Investment

Table 2.27 reports the amounts invested<sup>37</sup> at the port of Ostend over the 2013-2018 period. Investment is broken down into a maritime and non-maritime cluster, each further sub-divided into its contribution branches.

In 2018, the public sector invested the most in the port of Ostend, accounting for one-fourth of the invested amounts. The metalworking industry, whose investment in the port of Ostend almost doubled, was ranked second with a share of 16%. Other major investors were the construction, chemicals and other industries, fishing and fish industry and other logistic services.

**TABLE 2.26 INVESTMENT AT THE PORT OF OSTEND**  
(in € million)

	2013	2014	2015	2016	2017	2018	Contribution to growth (%)*
Public sector	12.0	13.9	13.8	23.8	5.4	32.6	32.2
Fishing and fish industry	5.8	4.0	4.3	4.1	11.1	9.5	-1.9
Shipping agents and forwarders	1.9	0.6	2.5	3.8	0.4	1.5	1.3
Other maritime	5.1	52.0	1.6	2.1	5.2	3.7	-1.8
Maritime	24.8	70.5	22.2	33.8	22.1	47.3	29.8
Metalworking industry	15.6	11.2	12.5	8.7	11.2	21.4	12.1
Construction	9.4	13.6	10.6	21.2	15.1	20.1	5.9
Other industries	1.2	1.4	18.8	14.5	10.7	12.6	2.2
Other non-maritime	25.2	22.8	16.6	15.9	25.4	28.7	3.9
Non-maritime	51.4	49.0	58.5	60.3	62.4	82.8	24.1
Direct	76.2	119.5	80.7	94.1	84.5	130.1	53.9

Source: NBB.

\* For definition of contribution to growth, see Annex 2.1.

Note: The pattern of investment is closely linked to projects and is therefore highly volatile, so that figures require a nuanced interpretation.

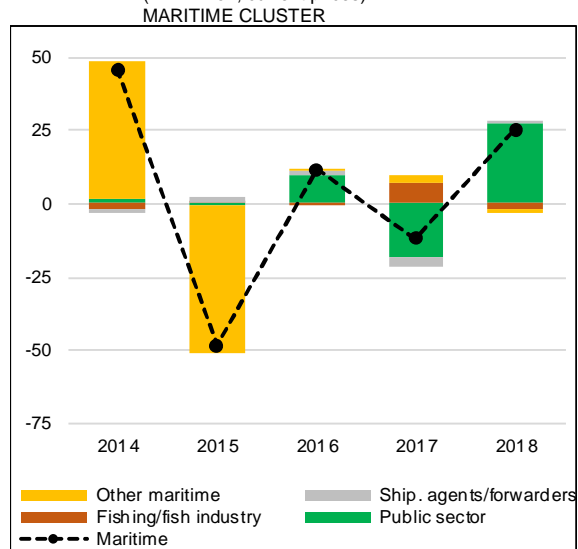
**Direct investment in the port of Ostend grew by 53.9%** from € 84.5 million in 2017 to € 130.1 million in 2018. The maritime and non-maritime cluster each contributed 29.8% and 24.1% respectively (see last column of table 2.27). **The contribution is the biggest by the public sector (part of 32.2% to total investment growth), the metalworking industry (contribution of 12.1%) and construction (contribution of 5.9%).** The high public investment by the Flemish Region in 2018 was used for the projects on widening the port channel at the Halve Maan and restoration of the Westerstaketsel. The latter was necessary since stability was no longer guaranteed. Both projects are part of the coastal defence and maritime accessibility plan for Ostend, also called the public working plan. The metalworking industry almost doubled its investment level in 2018 due to high sums invested in new test chambers and a high-voltage cabin by *Daikin Europe*. The rising investment in construction resulted from additional investment by many construction companies. The other industries sector stepped up its investment by 17.8% in 2018 thanks to higher figures under the heading “assets under construction” for *Aquafin NV* and *I.V.O.O. (Intergemeentelijke Vereniging voor afvalbeheer in Oostende en Ommeland)*.

The top 10 companies in terms of investment are listed in table 2.28, together they reflect 68% of all investment at the port of Ostend in 2018.

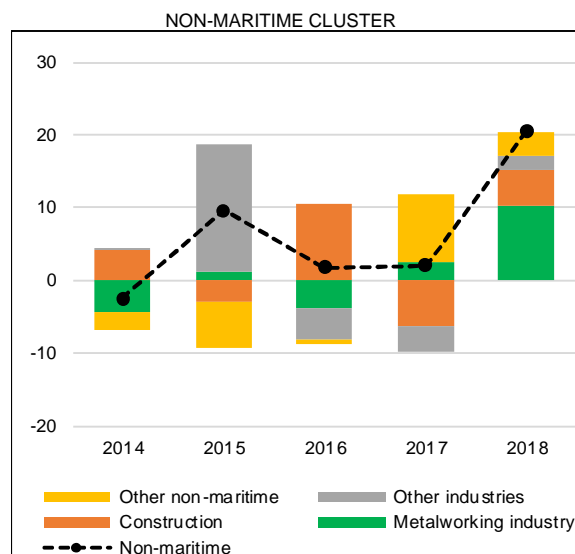
<sup>37</sup> Table 5.4.3 in Annex 5 illustrates investment at the port of Ostend in detail, together with the respective shares of the component economic sectors and their changes over the years.

**FIGURE 2.12 CHANGE IN INVESTMENT AT PORT OF OSTEND**

(in € million, current prices)



Source: NBB.



**TABLE 2.27 TOP 10 INVESTMENT AT THE PORT OF OSTEND**

Rank	Name	Sector
1	Public sector	Public sector
2	Daikin Europe	Metalworking industry
3	Aquafin Nv	Other industries
4	Algemene Ondernemingen Soetaert	Construction
5	Topan	Construction
6	Proviron Functional Chemicals	Chemicals industry
7	Rederij Jacobus	Fishing and fish industry
8	Verhelst Aannemingen	Construction
9	Verhelst Machines	Metalworking industry
10	Otary Rs	Other logistic services

Source: NBB.

## 2.5 Liège port complex

### 2.5.1 Port developments

**The inland Liège port complex enlarged its volume of freight shipped slightly to 16 million tonnes in 2018**, 0.1% more than in 2017. The container terminals at the port complex handled 85 821 TEU<sup>38</sup> in total, 15% more compared to 2017, mainly due to extra container traffic at the Liège Container Terminal (LCT). In addition to containers, handling of metals (+17%), petroleum products (+5%) and chemicals (+3%) showed moderate to strong growth. Falling volumes were found in wood products (-20%), minerals (-5%), raw materials and waste (-3%) and coal (-2%). (Port autonome de Liège, 2019).

**TABLE 2.28 MARITIME TRAFFIC AT THE LIÈGE PORT COMPLEX**

(in millions of tonnes)						
	2016	2017	2018	2019	Change 2017-18 (%)	Change 2018-19 (%)
Total	15.5	15.9	16.0	15.9	0.1	-0.4

Source: Port authority.

As Belgium's largest inland port, the Liège port complex, experienced **a small decline** in its cargo traffic **to 15.9 million tonnes in 2019**.

Since the end of 2018, the Liège Container Terminal (LCT) and Trilogiport have continued as a joint venture under the name of **DP World Liège**. The **joint venture** is a good deal for both parties, as the LCT terminal in Renory suffered from shortage of space, while DP World, the Trilogiport operator, had a hard time starting up and attracting more volumes on Trilogiport. Tercofin, the owner of LCT, owns other companies as well, including TFC (*Transport Fluvial de Conteneurs*). The latter is responsible for barge transport between LCT and the port of Antwerp and the joint venture also transports Trilogiport's volumes. This cooperative venture offers growth opportunities for both terminals. LCT container volumes have grown by 20% annually over the last few years, while DP World has offered many expansion opportunities and space for logistics. On top of this, container volumes can now be bundled more effectively, which can reduce congestion in seaports.

In the course of 2020, the trimodal terminal DP World Liège will not only extend its existing railway but will also construct a second rail track. In addition, the surface area of the container terminal will be expanded by 25 760 square metres of extra space.

### 2.5.2 Value added

Table 2.30 shows direct and indirect value added<sup>39</sup> at the Liège port complex over the period 2013-2018. In terms of value added, the Liège port complex is mainly non-maritime, this cluster's share was 97.3% in 2018, largely consisting of the metalworking industry (31.7%), chemicals industry (15.6%) and construction (14.1%).

The last column in table 2.30 records the contribution made by each component to total change in value added in 2017-2018. **Direct value added in the Liège port complex fell by 15.1% in 2018. This reduction came from the non-maritime cluster (contribution of -15.2% to total decline)**, while the maritime cluster delivered a positive contribution of 0.1%. Several cargo-handling firms actually enjoyed a rise in their value added figures. Most of the shipping companies recorded no change in their value added. The sectors contributing most to the drop in total value added in 2018 were energy and fuel production, with respectively -15.7% and -0.4% (see table 5.5.1 in Annex 5). **The drop in the energy branch** can be explained by the reduced availability of nuclear power plants in 2018 compared with 2017 because of the outage of several units following works or inspections of the concrete of non-nuclear

<sup>38</sup> TEU stands for Twenty-foot Equivalent Unit which can be used to measure a ship's cargo carrying capacity. The dimensions of one TEU are equal to that of a standard 20 shipping container: 20 feet long, 8 feet tall and 8.6 feet high.

<sup>39</sup> Table 5.5.1 in Annex 5 notes value added for more detailed branches, together with their respective shares and their changes over the years.

secondary buildings and because of various technical interventions within the framework of the extension of the lifespan of the power plants. **The decline in fuel production** was largely due to lower refinery margins.

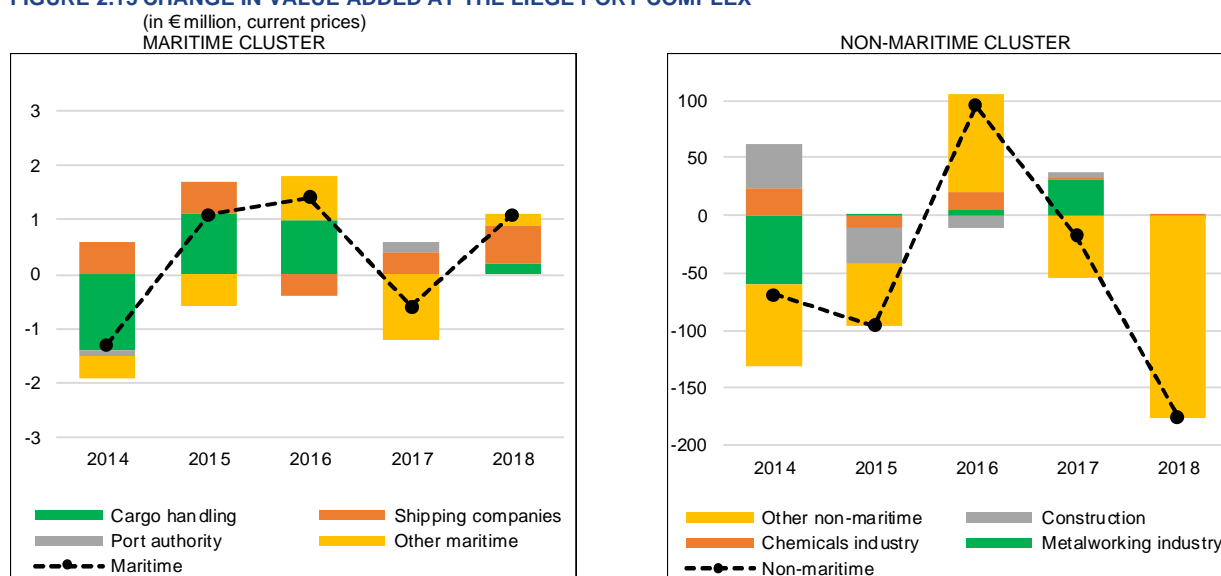
**TABLE 2.29 VALUE ADDED AT THE LIÈGE PORT COMPLEX**  
(in € million)

	2013	2014	2015	2016	2017	2018	Contribution to growth (%)*
Cargo handling	14.5	13.1	14.2	15.2	15.2	15.4	0.0
Shipping companies	3.0	3.6	4.2	3.8	4.2	4.9	0.1
Port authority	2.7	2.6	2.6	2.6	2.8	2.8	0.0
Other maritime	4.6	4.2	3.6	4.4	3.2	3.4	0.0
<b>Maritime</b>	<b>24.8</b>	<b>23.5</b>	<b>24.6</b>	<b>26.0</b>	<b>25.4</b>	<b>26.5</b>	<b>0.1</b>
Metalworking industry	333.5	274.6	275.0	278.9	309.6	309.3	0.0
Chemicals industry	118.7	143.1	132.4	149.4	151.3	152.3	0.1
Construction	137.5	175.8	144.3	133.8	138.3	137.3	-0.1
Other non-maritime	620.9	548.5	494.6	579.7	525.0	350.3	-15.2
<b>Non-maritime</b>	<b>1 210.6</b>	<b>1 142.0</b>	<b>1 046.3</b>	<b>1 141.8</b>	<b>1 124.2</b>	<b>949.2</b>	<b>-15.2</b>
<b>Direct</b>	<b>1 235.4</b>	<b>1 165.5</b>	<b>1 070.9</b>	<b>1 167.8</b>	<b>1 149.6</b>	<b>975.7</b>	<b>-15.1</b>
<b>Indirect</b>	<b>1 310.2</b>	<b>1 145.5</b>	<b>969.0</b>	<b>1 044.7</b>	<b>1 123.8</b>	<b>971.4</b>	
<b>Total</b>	<b>2 545.6</b>	<b>2 311.0</b>	<b>2 039.9</b>	<b>2 212.5</b>	<b>2 273.4</b>	<b>1 947.1</b>	

Source: NBB.

\* For definition of contribution to growth, see Annex 2.1.

**FIGURE 2.13 CHANGE IN VALUE ADDED AT THE LIEGE PORT COMPLEX**



The ten biggest companies in terms of value added<sup>40</sup>, mentioned in table 2.31, accounted for almost 69% of the direct value added created in the Liège port complex in 2018. Steel company *ArcelorMittal* experienced lower sales prices for its steel in 2018 because Europe had been overwhelmed by local steel while the automobile and industrial customers of *ArcelorMittal* cut back their orders. *EDF Luminus* felt the impact of the reduced availability of Electrabel's nuclear power generation units.

<sup>40</sup> Changes in commodity and sales prices can have an impact on changes in value added in a given sector. Other explanations are mergers, restructuring, failures, business relocation and the creation of new companies. Higher depreciations due to bigger investment programmes or the reversal of impairments and provisions in the annual accounts can explain the shifts in value added as well.

Direct value added accounted for 0.2% of Belgian GDP or 0.9% of the GDP in the Walloon Region in 2018. Total value added, including indirect effects, accounted for 0.4% of Belgian GDP. The fall in indirect value added is largely attributable to the companies delivering inputs to the energy sector, fuel production and metalworking industries.

**TABLE 2.30 TOP 10 VALUE ADDED AT THE LIÈGE PORT COMPLEX**

Rank	Name	Sector
1	ArcelorMittal Belgium	Metalworking industry
2	Prayon	Chemicals industry
3	Biowanze	Fuel production
4	Electrabel	Energy
5	Cockerill Maintenance & Ingenierie	Metalworking industry
6	N. et B. Knauf et Cie	Construction
7	Carrières et Fours à Chaux Dumont-Wautier	Construction
8	Total Belgium	Trade
9	Imerys Mineraux Belgique	Chemicals industry
10	Cimenteries CBR Cementbedrijven	Construction

Source: NBB.

### 2.5.3 Employment

Table 2.32 illustrates the (in)direct employment<sup>41</sup> figures at the Liège port complex over the period 2013-2018. In terms of full-time equivalent jobs, the Liège port complex is mainly non-maritime with a stable share of 96% during the period. The biggest employer providers are the metalworking industry (30%), the energy (15%) and chemicals industry (13%).

**TABLE 2.31 EMPLOYMENT AT THE LIÈGE PORT COMPLEX**  
(in FTE)

	2013	2014	2015	2016	2017	2018	Contribution to growth (%)*
Cargo handling	153	153	157	174	185	190	0.1
Shipping companies	51	52	54	55	52	53	0.0
Shipping agents and forwarders	56	47	41	42	44	44	0.0
Other maritime	45	44	43	45	44	43	0.0
Maritime	306	296	294	316	325	331	0.1
Metalworking industry	3 718	2 783	2 440	2 307	2 355	2 376	0.3
Energy	1 246	1 293	1 293	1 251	1 224	1 209	-0.2
Chemicals industry	1 021	996	1 011	1 036	1 032	1 032	0.0
Other non-maritime	2 786	2 924	3 142	2 902	2 970	2 911	-0.7
Non-maritime	8 770	7 996	7 886	7 496	7 581	7 527	-0.7
Direct	9 076	8 292	8 180	7 812	7 905	7 858	-0.6
Indirect	12 966	11 189	10 028	9 718	10 305	10 445	
Total	22 042	19 481	18 208	17 530	18 210	18 303	

Source: NBB.

\* For definition of contribution to growth, see Annex 2.1.

**Direct employment in the Liège port complex fell slightly by 0.6% in 2018, entirely due to the negative contribution of 0.7% by the non-maritime cluster, in turn explained by drops in the energy, construction and food industries, respectively contributing -0.2%, -0.5% and -0.4% to total decline. The decrease in jobs in the energy sector was linked to the fall in the availability of nuclear power**

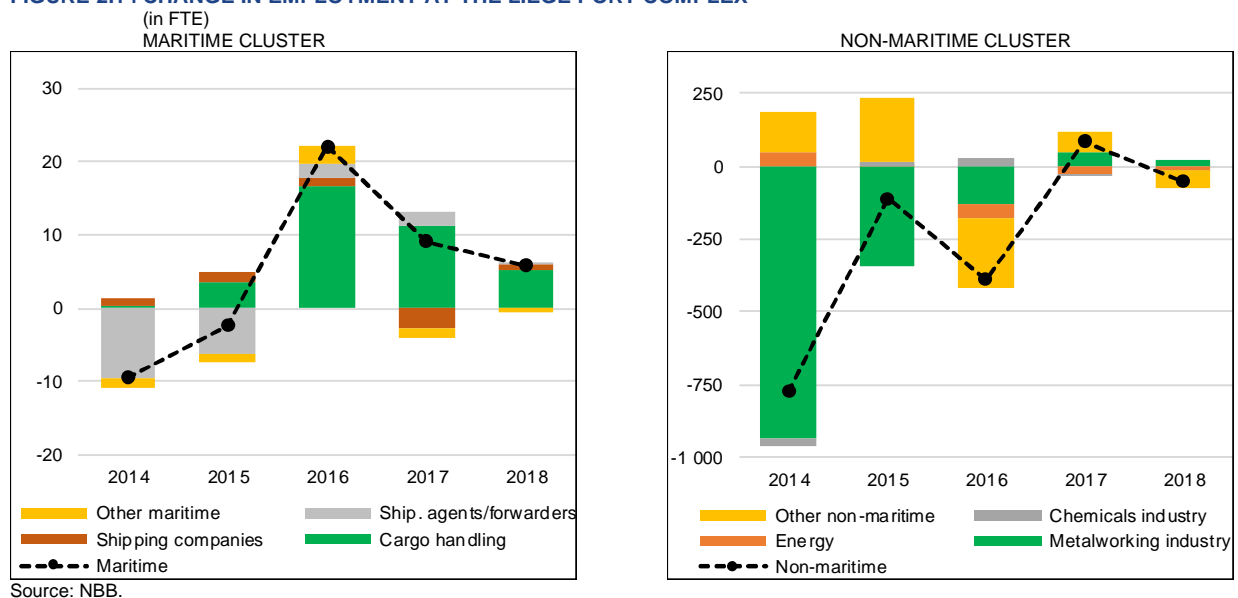
<sup>41</sup> More details for all component economic sectors, together with their shares and changes over time are noted in Annex 5 table 5.5.2.

plants in 2018 relative to 2017. Due to the acquisition of *Beton Baguette Marcel* by *Cimenteries CBR*, a large drop in jobs was visible in construction, due to a restructuring following the acquisition. The decline in the food industry resulted from the reduction of staff in the Liège branch of a big food employer. Employment grew very slowly in the maritime cluster (contribution of +0.1% to total decline), because of additional jobs in the cargo handling branch due to extra container traffic at the Liège Container Terminal.

The ten biggest companies in terms of full-time equivalents, mentioned in table 2.33, represented almost 65% of all full-time equivalents employed directly in the Liège port complex in 2018. Direct employment accounted for 0.2% of Belgian domestic employment or 0.7% of the employment in the Walloon Region in 2018. Total employment, including indirect job-creation, accounted for 0.4% of the Belgian domestic employment.

In contrast to the sharp fall in indirect value added, indirect employment rose slightly in 2018 despite the downward trend in direct employment. This evolution could be explained by the metal working industry who did generate extra indirect jobs due to an increase in its multiplier and a positive direct job creation visible in that branch.

**FIGURE 2.14 CHANGE IN EMPLOYMENT AT THE LIEGE PORT COMPLEX**



**TABLE 2.32 TOP 10 EMPLOYMENT AT THE LIÈGE PORT COMPLEX**

Rank	Name	Sector
1	ArcelorMittal Belgium	Metalworking industry
2	Electrabel	Energy
3	Cockerill Maintenance & Ingenierie	Metalworking industry
4	Prayon	Chemicals industry
5	Association Intercommunale de Traitement des Déchets Liégeois	Other industries
6	N. et B. Knauf et Cie	Construction
7	Cimenteries CBR Cementbedrijven	Construction
8	Carrières et Fours à Chaux Dumont-Wautier	Construction
9	Arjemo	Other logistic services
10	Société Européenne De Galvanisation	Metalworking industry

Source: NBB.



## 2.5.4 Investment

Table 2.34 notes the investment<sup>42</sup> levels at the Liège port complex over the 2013-2018 period. **In 2018, investment shrank by 2.6%** from € 242 million to € 236 million.

**TABLE 2.33 EMPLOYMENT AT THE LIÈGE PORT COMPLEX**  
(in € million)

	2013	2014	2015	2016	2017	2018	Contribution to growth (%)*
Cargo handling	3.4	2.6	3.0	6.9	3.6	4.0	0.2
Public sector	0.0	0.0	3.4	0.3	0.8	1.2	0.2
Shipping agents and forwarders	0.2	2.1	0.6	0.8	0.5	0.8	0.1
Other maritime	0.4	0.5	1.0	0.5	0.9	0.8	0.0
Maritime	4.0	5.2	8.0	8.5	5.8	6.8	0.4
Energy	88.9	79.8	93.4	66.4	63.6	75.2	4.8
Metalworking industry	40.1	30.5	27.3	35.2	55.8	43.5	-5.1
Chemicals industry	21.6	18.4	31.4	31.8	30.2	40.3	4.2
Other non-maritime	60.8	64.5	59.0	54.4	86.8	70.2	-6.9
Non-maritime	211.4	193.2	211.1	187.8	236.4	229.2	-3.0
Direct	215.4	198.4	219.1	196.3	242.2	236.0	-2.6

Source: NBB.

\* For definition of contribution to growth, see Annex 2.1.

Note: The pattern of investment is closely linked to projects and is therefore highly volatile, so figures require a nuanced interpretation.

97% of the investment at the Liège port complex in 2018 came from the non-maritime cluster. The energy sector invested the most, accounting for almost one-third of the sums invested. The metalworking industry was ranked second with a share of 18%. Other important investors were the chemicals industry, other industries and construction.

The last column in table 2.34 shows the contribution of each activity branch to total investment drop in the 2017-2018 period. **Investment in the non-maritime cluster contributed negatively (-3%)**, while conversely, investment in the maritime cluster contributed positively (+0.4%) to the total investment change in 2018. Falling investment in the non-maritime cluster was **due to lower investment amounts in the metalworking industry** (negative contribution of -5.1%) **and in “other non-maritime sectors”** (negative contribution of -6.9%), although both these branches of activity invested heavily in 2017. *Arcelormittal Belgium*, the big steel company, invested large sums in 2017 which returned to lower levels in 2018. The drop in investment in “other non-maritime sectors” **resulted from lower investment levels in other logistic services and in other industries**. The first is explained by much less investment by *D.I. Trilogiport Belgium* than the huge outlay in 2017. *D.I. Trilogiport Belgium* is a subsidiary of Jost Group, which provides transport and logistics services. The second came from investment cuts by two major players in “other industries”.

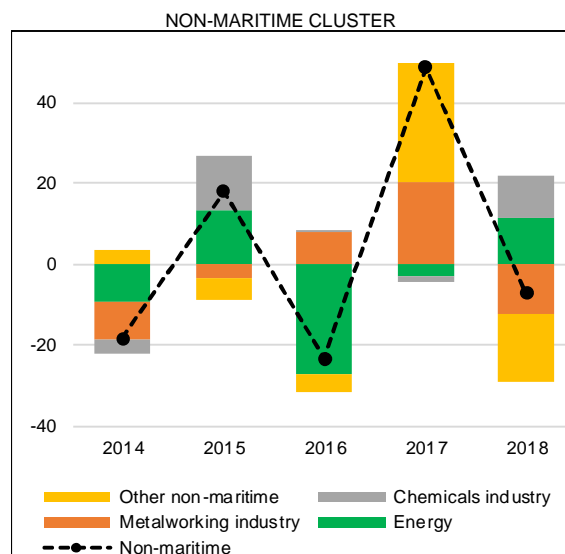
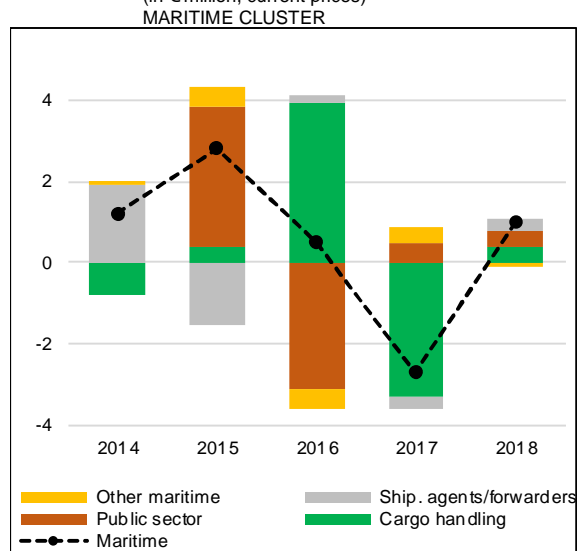
The **limited investment growth in the maritime cluster (contribution of +0.4% to total growth)** is explained by higher investment by cargo handlers and the public sector. The latter refers to infrastructure investment by the Walloon Region, concerning new docks, roads and railways.

The top 10 companies in terms of investment are listed in table 2.35 and accounted for 78% of all investment in the Liège port complex in 2018.

<sup>42</sup> More details, together with the respective shares of the component economic sectors and their changes over the years, are shown in table 5.5.3 in Annex 5.

**FIGURE 2.15 CHANGE IN INVESTMENT AT THE LIÈGE PORT COMPLEX**

(in € million, current prices)



Source: NBB.

**TABLE 2.34 TOP 10 INVESTMENT AT THE LIÈGE PORT COMPLEX**

Rank	Name	Sector
1	Electrabel	Energy
2	Prayon	Chemicals industry
3	Cockerill Maintenance & Ingenierie	Metalworking industry
4	Association Intercommunale de Traitement des Déchets Liégeois	Other industries
5	ArcelorMittal Belgium	Metalworking industry
6	Société Européenne De Galvanisation	Metalworking industry
7	EDF Luminus	Energy
8	Biowanze	Fuel production
9	Cimenteries CBR Cementbedrijven	Construction
10	Recyclage et Valorisation Technique	Other industries

Source: NBB.

## 2.6 Port of Brussels

### 2.6.1 Port developments<sup>43</sup>

The port of Brussels is the second largest Belgian inland port with a surface area of 107 hectares, 14 km of waterways and 200 companies. Since the establishment of the port of Brussels in 1993, more than five million tonnes were handled for the first time **in 2018: maritime traffic grew by 7.7%**. The main categories of cargo handled were building materials and petroleum products, representing respectively slightly more than 60% and 20% of the total volume. Container traffic, as the third largest category, grew by 19% expressed in TEU<sup>44</sup>, setting another new record.

**The record figure of 5.2 million tonnes of maritime traffic in 2018 was maintained in 2019**, which illustrates that companies are increasingly looking at an inland port such as Brussels. The two most important types of cargo are still building materials and petroleum products, the first growing (+2%), the second dropping slightly (-7%) partly due to mild weather conditions in 2019 and drastic changes in the travel habits of Brussels inhabitants. Container traffic secured third place in 2019 with a new all-time high for this type of transport in Brussels (+20%) with nearly 45 000 TEU. The figures justify the expansion projects currently under study for the port of Brussels container terminal. (Port of Brussels, 2019a, 2019b)

The port of Brussels is seeking to promote inland waterway traffic even more, in order to take more off the roads. In addition, it wants to contribute to an ecological transition of the economy and to support companies that are part of that transition, for instance by facilitating the development of the circular economy in Brussels.

**TABLE 2.35 MARITIME TRAFFIC AT THE PORT OF BRUSSELS**

(in millions of tonnes)

	2016	2017	2018	2019	Change 2017-2018 (%)	Change 2018-2019 (%)
Total	4.5	4.8	5.2	5.2	7.7	0.0

Source: Port authority.

### 2.6.2 Value added

Table 2.37 gives direct and indirect value added<sup>45</sup> at the port of Brussels over the period 2013-2018.

**Direct value added at the port of Brussels in 2018 was mainly generated in the non-maritime cluster (98%):** other logistic services accounted for 63% of value added and trade, as the second biggest branch, provided 18%.

**Direct value added in the port of Brussels fell sharply by 5.1% in 2018 to €808.4 million.** The **biggest negative contribution is visible in the “other logistic services”** and “other non-maritime branches”: contributing -2.2% and -2.5% respectively. *Solvay*, the principal player in other logistic services in Brussels, experienced a drop in its other operating income, which resulted in lower value added in 2018. Another smaller logistic service player moved outside the port site at the beginning of 2018.

The fall in the “other non-maritime branches” was mainly explained by a decline **in chemicals and the food industry**: the former as a result of lower operating incomes and higher commodity prices in industrial chemical companies, the latter as an outcome of lower foreign sales revenues for one big food company at the port of Brussels.

<sup>43</sup> Sources: [www.portdebruxelles.be](http://www.portdebruxelles.be).

<sup>44</sup> TEU stands for Twenty foot Equivalent Unit.

<sup>45</sup> Table 5.6.1 in Annex 5 reveals the details of the component economic sectors, their shares and changes over the years.

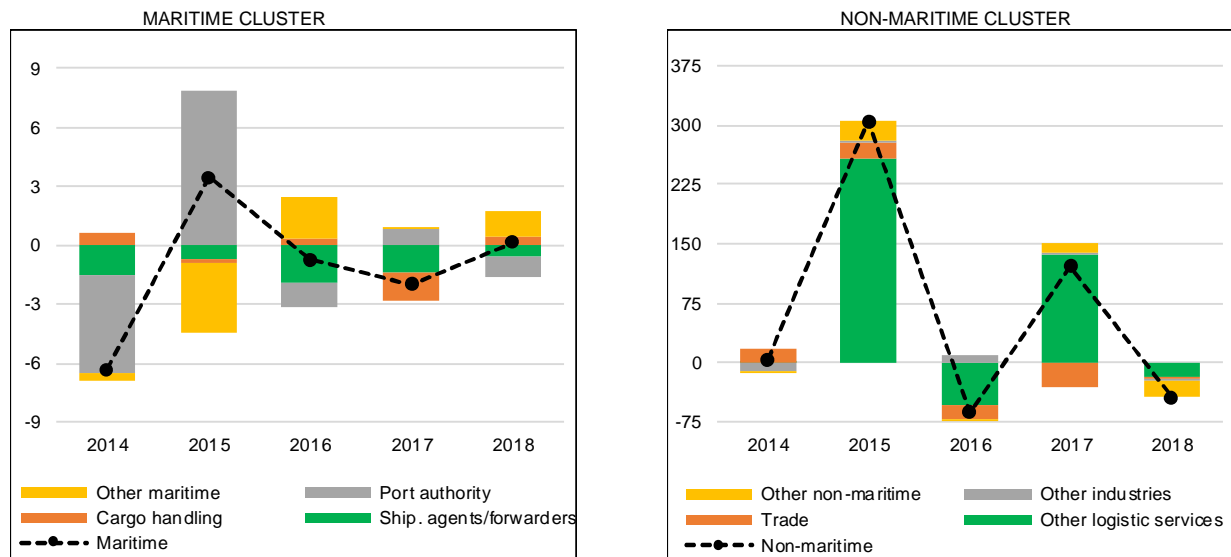
**TABLE 2.36 VALUE ADDED AT THE PORT OF BRUSSELS**  
(in € million)

	2013	2014	2015	2016	2017	2018	Contribution to growth (%)*
Shipping agents and forwarders	14.6	13.2	12.5	10.6	9.2	8.6	-0.1
Cargo handling	5.8	6.4	6.3	6.5	5.0	5.4	0.0
Port authority	3.1	-1.9	6.0	4.7	5.5	4.5	-0.1
Other maritime	1.7	1.3	-2.3	-0.1	-0.1	1.3	0.2
<b>Maritime</b>	<b>25.3</b>	<b>19.0</b>	<b>22.4</b>	<b>21.7</b>	<b>19.7</b>	<b>19.8</b>	<b>0.0</b>
Other logistic services	186.8	187.6	443.8	390.7	525.8	506.7	-2.2
Trade	158.0	173.7	194.2	176.3	146.2	145.4	-0.1
Other industries	56.3	45.3	47.8	57.8	61.7	59.7	-0.2
Other non-maritime	64.0	62.3	88.0	85.7	98.2	76.7	-2.5
<b>Non-maritime</b>	<b>465.0</b>	<b>469.0</b>	<b>773.6</b>	<b>710.4</b>	<b>832.0</b>	<b>788.5</b>	<b>-5.1</b>
<b>Direct</b>	<b>490.4</b>	<b>487.9</b>	<b>796.2</b>	<b>732.2</b>	<b>851.7</b>	<b>808.4</b>	<b>-5.1</b>
<b>Indirect</b>	<b>368.1</b>	<b>354.8</b>	<b>473.4</b>	<b>462.3</b>	<b>508.8</b>	<b>475.3</b>	
<b>Total</b>	<b>858.5</b>	<b>842.7</b>	<b>1 269.6</b>	<b>1 194.5</b>	<b>1 360.5</b>	<b>1 283.7</b>	

Source: NBB.

\* For definition of contribution to growth, see Annex 2.1.

**FIGURE 2.16 CHANGE IN VALUE ADDED AT THE PORT OF BRUSSELS**  
(in € million, current prices)



Source: NBB.

**TABLE 2.37 TOP 10 VALUE ADDED AT THE PORT OF BRUSSELS**

Rank	Name	Sector
1	Solvay	Other logistic services
2	Plastic Omnium Advanced Innovation And Research	Other logistic services
3	Aquiris	Other industries
4	Ineos Services Belgium	Other logistic services
5	Solvay Chemicals International	Trade
6	Bruxelles Energie - Brussel Energie	Other industries
7	Scania Belgium	Trade
8	Solvay Specialty Polymers Belgium	Chemicals industry
9	Total Belgium	Trade
10	Ineos Sales Belgium	Trade

Source: NBB.

The top 10 companies in terms of value added (table 2.38) account for 73% of direct value added generated in port of Brussels.

The decline in indirect value added is attributable to developments in the chemicals industry, the food industry and the other logistic services segment.

Direct value added accounted for 1.0% of the GDP of the Brussels Capital Region and 0.2% of Belgian GDP. Total value added, including indirect effects, accounted for 0.3% of Belgian GDP.

### 2.6.3 Employment

Table 2.39 shows that **direct employment<sup>46</sup> at port of Brussels declined with 86 jobs in 2018 (-2.2%)**. Most of the employment at Brussels' port is created in the non-maritime cluster (92%): one-third in other logistic services and 28% in the trade segment.

**TABLE 2.38 EMPLOYMENT AT THE PORT OF BRUSSELS**  
(in FTE)

	2013	2014	2015	2016	2017	2018	Contribution to growth (%)*
Port authority	123	122	125	123	122	120	-0.1
Shipping agents and forwarders	192	167	172	145	113	118	0.1
Cargo handling	93	99	87	84	51	55	0.1
Other maritime	18	17	18	20	15	10	-0.1
<b>Maritime</b>	<b>426</b>	<b>405</b>	<b>402</b>	<b>372</b>	<b>302</b>	<b>303</b>	<b>0.0</b>
Other logistic services	1 191	1 212	1 216	1 223	1 265	1 241	-0.6
Trade	1 359	1 369	1 369	1 254	1 147	1 093	-1.4
Other industries	328	343	347	364	352	353	0.0
Other non-maritime	876	852	897	855	864	854	-0.3
<b>Non-maritime</b>	<b>3 754</b>	<b>3 777</b>	<b>3 829</b>	<b>3 696</b>	<b>3 628</b>	<b>3 541</b>	<b>-2.2</b>
<b>Direct</b>	<b>4 181</b>	<b>4 182</b>	<b>4 231</b>	<b>4 068</b>	<b>3 930</b>	<b>3 843</b>	<b>-2.2</b>
<b>Indirect</b>	<b>3 808</b>	<b>3 693</b>	<b>3 783</b>	<b>3 523</b>	<b>3 292</b>	<b>3 216</b>	
<b>Total</b>	<b>7 989</b>	<b>7 875</b>	<b>8 014</b>	<b>7 591</b>	<b>7 221</b>	<b>7 059</b>	

Source: NBB.

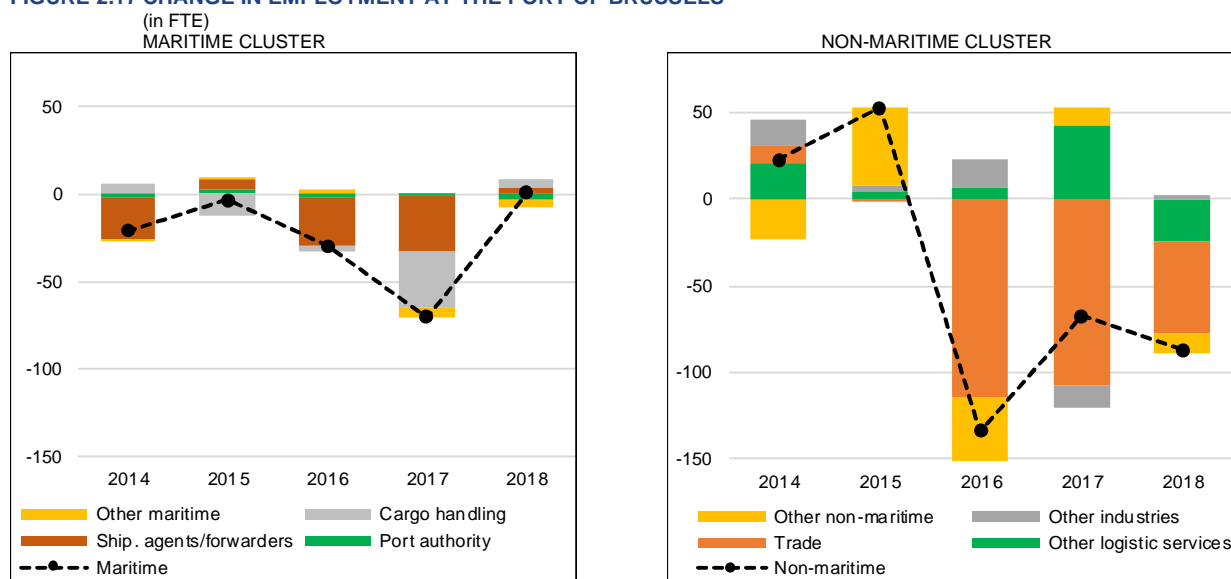
\* For definition of contribution to growth, see Annex 2.1.

The fall in direct employment in 2018 was entirely **explained by the drop** in the non-maritime sector, more precisely **in the trade segment** (contribution of -1.4%) **and other logistic services** (contribution of -0.6%). The job losses in the trade branch derived from a good many trade firms cutting back their staff numbers and the movement of a trade company outside the port site. The lower employment in "other logistic services" resulted from a business failure (*Aximat*) and the movement of a logistics firm (*Pall Artelis*) outside the geographical site of the port of Brussels.

The ten biggest employers (table 2.40) accounted for 44% of all full-time equivalents employed directly in the port of Brussels in 2018. Indirect employment fell because of lower direct employment in trade and other logistic services. Direct employment represented 0.6% of the employment in the Brussels-Capital Region and 0.1% of Belgian domestic employment. Total employment, including indirect workplaces, accounted for 0.2% of Belgian domestic employment.

<sup>46</sup> Table 5.6.2 in Annex 5 gives details on employment figures at the port of Brussels, together with the respective shares of the branches and their change over time.

**FIGURE 2.17 CHANGE IN EMPLOYMENT AT THE PORT OF BRUSSELS**



Source: NBB.

**TABLE 2.39 TOP 10 EMPLOYMENT AT THE PORT OF BRUSSELS**

Rank	Name	Sector
1	Solvay	Other logistic services
2	Brussels Port Authority	Port authority
3	Plastic Omnium Advanced Innovation And Research	Other logistic services
4	Scania Belgium	Trade
5	Ceres	Food industry
6	Ineos Services Belgium	Other logistic services
7	Suez R&R Be North	Other industries
8	Loomis Belgium	Other logistic services
9	Feneko	Metalworking industry
10	Bruxelles Energie - Brussel Energie	Other industries

Source: NBB.

### 2.6.4 Investment

Table 2.41 notes the investment<sup>47</sup> levels at the port of Brussels over the 2013-2018 period. **In 2018, investment expanded by 43%** from €72 million to €103 million. 88% of the funds invested in the Brussels port came from the non-maritime cluster. "Other logistic services" invested more than half of the total sums invested. Trade was ranked second (share of 14%).

While investment in the maritime cluster fell due to lower sums invested by the port authority and public sector, which reflected a negative contribution of respectively -4.8% and -6.8% to the total investment change in 2018, investment in the non-maritime cluster contributed positively with as much as 54.1%. **Expanding investment in non-maritime activities was mostly seen in "other logistic services" and "other industries"**. The other logistic services segment benefited from higher amounts invested in 2018 by *Plastic Omnium* – a supplier of components to car manufacturers – which wants to focus more on research into fuel cells and hydrogen propulsion and went on to enlarge its research centre in 2019. Higher investment in the *Aquiris* waste water treatment plant in Brussels explained the higher investment in "other industries".

<sup>47</sup> More details, together with the respective shares of the component economic sectors and their changes over the years, are shown in table 5.6.3 in Annex 5.

The top 10 companies in terms of investment are listed in table 2.42 and accounted for 69% of all investment in the port of Brussels in 2018.

**TABLE 2.40 INVESTMENT AT THE PORT OF BRUSSELS**  
(in € million)

	2013	2014	2015	2016	2017	2018	Contribution to growth (%)*
Port authority	10.7	5.4	7.5	9.0	9.0	5.5	-4.8
Public sector	0.0	0.0	3.7	8.8	8.6	3.7	-6.8
Cargo handling	0.5	1.6	3.3	1.3	1.5	1.5	0.0
Other maritime	13.1	0.6	5.3	0.6	0.7	1.2	0.7
<b>Maritime</b>	<b>24.3</b>	<b>7.6</b>	<b>19.8</b>	<b>19.7</b>	<b>19.8</b>	<b>11.9</b>	<b>-11.0</b>
Other logistic services	20.5	19.4	17.7	11.8	28.4	54.8	36.8
Trade	14.6	13.5	15.4	19.4	12.8	14.1	1.9
Other industries	1.0	3.4	1.5	13.0	2.2	8.4	8.8
Other non-maritime	8.0	8.9	9.7	10.5	8.6	13.5	6.8
<b>Non-maritime</b>	<b>44.1</b>	<b>45.2</b>	<b>44.3</b>	<b>54.6</b>	<b>52.0</b>	<b>90.8</b>	<b>54.1</b>
<b>Direct</b>	<b>68.4</b>	<b>52.8</b>	<b>64.1</b>	<b>74.3</b>	<b>71.8</b>	<b>102.7</b>	<b>43.1</b>

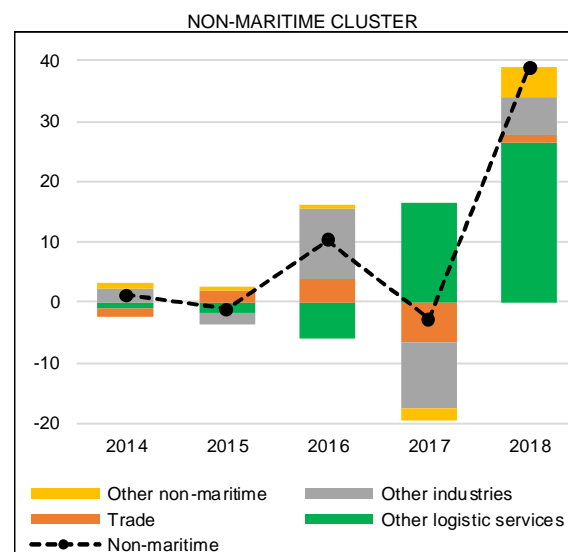
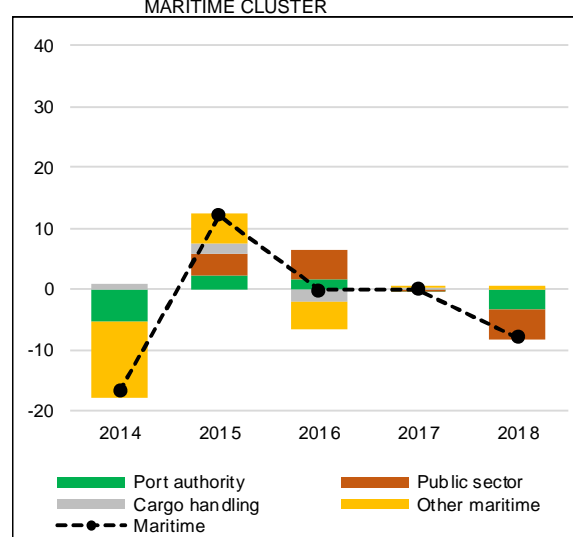
Source: NBB.

\* For definition of contribution to growth, see Annex 2.1.

Note: The pattern of investment is closely linked to projects and is therefore highly volatile, so figures require a nuanced interpretation.

**FIGURE 2.18 CHANGE IN INVESTMENT AT THE PORT OF BRUSSELS**

(in € million, current prices)



Source: NBB.

**TABLE 2.41 TOP 10 INVESTMENT AT THE PORT OF BRUSSELS**

Rank	Name	Sector
1	Plastic Omnium Advanced Innovation And Research	Other logistic services
2	Solvay	Other logistic services
3	Brussels Port Authority	Port authority
4	Aquiris	Other industries
5	Amadeus	Other logistic services
6	Ziegler	Road transport
7	Go4green Project Financing	Energy
8	Loomis Belgium	Other logistic services
9	Diamond Europe	Trade
10	Scania Belgium	Trade

Source: NBB.



## 3 IMPACT OF BREXIT ON BELGIAN ECONOMY

### 3.1 Introduction

The outcome of the Brexit trade negotiations between the EU and the UK can have a very significant effect on the size of the trade flows between these two blocs. This chapter will try to shed some light on the macroeconomic impact of Brexit on the Belgian economy.

Given its geographical position as an island, the UK is extremely dependent on its ports, through which some 95% of its trade passes and consequently, the ports of Antwerp and Zeebrugge are ideal hubs, given their proximity to the UK. It goes without saying that the consequences of reduced trade flows between the EU and the UK will also have an important bearing on the volume of goods that will be processed in and between these ports. Given that the Brexit referendum took place back in 2016, it is entirely possible that Brexit already has had negative consequences, but it is difficult to properly analyse the maritime freight statistics from trade flows between Belgian ports and the UK, given the significant increase in volatility in these flows. This was, in turn, the result of greater uncertainty linked to the consecutive extension of negotiation deadlines, which resulted in difficult contingency planning for firms on both sides of the Channel. Uncertain about the timing and the outcome of a trade deal, firms were and still are obliged to build up strategic stockpiles in order to prevent future disruptions in supply chains. This timely replenishment of stocks can easily hide an intrinsic worsening in the intensity of goods trade.

### 3.2 Political context

In the referendum held on 23 June 2016, a majority of the British electorate voted in favour of leaving the European Union. The referendum result was a political decision that was not legally binding, but on 29 March 2017, the UK Government decided to trigger Article 50 of the Treaty on European Union and notified the European Council of its decision to withdraw from the EU. This triggering of Article 50 normally allows a maximum negotiation period of two years to agree on the terms of the UK's withdrawal, after which its membership of the EU formally ends. But the UK requested several Article 50 extensions, and finally pulled out of the EU on 31 January 2020. The Withdrawal Act also sets out a transition period which is supposed to last until 31 December 2020. This transition period can be extended once, by up to one to two years. Such a decision must be taken jointly by the EU and United Kingdom before 1 July 2020. During this transition period, and even though the UK will no longer be represented in the EU institutions, a continuation of the EU-related pre-Brexit legal framework will apply. This means, in particular, that during the transition period the UK will remain in the EU Customs Union and in the Single Market with free movement of people, goods, services and capital applying. Moreover, the UK will need to continue to contribute to the EU budget covering the period 2014-2020 and the Court of Justice of the European Union will continue to have jurisdiction over the UK. If the transition period is extended beyond 31 December 2020, the UK will not need to contribute to the EU budget any longer, but a financial contribution to the EU budget will be needed as compensation for full membership of the Single Market. However, on the 12th of June 2020, the UK has formally confirmed that it will not seek an extension to the post-Brexit transition period, implying that the current transition arrangement will end on the 31<sup>st</sup> of December 2020. Even though the Withdrawal Agreement under Article 50 already included a political declaration concerning the future relationship between the EU and the UK, this framework now needs to be confirmed in the remaining transition period and all details need to be worked out in a new binding agreement between the EU and the UK and will need to be fully ratified before the end of this year.

### ***There are various options for the future trade relationship between the EU and the UK***

The future relationship between the EU and the UK has many angles, but in this section, we will mainly look at it from the trade side. Both parties will need to define the exact shape of their future trade relationship, as the current free access for the UK to the Single Market and for EU Member States to the UK will cease to apply once the transition period ends.

Failing to reach an agreement (either because one party deliberately leaves the negotiation table or neither of the two parties manage to find common ground for an agreement) would lead to a “no-deal” or a so-called “hard Brexit” scenario. Bilateral trade between the EU and the UK would then be on terms set by the World Trade Organisation (WTO). Under such terms, tariffs and other conditions (such as import quotas or meeting certain regulations) applying to bilateral trade flows may not be less advantageous than for any other country the EU or UK trades with. In a WTO scenario, free movement of goods and services will of course remain in force between the remaining EU27 Member States, but they will now impose en bloc tariffs and other trade conditions on UK firms willing to export to the EU, while the UK can do likewise with firms from EU Member States willing to export to the UK.

This “no-deal” worst-case scenario is of course only one extreme point on the scale of possible trade negotiation outcomes. At the other end of the scale, one could consider a trade deal in line with the agreement the EU has with Norway, Iceland and Liechtenstein, implying very strongly intertwined economies, but entirely dominated by EU regulations. This arrangement can be defined as a kind of EU membership by association, which gives full and tariff-free access to the entire Single Market, while accepting the free movement of people, goods, services and capital, but while still being able to sign trade deals with other countries independently.

In between those two extreme positions, other negotiation outcomes for a future trade deal are of course possible. These range from trade relationships such as that between the EU and Switzerland (tariff-free goods trade with the EU, but rather limited access to EU services, free movement of people and abiding by EU regulations for products covered) between the EU and Turkey (offsetting up a new customs union with common external tariffs for products covered by the deal), between the EU and the Ukraine (progressive convergence towards virtually full access to the Single Market and a likewise gradual incorporation of relevant EU laws into Ukrainian legislation and full adoption of EU legislation on product standards, etc.) or the Comprehensive Economic and Trade Agreement (CETA) between the EU and Canada. CETA has not yet formally entered into force, but large parts of the Agreement have been provisionally applied from 21 September 2017 onwards. This trade pact can be considered as a major improvement for business opportunities for both EU and Canadian firms in the other party’s economic area. It allows mutual free trade, mainly for industrial goods and some agricultural produce, together with some arrangements for services and investment. But where all previously discussed trade agreements assume some combination of acceptance of the *acquis communautaire* (the total body of EU’s legal system and rules) and/or adoption of EU technical product standards, the EU’s Trade Agreement with Canada abandons this requirement entirely. Rather than imposing own product regulations, there is mutual recognition of professional qualifications together with a balanced dispute settlement system.

### ***There will be a clear relationship between the final deal and the expected impact on the economy***

Depending on the final outcome of the negotiations between the EU and the UK, Brexit may, to some smaller or larger extent, result in a lower trade openness between the EU and the UK, with negative growth implications for both the UK and the individual Member States of the EU. These will be more negative with the future trade relationship between EU and UK becoming less preferential and troubled with all kinds of tariff and non-tariff trade barriers.

As it is currently impossible to tell which trade agreement will see the light of day at the end of the transition period, this section will present potential macroeconomic consequences for the Belgian economy of a relevant 'soft' and 'hard' Brexit scenario.

### ***Defining and motivating two relevant trade deals: a soft and a hard Brexit scenario***

The wide acceptance in the UK of the notion "Brexit is Brexit" is interpreted here as implying that the UK attaches great importance to the idea of taking back control through political sovereignty and has not opted out of the EU in order to re-enter it in an artificial or de facto way through the acceptance of a trade deal that is largely dominated by EU regulation (let alone the UK re-entering a customs union with the EU) or that would not give the British the right to determine their migration policy freely in a sovereign way. In this exercise, we therefore theoretically rule out deals that bear resemblance to the agreements the EU has concluded with Norway, Switzerland, Turkey or the Ukraine, as they cross too many 'red lines' with respect to the UK's demand for political sovereignty. We will therefore define both a soft Brexit scenario in which both parties conclude a free trade agreement that uses the EU's CETA deal with Canada as a blueprint and a hard Brexit scenario in which both parties do not succeed in concluding a free trade agreement, and where trade will consequently be set on WTO terms.

In the soft Brexit scenario, we will calculate the macroeconomic cost for the Belgian economy when the trade negotiations between the EU and the UK finally approach a free trade agreement (FTA) that bears significant resemblance to the CETA deal. Among other things, this would imply that the EU and the UK agree to grant tariff-free access to each other's economy for (a large share of) their bilateral trade in goods and where there is some scope for a positive outcome for services-related trade and the removal of investment barriers.

Failing to compromise on a future trade relationship is the basic assumption behind the hard Brexit scenario. Following any such 'no-deal Brexit', both the EU and the UK would need to trade on World Trade Organisation rules after the end of the transition period. Trading on the WTO's most-favoured-nation (MFN) principle implies a policy of non-discriminatory trading with all trade partners with which no free trade agreement exists. This implies that a trade favour granted to one state must automatically be applied to all other trade partners. In such a WTO scenario, bilateral trade will be taxed and potentially limited through a list of tariffs and quotas. For the calculation of the macroeconomic cost of this kind of scenario, we will further assume an orderly 'no-deal Brexit', implying (among other things) proper and timely notification to each and all involved so that all necessary contingency measures can be put in place.

### ***How "CETA-like" can a deal with the UK really be? Some words of caution***

While it is a legitimate thought process to use CETA as a blueprint for a future trade relationship between the EU and the UK, it needs to be pointed out that it cannot necessarily be seen as the most likely outcome of the negotiation process. First and foremost, the CETA deal was a major step forward in trade relations between the EU and Canada, while the future deal between the EU and the UK can at best only be a watered-down version of the relationship that existed pre-Brexit. This can have tactical and strategical consequences at the negotiation table. Secondly, the EU market is much more important for the UK than it is for Canada. Almost half of the UK's trade is with the EU, while the proportion is only about 10% for Canada. This strong integration with and dependence on the EU market can potentially tilt the balance of power in the trade negotiations. Thirdly, there is quite a big difference in the nature of the Canadian and UK trade with the EU. The UK is much more specialised in financial services (which account for almost 10% of the country's total exports), most of which were barely touched upon in CETA, where most of the (financial) services are either limited or penalised with strong regulations. Given the importance of financial services, it is clear that the new shape of the financial services landscape and the definition of the associated regulatory regime(s) will be high on the agenda.

### ***The importance of the level playing field concerns in the trade talks***

Moreover, given the strong economic ties between the EU and the UK on the one hand and the UK's focus on political sovereignty on the other, the so-called "level playing field" concerns will undoubtedly play a very important role at the negotiation table and probably ultimately determine whether the new trade agreement will come closer to a CETA-like deal than a WTO deal. The level playing field talks focus on the notion of (un)fair competition, mutual adherence to maintaining social, environmental and employment standards at the current high levels or a common idea on the amount of state aid or the level of corporation tax, for example, that can be called fair. Acceptance of these common rules and standards is key between members of the EU. Given the strong economic integration between the EU and the UK, the EU in particular will be keen on a binding political commitment guaranteeing continued and well-defined fair competition, in order to rule out any unilateral drifting towards a low-cost and/or low regulatory environment. The inability to reach such an agreement will almost surely push a deal in the direction of a harder Brexit outcome.

### ***Non-tariff trade barriers will hamper trade in both a soft and a hard Brexit scenario***

The assumption we focus on most in the definition of our CETA-like free trade agreement between the EU and the UK is that both parties agree to remove all import duties on goods trade, but that some services trade restrictions would remain. There must be no misunderstanding about the fact that the assumption of no import duties does not imply a return to some kind of de facto pre-Brexit situation, with the only difference that the UK is no longer a member of the EU. While tariffs on imports will be removed in this scenario, non-tariff trade barriers will continue to hamper mutual trade flows significantly. Non-tariff barriers to trade are numerous and relate in particular to any kind of red tape, extra regulation and border checks to verify that particular products comply with specific regulations and requirements, quantitative import restrictions, product certification, compliance with technical regulations, standards, safety measures, public and plant health measures, prior deposits, complex VAT requirements, and so on that can entail huge extra costs for exporting and importing firms. The main non-tariff barrier may well be the procedure for checking rules of origin applying to a product. This procedure verifies whether a product really meets the criteria for tariff exemption by checking the national source of a product. A proof of origin must be submitted to the customs authority of the importing country to guarantee that a product does not originate from a third country (through transit trade), for which such tariff exemptions do not apply.

A free trade agreement without import duties on the goods trade can under no circumstance be put on a par with a trade relationship under a customs union, as the numerous non-tariff impediments to trade may actually hinder trade even more than pure tariffs already do. Once goods are cleared through the EU Customs Union, they can move freely from one country to another without the slightest border check.

All these technical and non-technical non-tariff trade barriers are clearly associated with extra costs for exporting and/or importing firms. While the non-tariff trade barriers are clearly of a different nature than pure tariffs, they evidently hamper and distort trade flows in much the same way. Through rigorously categorising the different kinds of non-trade barriers and estimating the mark-up effect of these kinds of frictions on the import price, it is possible to calculate a tariff equivalent of a non-tariff trade barrier. These are mostly referred to as ad valorem equivalents, i.e. a tariff that is equally restrictive as the non-tariff trade measure in proportion to the value of the goods or transaction concerned.

### 3.3 The macroeconomic consequences of a soft and a hard Brexit scenario

The macroeconomic implications of Brexit for each EU27 Member State will be largely proportional to the importance of its trade flows with the UK, as it is precisely these trade flows that will be hampered by some combination of tariffs and an ad valorem equivalent of the non-tariff measures. Therefore, even disregarding the macroeconomic costs originating from other channels, the negative implications for the UK will be significantly larger than for Belgium for instance, as the share of British export to the EU comes to around 45% of its total exports, while only 8% of Belgium's exports go to the UK. This does not detract from the fact that Belgium's trade share with the UK is significant, and bigger than for almost all other EU27 countries. This is largely the result of Belgium's geographical position and the presence of the port of Antwerp.

The scenarios investigated here make some further assumptions for the UK economy post-Brexit, such as a reduction in foreign direct investment in the UK from non-EU sources (as the UK's role as a hub or "export platform" to the EU will likely diminish), a reduction in net migration and a slowing of labour productivity in line with a downward revision of the UK's potential output, a drop in the value of the pound and a drop in equity prices. A WTO scenario will clearly have more negative consequences for the channels mentioned above than a CETA-like free trade agreement.

Both simulations discussed above were carried out using the **National Bank of Belgium's "Noname" macroeconometric model**, that is also used to prepare the regular economic projections for the Belgian economy or in the context of policy simulations, such as calculating the effects of the tax shift on the Belgian economy. The equations in Noname show a stylized version of the working of the Belgian economy, based on both economic theory and estimation. There are equations for the demand components of GDP (consumption, investment, trade), for the labour market (employment, wages), equations that track the income accounts of the different sectors (households, firms, government and 'rest of the world') and in addition the model also provides insight in the price formation of the economy.

The equations try to model a representative (i.e. a typical, average) worker, firm, household or product. The results of a model projection or simulation with a model as "Noname" **can only be interpreted for the entire economy**. It is not possible to differentiate the results on the basis of firm type (small, medium, large or exporting versus non-exporting firm), worker type (skilled versus unskilled for instance) or study redistributive income effects for heterogeneous types of households (poor vs. rich). Also, in the context of this study, the model results **will shed light on what will happen to the entire Belgian economy as a consequence of Brexit**, but it will be impossible to draw precise conclusions with respect to the microeconomic effect of Brexit on Belgian port activities, let alone specific ports.

We will consider as a baseline (i.e. point of comparison) the projected state of the Belgian economy under the assumption that the UK would retain full membership of the EU Single Market, under exactly the same conditions that prevailed before the 2016 referendum. The results for the macroeconomic variables we consider in the two alternative scenarios (a free trade agreement along the lines of the CETA agreement with Canada vs. a hard Brexit scenario) will then be expressed as the difference with respect to that baseline. While there can be some extra volatility in the financial markets and trade flows around the date on which the agreements become effective as a consequence of extra uncertainty, we will focus on the medium-term impact of Brexit and will define this as "5 years after the transition period ends".

The input for both scenarios will be the relevant new tariffs (if any), the tariff equivalent of the new non-tariff measures, the expected exchange rate movement of the pound together with downward adjustments for Belgian and EU27 exports to the UK as a result of the lower potential growth outlook for the UK economy. Finally, we will also take into account the indirect effect of reduced demand from the other EU27 Member State economies for Belgian exports, given that these other Member States will also suffer from the Brexit shock described above.

It is important to mention here that the impact of all other and potentially Brexit-related changes in the economic environment, such as the conclusion of favourable trade deals between the UK and other countries or domestic UK reforms post-Brexit, are not accounted for in this exercise.

No tariffs apply on goods trade **in the FTA scenario**, but the ad valorem equivalent of non-tariff trade barriers is estimated to push up UK import prices for Belgian goods and services by on average 6.9%. **In the WTO scenario**, the new tariffs together with the tariff equivalent of the non-tariff measures would rise to 15.7%.

The transmission channels for the introduction of tariffs and non-tariff trade barriers are not difficult to understand. A tariff is a tax on import and effectively increases import prices, which makes firms trying to export their product in that market less competitive vis-à-vis producers in the home market. Some imports will be substituted by home production while the remaining imports become more expensive. Ultimately, consumers will be faced with less choice and higher prices, which will lead to a drop in their consumption demand, given a certain level of disposable income. The same reasoning holds for firms' investment projects.

The depreciation of the pound will temporarily benefit UK exporters, as it makes their exports cheaper and consequently more competitive, at the expense of exporters from the EU27, who will be put at a competitive disadvantage. The increase in aggregate tariff and non-tariff measures and the movement of exchange rates in the FTA and WTO scenarios is such that, for EU27 importers from the UK, both effects largely cancel each other out. This implies that the nominal effects for the Belgian economy are expected to remain rather muted. However, EU27 exporters to the UK will suffer from both the disadvantageous exchange rate effect and the impact of the new tariffs and the non-tariff measures. These will result in a significant increase in UK import prices which will gradually be passed on to consumer prices and result in a temporary surge in inflation. These price rises will bring detrimental effects for UK private consumption. The higher import prices will ultimately also find their way into UK export prices and gradually unwind the beneficial effects of the depreciation of the pound.

**TABLE 3.1 MEDIUM-TERM IMPACT OF BREXIT ON BELGIAN ECONOMY<sup>(1)</sup>**  
(total impact with respect to a scenario without Brexit, in % unless otherwise stated)

	FTA	WTO
Consumption prices	-0.2	-0.1
Export prices ( <i>average over all destinations</i> )	-0.3	-0.2
Import prices ( <i>average over all destinations</i> )	-0.2	0.0
GDP ( <i>in volume</i> )	-0.3	-0.7
Private consumption ( <i>in volume</i> )	-0.1	-0.2
Total investment ( <i>in volume</i> )	-0.5	-0.9
Exports ( <i>in volume, sum of all destinations</i> )	-0.9	-1.7
Imports ( <i>in volume, sum of all destinations</i> )	-0.7	-1.4
Unemployment rate (in percentage point)	0.2	0.4
Employment	-0.2	-0.5
Disposable income of households (in real terms)	-0.1	-0.2

Source: NBB.

<sup>(1)</sup> Five years after the transition period ends.

The results in the table above show that the **impact of Brexit on the Belgian economy is expected to remain fairly moderate, on condition that the EU and the UK will be able to negotiate and implement a free trade agreement**. Five years after the transition period ends, the level of exports would be 0.9% below what it would have been in a no-Brexit scenario, as a result of which real total investment and private consumption would be 0.5 and 0.1 % below their baseline levels. In the medium term, Belgian GDP would be 0.3 % and employment 0.2 % below their respective levels in the reference scenario and the unemployment rate would attain a level that is 0.2 of a percentage point higher.

If no free trade agreement can be reached and **the EU27 and the UK has to trade on WTO terms**, then there will be **a substantial deterioration in the results**. In the medium term, Belgian GDP would be 0.7 % lower than in a reference scenario without Brexit. Exports, total investment and employment would be lower by 1.7 %, 0.9 % and 0.5 % respectively and the unemployment rate would be 0.4 percentage point higher.

As has already been mentioned above, these results can only be interpreted as the impact of a certain variant of Brexit on the total Belgian economy. It does account for both **direct effects** (i.e. bilateral effects w.r.t. the UK) **and effects through third countries** (as these will also suffer from Brexit, and therefore will need to import less from Belgium). Also, the results for the trade flows shown above incorporate both goods and services.

But more specifically, the reduction in exports and imports, that is the result of Brexit, **corresponds to the reduction in trade for an average firm in the Belgian economy**. The results will hide the fact that, in the total spectrum of firms, there will be firms that will lose less or almost nothing at all (because they don't trade with the UK) and other firms that will lose a lot more (as e.g. the UK is their main export market).

Exactly the same holds true for activities that are concentrated on trade with the UK (a lot) more than on average, such as will be the case for the ports of Zeebrugge and Antwerp. Consequently, the macroeconomic results that were published above can then not be used to say something meaningful about the expected decline in trade with the UK for a sub-activity of the Belgian economy.

## 4 IMPACT OF COVID-19

This Working Paper was largely compiled before the outbreak of COVID-19 profoundly disrupted the world economy. Still, this chapter attempts to give an overview of some initial effects on the ports in general, capturing information available up to 23 June.

As the virus is affecting the whole world, most governments and companies' first focus is people's health and safety. Although the spread of the virus happened fast, the effect for companies will most probably be felt for months to come. The already visible impact of COVID-19 includes sharp drops in trade flows, extended temporary closure of manufacturing plants, reduced maritime activity and lower demand for crude oil. In the meantime, manufacturing plants have started to reopen again in Europe and the rest of the world.

### 4.1 Impact on ports worldwide

COVID-19 has turned port lives upside down. In order to closely monitor the impact of COVID-19 on ports worldwide, PortEconomics launched a **weekly IAPH-WPSP<sup>48</sup> survey**. 76 port authorities responded, 38% of which were European ports.

In the first weeks following the survey launch (April 2020), the barometer still reported steady overall port *cargo volumes*, although European ports felt a greater impact of reduced cargo vessel calls than ports in other regions of the world. Notteboom warned that the full impact of COVID-19 on container volumes was yet to come. During the months of May and June, COVID-19 resulted in a large number of blank sailings<sup>49</sup> mainly on the trade routes with the Far East. These blank sailings have particularly affected the number of mainline vessel calls at hub ports, with a peak in Europe in mid-May. Other regions did not appear to have reached a similar peak, but were also negatively impacted and still are. As a result of many blank sailings, call sizes in terms of overall container moves recorded levels at individual hub ports never seen before. In Europe, 18 000 plus TEU was handled on one ultra-large container vessel call, while in North America, there were reports of an over 34 000 TEU vessel being handled. If similar incidents happen in other ports in the European and the North American region, those ports will be kept busy with these mini cargo peaks in the coming weeks. (Notteboom, 2020b)

*Passenger and cruise vessel calls* were reduced significantly from the start of the COVID-19 outbreak. In the second half of June a limited number of European countries (e.g. Finland, Greece, Italy, Spain) were allowing some business on passenger and mini-cruise services with strict safety restrictions in place, as continental Europe was re-emerging from the lockdown. In most parts of the rest of the world, a complete ban remains in place on cruise and passenger vessel services due to immigration controls, with passengers only being permitted to enter the country if they are being repatriated. (Notteboom, 2020b)

A mixed picture appears concerning *capacity use at warehousing and storage facilities* in ports as the impact of contagion varies more and more between regions. In the first weeks of the survey, one-third of ports reported an increase in the use of warehousing and distribution facilities for foodstuffs and medical supplies. In the case of consumer goods, some ports witnessed higher capacity utilisation rates, while others reported under-utilisation of existing facilities. The European region faced fewer warehousing and storage capacity shortages, with a decline in utilisation over the time. From mid-June onwards, there has been a slight overall trend towards under-utilisation of warehousing facilities and less distribution

---

<sup>48</sup> IAPH stands for International Association of Ports and Harbors. WPSP for World Ports Sustainability Program.

<sup>49</sup> A scheduled sailing that has been cancelled by a carrier or shipping line so a vessel skips certain ports or even the entire route, is called a blank sailing. Blank sailings happen for a reason. When demand for space on vessels is low, carriers can ensure that vessels are full and rates stay up when fewer sailings are available. Demand for space on vessels is low following holidays like Chinese New Year after factories have been closed, so it is common to see blank sailings at such times. Due to the corona pandemic, many factories had to close down which led to lower demand for maritime transport. To keep container rates up, the supply of sailings was reduced.



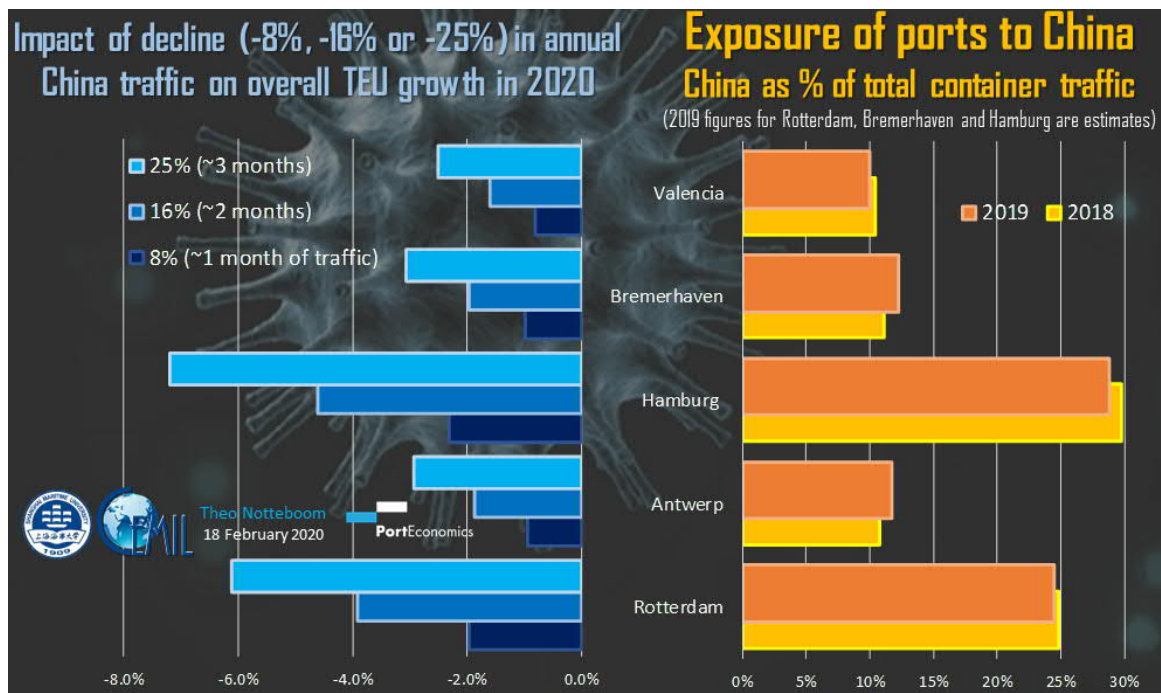
activities, especially in countries emerging from lockdown, where the drop in import volumes is being felt. (Notteboom, 2020b)

At the start of the lockdown in March, *dockworker availability* was impacted but not actually hampering port operations. The majority of non-essential port personnel, such as port authorities' staff, continued to work mostly from home. In June, some ports suffered more from low dockworker availability than others depending on the average age of the workforce, as a consequence of the obligation to take leave as a precaution due to being in the risk category by age. (Notteboom, 2020b)

The impact on ports worldwide is not just a container story. **Ports have been impacted by COVID-19 in three different ways.** First, they suffer internal operational disruptions, meaning disruptions of port operations due to the absence of their own workforce or increasing safety regulations that need to be applied. Second, ports are being affected by external operational disruptions due to the growing volatility in the supply chain and limited external resources. Third and most importantly, ports are impacted by the demand shock owing to disruptions in maritime cargo flows and distortions in industrial activity (Deloitte, 2020).

**Ports are not all affected equally** due to their difference in exposure to Chinese container volumes transhipped to Europe. At first sight, Antwerp and Rotterdam are two similar ports, yet they both reacted differently in their container traffic to the impact of the coronavirus crisis. The reason is their different exposure to China: 24% of the container traffic in the port of Rotterdam in 2019 came from China, while container transshipment in the port of Antwerp coming from China only accounts for 12% (figure 4.1). These figures do not include intra-European transshipment flows linked to the mainline services to and from China. If the contagion effects were to result in a 25% decline in Chinese container volumes in European ports in 2020, then Rotterdam would lose 6 percentage points of growth potential in 2020 and Antwerp about 3 percentage points. So, the more diversified the portfolio of goods transported, the more resilient a port is to external shocks. (Notteboom, 2020a)

FIGURE 4.1 CHINESE CONTAINER VOLUMES IN KEY EUROPEAN PORTS



Source: Notteboom(2020a)

Note: The figures do not include intra-European transshipment flows linked to mainline services from/to China.

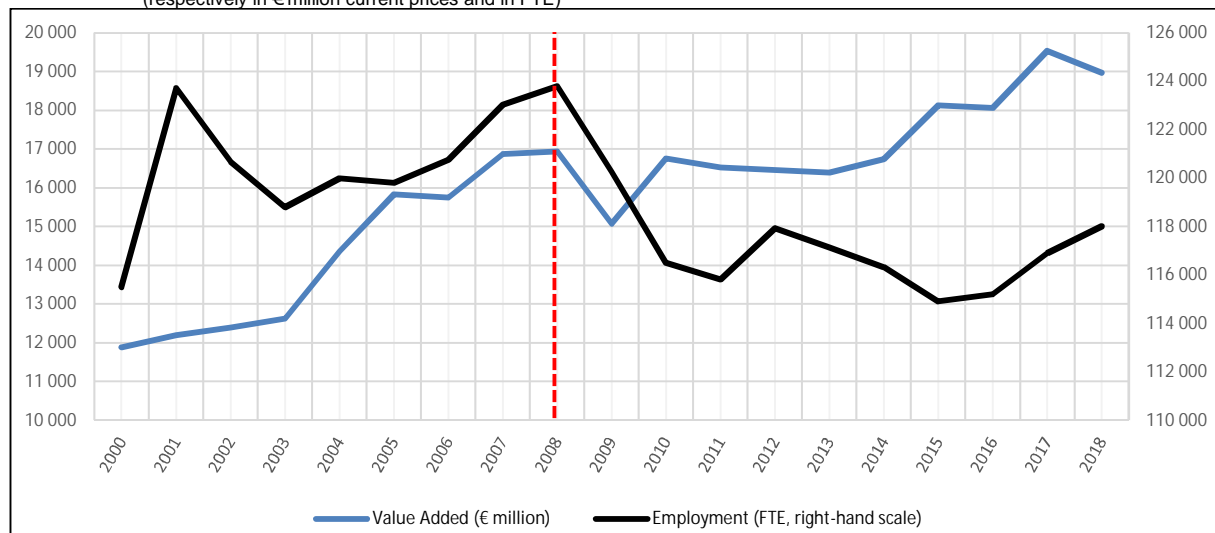
At first, the COVID-19 outbreak only had an impact on China and shipping to and from China, but the virus has since spread rapidly worldwide. Due to globalisation, the interconnectivity between ports has risen. As a consequence, the impact of coronavirus in one port has huge consequences on ports around the world. So, in the end, all ports will be hit both directly and indirectly through reduced activity in other ports.

#### 4.2 Impact on Belgian ports

Given the lack of hard data, it is still unclear how much the damage COVID-19 has really done to port activity, how fast the recovery will be (especially in the absence of a vaccine and continuously hampering social distancing measures) and how much permanent damage will be done to the world economy in general and port activity more specifically. One way to shed some extra light on this is by looking at how and how quickly Belgian ports recovered in the aftermath of the financial crisis (2008-2009).

Figure 4.2 shows that the value added generated by Belgian ports already showed the first signs of recovery in 2010, even though the growth dynamics remained quite sluggish in subsequent years and it took until 2015 for growth rates to really turn positive again. The employment figures were a lot bleaker, however, and showed, with the notable exception of the year 2012, negative growth rates until 2015. During this period, employment in the ports, measured in full-time equivalents, contracted from some 124 000 to some 115 000. The real question is of course to what extent the financial crisis can be compared to the COVID-19 crisis, in nature and magnitude.

**FIGURE 4.2 LEVEL OF DIRECT VALUE ADDED AND DIRECT EMPLOYMENT AT BELGIAN PORTS**  
(respectively in € million current prices and in FTE)



Source: NBB.

It is important to take into consideration that historical evidence suggests that severe financial crises are associated with relatively severe and especially long-lasting economic recessions or periods of stagnation, which is exactly what chart 4.2 shows.

With the data we already have so far, it is fair to say that the COVID-19 crisis will be much more profound, generated by a shock of unprecedented magnitude in peace time. While the recovery will be slow and almost certainly incomplete, most economists are still relatively optimistic that normal growth rates could resume in the course of 2022.

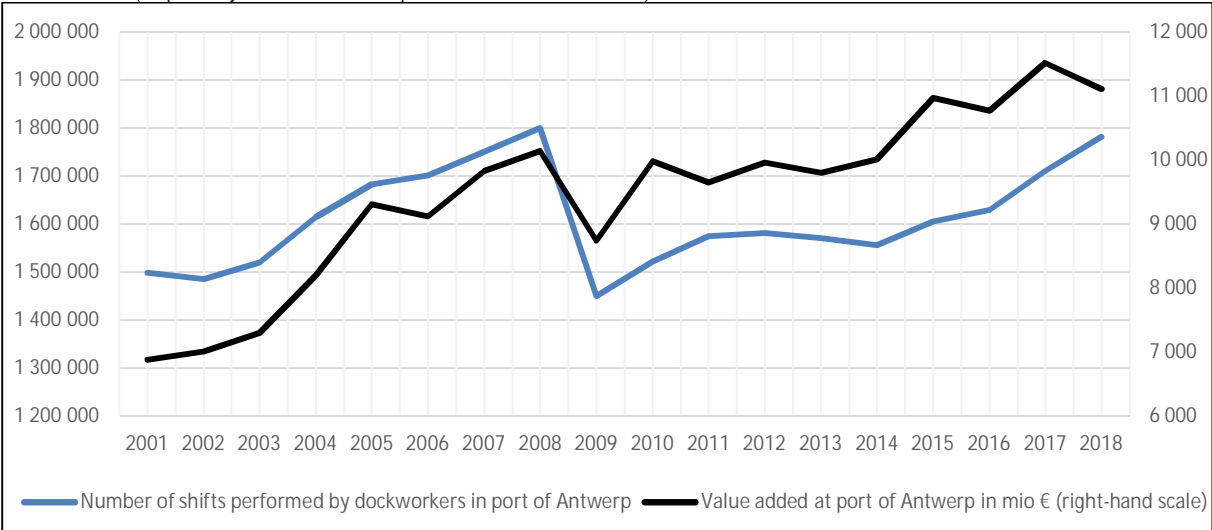
The reason for this relative optimism is the fact that the nature of the COVID-19 shock is entirely different than the one that generated the financial crisis. The current crisis is a health crisis that has turned into an

economic crisis as a consequence of the lockdowns of companies and shops, decided by most governments around the world. This caused an unprecedented supply-side shock, with firms unable to produce at their normal levels, shops unable to sell and a significant portion of workers unable to work. During the months of May and June, most governments started to roll out phased exit strategies, and with social distancing measures still in place, these enabled most companies and shops to relaunch their activities. However, during the months of March and April, supply chains had been broken or brought to a halt altogether through the strict lockdowns in most parts of the world. Moreover, the cash situation of very many households and firms suffered significantly, as a result of which they postponed their consumption and investment plans or abandoned them altogether, leading to very weak actual demand and demand expectations.

Also in contrast to the financial crisis, the collapse in economic activity has been driven in almost equal measure by both the manufacturing and services sector, while in most crisis periods the latter holds up a lot better. This makes it more difficult to use the historical relationship between the (expected) fall in world GDP and the (expected) fall in trade flows, for instance. A historical measure of this type would almost certainly overstate the impact of the current fall in world GDP on trade flows. While trade flows have certainly been hit hard, early data on trade flows shows that the damage is probably less than had been feared.

Due to previous crises, the port sector has learned to be more resilient to unexpected shocks (Notteboom, 2020c). One element that supports this relative optimism in the context of the port of Antwerp is the fact that the drop in performed shifts by dockworkers (see figure 4.4 below) seems relatively less severe than the observed drop at the beginning of the financial crisis, even though the fall in performed shifts in the month of May alone is huge and will negatively impact the 6-month moving average until October 2020. But to the extent that these performed shifts by dockworkers are relatively well correlated with port activity and with the value added generated by the port (see figure 3.3) and knowing that economic activity is expected to pick up in the second half of this year (NBB, 2020b) although the ease and speed of recovery remain uncertain, one could expect port activity and the number of performed shifts to start to improve from July onwards, in line with general activity in the Belgian economy. The performed shifts by dockworkers at the port of Antwerp will be explored in more detail in the next chapter.

**FIGURE 4.3 LEVEL OF DIRECT VALUE ADDED AND NUMBER OF SHIFTS PERFORMED BY DOCKWORKERS AT PORT OF ANTWERP**  
(respectively in € million current prices and in number of shifts)



Sources: NBB, CEPA.

According to the Spring economic projections for Belgium by the National Bank of Belgium, economic activity in Belgium, measured by its gross domestic product, is set to fall by 9% in 2020, with a severe

decline in the first half of the year as a result of the restrictions imposed to prevent the spread of the COVID-19 pandemic. The crisis is expected to wipe out €47 billion in welfare in 2020. The recovery expected to start in the second half of this year is predicted to be gradual and only partial, with growth reaching 6.4% next year and 2.3% in 2022. The projected growth figures are dependent on the revival of domestic and foreign demand in the coming quarters and on avoiding a second wave of the virus, that would necessitate additional restrictions. (NBB, 2020b)

Since 70% of the Belgian cargo traffic passes through the port of Antwerp, the next section will focus on the impact of the COVID-19 crisis on this port.

### 4.3 Impact on port of Antwerp

#### 4.3.1 *The impact on cargo traffic and dockworkers*<sup>50</sup>

In order to keep the port of Antwerp running, the Port Authority of Antwerp has held a weekly taskforce meeting since mid-March 2020. The experts examine the impact of COVID-19 on port operations and nautical chain in Antwerp and on its maritime freight traffic for each cargo type separately. Trends were not only established by the COVID-19 pandemic, but also by other macroeconomic developments such as the contraction in the motor vehicle industry in Europe, the safeguard measures for steel imposed by the European Commission and the disagreement in the OPEC+ alliance.

At the beginning of the COVID-19 outbreak in Belgium, **container traffic** at the port of Antwerp was not affected right away. Although from mid-March 2020 onwards, more Chinese sailings were cancelled due to the Chinese New Year and the impact of corona in China, only small downward effects on container traffic at the port of Antwerp were visible. The fall was not surprising since a similar drop is seen each year in that period, as the shipping industry in China grinds to a halt each year during the week of Chinese New Year. In April, changes in container import and export flows continued to offset each other. While some container export flows stalled (due to lock-down in Belgium), container import flows as food, pharmaceuticals and e-commerce supply were running at full speed. However, since late April, container volumes and movements at Antwerp started to contract. Not only export but also import flows fell, as a result of blank sailings coming from the Far East and transatlantic routes. At the end of May, export cargo flows started to resume very slowly thanks to the re-opening of Belgian and European companies. As a result of many blank sailings, calls of container ships decreased but were partly compensated by more volume per ship on average and extra calls, on top of the normal sailing schedules. Call sizes in terms of overall container moves recorded levels never seen before. In Antwerp, 18 000 plus TEU was handled on one ultra-large container vessel call in order to capture the volumes of temporarily suspended container services. If similar call sizes reoccur, Antwerp dockworkers will be kept busy with these mini cargo peaks in the second and third quarter of 2020.

To sum up, a first phase of blank sailings was due to the coronavirus outbreak in China, with an impact on Antwerp starting from mid-March. A second phase was announced the moment the COVID-19 outbreak turned into a pandemic, having an impact in April, May and June, and with a peak everywhere in Europe during the months of May and June. A third, although smaller, phase of blank sailings was announced at the beginning of June, which will have an impact on the third and fourth quarter of 2020. Depending on how strong the relaunch of the world economy is, more container volumes will need to be reshipped again in the future.

The downward trend in **breakbulk, dry bulk and RoRo cargo traffic** at the port of Antwerp during the first half of 2020 was not just attributable to COVID-19. The negative pattern had already been visible since mid-2019 due to declining automotive sales and lower steel trading. The little rotation<sup>51</sup> in steel -

---

<sup>50</sup> The input of data and information comes from the Port Authority of Antwerp and from CEPA (the employers' organisation of the goods handlers at the port of Antwerp).

<sup>51</sup> Little rotation in steel implies reduced import and export flows of steel.

the main component of breakbulk traffic - could be explained by a lower steel demand in Europe resulting from a contraction in the motor vehicle industry due to stricter emission tests for motorised vehicles imposed in Europe and the wait-and-see approach of European consumers pending the introduction of low emission zones in many European cities which are a cause for much uncertainty. It was the German car industry that was mainly affected because of its specialisation in heavy-duty diesel vehicles, which are currently the most in doubt (NBB, 2020a). This, in turn, was reflected in lower demand for steel, resulting in less high-quality steel entering the port of Antwerp. The import quota on steel, imposed by European Union safeguard measures, also explained a part of the decreasing rotation in steel at the port of Antwerp. Due to the corona crisis consumers keep postponing their car purchases, which is probably reinforcing the effect outlined earlier.

The outbreak of the corona virus was accompanied by a fall in **liquid bulk traffic** at the port of Antwerp, partly explained by the fall in demand for kerosene due to the number of planes grounded, partly by reduced demand for motor fuels due to a slowdown in road passenger and freight transport and partly by lower demand for chemical products due to customers have to close. In addition, the low crude oil prices<sup>52</sup> resulted in a high filling level and little rotation in the storage tanks in Antwerp. A lot of fuel storage is related to trading activities and plummeting oil prices and low demand put these activities under severe pressure, which reinforced the drop in traffic of liquid bulk. Since the end of April, the volume of liquid bulk has stabilised owing partly to more demand for hygiene products, plexi glass and packaging, for which extra oil derivatives were needed as intermediate goods in that chemical production process. In the second half of June, Gunvor Petroleum Antwerp<sup>53</sup> decided to stop its operational activity. This will have an extra negative impact on liquid bulk traffic, since its main raw material (crude oil) was imported via tankers in the port of Antwerp.

**COVID-19 affected maritime traffic at the port of Antwerp mainly via container handling.** The effect came with a time lag, since container transport in volume terms still grew by 9.5% in the first quarter of 2020 compared to the first quarter of 2019. This growth needs to be nuanced since container handling performed weakly during the first quarter in 2019, while it was boosted during the first quarter in 2020 due to strikes in the French ports, which explained why the port of Antwerp had to handle a lot of French cargo. Although **coronavirus** had a limited effect on volume in the first quarter, it **influenced the cargo mix**. The port of Antwerp recorded a notable increase in the number of pharmaceuticals and e-commerce goods, and growing demand for long-life foodstuffs and fresh fruit and vegetables. In the second quarter of 2020, the port of Antwerp forecasts a drop in container volumes, due to a peak of blank sailings in May and June. The trend in the third quarter will probably improve and lead to more stable growth although blank sailings will still occur. It partly depends on how smoothly industries restart and how quickly consumer confidence is re-established. For the fourth quarter, everything depends on whether or not there is a second wave of coronavirus in or outside Europe.

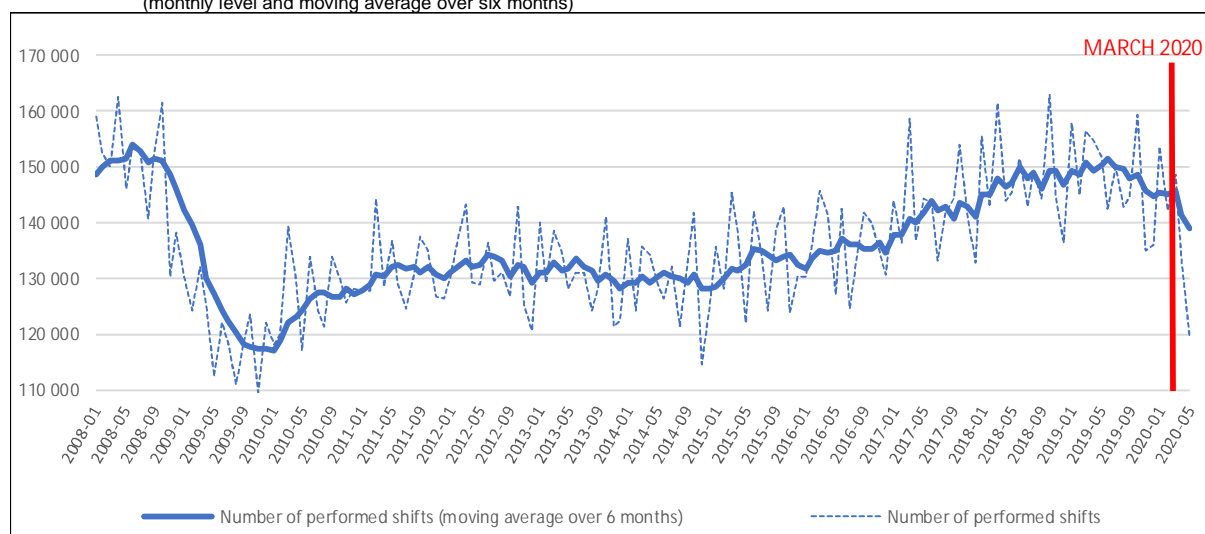
**The amount of cargo handled at the port of Antwerp is the main explanatory factor for the number of shifts performed by dockworkers.** CEPA, the employers' organisation for goods handlers at the port of Antwerp, collects monthly data on the number of jobs worked (see dotted graphs in figure 4.4). To smooth out the changes in the monthly figures, a moving average is calculated over six months (see full line in figure 4.4).

---

<sup>52</sup> Oil prices have been under pressure in the last few months due to the spread of coronavirus. The global economy is at a low ebb and as a result, demand for oil has declined considerably. By limiting oil production, OPEC countries hoped to stabilise prices or push them up themselves. Russia saw nothing in OPEC's proposal to limit oil production by 1.5 million barrels per day. Saudi Arabia tried to compel Russia to follow in the OPEC plan in another way by stepping up oil production significantly and flooding the market, triggering a price war. As a result, the price of a barrel of crude oil dropped by 30%, the lowest level since 2016.

<sup>53</sup> Gunvor Petroleum Antwerp (GPA) is a mid-sized refinery located at the port of Antwerp. GPA refines crude oil of various types, coming from Russia and Venezuela. Production restrictions have led to a sharp increase in purchase prices of that crude oil, while the price for their refined output was still low. This resulted in negative cash flow figures, which was not sustainable according to the company. So, GPA decided to halt its activity with the potential loss of 220 jobs.

**FIGURE 4.4 PERFORMED SHIFTS BY DOCKWORKERS AT PORT OF ANTWERP**  
(monthly level and moving average over six months)



Source: CEPA.

The number of shifts performed by dockworkers, refers to the jobs done by all four types of dockworkers: the authorised dock workers in paid employment per shift, the authorised dock workers in permanent employment, the logistics workers with safety certificates and the special craftsmen. The number of performed tasks had already started to decline since mid-2019 due to lower steel rotation resulting from a slack demand for steel because of cyclical elements and steel quotas imposed by the EU.

Since March 2020, the level of performed shifts has kept on falling, a trend that seemed, surprisingly, only slightly reinforced in the wake of the coronavirus outbreak in Belgium. Up until the end of May, these figures on dockworkers are not as bad as they were during the 2008-2009 financial crisis (when they dropped faster and to a much lower level), implying that, at first sight, the impact of COVID-19 on Antwerp's port operations seems to be less severe than the impact measured during the global financial crisis. The question is of course when and how fast maritime goods traffic will be relaunched on a permanent basis.

With the easing of the health emergency, confinement measures are being scaled back gradually. The resumption of activities implies the start of a recovery that is still hesitant and could be interrupted at any moment by new coronavirus outbreaks if targeted containment measures (testing, tracking and tracing programmes) prove ineffective. What the impact will be for the port of Antwerp in 2020 and later, is still uncertain. It all depends on how quickly COVID-19 can be forced back worldwide or how fast a medical solution is found. As a world port, Antwerp depends on trends in world trade and the global GDP. It is impossible to predict with sufficient accuracy how fast the recovery will develop and how much of the damage will be permanent, just as there is uncertainty about the impact on demand. All these elements will determine how big the final impact on the port of Antwerp and on the Belgian ports in general will be.

To date, the port of Antwerp has preserved its standing due to its geographical diversification, the buffering role that storage plays and the presence of its chemicals cluster<sup>54</sup>, which ensures the anchoring of volumes.

<sup>54</sup> Unfortunately, we were not able to collect survey data on the chemicals industry facilities at the port of Antwerp, in order to analyse the resilience and the agile handling of this sector in these strange times.



### 4.3.2 The impact on maritime activities at the port of Antwerp

Thanks to close collaboration with Alfaport Voka, a survey was conducted in the second week of June 2020 in order to assess the impact of the COVID-19 on port activity in Antwerp. Only the big companies<sup>55</sup> with a maritime activity were approached, especially those active as cargo handlers, shipping companies and shipping agents and forwarders.

In all, only 34 of the 60 companies contacted replied to the survey. It featured to nine questions, three of which sought to trace the nature of respondents' business activity and the size of the company. The other questions focused on company turnover, use of temporary lay-off scheme, their main concerns and investment plans. We assume that the low response was due to the short time span for obtaining data and questionnaire fatigue among companies.

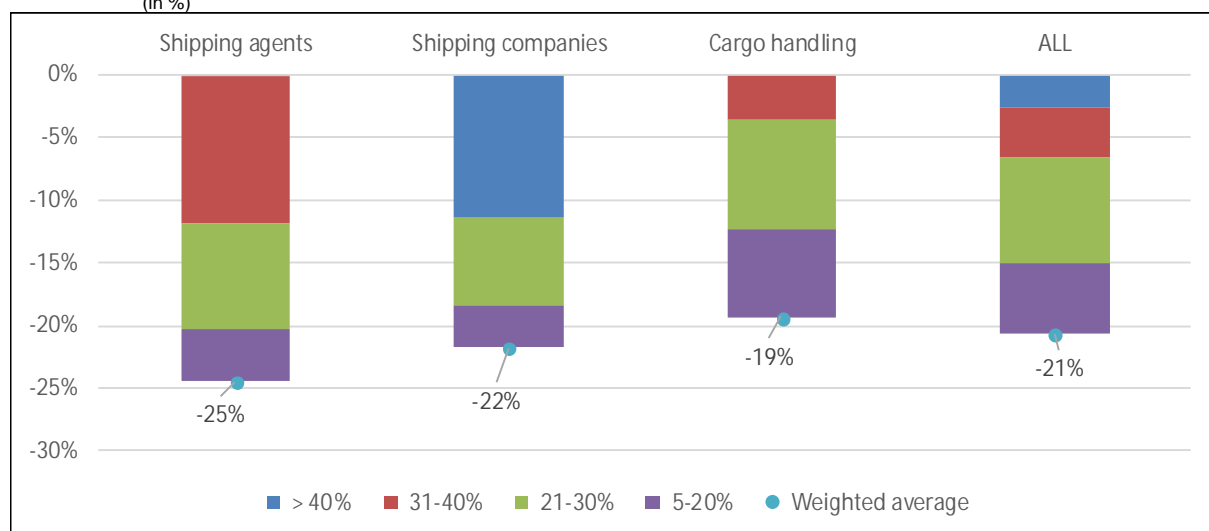
Looking at the size of companies that did answer, we see that there is clearly an overrepresentation of the largest companies in our sample. We have to keep this in mind when interpreting the figures. Moreover, some cautiousness is recommended since some companies had a hard time distinguishing their activity in the port of Antwerp from their business elsewhere<sup>56</sup>. Nevertheless, it is interesting to look at the general perceptions of the maritime companies surveyed.

#### **Maritime companies' turnover expected to drop by 21% in 2020**

All of the companies in our sample, except for one liquid bulk shipping company, predict a drop in turnover in 2020 compared to 2019. 50% of the companies questioned expect a fall of 5 to 20% in turnover in 2020, 40% expect a drop in turnover of more than 20%, while 10% expect that figure to be more than 40%. Taking into account the company size in terms of the revenue figures in 2019, the average maritime business anticipates a decline in turnover of 21% in 2020.

The drop in revenue expected for 2020 by cargo-handling companies, amounts to 19%, while the anticipated dip in revenue among shipping agents and forwarders is 25%. In this branch of activity, one big corporation in terms of revenue in 2019, has a more pessimistic perspective which influences the weighted average drop in turnover for the sector significantly.

**FIGURE 4.5 DECOMPOSITION OF DECLINE IN COMPANY TURNOVER, FOR 2020**  
(in %)



Source: Based on results of survey by Alfaport Voka.

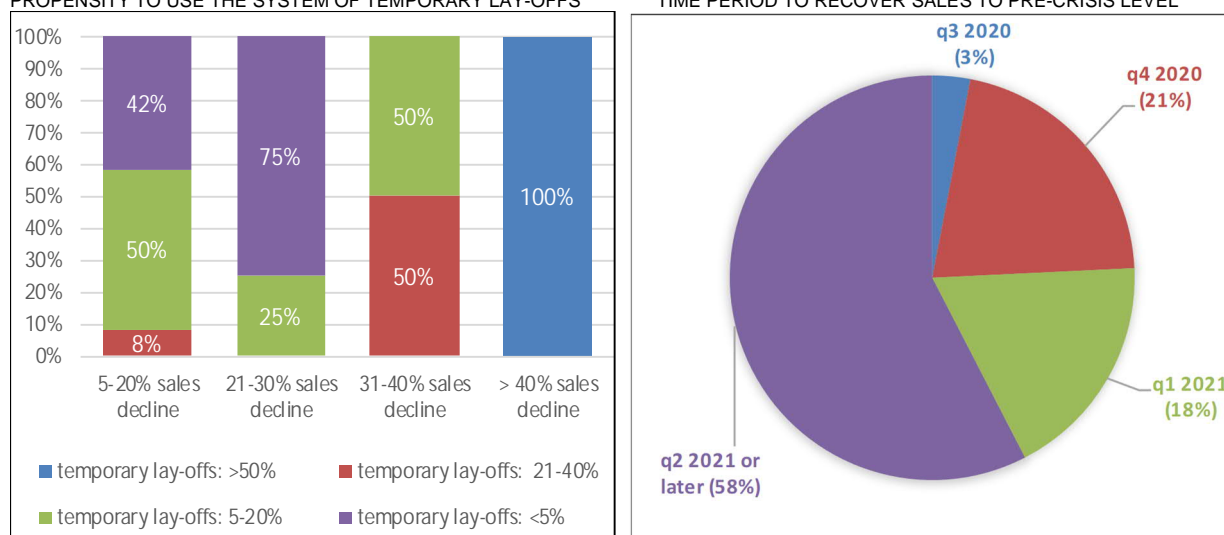
<sup>55</sup> The NBB was not able to influence the sample of maritime firms that would be questioned, in order to obtain a representative pool in size.

<sup>56</sup> Three cargo-handling companies recorded an employment level much higher than what we should expect to see in the port of Antwerp.

It is interesting to mention that in the survey<sup>57</sup> carried out by the Economic Risk Management Group (ERMG) also in early June, to which more than 2 300 enterprises and self-employed located in Belgium responded, revealed that businesses recorded a dip in turnover of 23%<sup>58</sup> in that week in comparison to pre-coronavirus levels (NBB, 2020b). This figure cannot be compared directly to the drop in sales in our own survey reported for that week, as the ERMG survey tries to measure the fall in turnover for exactly that week compared with 'normal' turnover the same week, while in our own survey, maritime companies try to estimate the drop in sales for the year 2020 compared with the year before.

Our own survey indicates that one in two firms is making use of the temporary lay-off scheme for their workers. Logically speaking, firms recording a bigger decline in their sales, are making more extensive use of this scheme and report that it is more likely that they will transform some of the temporary lay-offs into permanent redundancies as soon as the temporary lay-off scheme expires. From all companies noting drops in their turnover, 76% do not expect it to regain pre-crisis levels before 2021 and as many as 58% of the respondents do not expect it to return to their pre-crisis levels before the second quarter of 2021. The number of respondents is too small to refine this analysis, implying that companies with the most negative responses cannot be allocated to a specific sector.

**FIGURE 4.6 USE OF TEMPORARY LAY-OFFS - WHEN A RECOVERY TO PRE-CRISIS LEVEL IS FORESEEN**  
 PROPENSITY TO USE THE SYSTEM OF TEMPORARY LAY-OFFS      TIME PERIOD TO RECOVER SALES TO PRE-CRISIS LEVEL



Source: Based on results of survey by Alfaport Voka.

**Slack demand cited as main concern**

In 85% of the companies surveyed, the element that concerns them the most is “weak demand” (figure 4.7). This factor is important in all three branches of activity, since the three sectors rely heavily on foreign demand. The slow recovery of international trade and the increasing number of blank sailings partly hinder their business activity. 44% of the companies are facing liquidity problems, both small-scale and large companies. 18% are having difficulty in applying social distancing measures, while 15% are affected

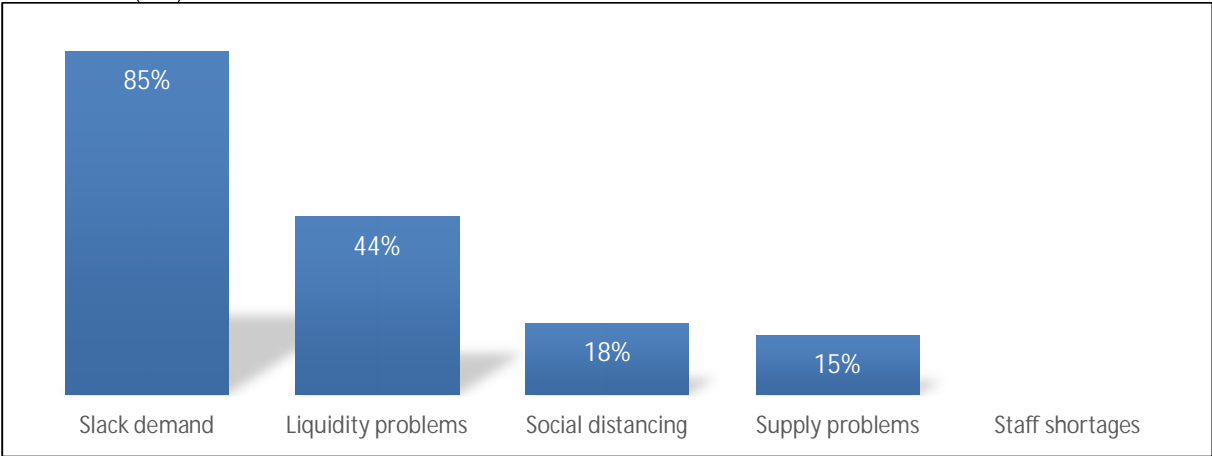
<sup>57</sup> Between March and end-June 2020, a survey has been carried out by a number of federations of enterprises and the self-employed (BECl, Boerenbond, NSZ, UNIZO, UW,E VOKA) among more than 6000 private companies located in Brussels, Flanders and Wallonia. This survey was repeated on a weekly basis and quite recently on a fortnightly basis. The survey assesses the impact of COVID-19 on economic activity in Belgium.

<sup>58</sup> The dip in turnover of 23% in the week beginning 8-9June, was a more optimistic figure than the one of the previous two survey rounds, meaning that over a period of four weeks, the drop in turnover has been lowered with 8 percentage points (from -31% on 12 May to -23% on June).



by supply problems, both concerns being particularly visible in container cargo-handling companies. Staff shortages were not cited as a current concern by the firms surveyed.

**FIGURE 4.7 MAIN CONCERNS OF FIRMS SURVEYED**  
(in %)

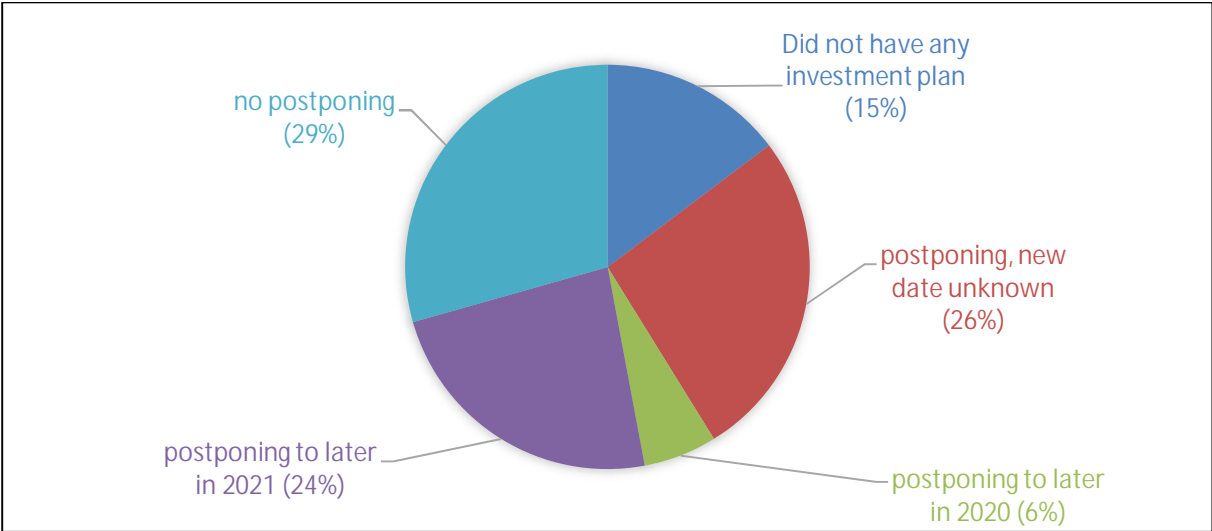


Source: Based on results of survey by Alfaport Voka.

**Many investment plans have been postponed**

More than half of the firms questioned have been forced to delay some of their investment plans. More precisely, 30% said they had put off their original investment plans until later in 2020 or 2021, while 26% had postponed their investment plans to a later, as yet unknown date. In our sample, 29% continued their investment plans without any delay.

**FIGURE 4.8 SHARE OF SURVEYED FIRMS THAT POSTPONE INVESTMENT PLANS**



Source: Based on results of survey by Alfaport Voka.

## 5 SUMMARY

During the 2013-2018 period, cargo traffic at Belgian ports grew year after year. In 2018, maritime freight traffic rose by 4.9% to 331 million of tonnes. Every port contributed to that total growth. The port of Antwerp posted a record volume of traffic for the sixth year running. Containers and liquid bulk (petroleum products and chemicals) were the main drivers. The transshipment of cargo at the port of Zeebrugge rebounded as a result of a meaningful recovery of LNG traffic, while RoRo traffic continued to expand in this coastal port. Growth of dry bulk was responsible for the highest cargo turnover in five years at the port of Ostend. The port of Brussels posted an all-time record as a result of the modal shift of earthmoving operations from road to inland waterway and more containers being handled. Growth of cargo traffic at the ports of Ghent and Liège was rather limited.

Comparing the Belgian ports to their European competitors, cargo traffic figures illustrate a slight increase of the “Flemish port share” in the “Hamburg-Le Havre” port range and a slightly expanding share of Belgian inland ports in the West European inland port range “Duisburg-Paris-Brussels-Liège” in 2018.

The upward trend in Belgian maritime cargo traffic in 2018 is reflected in employment at Belgian ports as a whole, since direct and indirect employment grew by 0.8% in 2018 to 249 612 full-time equivalents, accounting for 5.9% of Belgian domestic employment. The rise in direct employment was partly due to a significant surge in the number of jobs registered in the cargo handling. All Flemish ports generated additional jobs. Aside from extra employment creation in cargo handling, other branches generated extra jobs too. At the port of Antwerp, employment also expanded in the chemicals industry and in ‘other logistic services’. At the port of Ghent, employment grew in car manufacturing, while in Zeebrugge, this was the case in the ‘shipping agents and forwarders’ branch and road transport. The metalworking industry and ‘other logistic services’ at the port of Ostend created new jobs as well.

While employment in Belgian ports grew, value added contracted in 2018 compared to the record year of 2017: both direct and indirect effects fell, together at a rate of -3.9%, leading to value added of € 32 billion in 2018, representing 7% of Belgian GDP. The direct effects declined particularly in the non-maritime branches of the ports of Antwerp and Liège. In both ports, the energy sector was affected by reduced capacity at nuclear power plants. Also, fuel production faced lower value added on the back of reduced refinery margins. The inland port of Brussels experienced a fall in its value added as well, mainly explained by the contraction in ‘other logistic services’. By contrast, the ports of Ghent and Ostend generated more value added. The increase in the port of Ghent was due to the trade and car manufacturing branches. Growth in the port of Ostend was driven by the dredging sector and the metalworking industry. Value added at the port of Zeebrugge held steady.

The pattern of investment is closely linked to projects and therefore highly volatile. Taking all Belgian ports together, direct investment went up to almost € 6 billion in 2018. The increase was mainly explained by investment at the port of Antwerp in the context of a merger in the shipping companies branch. If that merger investment figure is deducted from total investment in Belgian ports, investment would fall by € 210 million in 2018 compared to 2017, because of lower investment in the port construction and dredging segment, fuel production, car manufacturing and metalworking industries.

On 31 January 2020, the UK left the European Union and is in a transition period until the end of 2020, during which it effectively remains in the EU's Customs Union and Single Market and continues to comply with EU rules. The departure of the UK from the EU will result in less trade openness and consequently in reduced trade flows. The damage this will cause to the respective economies will crucially depend on the kind of deal that is concluded during the transition period: the less preferential the future trade relationship between EU and UK is and the more tariff and non-tariff trade barriers it involves, the bigger the negative implications on growth will be. A simulation exercise performed with the National Bank of Belgium's macro model showed that when an ambitious free trade agreement is concluded, along the

lines of the CETA trade deal worked out between the EU and Canada, the damage to the Belgian economy would remain fairly limited, with a medium term impact on Belgian GDP of some -0.3%. In a hard Brexit scenario, the damage to the Belgian economy could be more significant and would reduce GDP by 0.7% over the medium term. If the negotiated free trade agreement between the EU and the UK turns out to be less ambitious than a 'CETA-like' deal, the impact on GDP would shift away from the soft Brexit scenario, towards a hard Brexit scenario.

The spread of COVID-19 has shaken people's lives around the globe, threatening health and disrupting economic activity. To contain the spread of the virus, most governments worldwide imposed stringent containment measures. Activity in many sectors was shut down, travel and mobility curtailed. Such measures succeeded in slowing the spread of infection and saving lives but have resulted in huge economic disruptions. All ports worldwide have been affected. Globalisation has widened the interconnectivity between ports, meaning that the impact of the virus in one port has huge consequences on all ports around the world. Maritime traffic at the port of Antwerp, as a world port, was hit in the container handling segment due to many blank sailings, peaking in May and June. The calls of container ships decreased but were partly compensated by more volume per ship on average and extra calls, on top of the normal sailing schedules. The cargo mix has changed to more demand for pharmaceuticals, e-commerce goods, long-life foodstuffs and fresh fruit and vegetables. Liquid bulk traffic fell as well, in the beginning of the crisis explained by falling demand for kerosene and motor fuels and a lower demand for chemical products. In May and June the drop was reinforced due to little rotation in liquid storage tanks and the stop in business activity of the Gunvor Petroleum Antwerp company. The downward trend in breakbulk, dry bulk and RoRo traffic, visible since mid-2019, has been reinforced by the coronavirus crisis to some extent. Looking at the downward trend in shifts performed by dockworkers at the port of Antwerp since mid-2019 due to lower demand for steel, the movement has been slightly reinforced because of the coronavirus outbreak, with a level still under the peak during the global financial crisis, implying that, so far the port is holding up well. The average company with maritime business activity (shipping companies, cargo handlers, shipping agents and forwarders) expects its turnover to decline by 21% in 2020, with no return to pre-corona levels before 2021. Maritime firms, recording a bigger decline in their turnover, are making more extensive use of the temporary lay-off scheme for their workers and report that it is more than likely that they will transform some of the temporary unemployment into permanent lay-offs the moment the temporary lay-off scheme expires. Their main concern is weak demand. The slow recovery of international trade and the increasing number of blank sailings are still hindering their maritime business activity to some extent. As a result, more than half of them are being forced to delay their investment plans.

## List of abbreviations

BNRC	Belgian National Railway Company
EU	European Union
FTE	Full-time equivalent
GDP	Gross domestic product
GT	Gross tonnage
IOT	Input-Output Table
NAI	National Accounts Institute
NBB	National Bank of Belgium
SMEs	Small and medium-sized enterprises
SUT	Supply and Use Table
TEU	Twenty-foot Equivalent Unit

## List of Tables

Table 1.1	GDP of the main economies and of Belgium.....	10
Table 1.2	Cargo traffic in the Belgian ports.....	11
Table 1.3	Maritime traffic in the Flemish ports in 2017-2018.....	12
Table 1.4	Total maritime traffic in the Hamburg - Le Havre range.....	13
Table 1.5	Cargo traffic by ship in the ports of Duisburg, Paris, Liège and Brussels.....	14
Table 1.6	Overview of value added by port.....	15
Table 1.7	Overview of value added by branch of activity.....	15
Table 1.8	Overview of employment by port.....	18
Table 1.9	Overview of employment by branch of activity.....	18
Table 1.10	Overview of investment by port.....	20
Table 1.11	Overview of investment by branch of activity.....	20
Table 1.12	Return on equity by port.....	24
Table 1.13	Liquidity ratio per port.....	25
Table 1.14	Financial independence per port.....	25
Table 2.1	Maritime traffic at the port of Antwerp.....	30
Table 2.2	Value added at the port of Antwerp.....	32
Table 2.3	Top 10 value added at the port of Antwerp.....	33
Table 2.4	Employment at the port of Antwerp.....	34
Table 2.5	Top 10 employment at the port of Antwerp.....	35
Table 2.6	Investment at the port of Antwerp.....	35
Table 2.7	Maritime traffic at North Sea port Flanders.....	38
Table 2.8	Value added at North Sea port Flanders.....	39
Table 2.9	Top 10 value added at North Sea port Flanders.....	40
Table 2.10	Employment at North Sea port Flanders.....	41
Table 2.11	Top 10 employment at North Sea port Flanders.....	42
Table 2.12	Investment at North Sea port Flanders.....	42
Table 2.13	Top 10 investment at North Sea port Flanders.....	43
Table 2.14	Maritime traffic at the port of Zeebrugge.....	44
Table 2.15	Value added at the port of Zeebrugge.....	45
Table 2.16	Top 10 value added at the port of Zeebrugge.....	47
Table 2.17	Employment at the port of Zeebrugge.....	47
Table 2.18	Top 10 employment at the port of Zeebrugge.....	49
Table 2.19	Investment at the port of Zeebrugge.....	49
Table 2.20	Top 10 investment at the port of Zeebrugge.....	51
Table 2.21	Maritime traffic at the port of Ostend.....	52
Table 2.22	Value added at the port of Ostend.....	53
Table 2.23	Top 10 value added at the port of Ostend.....	54
Table 2.24	Employment at the port of Ostend.....	55
Table 2.25	Top 10 employment at the port of Ostend.....	56
Table 2.26	Investment at the port of Ostend.....	57
Table 2.27	Top 10 investment at the port of ostend.....	58
Table 2.28	Maritime traffic at the Liège port complex.....	59
Table 2.29	Value added at the Liège port complex.....	60
Table 2.30	Top 10 value added at the Liège port complex.....	61
Table 2.31	Employment at the Liège port complex.....	61
Table 2.32	Top 10 employment at the Liège port complex.....	62
Table 2.33	Employment at the Liège port complex.....	63
Table 2.34	Top 10 investment at the Liège port complex.....	64
Table 2.35	Maritime traffic at the port of Brussels.....	65
Table 2.36	Value added at the port of brussels.....	66
Table 2.37	Top 10 value added at the port of Brussels.....	66
Table 2.38	Employment at the port of brussels.....	67
Table 2.39	Top 10 employment at the port of Brussels.....	68
Table 2.40	Investment at the port of Brussels.....	69
Table 2.41	Top 10 investment at the port of Brussels.....	70
Table 3.1	Medium-term impact of brexit on Belgian economy <sup>(1)</sup> .....	76

Annex 5	
Table 5.1.1	Value added at port of Antwerp ..... 107
Table 5.1.2	Employment at port of Antwerp ..... 107
Table 5.1.3	Investment at port of Antwerp ..... 108
Table 5.2.1	Value added at North Sea port Flanders ..... 108
Table 5.2.2	Employment at North Sea port Flanders ..... 109
Table 5.2.3	Investment at North Sea port Flanders ..... 109
Table 5.3.1	Value added at port of Zeebrugge ..... 110
Table 5.3.2	Employment at port of Zeebrugge ..... 110
Table 5.3.3	Investment at port of Zeebrugge ..... 111
Table 5.4.1	Value added at port of Ostend ..... 111
Table 5.4.2	Employment at port of Ostend ..... 112
Table 5.4.3	Investment at port of Ostend ..... 112
Table 5.5.1	Value added at Liège port complex ..... 113
Table 5.5.2	Employment value added at Liège port complex ..... 113
Table 5.5.3	Investment value added at Liège port complex ..... 114
Table 5.6.1	Value added at port of Brussels ..... 114
Table 5.6.2	Employment at port of Brussels ..... 115
Table 5.6.3	Investment at port of Brussels ..... 115

## List of Figures

Figure 1.1	Value added at the Belgian ports .....	16
Figure 1.2	Employment at the Belgian ports.....	16
Figure 1.3	Most important sectors at the Belgian ports in terms of value added in 2018 .....	17
Figure 1.4	Most important sectors at the Belgian ports in terms of employment in 2018 .....	19
Figure 1.5	Investment at the Belgian ports .....	21
Figure 1.6	Convergence path of return on equity .....	23
Figure 1.7	Convergence path of liquidity ratio .....	26
Figure 1.8	Convergence path of financial independence .....	27
Figure 1.9	Components of value added .....	29
Figure 2.1	Change in value added at the port of Antwerp.....	33
Figure 2.2	Change in employment at the port of Antwerp.....	34
Figure 2.3	Change in investment at the port of Antwerp.....	37
Figure 2.4	Change in value added at North Sea port Flanders .....	40
Figure 2.5	Change in employment at North Sea port Flanders .....	41
Figure 2.6	Change in investment at North Sea port Flanders .....	43
Figure 2.7	Change in value added at the port of Zeebrugge.....	46
Figure 2.8	Change in employment at the port of Zeebrugge.....	48
Figure 2.9	Change in investment at the port of Zeebrugge .....	50
Figure 2.10	Change in value added at port of Ostend .....	54
Figure 2.11	Change in employment at port of Ostend .....	56
Figure 2.12	Change in investment at port of Ostend .....	58
Figure 2.13	Change in value added at the Liege port complex .....	60
Figure 2.14	Change in employment at the Liege port complex .....	62
Figure 2.15	Change in investment at the Liege port complex .....	64
Figure 2.16	Change in value added at the port of Brussels .....	66
Figure 2.17	Change in employment at the port of Brussels .....	68
Figure 2.18	Change in investment at the port of Brussels .....	69
Figure 4.1	Chinese container volumes in key European ports .....	79
Figure 4.2	Level of direct value added and direct employment at Belgian ports .....	80
Figure 4.3	Level of direct value added and number of shifts performed by dockworkers at port of Antwerp .....	81
Figure 4.4	Performed shifts by dockworkers at port of Antwerp .....	84
Figure 4.5	Decomposition of decline in company turnover, for 2020 .....	85
Figure 4.6	Use of temporary lay-offs - when a recovery to pre-crisis level is foreseen.....	86
Figure 4.7	Main concerns of firms surveyed.....	87
Figure 4.8	Share of surveyed firms that postpone investment plans .....	87





## Bibliography

- Bremenports (2019), *Facts & Figures 2018 at the ports of Bremen and Bremerhaven*.
- Deloitte (2020), *Global Port Trends 2030*, April 2030.
- European Commission (2018), *EU Transport in figures*, Brussels.
- European Sea Ports Organisation (2019), *Annual report 2018-2019*.
- Eurostat (2013), *European system of accounts ESA 2010*.
- Gueli E., P. Ringoot and M. Van Kerckhoven (2019), *Economic importance of the Belgian ports: Flemish maritime ports, Liège port complex and the port of Brussels – Report 2017*, NBB, Working Paper N° 368 (Document series), Brussels.
- Haropa (2019), *Rapport d'activité 2018 Port de Paris et Port du Havre*.
- Lagneaux F. (2006), *Economic importance of the Belgian ports: Flemish maritime ports and Liège port complex - Report 2004*, NBB, Working Paper n°86 (Document series), Brussels.
- Maatschappij Linkerscheldoever (2019), *Jaarverslag 2018*.
- Maatschappij van de Brugse Zeehaven (2019), *Jaarverslag 2018*.
- Maatschappij van de Brugse Zeehaven, website: <https://portofzeebrugge.be/en/port/facts-and-figures>.
- Merckx J.-P., MORA (2019), *De Vlaamse havens - Feiten, statistieken en indicatoren voor 2018*.
- National Accounts Institute (2014), *Classifications*. Ed. By National Accounts institute.
- National Accounts Institute (2019), *Methodologische herziening 2019 – overzicht van voornaamste wijzigingen*.
- National Accounts Institute (2019), *Input-Output Tables 2015*, Federal Planning Bureau, December 2019, Brussels.
- National Accounts Institute, *National accounts: Supply and use Tables 2016*, December 2019, Brussels.
- NBB, Central Balance Sheet Office, Annual accounts submitted to the Central Balance Sheet Office, from 2013 to 2018.
- NBB, General Statistics Department, *stat.nbb.be - Online statistics*.
- NBB (2020a), *Annual Report 2019 - Economic and financial developments*, NBB, Brussels.
- NBB (2020b), "Economic projections for Belgium – Spring 2020", *NBB Economic Review June 2020*
- North Sea Port: website <https://www.northseaport.com>.
- Notteboom T. (2020a), Article: "COVID-19 virus: How vulnerable are European container ports to the drop in Chinese port volumes?", published by Centre for Euroasian Maritime & Inland Logistics, 18 February 2020.
- Notteboom T., T. Pallis (2020b), IAPH-WPSP Port Economic Impact Barometer, April-May-June 2020.
- Notteboom T., P. Tirschwell, G. Seroka, J. Hoffmann (2020c) in a Coronavirus webinar panel discussion on *improving ship-shore relations in the post COVID-19 era* on 14 May 2020: <https://www.iaphworldports.org/news/7688>.
- Oosterhaven, J. and D. Stelder (2002), Net multipliers avoid exaggerating impacts: with a bi-regional illustration for the Dutch transportation sector", *Journal of the Regional Science* 42.3, pp.533-543.
- Pallis A.A., P. W. de Langen (2010), Seaports and the structural implications of the economic crisis, *Research in Transportation Economics*.
- Port autonome de Liège (2019), *Rapport annuel 2018*.
- Port Dunkerque (2019), *Rapport d'activité 2018*.
- Port of Amsterdam (2016), *Jaarverslag 2015*, Haven Amsterdam, Netherlands.

- Port of Antwerp (2019a), *Annual report 2018*.
- Port of Antwerp (2019b), *Feiten & Cijfers 2018*.
- Port of Antwerp (2019c), *Yearbook of statistics 2018*.
- Port of Brussels (2019a), *Waterwegtrafiek 2018*.
- Port of Brussels (2019b), *Beheersverslag 2018*.
- Port of Hamburg (2016), *The Port of Hamburg in 2015*, Hamburg, Germany.
- Port of Ostend (2020), *Jaarverslag 2019*.
- Port of Rotterdam (2019), *Feiten en cijfers*.
- Van der Lugt L., O. de Jong, M. Dooms, S. de Schepper (2017), "Socio-Economic indicators: top-down calculation method", *Portopia 7th Framework Programme*.
- Rashed, Y., H. Meersman,, E. Van de Voorde and T. Vanellander (2016)."Short-term forecast of container throughput: an ARIMA-intervention model for the port of Antwerp", *Maritime Economics & Logistics*, pp 1-16.
- Strassert, G. (1986), "Zur Bestimmung Strategischer Sektoren mit Hilfe von Input-Output Modellen", *Jahrbucher fur Nationalokonomie und Statistiek 182*, pp.211-215.
- Sys C. (2020), *De maritieme sector houdt er (voorlopig) nog de vaart in*, 2 April 2020.
- United Nations (2019), *Review of Maritime Transport 2019*, UNCTAD New York and Geneva.
- Vansteelandt, S., J. Carpenter and M.G. Kenward (2010), "Analysis of incomplete data using inverse probability weighting and doubly robust estimators", in: *Methodology – European Journal of Research Methods for the behavioral and social sciences 6.1*, pp.37-48.
- Vansteelandt, S., F. Coppens, D. Reynders, M. Vackier, L. Van Belle, "*Estimation methods for computing a branch's total value added from incomplete annual accounting data*", NBB, Working Paper N°371 (Document series), Brussels.
- Van Wymeersch, C. *et al.* (2017), *Financiële Analyse van de onderneming*.
- Vlaamse overheid (2019), *Mobiliteit en Openbare werken: Synthesenota mbt Extra Containerbehandelingscapaciteit Havengebied Antwerpen*, Brussel.

## Annex 1: List of NACE-BEL branches (NACE-BEL 2008)<sup>59</sup>

SUT	NACE-BEL	Cluster	Segment	Sector	Definition
03A	03110	MAR	MAR	VI	Marine fishing
08A	08121	NOMAR	IN	AI	Quarrying of gravel
08A	08122	NOMAR	IN	AI	Quarrying of sand
08A	08910	NOMAR	IN	AI	Mining of chemical and fertiliser minerals
08A	08990	NOMAR	IN	AI	Other mining and quarrying n.e.c.
09A	09900	NOMAR	IN	AI	Support activities for other mining and quarrying
10A	10130	NOMAR	IN	VO	Production of meat and poultry meat products
10B	10200	MAR	MAR	VI	Processing and preserving of fish, crustaceans and molluscs
10C	10320	NOMAR	IN	VO	Manufacture of fruit and vegetable juice
10D	10410	NOMAR	IN	VO	Manufacture of oils and fats
10E	10510	NOMAR	IN	VO	Operation of dairies and cheese making
10E	10520	NOMAR	IN	VO	Manufacture of ice cream
10F	10610	NOMAR	IN	VO	Manufacture of grain mill products
10H	10810	NOMAR	IN	VO	Manufacture of sugar
10H	10820	NOMAR	IN	VO	Manufacture of cocoa, chocolate and sugar confectionery
10I	10890	NOMAR	IN	VO	Manufacture of other food products n.e.c.
10J	10910	NOMAR	IN	VO	Manufacture of prepared feeds for farm animals
11A	11010	NOMAR	IN	VO	Distilling, rectifying and blending of spirits
11A	11060	NOMAR	IN	VO	Manufacture of malt
13A	13100	NOMAR	IN	AI	Preparation and spinning of textile fibres
13B	13929	NOMAR	IN	AI	Manufacture of other textiles, except wearing apparel
16A	16100	NOMAR	IN	AI	Sawmilling and planing of wood
16A	16230	NOMAR	IN	AI	Manufacture of other builders' carpentry and joinery
16A	16240	NOMAR	IN	AI	Manufacture of wooden containers
17A	17120	NOMAR	IN	AI	Manufacture of paper and paperboard
17A	17210	NOMAR	IN	AI	Manufacture of corrugated paper and paperboard and of containers of paper and paperboard
17A	17290	NOMAR	IN	AI	Manufacture of other articles of paper and paperboard
18A	18120	NOMAR	IN	AI	Other printing
18A	18130	NOMAR	IN	AI	Pre-press and pre-media services
19A	19200	NOMAR	IN	PE	Manufacture of refined petroleum products
20A	20110	NOMAR	IN	CH	Manufacture of industrial gases
20A	20120	NOMAR	IN	CH	Manufacture of dyes and pigments
20B	20130	NOMAR	IN	CH	Manufacture of other inorganic basic chemicals
20A	20140	NOMAR	IN	CH	Manufacture of other organic basic chemicals
20A	20150	NOMAR	IN	CH	Manufacture of fertilisers and nitrogen compounds
20A	20160	NOMAR	IN	CH	Manufacture of plastics in primary forms
20A	20170	NOMAR	IN	CH	Manufacture of synthetic rubber in primary forms
20C	20200	NOMAR	IN	CH	Manufacture of pesticides and other agrochemical products
20D	20300	NOMAR	IN	CH	Manufacture of paints, varnishes and similar coatings, printing ink and mastics
20F	20520	NOMAR	IN	CH	Manufacture of glues
20F	20590	NOMAR	IN	CH	Manufacture of other chemical products n.e.c.
20G	20600	NOMAR	IN	CH	Manufacture of man-made fibres
21A	21100	NOMAR	IN	CH	Manufacture of basic pharmaceutical products

<sup>59</sup> The nomenclature in this list is in accordance with the NACE-BEL revision having taken place in 2008 (Rev.2).

SUT	NACE-BEL	Cluster	Segment	Sector	Definition
21A	21201	NOMAR	IN	CH	Manufacture of medicines
22A	22110	NOMAR	IN	CH	Manufacture of rubber tyres and tubes; retreating and rebuilding of rubber tyres
22A	22190	NOMAR	IN	CH	Manufacture of other rubber products
22B	22210	NOMAR	IN	CH	Manufacture of plastic plates, sheets, tubes and profiles
22B	22220	NOMAR	IN	CH	Manufacture of plastic packing goods
22B	22230	NOMAR	IN	CH	Manufacture of builders' ware of plastic
22B	22290	NOMAR	IN	CH	Manufacture of other plastic products
23A	23110	NOMAR	IN	CS	Manufacture of flat glass
23A	23120	NOMAR	IN	CS	Shaping and processing of flat glass
23B	23322	NOMAR	IN	CS	Manufacture of tiles and construction products, in baked clay
23C	23510	NOMAR	IN	CS	Manufacture of cement
23C	23520	NOMAR	IN	CS	Manufacture of lime and plaster
23D	23610	NOMAR	IN	CS	Manufacture of concrete products for construction purposes
23D	23620	NOMAR	IN	CS	Manufacture of plaster products for construction purposes
23D	23630	NOMAR	IN	CS	Manufacture of ready-mixed concrete
23D	23640	NOMAR	IN	CS	Manufacture of mortars
23D	23700	NOMAR	IN	CS	Cutting, shaping and finishing of stone
23D	23990	NOMAR	IN	CS	Manufacture of other non-metallic mineral products n.e.c.
24A	24100	NOMAR	IN	ME	Manufacture of basic iron and steel and of ferro-alloys
24A	24200	NOMAR	IN	ME	Manufacture of tubes, pipes, hollow profiles and related fittings, of steel
24B	24310	NOMAR	IN	ME	Cold drawing of bars
24B	24420	NOMAR	IN	ME	Aluminium production
24B	24510	NOMAR	IN	ME	Casting of iron
25A	25110	NOMAR	IN	ME	Manufacture of metal structures and parts of structure
25A	25120	NOMAR	IN	ME	Manufacture of doors and windows of metal
25A	25210	NOMAR	IN	ME	Manufacture of central heating radiators and boilers
25A	25290	NOMAR	IN	ME	Manufacture of other tanks, reservoirs and containers of metal
25A	25300	NOMAR	IN	ME	Manufacture of steam generators, except central heating hot water boilers
25A	25501	NOMAR	IN	ME	Forging of metal
25B	25610	NOMAR	IN	ME	Treatment and coating of metals
25B	25620	NOMAR	IN	ME	Machining
25C	25930	NOMAR	IN	ME	Manufacture of wire products, chain and springs
25C	25940	NOMAR	IN	ME	Manufacture of fasteners and screw machine products
25C	25999	NOMAR	IN	ME	Manufacture of other fabricated metal articles
26A	26110	NOMAR	IN	MP	Manufacture of electronic valves and tubes and other electronic components
26B	26300	NOMAR	IN	MP	Manufacture of communication equipment
26B	26400	NOMAR	IN	MP	Manufacture of consumer electronics
26C	26510	NOMAR	IN	MP	Manufacture of instruments and appliances for measuring, testing and navigation
27A	27110	NOMAR	IN	MP	Manufacture of electric motors, generators and transformers
27A	27120	NOMAR	IN	MP	Manufacture of electricity distribution and control apparatus
27A	27401	NOMAR	IN	MP	Manufacture of electric lamps
27B	27510	NOMAR	IN	MP	Manufacture of electric domestic appliances
27B	27900	NOMAR	IN	MP	Manufacture of other electrical equipment
28A	28110	NOMAR	IN	ME	Manufacture of engines and turbines, except aircraft, vehicle and cycle engines
28A	28120	NOMAR	IN	ME	Manufacture of fluid power equipment
28A	28220	NOMAR	IN	ME	Manufacture of lifting and handling equipment
28A	28250	NOMAR	IN	ME	Manufacture of non-domestic cooling and ventilation equipment

SUT	NACE-BEL	Cluster	Segment	Sector	Definition
28A	28291	NOMAR	IN	ME	Manufacture of packing-machines
28A	28295	NOMAR	IN	ME	Manufacture of filter equipment
28A	28299	NOMAR	IN	ME	Manufacture of other general-purpose machinery n.e.c.
28B	28910	NOMAR	IN	ME	Manufacture of machinery for metallurgy
29A	29100	NOMAR	IN	AU	Manufacture of motor vehicles
29B	29201	NOMAR	IN	AU	Manufacture of bodies (coachwork) for motor vehicles
29B	29202	NOMAR	IN	AU	Manufacture of trailers and semi-trailers and caravans
29B	29320	NOMAR	IN	AU	Manufacture of other parts and accessories for motor vehicles
30A	30110	MAR	MAR	SB	Building of ships and floating structures
30A	30120	MAR	MAR	SB	Building of pleasure and sporting boats
30B	30200	NOMAR	IN	AI	Manufacture of railway locomotives and rolling stock
32B	32990	NOMAR	IN	AI	Other manufacturing n.e.c.
33A	33110	NOMAR	IN	ME	Repair of fabricated metal products
33A	33120	NOMAR	IN	ME	Repair of machinery
33A	33150	MAR	MAR	SB	Repair and maintenance of ships and boats
33A	33170	NOMAR	IN	ME	Repair and maintenance of other transport equipment
35A	35110	NOMAR	IN	EN	Production of electricity
35B	35210	NOMAR	IN	EN	Manufacture of gas
35B	35220	NOMAR	IN	EN	Distribution of gaseous fuels through mains
37A	37000	NOMAR	IN	AI	Sewerage
38A	38110	NOMAR	IN	AI	Collection of non-hazardous waste
38A	38219	NOMAR	IN	AI	Other processing and disposal of non-hazardous waste
38A	38222	NOMAR	IN	AI	Processing and disposal of hazardous
38B	38310	NOMAR	IN	AI	Dismantling of wrecks
38B	38321	NOMAR	IN	AI	Sorting of non-hazardous waste for recycling
38B	38322	NOMAR	IN	AI	Recovery of waste metal
38B	38323	NOMAR	IN	AI	Recovery of inert waste
39A	39000	NOMAR	IN	AI	Remediation activities and other waste management services
41A	41102	NOMAR	IN	CS	Non-residential development projects
41A	41203	NOMAR	IN	CS	Construction of other non-residential buildings
42A	42110	NOMAR	IN	CS	Construction of roads and motorways
42A	42130	NOMAR	IN	CS	Construction of bridges and tunnels
42A	42211	NOMAR	IN	CS	Construction of water and gas supply networks
42A	42219	NOMAR	IN	CS	Civil engineering works relating to fluids n.e.c.
42A	42220	NOMAR	IN	CS	Construction of utility projects for electricity and telecommunications
42A	42911	MAR	MAR	DR	Dredging
42A	42919	MAR	MAR	DR	Construction of water projects, except dredging
43A	43110	NOMAR	IN	CS	Demolition
43A	43120	NOMAR	IN	CS	Site preparation
43B	43211	NOMAR	IN	CS	Electrical engineering installations in buildings
43B	43221	NOMAR	IN	CS	Plumbing
43B	43222	NOMAR	IN	CS	Heat and air conditioning installation
43B	43291	NOMAR	IN	CS	Insulation work activities
43C	43320	NOMAR	IN	CS	Joinery installation
43C	43341	NOMAR	IN	CS	Painting of buildings
43D	43910	NOMAR	IN	CS	Roofing activities
43D	43999	NOMAR	IN	CS	Other specialised construction activities
45A	45111	NOMAR	CO	CO	Wholesale of cars and light motor vehicles

SUT	NACE-BEL	Cluster	Segment	Sector	Definition
45A	45191	NOMAR	CO	CO	Wholesale of other motor vehicles (> 3,5 ton)
45A	45193	NOMAR	CO	CO	Retail sale of other motor vehicles (> 3,5 ton)
45A	45202	NOMAR	CO	CO	Maintenance and general repair of motor vehicles
45A	45205	NOMAR	CO	CO	Tyre specialists
45A	45310	NOMAR	CO	CO	Wholesale trade and intermediary of motor vehicle parts and accessories
46A	46110	NOMAR	CO	CO	Agents involved in the sale of agricultural raw materials, live animals, textile raw materials and semi-finished goods
46A	46120	NOMAR	CO	CO	Agents involved in the sale of fuels, ores, metals and industrial chemicals
46A	46140	NOMAR	CO	CO	Agents involved in the sale of machinery, industrial equipment, ships and aircraft
46A	46170	NOMAR	CO	CO	Agents involved in the sale of food, beverages and tobacco
46A	46180	NOMAR	CO	CO	Agents specialised in the sale of other particular products
46A	46190	NOMAR	CO	CO	Agents involved in the sale of a variety of goods
46A	46216	NOMAR	CO	CO	Wholesale of animal feeds and agricultural raw materials
46A	46319	NOMAR	CO	CO	Wholesale of fruit and vegetables, except potatoes
46A	46332	NOMAR	CO	CO	Wholesale of edible oils and fats
46A	46349	NOMAR	CO	CO	Wholesale of alcoholic and other beverages, general assortment
46A	46381	NOMAR	CO	CO	Wholesale of fish, crustaceans and molluscs
46A	46389	NOMAR	CO	CO	Wholesale of other food n.e.c.
46A	46391	NOMAR	CO	CO	Non-specialised wholesale of frozen food
46A	46392	NOMAR	CO	CO	Non-specialised wholesale of non-frozen food, beverages and tobacco
46A	46412	NOMAR	CO	CO	Wholesale trade in household textiles and bedding
46A	46423	NOMAR	CO	CO	Wholesale trade in clothing other than work clothes and underwear
46A	46431	NOMAR	CO	CO	Wholesale trade in domestic electrical appliances and audio and video equipment
46A	46442	NOMAR	CO	CO	Wholesale of cleaning materials
46A	46460	NOMAR	CO	CO	Wholesale of pharmaceutical goods
46A	46499	NOMAR	CO	CO	Wholesale of other household goods n.e.c.
46A	46510	NOMAR	CO	CO	Wholesale of computers, computer peripheral equipment and software
46A	46620	NOMAR	CO	CO	Wholesale of machine tools
46A	46630	NOMAR	CO	CO	Wholesale of mining, construction and civil engineering machinery
46A	46693	NOMAR	CO	CO	Wholesale trade in electrical equipment, including installation materials
46A	46694	NOMAR	CO	CO	Wholesale trade in lifting and transport equipment
46A	46695	NOMAR	CO	CO	Wholesale trade in pumps and compressors
46A	46699	NOMAR	CO	CO	Wholesale of other machinery and equipment n.e.c.
46B	46710	NOMAR	CO	CO	Wholesale of solid, liquid and gaseous fuels and related products
46A	46720	NOMAR	CO	CO	Wholesale of metals and metal ores
46A	46731	NOMAR	CO	CO	Wholesale of construction materials, general assortment
46A	46732	NOMAR	CO	CO	Wholesale of wood
46A	46733	NOMAR	CO	CO	Wholesale trade in wallpapers, paints and household textiles
46A	46741	NOMAR	CO	CO	Wholesale of hardware
46A	46751	NOMAR	CO	CO	Wholesale of industrial chemical products
46A	46769	NOMAR	CO	CO	Wholesale trade in other intermediate products n.e.c.
46A	46772	NOMAR	CO	CO	Wholesale trade in iron and steel scrap and non-ferrous scrap metals
46A	46900	MAR	MAR	CP	Non-specialised wholesale trade
47A	47230	NOMAR	CO	CO	Retail sale of fish, crustaceans and molluscs in specialised stores
47B	47300	NOMAR	CO	CO	Retail sale of automotive fuel in specialised stores
47A	47410	NOMAR	CO	CO	Retail sale of computers, peripheral units and software in specialised stores
47A	47521	NOMAR	CO	CO	Specialist retail trade in building materials and DIY supplies, general range
47A	47781	NOMAR	CO	CO	Specialist retail trade in fuels other than road fuel

SUT	NACE-BEL	Cluster	Segment	Sector	Definition
49A	49200	NOMAR	TR	TP	Freight rail transport
49C	49410	NOMAR	TR	WE	Freight transport by road, except removal
49C	49420	NOMAR	TR	WE	Removal services
49C	49500	NOMAR	TR	WE	Transport via pipelines
50A	50200	MAR	MAR	RE	Sea and coastal freight water transport
50B	50400	MAR	MAR	RE	Inland freight water transport
52A	52100	MAR	MAR	GO	Warehousing and storage, including refrigerating
52A	52210	NOMAR	LO	AD	Service activities incidental to land transportation
52A	52220	MAR	MAR	GO	Service activities incidental to water transportation
52A	52241	MAR	MAR	GO	Cargo handling in sea ports
52A	52249	MAR	MAR	GO	Cargo handling except sea ports
52A	52290	MAR	MAR	SE	Other transportation support activities
53A	53200	NOMAR	TR	WE	Other postal and courier activities
62A	62010	NOMAR	LO	AD	Computer programming activities
66A	66210	NOMAR	LO	AD	Risk and damage evaluation
66A	66220	NOMAR	LO	AD	Activities of insurance agents and brokers
66A	66290	NOMAR	LO	AD	Other activities auxiliary to insurance and pension funding
68B	68203	NOMAR	LO	AD	Renting and operating of own or leased non residential real estate, except lands
68A	68321	NOMAR	LO	AD	Management of residential real estate on a fee or contract basis
68A	68322	NOMAR	LO	AD	Management of non-residential real estate on a fee or contract basis
69A	69201	NOMAR	LO	AD	Accountants and fiscal advisors
70A	70100	NOMAR	LO	AD	Activities of head offices
70A	70220	NOMAR	LO	AD	Business and other management consultancy activities
71A	71121	NOMAR	LO	AD	Engineering activities and related technical consultancy, except surveyor
71A	71209	NOMAR	LO	AD	Other technical testing and analysis
72A	72190	NOMAR	LO	AD	Other research and experimental development on natural sciences and engineering
73A	73110	NOMAR	LO	AD	Advertising agencies
77A	77120	NOMAR	LO	AD	Renting and leasing of trucks
77C	77320	NOMAR	LO	AD	Renting and leasing of construction and civil engineering machinery and equipment
77C	77340	NOMAR	LO	AD	Renting and leasing of water transport equipment
77C	77399	NOMAR	LO	AD	Renting and leasing of other machinery, equipment and tangible goods
80A	80100	NOMAR	LO	AD	Private security activities
81A	81100	NOMAR	LO	AD	Combined facilities support activities
81B	81220	NOMAR	LO	AD	Other building and industrial cleaning activities
81B	81290	NOMAR	LO	AD	Other cleaning activities
82A	82110	NOMAR	LO	AD	Combined office administrative service activities
82A	82920	NOMAR	LO	AD	Packaging activities
82A	82990	NOMAR	LO	AD	Other business support service activities n.e.c.
84A	84111	MAR	MAR	PU	Federal public administration activities
84B	84220	MAR	MAR	PU	Defence activities

Source: NBB.

## Legend

Cluster code	Cluster definition	Segment code	Segment definition	Sector code	Sector definition
MAR	Maritime	MAR	Maritime	GO	Cargo handling
				SE	Shipping agents and forwarders
				RE	Shipping companies
				DR	Port construction and dredging
				HB	Port authority
				PU	Public sector
				SB	Shipbuilding and repair
				CP	Port trade
				VI	Fishing and fish industry
NOMAR	Non-maritime	CO	Trade	CO	Trade
				EN	Energy
				PE	Fuel production
				CH	Chemicals industry
				AU	Car manufacturing
				MP	Electronics
		TP	Land transport	ME	Metalworking industry
				CS	Construction
				VO	Food industry
LO	Other logistic services	AI	Other industries		
		WE	Road transport		
				TP	Other land transport
				AD	Other logistic services



## Annex 2: Formulae

### 2.1 Contribution to growth

Let us assume that  $s$  is a sector in port  $p$  and let  $v_{sp}(y)$  be the value of some variable for that sector  $s$  in port  $p$  in year  $y$ .  $v$  could be value added, employment, ... Then the total for  $p$  for that variable is just the sum of the values for all the sectors in that port or  $v_{*p}(y) = \sum_{s \in p} v_{sp}(y)$ .

The growth of the value for the port between  $y - 1$  and  $y$  is equal to the change in value, divided by the value in the first year or  $g_{*p}(y) = \frac{v_{*p}(y) - v_{*p}(y-1)}{v_{*p}(y-1)}$  and similar for the growth of the sector in that port:

$$g_{sp}(y) = \frac{v_{sp}(y) - v_{sp}(y-1)}{v_{sp}(y-1)}$$

It follows from this that:

$$\begin{aligned} g_{*p}(y) &= \frac{v_{*p}(y) - v_{*p}(y-1)}{v_{*p}(y-1)} \\ &= \sum_{s \in p} \frac{v_{sp}(y) - v_{sp}(y-1)}{v_{*p}(y-1)} \\ &= \sum_{s \in p} \frac{v_{sp}(y) - v_{sp}(y-1)}{v_{*p}(y-1)} \underbrace{\frac{v_{sp}(y-1)}{v_{*p}(y-1)}}_{= 1 \text{ if } v_{sp}(y-1) \neq 0} \end{aligned}$$

$$\begin{aligned} &\underbrace{\sum_{s \in p} \frac{v_{sp}(y) - v_{sp}(y-1)}{v_{*p}(y-1)} \frac{v_{sp}(y-1)}{v_{*p}(y-1)}}_{\text{sum of sectoral contributions}} \\ &= \sum_{s \in p} \underbrace{\frac{v_{sp}(y) - v_{sp}(y-1)}{v_{*p}(y-1)}}_{\text{sum contribution}} \underbrace{\frac{v_{sp}(y-1)}{v_{*p}(y-1)}}_{\alpha_{sp}(y-1)} \\ &= g_{sp}(y), \text{ see supra} \quad \alpha_{sp}(y-1) \end{aligned}$$

where  $\alpha_{sp}(y-1) = \frac{v_{sp}(y-1)}{v_{*p}(y-1)}$  is the value for the sector divided by the total for the port, or it is the share of the sector for that port (if  $\forall s \in p, v_{sp}(y-1) \geq 0$ ).

So we find that the growth of  $v$  in the port  $p$  is the sum of sectoral contributions to that growth, each sector's contribution is equal to that sector's share in the previous year times the sector's own growth. This is equivalent to saying that the growth for the port is the weighted average of the growths of the sectors in that port, the weights are the shares of the sectors in  $y - 1$ .

## 2.2 Decomposition of the globalised ratio

A (company) ratio is by definition a division of a variable for a company (the numerator,  $n_c$ ) by another variable for that company (the denominator,  $d_c$ ) or  $r_c = \frac{n_c}{d_c}$ .

The globalised ratio for a sector is then the sum of the numerators divided by the sum of the denominators or  $r_s = \frac{\sum_{c \in S} n_c}{\sum_{c \in S} d_c}$ . Using some basic properties of addition and multiplication we find that:

$$\begin{aligned}
 r_s &= \frac{\sum_{c \in S} n_c}{\sum_{c \in S} d_c} \\
 &= \frac{\sum_{c \in S} n_c}{D_s}, \text{ (where } D_s = \sum_{c \in S} d_c \text{)} \\
 &= \frac{\sum_{c \in S} n_c \frac{d_c}{d_c}}{D_s}, \text{ (if } d_c \neq 0 \text{)} \\
 &= \frac{\sum_{c \in S} d_c \frac{n_c}{d_c}}{D_s} \\
 &= \sum_{c \in S} \frac{d_c}{D_s} \frac{n_c}{d_c} \\
 &= \sum_{c \in S} \omega_c \frac{n_c}{d_c}, \text{ (where } \omega_c = \frac{d_c}{D_s} \text{)} \\
 &= \sum_{c \in S} \omega_c r_c
 \end{aligned}$$

So we find that:

$$r_s = \sum_{c \in S} \overbrace{\omega_c r_c}^{\text{sum of individual contributions}}$$

$\underbrace{\omega_c r_c}_{\text{contribution of company } c}$

where  $\omega_c = \frac{d_c}{D_s}$  is the share of the company  $c$  in sector  $s$  measured in terms of the denominator.

So we find that the globalised ratio for a sector is a weighted sum of the ratios of the individual companies in that sector. The weight for a company is the share of the company in the sector, measured in terms of the ratio's denominator.

### Annex 3: Definition of the financial ratios

RATIO	ITEMS USED IN ANNUAL ACCOUNTS
<i>RETURN ON EQUITY AFTER TAX</i>	
<i>Numerator (N)</i> .....	9904
<i>Denominator (D)</i> .....	10/15
<i>Ratio = N / D * 100</i>	
<i>Conditions for calculating the ratio: 12-month financial year and item 10/15 &gt; 0</i>	
<i>LIQUIDITY IN THE BROAD SENSE</i>	
<i>Numerator (N)</i> .....	3+40/41+50/53+54/58+490/1
<i>Denominator (D)</i> .....	42/48+492/3
<i>Ratio = N / D</i>	
<i>Conditions for calculating the ratio: none</i>	
<i>SOLVENCY: DEGREE OF FINANCIAL INDEPENDENCE</i>	
<i>Numerator (N)</i> .....	10/15
<i>Denominator (D)</i> .....	10/49
<i>Ratio = N / D * 100</i>	
<i>Conditions for calculating the ratio: none</i>	

# Annex 4: Cost approach to value added

COMPONENT	ITEMS USED IN ANNUAL ACCOUNTS
Staff costs	62
Depreciation	630
Other charges	631/4+635/8+640/8+649
Recurrent operating profit	9901-740+66A-76A

## Annex 5: Detailed tables by port area

### 5.1 Port of Antwerp

**TABLE 5.1.1 VALUE ADDED AT PORT OF ANTWERP** (in € million)

	2013	2014	2015	2016	2017	2018	$\sigma_{2018,s}$	$\alpha_{2018,s}$	$\bar{\alpha}_s$
Cargo handling	1 563.3	1 604.8	1 666.0	1 701.7	1 795.0	1 766.3	15.9	-1.6	2.5
Shipping agents and forwarders	631.6	593.1	632.9	608.5	611.9	609.6	5.5	-0.4	-0.7
Shipping companies	368.0	438.8	737.1	662.4	431.9	399.8	3.6	-7.4	1.7
Port construction and dredging	272.9	236.2	308.3	278.6	286.5	275.7	2.5	-3.8	0.2
Port authority	243.5	251.0	252.4	247.9	258.9	246.5	2.2	-4.8	0.2
Public sector	151.3	150.8	143.6	145.7	148.7	149.9	1.3	0.8	-0.2
Shipbuilding and repair	32.0	35.9	29.9	31.4	34.1	31.8	0.3	-6.7	-0.1
Port trade	17.7	11.0	12.2	10.1	6.9	5.1	0.0	-26.1	-22.0
Fishing and fish industry	0.9	1.4	1.2	1.8	1.1	0.6	0.0	-45.5	-7.8
<b>Maritime</b>	<b>3 281.2</b>	<b>3 323.0</b>	<b>3 783.6</b>	<b>3 688.1</b>	<b>3 575.0</b>	<b>3 485.3</b>	<b>31.4</b>	<b>-2.5</b>	<b>1.2</b>
Chemicals industry	2 944.2	3 113.2	3 427.3	3 165.0	3 671.0	3 667.1	33.0	-0.1	4.5
Trade	855.1	917.0	901.7	999.0	1 077.2	1 113.6	10.0	3.4	5.4
Fuel production	806.2	824.9	1 063.4	1 066.6	1 262.7	1 020.5	9.2	-19.2	4.8
Other logistic services	505.5	502.1	545.9	559.6	625.6	654.8	5.9	4.7	5.3
Construction	154.0	160.0	159.0	158.1	168.8	225.4	2.0	33.5	7.9
Metalworking industry	248.7	250.3	249.1	235.3	250.6	217.6	2.0	-13.2	-2.6
Other industries	139.4	144.5	149.3	163.3	172.2	167.8	1.5	-2.6	3.8
Energy	393.6	321.8	281.5	342.8	311.1	156.1	1.4	-49.8	-16.9
Road transport	141.3	141.6	145.3	142.5	147.2	144.1	1.3	-2.1	0.4
Other land transport	166.9	155.0	114.2	102.8	93.4	100.7	0.9	7.8	-9.6
Car manufacturing	93.3	86.5	77.1	77.3	86.3	77.8	0.7	-9.8	-3.6
Food industry	63.1	59.3	61.6	61.3	63.8	65.6	0.6	2.8	0.8
Electronics	8.3	10.1	10.2	10.4	12.6	10.0	0.1	-20.6	3.8
<b>Non-maritime</b>	<b>6 519.6</b>	<b>6 686.3</b>	<b>7 185.6</b>	<b>7 084.0</b>	<b>7 942.5</b>	<b>7 621.1</b>	<b>68.6</b>	<b>-4.0</b>	<b>3.2</b>
Direct	9 800.8	10 009.3	10 969.2	10 772.1	11 517.5	11 106.4	100.0	-3.6	2.5
Indirect	8 988.1	8 988.9	8 312.8	7 836.7	8 429.6	7 866.6			
<b>Total</b>	<b>18 788.9</b>	<b>18 998.2</b>	<b>19 282.0</b>	<b>18 608.8</b>	<b>19 947.1</b>	<b>18 973.0</b>			

Source: NBB.

Where  $\sigma_{2018,s} = 100 \times \frac{v_{2018,s}}{v_{2018,Direct}}$  is the share of sector  $s$  (in %) in 2018,  $\alpha_{2018,s} = 100 \times \frac{v_{2018,s} - v_{2017,s}}{v_{2017,s}}$  is the growth of sector  $s$  (in %)

between 2017 and 2018,  $\bar{\alpha}_s = 100 \times \left( \left( \frac{v_{2018,s}}{v_{2013,s}} \right)^{1/5} - 1 \right)$  is the (geometric) average growth of sector  $s$  (in %) between 2013 and 2018.

**TABLE 5.1.2 EMPLOYMENT AT PORT OF ANTWERP** (in FTE)

	2013	2014	2015	2016	2017	2018	$\sigma_{2018,s}$	$\alpha_{2018,s}$	$\bar{\alpha}_s$
Cargo handling	14 558	14 581	14 842	14 961	15 456	16 046	25.6	3.8	2.0
Shipping agents and forwarders	6 868	6 701	6 686	6 593	6 523	6 316	10.1	-3.2	-1.7
Public sector	1 867	1 828	1 745	1 740	1 699	1 669	2.7	-1.8	-2.2
Port construction and dredging	1 513	1 260	1 313	1 420	1 441	1 590	2.5	10.3	1.0
Port authority	1 703	1 607	1 564	1 584	1 570	1 551	2.5	-1.2	-1.9
Shipping companies	915	929	865	890	770	791	1.3	2.7	-2.9
Shipbuilding and repair	410	371	360	359	363	354	0.6	-2.4	-2.9
Port trade	115	92	89	82	52	43	0.1	-18.3	-18.0
Fishing and fish industry	13	14	13	13	11	6	0.0	-44.1	-13.5
<b>Maritime</b>	<b>27 961</b>	<b>27 381</b>	<b>27 478</b>	<b>27 640</b>	<b>27 885</b>	<b>28 365</b>	<b>45.3</b>	<b>1.7</b>	<b>0.3</b>
Chemicals industry	10 982	10 936	10 803	10 873	10 971	11 276	18.0	2.8	0.5
Other logistic services	4 061	4 180	4 349	4 622	5 245	5 455	8.7	4.0	6.1
Fuel production	2 607	2 626	2 751	2 752	2 904	2 874	4.6	-1.1	2.0
Metalworking industry	3 687	3 579	3 557	3 572	3 573	2 865	4.6	-19.8	-4.9
Construction	1 703	1 723	1 673	1 751	1 826	2 442	3.9	33.7	7.5
Trade	2 260	2 404	2 151	2 174	2 271	2 211	3.5	-2.6	-0.4
Road transport	2 049	2 154	2 056	1 946	1 928	1 879	3.0	-2.6	-1.7
Other land transport	2 506	2 439	1 924	1 724	1 497	1 497	2.4	0.0	-9.8
Other industries	1 179	1 200	1 226	1 232	1 293	1 305	2.1	0.9	2.0
Energy	993	946	920	1 019	1 061	1 053	1.7	-0.7	1.2
Car manufacturing	1 020	1 004	941	846	910	861	1.4	-5.4	-3.3
Food industry	403	407	405	382	410	422	0.7	2.9	0.9
Electronics	127	133	134	137	140	130	0.2	-7.2	0.4
<b>Non-maritime</b>	<b>33 578</b>	<b>33 731</b>	<b>32 889</b>	<b>33 029</b>	<b>34 029</b>	<b>34 270</b>	<b>54.7</b>	<b>0.7</b>	<b>0.4</b>
Direct	61 539	61 112	60 367	60 669	61 914	62 635	100.0	1.2	0.4
Indirect	83 139	80 662	74 546	74 449	80 126	79 960			
<b>Total</b>	<b>144 678</b>	<b>141 774</b>	<b>134 913</b>	<b>135 118</b>	<b>142 040</b>	<b>142 594</b>			

Source: NBB.

Where  $\sigma_{2018,s} = 100 \times \frac{v_{2018,s}}{v_{2018,Direct}}$  is the share of sector  $s$  (in %) in 2018,  $\alpha_{2018,s} = 100 \times \frac{v_{2018,s} - v_{2017,s}}{v_{2017,s}}$  is the growth of sector  $s$  (in %)

between 2017 and 2018,  $\bar{\alpha}_s = 100 \times \left( \left( \frac{v_{2018,s}}{v_{2013,s}} \right)^{1/5} - 1 \right)$  is the (geometric) average growth of sector  $s$  (in %) between 2013 and 2018.

**TABLE 5.1.3 INVESTMENT AT PORT OF ANTWERP** (in € million)

	2013	2014	2015	2016	2017	2018	$\sigma_{2018,s}$	$\alpha_{2018,s}$	$\bar{\alpha}_s$
Shipping companies	432.7	1 009.8	591.0	734.4	401.8	1 573.0	33.9	291.5	29.5
Cargo handling	493.1	578.6	607.5	675.2	730.2	930.8	20.0	27.5	13.5
Port construction and dredging	14.8	27.4	70.6	34.4	334.9	230.5	5.0	-31.2	73.2
Port authority	196.3	154.2	131.0	141.1	79.6	98.6	2.1	23.9	-12.9
Shipping agents and forwarders	29.5	32.7	33.0	37.1	45.8	49.9	1.1	9.0	11.1
Public sector	58.5	26.5	19.8	29.3	15.6	38.0	0.8	143.6	-8.3
Shipbuilding and repair	6.0	1.3	1.7	2.3	1.2	2.6	0.1	116.7	-15.4
Fishing and fish industry	0.0	0.0	0.0	0.0	0.6	0.7	0.0	16.7	
Port trade	0.5	0.4	0.3	0.5	1.1	0.1	0.0	-90.9	-27.5
<b>Maritime</b>	<b>1 231.4</b>	<b>1 830.9</b>	<b>1 454.9</b>	<b>1 654.3</b>	<b>1 610.8</b>	<b>2 924.2</b>	<b>63.0</b>	<b>81.5</b>	<b>18.9</b>
Chemicals industry	576.9	737.3	690.8	791.8	804.8	818.0	17.6	1.6	7.2
Energy	74.5	108.4	167.4	142.1	249.2	280.3	6.0	12.5	30.3
Fuel production	239.0	417.8	525.3	616.7	433.6	242.9	5.2	-44.0	0.3
Other logistic services	78.7	69.8	85.4	120.3	136.9	149.8	3.2	9.4	13.7
Other land transport	15.7	12.2	23.6	13.7	30.7	45.7	1.0	48.9	23.8
Other industries	28.1	19.6	24.0	25.1	84.0	44.2	1.0	-47.4	9.5
Food industry	15.7	12.9	22.7	13.3	13.1	34.9	0.8	166.4	17.3
Trade	54.1	56.1	53.8	48.0	35.6	33.8	0.7	-5.1	-9.0
Road transport	22.4	33.9	24.7	32.1	20.2	32.2	0.7	59.4	7.5
Construction	11.4	8.7	15.1	12.6	18.4	25.2	0.5	37.0	17.2
Metalworking industry	15.6	11.4	12.9	14.3	18.6	11.1	0.2	-40.3	-6.6
Car manufacturing	8.5	0.6	5.7	2.7	4.4	2.6	0.1	-40.9	-21.1
Electronics	1.0	0.0	0.0	0.0	0.4	0.3	0.0	-25.0	-21.4
<b>Non-maritime</b>	<b>1 141.6</b>	<b>1 488.7</b>	<b>1 651.4</b>	<b>1 832.7</b>	<b>1 849.9</b>	<b>1 721.0</b>	<b>37.0</b>	<b>-7.0</b>	<b>8.6</b>
<b>Direct</b>	<b>2 373.0</b>	<b>3 319.6</b>	<b>3 106.3</b>	<b>3 487.0</b>	<b>3 460.7</b>	<b>4 645.2</b>	<b>100.0</b>	<b>34.2</b>	<b>14.4</b>

Source: NBB.

Where  $\sigma_{2018,s} = 100 \times \frac{v_{2018,s}}{v_{2018,Direct}}$  is the share of sector  $s$  (in %) in 2018,  $\alpha_{2018,s} = 100 \times \frac{v_{2018}-v_{2017}}{v_{2017}}$  is the growth of sector  $s$  (in %)

between 2017 and 2018,  $\bar{\alpha}_s = 100 \times \left( \left( \frac{v_{2018}}{v_{2013}} \right)^{1/5} - 1 \right)$  is the (geometric) average growth of sector  $s$  (in %) between 2013 and 2018.

## 5.2 North Sea Port Flanders

**TABLE 5.2.1 VALUE ADDED AT NORTH SEA PORT FLANDERS** (in € million)

	2013	2014	2015	2016	2017	2018	$\sigma_{2018,s}$	$\alpha_{2018,s}$	$\bar{\alpha}_s$
Cargo handling	244.9	247.6	222.9	233.4	252.0	256.8	5.8	1.9	1.0
Shipping agents and forwarders	31.0	33.0	34.8	34.1	42.0	37.6	0.8	-10.5	3.9
Port authority	23.4	24.8	23.9	32.2	30.5	30.4	0.7	-0.3	5.4
Public sector	21.1	21.1	21.4	22.2	21.1	22.5	0.5	6.6	1.3
Shipping companies	4.7	7.4	3.8	3.4	4.9	4.0	0.1	-18.4	-3.2
Shipbuilding and repair	3.4	4.1	4.1	3.9	4.1	3.5	0.1	-14.6	0.6
Port trade	0.2	0.3	0.4	0.4	0.3	0.3	0.0	0.0	8.4
<b>Maritime</b>	<b>328.7</b>	<b>338.3</b>	<b>311.3</b>	<b>329.6</b>	<b>354.9</b>	<b>355.1</b>	<b>8.0</b>	<b>0.1</b>	<b>1.6</b>
Trade	771.6	805.9	822.3	906.6	978.2	1 052.1	23.6	7.6	6.4
Metalworking industry	529.3	641.0	774.3	835.6	1 056.7	957.0	21.4	-9.4	12.6
Car manufacturing	735.4	713.5	722.6	711.5	746.4	786.4	17.6	5.4	1.4
Chemicals industry	323.7	384.5	428.5	372.5	486.5	491.6	11.0	1.0	8.7
Other industries	162.5	178.1	141.3	149.8	140.3	174.7	3.9	24.5	1.5
Construction	104.3	122.0	118.1	124.6	143.9	154.1	3.5	7.1	8.1
Other logistic services	138.9	141.8	138.3	113.4	123.8	123.0	2.8	-0.6	-2.4
Food industry	91.9	104.4	112.4	104.3	107.3	119.9	2.7	11.7	5.5
Fuel production	54.7	41.4	56.5	36.6	114.3	108.9	2.4	-4.7	14.8
Road transport	63.4	66.4	68.4	69.8	73.4	70.8	1.6	-3.5	2.2
Electronics	28.5	34.1	35.5	30.0	36.9	36.3	0.8	-1.6	5.0
Energy	53.8	36.2	38.1	57.6	49.6	23.6	0.5	-52.4	-15.2
Other land transport	11.6	10.1	11.3	11.8	11.1	11.1	0.2	0.0	-0.9
<b>Non-maritime</b>	<b>3 069.6</b>	<b>3 279.4</b>	<b>3 467.6</b>	<b>3 524.1</b>	<b>4 068.4</b>	<b>4 109.5</b>	<b>92.0</b>	<b>1.0</b>	<b>6.0</b>
<b>Direct</b>	<b>3 398.3</b>	<b>3 617.7</b>	<b>3 778.9</b>	<b>3 853.7</b>	<b>4 423.3</b>	<b>4 464.6</b>	<b>100.0</b>	<b>0.9</b>	<b>5.6</b>
<b>Indirect</b>	<b>3 697.2</b>	<b>3 903.3</b>	<b>3 457.4</b>	<b>3 444.5</b>	<b>4 170.5</b>	<b>4 026.8</b>			
<b>Total</b>	<b>7 095.5</b>	<b>7 521.0</b>	<b>7 236.3</b>	<b>7 298.2</b>	<b>8 593.8</b>	<b>8 491.4</b>			

Source: NBB.

Where  $\sigma_{2018,s} = 100 \times \frac{v_{2018,s}}{v_{2018,Direct}}$  is the share of sector  $s$  (in %) in 2018,  $\alpha_{2018,s} = 100 \times \frac{v_{2018}-v_{2017}}{v_{2017}}$  is the growth of sector  $s$  (in %)

between 2017 and 2018,  $\bar{\alpha}_s = 100 \times \left( \left( \frac{v_{2018}}{v_{2013}} \right)^{1/5} - 1 \right)$  is the (geometric) average growth of sector  $s$  (in %) between 2013 and 2018.

**TABLE 5.2.2 EMPLOYMENT AT NORTH SEA PORT FLANDERS** (in FTE)

	2013	2014	2015	2016	2017	2018	$\sigma_{2018,s}$	$\alpha_{2018,s}$	$\bar{\alpha}_s$
Cargo handling	2 361	2 407	1 870	2 057	2 097	2 282	7.9	8.8	-0.7
Shipping agents and forwarders	338	360	354	359	416	413	1.4	-0.8	4.1
Public sector	242	235	228	211	214	196	0.7	-8.6	-4.2
Port authority	156	148	148	148	143	138	0.5	-3.8	-2.5
Shipbuilding and repair	58	52	54	51	47	46	0.2	-1.9	-4.4
Shipping companies	25	18	5	4	4	4	0.0	2.6	-30.8
Port trade	1	3	3	4	2	3	0.0	38.9	20.1
<b>Maritime</b>	<b>3 181</b>	<b>3 223</b>	<b>2 661</b>	<b>2 833</b>	<b>2 923</b>	<b>3 081</b>	<b>10.7</b>	<b>5.4</b>	<b>-0.6</b>
Car manufacturing	9 033	9 088	9 546	9 389	9 357	9 505	33.1	1.6	1.0
Metalworking industry	5 836	6 057	6 018	6 152	6 030	5 819	20.3	-3.5	-0.1
Chemicals industry	2 109	2 102	2 109	2 145	2 176	2 241	7.8	3.0	1.2
Construction	1 240	1 460	1 452	1 539	1 675	1 781	6.2	6.3	7.5
Trade	2 106	2 072	1 597	1 603	1 639	1 663	5.8	1.4	-4.6
Other logistic services	1 101	1 159	1 166	1 157	1 345	1 318	4.6	-2.0	3.7
Other industries	968	1 019	889	930	975	991	3.5	1.6	0.5
Road transport	749	783	717	732	760	766	2.7	0.8	0.4
Food industry	601	632	650	637	677	681	2.4	0.5	2.5
Electronics	235	253	267	258	250	262	0.9	4.8	2.2
Fuel production	39	42	220	228	235	234	0.8	-0.6	43.3
Energy	170	180	185	197	202	198	0.7	-1.7	3.2
Other land transport	174	160	188	191	160	166	0.6	3.6	-1.0
<b>Non-maritime</b>	<b>24 358</b>	<b>25 006</b>	<b>25 004</b>	<b>25 158</b>	<b>25 481</b>	<b>25 624</b>	<b>89.3</b>	<b>0.6</b>	<b>1.0</b>
<b>Direct</b>	<b>27 539</b>	<b>28 229</b>	<b>27 665</b>	<b>27 991</b>	<b>28 404</b>	<b>28 705</b>	<b>100.0</b>	<b>1.1</b>	<b>0.8</b>
<b>Indirect</b>	<b>34 970</b>	<b>35 362</b>	<b>31 322</b>	<b>32 070</b>	<b>34 189</b>	<b>34 984</b>			
<b>Total</b>	<b>62 509</b>	<b>63 591</b>	<b>58 986</b>	<b>60 061</b>	<b>62 592</b>	<b>63 688</b>			

Source: NBB.

Where  $\sigma_{2018,s} = 100 \times \frac{v_{2018,s}}{v_{2018,Direct}}$  is the share of sector  $s$  (in %) in 2018,  $\alpha_{2018,s} = 100 \times \frac{v_{2018,s} - v_{2017}}{v_{2017}}$  is the growth of sector  $s$  (in %) between 2017 and 2018,  $\bar{\alpha}_s = 100 \times \left( \left( \frac{v_{2018}}{v_{2013}} \right)^{1/5} - 1 \right)$  is the (geometric) average growth of sector  $s$  (in %) between 2013 and 2018.

**TABLE 5.2.3 INVESTMENT AT NORTH SEA PORT FLANDERS** (in € million)

	2013	2014	2015	2016	2017	2018	$\sigma_{2018,s}$	$\alpha_{2018,s}$	$\bar{\alpha}_s$
Cargo handling	81.5	48.9	45.4	90.4	142.2	72.0	13.0	-49.4	-2.4
Port authority	6.4	6.6	8.5	8.6	11.7	17.7	3.2	51.3	22.6
Shipping companies	1.3	1.0	0.2	0.7	2.2	4.1	0.7	86.4	25.8
Shipping agents and forwarders	1.8	1.9	1.8	4.4	2.0	4.0	0.7	100.0	17.3
Public sector	11.0	3.0	10.3	17.7	8.6	0.5	0.1	-94.2	-46.1
Shipbuilding and repair	0.2	0.4	0.8	0.6	1.2	0.3	0.1	-75.0	8.4
Port trade	0.0	0.1	0.0	0.1	0.0	0.0	0.0		
<b>Maritime</b>	<b>102.2</b>	<b>61.9</b>	<b>67.0</b>	<b>122.5</b>	<b>167.9</b>	<b>98.6</b>	<b>17.8</b>	<b>-41.3</b>	<b>-0.7</b>
Car manufacturing	34.1	50.6	53.4	116.0	191.5	120.6	21.7	-37.0	28.7
Chemicals industry	56.6	70.3	52.4	54.3	70.1	109.3	19.7	55.9	14.1
Metalworking industry	67.9	75.2	84.2	122.1	159.3	73.1	13.2	-54.1	1.5
Other logistic services	20.3	26.5	15.4	19.1	24.9	34.1	6.1	36.9	10.9
Trade	35.2	43.6	31.7	33.6	31.2	34.0	6.1	9.0	-0.7
Food industry	17.3	15.1	22.7	24.0	19.3	22.1	4.0	14.5	5.0
Construction	12.3	10.7	14.3	10.2	13.4	15.1	2.7	12.7	4.2
Other industries	24.5	19.3	17.1	18.2	16.5	14.0	2.5	-15.2	-10.6
Road transport	17.5	14.6	9.7	9.3	10.6	10.4	1.9	-1.9	-9.9
Other land transport	17.3	16.5	7.2	2.4	5.1	8.6	1.6	68.6	-13.0
Electronics	0.9	1.8	2.2	1.8	3.3	5.5	1.0	66.7	43.6
Energy	27.2	5.9	4.4	6.3	4.5	5.4	1.0	20.0	-27.6
Fuel production	3.0	2.2	1.7	2.2	2.3	3.9	0.7	69.6	5.4
<b>Non-maritime</b>	<b>334.1</b>	<b>352.3</b>	<b>316.4</b>	<b>419.5</b>	<b>552.0</b>	<b>456.1</b>	<b>82.2</b>	<b>-17.4</b>	<b>6.4</b>
<b>Direct</b>	<b>436.3</b>	<b>414.2</b>	<b>383.4</b>	<b>542.0</b>	<b>719.9</b>	<b>554.7</b>	<b>100.0</b>	<b>-22.9</b>	<b>4.9</b>

Source: NBB.

Where  $\sigma_{2018,s} = 100 \times \frac{v_{2018,s}}{v_{2018,Direct}}$  is the share of sector  $s$  (in %) in 2018,  $\alpha_{2018,s} = 100 \times \frac{v_{2018,s} - v_{2017}}{v_{2017}}$  is the growth of sector  $s$  (in %) between 2017 and 2018,  $\bar{\alpha}_s = 100 \times \left( \left( \frac{v_{2018}}{v_{2013}} \right)^{1/5} - 1 \right)$  is the (geometric) average growth of sector  $s$  (in %) between 2013 and 2018.

### 5.3 Port of Zeebrugge

**TABLE 5.3.1 VALUE ADDED AT PORT OF ZEEBRUGGE** (in € million)

	2013	2014	2015	2016	2017	2018	$\sigma_{2018,s}$	$\alpha_{2018,s}$	$\bar{\alpha}_s$
Cargo handling	194.7	205.4	219.1	249.2	250.5	251.4	24.1	0.4	5.2
Public sector	109.9	107.1	103.3	103.1	103.0	102.3	9.8	-0.7	-1.4
Shipping agents and forwarders	69.8	68.9	84.8	67.1	69.3	65.6	6.3	-5.3	-1.2
Fishing and fish industry	40.5	43.5	47.7	52.2	53.2	55.0	5.3	3.4	6.3
Shipping companies	50.0	50.0	48.3	53.9	47.9	49.4	4.7	3.1	-0.2
Port authority	32.5	36.7	35.8	35.0	37.7	41.7	4.0	10.6	5.1
Port construction and dredging	24.6	18.6	30.4	19.6	28.3	20.6	2.0	-27.2	-3.5
Shipbuilding and repair	10.8	10.1	9.6	11.2	10.6	9.6	0.9	-9.4	-2.3
Port trade	0.7	1.1	1.0	1.1	0.7	0.8	0.1	14.3	2.7
<b>Maritime</b>	<b>533.5</b>	<b>541.4</b>	<b>580.0</b>	<b>592.4</b>	<b>601.2</b>	<b>596.4</b>	<b>57.2</b>	<b>-0.8</b>	<b>2.3</b>
Trade	88.1	85.7	87.2	88.9	88.4	98.9	9.5	11.9	2.3
Energy	92.5	98.4	91.3	89.6	93.8	91.5	8.8	-2.5	-0.2
Road transport	57.5	47.7	45.6	50.1	59.5	62.9	6.0	5.7	1.8
Other industries	38.6	43.3	40.2	38.1	44.7	37.1	3.6	-17.0	-0.8
Other logistic services	24.5	26.6	28.9	36.1	40.5	37.1	3.6	-8.4	8.7
Construction	24.1	23.8	25.5	31.7	31.5	32.9	3.2	4.4	6.4
Food industry	32.4	35.7	33.8	35.7	34.6	31.6	3.0	-8.7	-0.5
Chemicals industry	30.7	36.1	34.0	33.2	37.2	31.5	3.0	-15.3	0.5
Metalworking industry	4.0	5.1	4.4	4.9	5.5	8.7	0.8	58.2	16.8
Other land transport	7.2	6.7	7.3	7.6	7.0	7.8	0.7	11.4	1.6
Electronics	54.5	3.0	3.3	3.5	4.5	4.1	0.4	-8.9	-40.4
Car manufacturing	1.1	1.3	1.5	1.4	1.7	1.7	0.2	0.0	9.1
<b>Non-maritime</b>	<b>455.2</b>	<b>413.4</b>	<b>403.0</b>	<b>420.8</b>	<b>448.9</b>	<b>445.8</b>	<b>42.8</b>	<b>-0.7</b>	<b>-0.4</b>
Direct	988.7	954.8	983.0	1 013.2	1 050.1	1 042.2	100.0	-0.8	1.1
Indirect	813.2	781.6	685.2	719.4	771.6	763.6			
<b>Total</b>	<b>1 801.9</b>	<b>1 736.4</b>	<b>1 668.2</b>	<b>1 732.6</b>	<b>1 821.7</b>	<b>1 805.8</b>			

Source: NBB.

Where  $\sigma_{2018,s} = 100 \times \frac{v_{2018,s}}{v_{2018,Direct}}$  is the share of sector  $s$  (in %) in 2018,  $\alpha_{2018,s} = 100 \times \frac{v_{2018,s} - v_{2017}}{v_{2017}}$  is the growth of sector  $s$  (in %)

between 2017 and 2018,  $\bar{\alpha}_s = 100 \times \left( \left( \frac{v_{2018}}{v_{2013}} \right)^{1/5} - 1 \right)$  is the (geometric) average growth of sector  $s$  (in %) between 2013 and 2018.

**TABLE 5.3.2 EMPLOYMENT AT PORT OF ZEEBRUGGE** (in FTE)

	2013	2014	2015	2016	2017	2018	$\sigma_{2018,s}$	$\alpha_{2018,s}$	$\bar{\alpha}_s$
Cargo handling	2 588	2 630	2 711	2 887	3 042	3 186	32.1	4.7	4.2
Public sector	1 600	1 563	1 478	1 443	1 399	1 357	13.7	-3.0	-3.2
Shipping agents and forwarders	652	658	653	637	643	685	6.9	6.6	1.0
Fishing and fish industry	516	533	530	530	520	496	5.0	-4.6	-0.8
Port construction and dredging	168	213	194	185	196	202	2.0	3.3	3.8
Shipping companies	191	212	174	147	173	175	1.8	1.0	-1.7
Port authority	134	135	133	136	133	131	1.3	-1.0	-0.4
Shipbuilding and repair	150	136	128	140	150	116	1.2	-22.6	-5.0
Port trade	9	14	13	15	11	12	0.1	5.3	5.3
<b>Maritime</b>	<b>6 007</b>	<b>6 092</b>	<b>6 015</b>	<b>6 120</b>	<b>6 267</b>	<b>6 360</b>	<b>64.2</b>	<b>1.5</b>	<b>1.1</b>
Trade	816	803	847	872	826	839	8.5	1.7	0.6
Road transport	806	662	581	670	683	726	7.3	6.3	-2.1
Other industries	399	447	418	398	415	401	4.0	-3.6	0.1
Construction	351	336	347	359	344	354	3.6	3.1	0.2
Food industry	293	300	310	337	291	291	2.9	0.1	-0.2
Other logistic services	206	169	209	235	276	274	2.8	-0.8	5.9
Chemicals industry	246	263	234	248	281	240	2.4	-14.5	-0.5
Energy	125	134	127	125	124	122	1.2	-1.2	-0.4
Other land transport	108	107	132	132	113	118	1.2	5.0	2.0
Metalworking industry	76	85	67	65	71	111	1.1	56.1	7.9
Electronics	306	43	46	55	62	58	0.6	-6.0	-28.3
Car manufacturing	11	13	13	15	17	17	0.2	-1.8	8.0
<b>Non-maritime</b>	<b>3 742</b>	<b>3 361</b>	<b>3 330</b>	<b>3 509</b>	<b>3 500</b>	<b>3 550</b>	<b>35.8</b>	<b>1.4</b>	<b>-1.0</b>
Direct	9 749	9 453	9 345	9 630	9 767	9 910	100.0	1.5	0.3
Indirect	10 126	9 875	8 755	9 099	9 563	9 898			
<b>Total</b>	<b>19 875</b>	<b>19 328</b>	<b>18 100</b>	<b>18 729</b>	<b>19 331</b>	<b>19 809</b>			

Source: NBB.

Where  $\sigma_{2018,s} = 100 \times \frac{v_{2018,s}}{v_{2018,Direct}}$  is the share of sector  $s$  (in %) in 2018,  $\alpha_{2018,s} = 100 \times \frac{v_{2018,s} - v_{2017}}{v_{2017}}$  is the growth of sector  $s$  (in %)

between 2017 and 2018,  $\bar{\alpha}_s = 100 \times \left( \left( \frac{v_{2018}}{v_{2013}} \right)^{1/5} - 1 \right)$  is the (geometric) average growth of sector  $s$  (in %) between 2013 and 2018.



**TABLE 5.3.3 INVESTMENT AT PORT OF ZEEBRUGGE** (in € million)

	2013	2014	2015	2016	2017	2018	$\sigma_{2018,s}$	$\alpha_{2018,s}$	$\bar{\alpha}_s$
Cargo handling	16.8	50.7	28.1	43.2	59.3	33.8	14.0	-43.0	15.0
Port authority	28.3	22.0	13.4	24.2	22.7	26.1	10.8	15.0	-1.6
Fishing and fish industry	7.7	8.8	13.8	6.2	8.1	10.7	4.4	32.1	6.8
Port construction and dredging	1.6	1.3	3.0	3.6	2.7	5.7	2.4	111.1	28.9
Shipbuilding and repair	1.0	2.5	3.3	4.7	2.0	4.7	1.9	135.0	36.3
Shipping agents and forwarders	4.6	14.7	15.0	19.3	9.3	4.4	1.8	-52.7	-0.9
Public sector	16.4	13.4	9.0	7.5	30.6	3.2	1.3	-89.5	-27.9
Shipping companies	0.2	0.8	0.2	13.0	16.7	0.2	0.1	-98.8	0.0
Port trade	0.2	0.0	0.0	0.2	0.1	0.0	0.0	-100.0	-100.0
<b>Maritime</b>	<b>76.8</b>	<b>114.2</b>	<b>85.8</b>	<b>121.9</b>	<b>151.5</b>	<b>88.8</b>	<b>36.7</b>	<b>-41.4</b>	<b>2.9</b>
Energy	44.0	31.7	85.0	105.5	65.0	59.7	24.7	-8.2	6.3
Other land transport	16.5	10.4	20.5	21.9	22.3	27.7	11.5	24.2	10.9
Road transport	12.0	10.8	16.6	35.6	18.0	14.5	6.0	-19.4	3.9
Trade	12.6	10.6	11.7	9.9	13.1	12.5	5.2	-4.6	-0.2
Other industries	9.6	6.3	6.2	4.1	8.1	11.6	4.8	43.2	3.9
Other logistic services	8.6	6.2	6.6	5.4	8.0	8.5	3.5	6.3	-0.2
Food industry	4.7	5.9	3.7	4.3	4.4	7.9	3.3	79.5	10.9
Chemicals industry	3.1	4.3	3.6	3.4	5.8	5.9	2.4	1.7	13.7
Construction	3.3	2.6	2.5	2.7	3.7	3.6	1.5	-2.7	1.8
Metalworking industry	0.3	0.3	0.3	0.2	2.9	0.9	0.4	-69.0	24.6
Electronics	5.5	0.5	0.4	0.2	0.1	0.2	0.1	100.0	-48.5
Car manufacturing	0.3	0.0	0.1	0.2	0.1	0.0	0.0	-100.0	-100.0
<b>Non-maritime</b>	<b>120.5</b>	<b>89.6</b>	<b>157.2</b>	<b>193.4</b>	<b>151.5</b>	<b>153.0</b>	<b>63.3</b>	<b>1.0</b>	<b>4.9</b>
<b>Direct</b>	<b>197.3</b>	<b>203.8</b>	<b>243.0</b>	<b>315.3</b>	<b>303.0</b>	<b>241.8</b>	<b>100.0</b>	<b>-20.2</b>	<b>4.2</b>

Source: NBB.

Where  $\sigma_{2018,s} = 100 \times \frac{v_{2018,s}}{v_{2018,Direct}}$  is the share of sector  $s$  (in %) in 2018,  $\alpha_{2018,s} = 100 \times \frac{v_{2018,s} - v_{2017,s}}{v_{2017,s}}$  is the growth of sector  $s$  (in %) between 2017 and 2018,  $\bar{\alpha}_s = 100 \times \left( \left( \frac{v_{2018,s}}{v_{2013,s}} \right)^{1/5} - 1 \right)$  is the (geometric) average growth of sector  $s$  (in %) between 2013 and 2018.

## 5.4 Port of Ostend

**TABLE 5.4.1 VALUE ADDED AT PORT OF OSTEND** (in € million)

	2013	2014	2015	2016	2017	2018	$\sigma_{2018,s}$	$\alpha_{2018,s}$	$\bar{\alpha}_s$
Public sector	49.9	51.7	56.0	58.0	59.0	61.1	10.8	3.6	4.1
Port construction and dredging	59.4	57.6	70.5	57.1	42.6	47.8	8.4	12.2	-4.3
Fishing and fish industry	37.2	39.8	38.7	40.6	43.5	37.8	6.7	-13.1	0.3
Shipbuilding and repair	14.3	14.0	12.8	12.9	13.2	14.4	2.5	9.1	0.1
Shipping agents and forwarders	4.5	2.9	5.0	4.0	5.0	5.5	1.0	10.0	4.1
Port authority	2.3	2.4	2.7	2.9	3.5	4.6	0.8	31.4	14.9
Cargo handling	2.2	3.1	2.4	2.5	1.3	2.3	0.4	76.9	0.9
Shipping companies	0.7	0.9	0.7	0.6	0.5	0.2	0.0	-60.0	-22.2
<b>Maritime</b>	<b>170.5</b>	<b>172.4</b>	<b>188.8</b>	<b>178.6</b>	<b>168.6</b>	<b>173.7</b>	<b>30.6</b>	<b>3.0</b>	<b>0.4</b>
Metalworking industry	161.5	169.6	168.3	164.6	190.6	199.3	35.1	4.6	4.3
Chemicals industry	38.3	36.7	34.2	38.4	36.6	38.6	6.8	5.5	0.2
Construction	33.1	31.7	33.9	30.8	39.2	35.0	6.2	-10.7	1.1
Road transport	25.0	22.8	25.0	26.0	26.0	24.7	4.3	-5.0	-0.2
Other logistic services	12.1	13.5	13.0	14.4	16.0	23.4	4.1	46.3	14.1
Other industries	4.3	7.2	20.6	22.9	18.5	22.6	4.0	22.2	39.4
Energy	13.4	18.8	18.9	19.6	18.7	21.3	3.7	13.9	9.7
Food industry	12.3	11.6	14.5	16.7	16.9	16.9	3.0	0.0	6.6
Trade	15.6	14.3	12.1	13.5	9.1	11.0	1.9	20.9	-6.7
Car manufacturing	2.2	0.8	2.7	0.8	1.4	1.3	0.2	-7.1	-10.0
Other land transport	0.0	0.0	0.7	0.6	0.5	0.5	0.1	0.0	
<b>Non-maritime</b>	<b>317.8</b>	<b>327.0</b>	<b>343.9</b>	<b>348.3</b>	<b>373.5</b>	<b>394.6</b>	<b>69.4</b>	<b>5.6</b>	<b>4.4</b>
<b>Direct</b>	<b>488.3</b>	<b>499.4</b>	<b>532.7</b>	<b>526.9</b>	<b>542.1</b>	<b>568.3</b>	<b>100.0</b>	<b>4.8</b>	<b>3.1</b>
<b>Indirect</b>	<b>395.7</b>	<b>385.0</b>	<b>387.6</b>	<b>367.2</b>	<b>380.2</b>	<b>395.4</b>			
<b>Total</b>	<b>884.0</b>	<b>884.4</b>	<b>920.3</b>	<b>894.1</b>	<b>922.3</b>	<b>963.7</b>			

Source: NBB.

Where  $\sigma_{2018,s} = 100 \times \frac{v_{2018,s}}{v_{2018,Direct}}$  is the share of sector  $s$  (in %) in 2018,  $\alpha_{2018,s} = 100 \times \frac{v_{2018,s} - v_{2017,s}}{v_{2017,s}}$  is the growth of sector  $s$  (in %) between 2017 and 2018,  $\bar{\alpha}_s = 100 \times \left( \left( \frac{v_{2018,s}}{v_{2013,s}} \right)^{1/5} - 1 \right)$  is the (geometric) average growth of sector  $s$  (in %) between 2013 and 2018.

**TABLE 5.4.2 EMPLOYMENT AT PORT OF OSTEND (in FTE)**

	2013	2014	2015	2016	2017	2018	$\sigma_{2018,s}$	$\alpha_{2018,s}$	$\bar{\alpha}_s$
Public sector	726	740	772	786	770	764	15.1	-0.7	1.0
Fishing and fish industry	414	409	422	413	424	431	8.5	1.7	0.9
Port construction and dredging	426	381	364	345	332	328	6.5	-1.4	-5.1
Shipbuilding and repair	223	221	198	207	223	235	4.6	5.4	1.1
Port authority	42	38	37	35	34	37	0.7	8.2	-2.3
Shipping agents and forwarders	12	20	31	28	28	30	0.6	6.8	19.8
Cargo handling	51	63	45	33	9	6	0.1	-31.9	-34.5
Shipping companies	1	2	1	2	4	4	0.1	-4.9	22.7
<b>Maritime</b>	<b>1 894</b>	<b>1 875</b>	<b>1 869</b>	<b>1 849</b>	<b>1 824</b>	<b>1 835</b>	<b>36.2</b>	<b>0.6</b>	<b>-0.6</b>
Metalworking industry	1 391	1 450	1 431	1 388	1 446	1 505	29.7	4.1	1.6
Construction	439	413	421	432	439	421	8.3	-4.1	-0.8
Road transport	418	406	419	417	416	405	8.0	-2.4	-0.6
Chemicals industry	311	312	309	304	299	310	6.1	3.7	0.0
Other logistic services	127	96	115	119	118	158	3.1	34.5	4.5
Food industry	130	142	143	135	130	133	2.6	2.0	0.4
Trade	194	197	208	201	113	121	2.4	7.1	-8.9
Other industries	56	79	118	117	120	120	2.4	0.7	16.4
Energy	55	56	46	36	38	34	0.7	-11.1	-9.3
Car manufacturing	31	33	29	26	26	22	0.4	-14.9	-6.2
Other land transport	0	0	10	9	7	7	0.1	-6.9	
<b>Non-maritime</b>	<b>3 152</b>	<b>3 184</b>	<b>3 251</b>	<b>3 183</b>	<b>3 150</b>	<b>3 236</b>	<b>63.8</b>	<b>2.7</b>	<b>0.5</b>
Direct	5 046	5 058	5 121	5 032	4 975	5 071	100.0	1.9	0.1
Indirect	4 399	4 309	4 268	4 071	4 130	4 184			
<b>Total</b>	<b>9 445</b>	<b>9 367</b>	<b>9 388</b>	<b>9 103</b>	<b>9 105</b>	<b>9 255</b>			

Source: NBB.

Where  $\sigma_{2018,s} = 100 \times \frac{v_{2018,s}}{v_{2018,Direct}}$  is the share of sector  $s$  (in %) in 2018,  $\alpha_{2018,s} = 100 \times \frac{v_{2018}-v_{2017}}{v_{2017}}$  is the growth of sector  $s$  (in %) between 2017 and 2018,  $\bar{\alpha}_s = 100 \times \left( \left( \frac{v_{2018}}{v_{2013}} \right)^{1/5} - 1 \right)$  is the (geometric) average growth of sector  $s$  (in %) between 2013 and 2018.

**TABLE 5.4.3 INVESTMENT AT PORT OF OSTEND (in €million)**

	2013	2014	2015	2016	2017	2018	$\sigma_{2018,s}$	$\alpha_{2018,s}$	$\bar{\alpha}_s$
Public sector	12.0	13.9	13.8	23.8	5.4	32.6	25.1	503.7	22.1
Fishing and fish industry	5.8	4.0	4.3	4.1	11.1	9.5	7.3	-14.4	10.4
Shipping agents and forwarders	1.9	0.6	2.5	3.8	0.4	1.5	1.2	275.0	-4.6
Port authority	1.5	2.9	1.1	0.4	2.0	1.3	1.0	-35.0	-2.8
Port construction and dredging	0.2	46.4	0.1	1.3	2.8	1.2	0.9	-57.1	43.1
Shipbuilding and repair	2.0	1.6	0.2	0.4	0.1	1.0	0.8	900.0	-12.9
Cargo handling	1.3	0.9	0.2	0.0	0.1	0.1	0.1	0.0	-40.1
Shipping companies	0.1	0.2	0.0	0.0	0.2	0.1	0.1	-50.0	0.0
<b>Maritime</b>	<b>24.8</b>	<b>70.5</b>	<b>22.2</b>	<b>33.8</b>	<b>22.1</b>	<b>47.3</b>	<b>36.4</b>	<b>114.0</b>	<b>13.8</b>
Metalworking industry	15.6	11.2	12.5	8.7	11.2	21.4	16.4	91.1	6.5
Construction	9.4	13.6	10.6	21.2	15.1	20.1	15.4	33.1	16.4
Other industries	1.2	1.4	18.8	14.5	10.7	12.6	9.7	17.8	60.0
Chemicals industry	6.6	5.7	6.0	5.9	8.6	9.3	7.1	8.1	7.1
Other logistic services	6.4	3.8	3.1	1.4	2.8	8.3	6.4	196.4	5.3
Road transport	5.6	1.8	2.4	2.5	4.3	4.0	3.1	-7.0	-6.5
Food industry	1.4	3.7	1.3	1.9	4.1	3.6	2.8	-12.2	20.8
Trade	4.7	7.4	3.6	2.9	4.9	2.5	1.9	-49.0	-11.9
Energy	0.2	0.2	0.3	1.1	0.7	0.9	0.7	28.6	35.1
Other land transport	0.1	0.0	0.0	0.0	0.0	0.1	0.1		0.0
Car manufacturing	0.2	0.1	0.0	0.1	0.0	0.0	0.0		-100.0
<b>Non-maritime</b>	<b>51.4</b>	<b>48.9</b>	<b>58.6</b>	<b>60.2</b>	<b>62.4</b>	<b>82.8</b>	<b>63.6</b>	<b>32.7</b>	<b>10.0</b>
<b>Direct</b>	<b>76.2</b>	<b>119.4</b>	<b>80.8</b>	<b>94.0</b>	<b>84.5</b>	<b>130.1</b>	<b>100.0</b>	<b>54.0</b>	<b>11.3</b>

Source: NBB.

Where  $\sigma_{2018,s} = 100 \times \frac{v_{2018,s}}{v_{2018,Direct}}$  is the share of sector  $s$  (in %) in 2018,  $\alpha_{2018,s} = 100 \times \frac{v_{2018}-v_{2017}}{v_{2017}}$  is the growth of sector  $s$  (in %) between 2017 and 2018,  $\bar{\alpha}_s = 100 \times \left( \left( \frac{v_{2018}}{v_{2013}} \right)^{1/5} - 1 \right)$  is the (geometric) average growth of sector  $s$  (in %) between 2013 and 2018.

## 5.5 Liège port complex

**TABLE 5.5.1 VALUE ADDED AT LIÈGE PORT COMPLEX** (in € million)

	2013	2014	2015	2016	2017	2018	$\sigma_{2018,s}$	$\alpha_{2018,s}$	$\bar{\alpha}_s$
Cargo handling	14.5	13.1	14.2	15.2	15.2	15.4	1.6	1.3	1.2
Shipping companies	3.0	3.6	4.2	3.8	4.2	4.9	0.5	16.7	10.3
Port authority	2.7	2.6	2.6	2.6	2.8	2.8	0.3	0.0	0.7
Shipping agents and forwarders	4.0	3.6	3.1	3.8	2.7	2.7	0.3	0.0	-7.6
Shipbuilding and repair	0.6	0.6	0.5	0.6	0.5	0.7	0.1	40.0	3.1
Maritime	24.8	23.5	24.6	26.0	25.4	26.5	2.7	4.3	1.3
Metalworking industry	333.5	274.6	275.0	278.9	309.6	309.3	31.7	-0.1	-1.5
Chemicals industry	118.7	143.1	132.4	149.4	151.3	152.3	15.6	0.7	5.1
Construction	137.5	175.8	144.3	133.8	138.3	137.3	14.1	-0.7	0.0
Energy	382.6	324.7	252.1	326.6	261.5	81.2	8.3	-68.9	-26.7
Fuel production	59.7	39.2	40.4	69.6	75.5	71.3	7.3	-5.6	3.6
Trade	67.4	66.0	59.6	61.5	51.6	69.3	7.1	34.3	0.6
Other industries	59.6	61.3	75.6	69.5	71.5	64.5	6.6	-9.8	1.6
Other logistic services	11.8	19.4	27.1	27.2	29.2	29.4	3.0	0.7	20.0
Food industry	29.4	26.9	28.4	15.4	23.6	22.0	2.3	-6.8	-5.6
Electronics	3.3	4.2	6.1	4.8	6.7	6.5	0.7	-3.0	14.5
Road transport	5.7	5.3	4.3	4.1	4.4	5.3	0.5	20.5	-1.4
Other land transport	1.0	1.1	0.7	0.6	0.6	0.6	0.1	0.0	-9.7
Car manufacturing	0.4	0.4	0.3	0.4	0.4	0.2	0.0	-50.0	-12.9
Non-maritime	1 210.6	1 142.0	1 046.3	1 141.8	1 124.2	949.2	97.3	-15.6	-4.7
Direct	1 235.4	1 165.5	1 070.9	1 167.8	1 149.6	975.7	100.0	-15.1	-4.6
Indirect	1 310.2	1 145.5	969.0	1 044.7	1 123.8	971.4			
Total	2 545.6	2 311.0	2 039.9	2 212.5	2 273.4	1 947.1			

Source: NBB.

Where  $\sigma_{2018,s} = 100 \times \frac{v_{2018,s}}{v_{2018,Direct}}$  is the share of sector  $s$  (in %) in 2018,  $\alpha_{2018,s} = 100 \times \frac{v_{2018,s} - v_{2017}}{v_{2017}}$  is the growth of sector  $s$  (in %) between 2017 and 2018,  $\bar{\alpha}_s = 100 \times \left( \left( \frac{v_{2018}}{v_{2013}} \right)^{1/5} - 1 \right)$  is the (geometric) average growth of sector  $s$  (in %) between 2013 and 2018.

**TABLE 5.5.2 EMPLOYMENT VALUE ADDED AT LIÈGE PORT COMPLEX** (in FTE)

	2013	2014	2015	2016	2017	2018	$\sigma_{2018,s}$	$\alpha_{2018,s}$	$\bar{\alpha}_s$
Cargo handling	153	153	157	174	185	190	2.4	2.8	4.4
Shipping companies	51	52	54	55	52	53	0.7	1.5	0.6
Shipping agents and forwarders	56	47	41	42	44	44	0.6	0.5	-4.7
Port authority	36	35	34	35	34	33	0.4	-2.9	-1.7
Shipbuilding and repair	9	9	9	10	10	10	0.1	6.3	2.8
Maritime	306	296	294	316	325	331	4.2	1.8	1.6
Metalworking industry	3 718	2 783	2 440	2 307	2 355	2 376	30.2	0.9	-8.6
Energy	1 246	1 293	1 293	1 251	1 224	1 209	15.4	-1.3	-0.6
Chemicals industry	1 021	996	1 011	1 036	1 032	1 032	13.1	0.0	0.2
Construction	1 058	1 017	1 047	1 026	1 061	1 020	13.0	-3.9	-0.7
Other industries	737	729	888	750	692	720	9.2	4.1	-0.5
Other logistic services	176	345	358	367	411	396	5.0	-3.6	17.7
Trade	386	396	387	367	370	366	4.7	-1.1	-1.1
Fuel production	122	125	125	125	122	121	1.5	-0.8	-0.2
Food industry	99	111	154	101	140	109	1.4	-22.0	1.9
Electronics	68	71	74	73	81	85	1.1	5.1	4.5
Road transport	115	105	91	76	75	79	1.0	5.5	-7.2
Other land transport	15	17	12	10	8	8	0.1	-1.2	-11.7
Car manufacturing	9	9	7	8	10	7	0.1	-29.5	-6.1
Non-maritime	8 770	7 996	7 886	7 496	7 581	7 527	95.8	-0.7	-3.0
Direct	9 076	8 292	8 180	7 812	7 905	7 858	100.0	-0.6	-2.8
Indirect	12 966	11 189	10 028	9 718	10 305	10 445			
Total	22 042	19 481	18 208	17 530	18 210	18 303			

Source: NBB.

Where  $\sigma_{2018,s} = 100 \times \frac{v_{2018,s}}{v_{2018,Direct}}$  is the share of sector  $s$  (in %) in 2018,  $\alpha_{2018,s} = 100 \times \frac{v_{2018,s} - v_{2017}}{v_{2017}}$  is the growth of sector  $s$  (in %) between 2017 and 2018,  $\bar{\alpha}_s = 100 \times \left( \left( \frac{v_{2018}}{v_{2013}} \right)^{1/5} - 1 \right)$  is the (geometric) average growth of sector  $s$  (in %) between 2013 and 2018.

**TABLE 5.5.3 INVESTMENT VALUE ADDED AT LIÈGE PORT COMPLEX** (in € million)

	2013	2014	2015	2016	2017	2018	$\sigma_{2018,s}$	$\alpha_{2018,s}$	$\bar{\alpha}_s$
Cargo handling	3.4	2.6	3.0	6.9	3.6	4.0	1.7	11.1	3.3
Public sector	0.0	0.0	3.4	0.3	0.8	1.2	0.5	50.0	
Shipping agents and forwarders	0.2	2.1	0.6	0.8	0.5	0.8	0.3	60.0	32.0
Port authority	0.0	0.3	0.8	0.1	0.2	0.5	0.2	150.0	
Shipping companies	0.4	0.2	0.2	0.4	0.7	0.2	0.1	-71.4	-12.9
Maritime	4.0	5.2	8.0	8.5	5.8	6.8	2.9	17.2	11.2
Energy	88.9	79.8	93.4	66.4	63.6	75.2	31.9	18.2	-3.3
Metalworking industry	40.1	30.5	27.3	35.2	55.8	43.5	18.4	-22.0	1.6
Chemicals industry	21.6	18.4	31.4	31.8	30.2	40.3	17.1	33.4	13.3
Other industries	14.5	14.5	18.0	14.0	31.6	25.7	10.9	-18.7	12.1
Construction	31.2	30.5	15.6	15.9	14.4	16.3	6.9	13.2	-12.2
Fuel production	5.9	7.2	7.2	7.7	7.7	9.6	4.1	24.7	10.2
Other logistic services	1.9	1.9	4.3	3.6	19.8	6.1	2.6	-69.2	26.3
Trade	2.7	6.7	7.0	5.9	7.0	5.9	2.5	-15.7	16.9
Food industry	1.9	1.9	4.2	4.2	4.1	3.4	1.4	-17.1	12.3
Electronics	0.5	0.6	0.7	1.6	1.8	1.5	0.6	-16.7	24.6
Road transport	1.2	0.5	1.7	1.2	0.4	1.5	0.6	275.0	4.6
Other land transport	0.9	0.7	0.3	0.3	0.0	0.2	0.1		-26.0
Car manufacturing	0.1	0.0	0.0	0.0	0.0	0.0	0.0		-100.0
Non-maritime	211.4	193.2	211.1	187.8	236.4	229.2	97.1	-3.0	1.6
Direct	215.4	198.4	219.1	196.3	242.2	236.0	100.0	-2.6	1.8

Source: NBB.

Where  $\sigma_{2018,s} = 100 \times \frac{v_{2018,s}}{v_{2018,Direct}}$  is the share of sector  $s$  (in %) in 2018,  $\alpha_{2018,s} = 100 \times \frac{v_{2018,s} - v_{2017,s}}{v_{2017,s}}$  is the growth of sector  $s$  (in %)

between 2017 and 2018,  $\bar{\alpha}_s = 100 \times \left( \left( \frac{v_{2018,s}}{v_{2013,s}} \right)^{1/5} - 1 \right)$  is the (geometric) average growth of sector  $s$  (in %) between 2013 and 2018.

## 5.6 Port of Brussels

**TABLE 5.6.1 VALUE ADDED AT PORT OF BRUSSELS** (in € million)

	2013	2014	2015	2016	2017	2018	$\sigma_{2018,s}$	$\alpha_{2018,s}$	$\bar{\alpha}_s$
Shipping agents and forwarders	14.6	13.2	12.5	10.6	9.2	8.6	1.1	-6.5	-10.0
Cargo handling	5.8	6.4	6.3	6.5	5.0	5.4	0.7	8.0	-1.4
Port authority	3.1	-1.9	6.0	4.7	5.5	4.5	0.6	-18.2	7.7
Shipping companies	1.5	1.0	-2.5	-0.3	-0.3	1.0	0.1	-433.3	-7.8
Port trade	0.0	0.0	0.1	0.1	0.1	0.2	0.0	100.0	
Public sector	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	-12.9
Shipbuilding and repair	0.0	0.1	0.1	0.1	0.1	0.0	0.0	-100.0	
Maritime	25.2	19.0	22.6	21.8	19.7	19.8	2.4	0.5	-4.7
Other logistic services	186.8	187.6	443.8	390.7	525.8	506.7	62.7	-3.6	22.1
Trade	158.0	173.7	194.2	176.3	146.2	145.4	18.0	-0.5	-1.6
Other industries	56.3	45.3	47.8	57.8	61.7	59.7	7.4	-3.2	1.2
Construction	16.0	15.6	15.8	20.2	21.8	23.4	2.9	7.3	7.9
Chemicals industry	8.5	4.9	31.6	27.5	33.7	18.6	2.3	-44.8	17.0
Road transport	17.1	18.2	18.1	14.5	16.0	16.8	2.1	5.0	-0.4
Food industry	13.8	14.8	12.9	13.0	16.1	11.0	1.4	-31.7	-4.4
Metalworking industry	7.3	8.1	7.8	9.6	9.9	9.8	1.2	-1.0	6.1
Other land transport	0.1	0.1	0.0	0.0	0.0	0.0	0.0		-100.0
Energy	1.1	0.7	1.6	0.8	0.8	-2.9	-0.4	-462.5	-221.4
Non-maritime	465.0	469.0	773.6	710.4	832.0	788.5	97.6	-5.2	11.1
Direct	490.2	488.0	796.2	732.2	851.7	808.3	100.0	-5.1	10.5
Indirect	368.1	354.8	473.4	462.3	508.8	475.3			
Total	858.3	842.8	1 269.6	1 194.5	1 360.5	1 283.6			

Source: NBB.

Where  $\sigma_{2018,s} = 100 \times \frac{v_{2018,s}}{v_{2018,Direct}}$  is the share of sector  $s$  (in %) in 2018,  $\alpha_{2018,s} = 100 \times \frac{v_{2018,s} - v_{2017,s}}{v_{2017,s}}$  is the growth of sector  $s$  (in %)

between 2017 and 2018,  $\bar{\alpha}_s = 100 \times \left( \left( \frac{v_{2018,s}}{v_{2013,s}} \right)^{1/5} - 1 \right)$  is the (geometric) average growth of sector  $s$  (in %) between 2013 and 2018.

**TABLE 5.6.2 EMPLOYMENT AT PORT OF BRUSSELS** (in FTE)

	2013	2014	2015	2016	2017	2018	$\sigma_{2018,s}$	$\alpha_{2018,s}$	$\bar{\alpha}_s$
Port authority	123	122	125	123	122	120	3.1	-2.0	-0.5
Shipping agents and forwarders	192	167	172	145	113	118	3.1	4.0	-9.3
Cargo handling	93	99	87	84	51	55	1.4	7.4	-10.0
Shipping companies	15	14	15	18	13	6	0.2	-55.0	-17.0
Port trade	0	0	1	1	1	3	0.1	200.0	
Public sector	3	3	2	1	1	1	0.0	0.0	-19.7
<b>Maritime</b>	<b>426</b>	<b>405</b>	<b>402</b>	<b>372</b>	<b>302</b>	<b>303</b>	<b>7.9</b>	<b>0.2</b>	<b>-6.6</b>
Other logistic services	1 191	1 212	1 216	1 223	1 265	1 241	32.3	-1.9	0.8
Trade	1 359	1 369	1 369	1 254	1 147	1 093	28.4	-4.7	-4.3
Other industries	328	343	347	364	352	353	9.2	0.5	1.5
Construction	263	247	245	237	247	240	6.2	-2.8	-1.9
Road transport	280	286	305	244	247	237	6.2	-4.0	-3.3
Chemicals industry	74	69	115	130	124	129	3.3	3.8	11.7
Food industry	150	140	128	122	123	124	3.2	1.0	-3.7
Metalworking industry	86	89	88	106	110	117	3.0	6.6	6.2
Energy	20	20	17	15	15	8	0.2	-49.0	-18.1
Other land transport	2	1	0	0	0	0	0.0	-100.0	-100.0
<b>Non-maritime</b>	<b>3 754</b>	<b>3 777</b>	<b>3 829</b>	<b>3 696</b>	<b>3 628</b>	<b>3 541</b>	<b>92.1</b>	<b>-2.4</b>	<b>-1.2</b>
Direct	4 181	4 182	4 231	4 068	3 930	3 843	100.0	-2.2	-1.7
Indirect	3 808	3 693	3 783	3 523	3 292	3 216			
<b>Total</b>	<b>7 989</b>	<b>7 875</b>	<b>8 014</b>	<b>7 591</b>	<b>7 221</b>	<b>7 059</b>			

Source: NBB.

Where  $\sigma_{2018,s} = 100 \times \frac{v_{2018,s}}{v_{2018,Direct}}$  is the share of sector  $s$  (in %) in 2018,  $\alpha_{2018,s} = 100 \times \frac{v_{2018,s} - v_{2017,s}}{v_{2017,s}}$  is the growth of sector  $s$  (in %) between 2017 and 2018,  $\bar{\alpha}_s = 100 \times \left( \left( \frac{v_{2018,s}}{v_{2013,s}} \right)^{1/5} - 1 \right)$  is the (geometric) average growth of sector  $s$  (in %) between 2013 and 2018.

**TABLE 5.6.3 INVESTMENT AT PORT OF BRUSSELS** (in € million)

	2013	2014	2015	2016	2017	2018	$\sigma_{2018,s}$	$\alpha_{2018,s}$	$\bar{\alpha}_s$
Port authority	10.7	5.4	7.5	9.0	9.0	5.5	5.4	-38.9	-12.5
Cargo handling	0.5	1.6	3.3	1.3	1.5	1.5	1.5	0.0	24.6
Shipping agents and forwarders	13.1	0.6	5.2	0.6	0.6	1.1	1.1	83.3	-39.1
Port trade	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.0	
Public sector	0.0	0.0	3.7	8.8	8.6	3.7	3.6	-56.9	
<b>Maritime</b>	<b>24.3</b>	<b>7.6</b>	<b>19.8</b>	<b>19.7</b>	<b>19.8</b>	<b>11.9</b>	<b>11.6</b>	<b>-39.9</b>	<b>-13.3</b>
Other logistic services	20.5	19.4	17.7	11.8	28.4	54.8	53.4	93.0	21.7
Trade	14.6	13.5	15.4	19.4	12.8	14.1	13.7	10.2	-0.7
Other industries	1.0	3.4	1.5	13.0	2.2	8.4	8.2	281.8	53.1
Road transport	2.3	3.5	2.7	1.9	1.5	4.1	4.0	173.3	12.3
Construction	2.7	2.2	2.3	2.2	2.6	3.6	3.5	38.5	5.9
Energy	0.0	0.1	0.3	0.0	1.4	2.6	2.5	85.7	
Chemicals industry	0.4	0.4	0.7	0.6	1.1	1.3	1.3	18.2	26.6
Metalworking industry	0.7	1.4	1.4	1.1	0.4	1.0	1.0	150.0	7.4
Food industry	1.8	1.3	2.3	4.6	1.6	0.9	0.9	-43.8	-12.9
Other land transport	0.1	0.0	0.0	0.0	0.0	0.0	0.0		
<b>Non-maritime</b>	<b>44.1</b>	<b>45.2</b>	<b>44.3</b>	<b>54.6</b>	<b>52.0</b>	<b>90.8</b>	<b>91.7</b>	<b>74.6</b>	<b>15.5</b>
<b>Direct</b>	<b>68.4</b>	<b>52.8</b>	<b>64.1</b>	<b>74.3</b>	<b>71.8</b>	<b>102.7</b>	<b>100.0</b>	<b>43.0</b>	<b>8.5</b>

Source: NBB.

Where  $\sigma_{2018,s} = 100 \times \frac{v_{2018,s}}{v_{2018,Direct}}$  is the share of sector  $s$  (in %) in 2018,  $\alpha_{2018,s} = 100 \times \frac{v_{2018,s} - v_{2017,s}}{v_{2017,s}}$  is the growth of sector  $s$  (in %) between 2017 and 2018,  $\bar{\alpha}_s = 100 \times \left( \left( \frac{v_{2018,s}}{v_{2013,s}} \right)^{1/5} - 1 \right)$  is the (geometric) average growth of sector  $s$  (in %) between 2013 and 2018.

## NATIONAL BANK OF BELGIUM - WORKING PAPERS SERIES

The Working Papers are available on the website of the Bank: <http://www.nbb.be>.

334. "Exchange rate movements, firm-level exports and heterogeneity", by A. Berthou and E. Dhyne, *Research series*, January 2018.
335. "Nonparametric identification of unobserved technological heterogeneity in production", by L. Cherchye, T. Demuyne, B. De Rock and M. Verschelde, *Research series*, February 2018.
336. "Compositional changes in aggregate productivity in an era of globalisation and financial crisis", by C. Fuss and A. Theodorakopoulos, *Research series*, February 2018.
337. "Decomposing firm-product appeal: How important is consumer taste?", by B. Y. Aw, Y. Lee and H. Vandenbussche, *Research series*, March 2018.
338. "Sensitivity of credit risk stress test results: Modelling issues with an application to Belgium", by P. Van Roy, S. Ferrari and C. Vespro, *Research series*, March 2018.
339. "Paul van Zeeland and the first decade of the US Federal Reserve System: The analysis from a European central banker who was a student of Kemmerer", by I. Maes and R. Gomez Betancourt, *Research series*, March 2018.
340. "One way to the top: How services boost the demand for goods", by A. Ariu, F. Mayneris and M. Parenti, *Research series*, March 2018.
341. "Alexandre Lamfalussy and the monetary policy debates among central bankers during the Great Inflation", by I. Maes and P. Clement, *Research series*, April 2018.
342. "The economic importance of the Belgian ports: Flemish maritime ports, Liège port complex and the port of Brussels – Report 2016", by F. Coppens, C. Mathys, J.-P. Merckx, P. Ringoot and M. Van Kerckhoven, *Document series*, April 2018.
343. "The unemployment impact of product and labour market regulation: Evidence from European countries", by C. Piton, *Research series*, June 2018.
344. "Trade and domestic production networks", by F. Tintelnot, A. Ken Kikkawa, M. Mogstad, E. Dhyne, *Research series*, September 2018.
345. "Review essay: Central banking through the centuries", by I. Maes, *Research series*, October 2018.
346. "IT and productivity: A firm level analysis", by E. Dhyne, J. Konings, J. Van den Bosch, S. Vanormelingen, *Research series*, October 2018.
347. "Identifying credit supply shocks with bank-firm data: methods and applications", by H. Degryse, O. De Jonghe, S. Jakovljević, Klaas Mulier, Glenn Schepens, *Research series*, October 2018.
348. "Can inflation expectations in business or consumer surveys improve inflation forecasts?", by R. Basselier, D. de Antonio Liedo, J. Jonckheere and G. Langenus, *Research series*, October 2018.
349. "Quantile-based inflation risk models", by E. Ghysels, L. Iania and J. Striaukas, *Research series*, October 2018.
350. "International food commodity prices and missing (dis)inflation in the euro area", by G. Peersman, *Research series*, October 2018.
351. "Pipeline pressures and sectoral inflation dynamics", by F. Smets, J. Tielens and J. Van Hove, *Research series*, October 2018.
352. "Price updating in production networks", by C. Duprez and G. Magerman, *Research series*, October 2018.
353. "Dominant currencies. How firms choose currency invoicing and why it matters", by M. Amiti, O. Itskhoki and J. Konings, *Research series*, October 2018.
354. "Endogenous forward guidance", by B. Chafwehé, R. Oikonomou, R. Priftis and L. Vogel, *Research series*, October 2018.
355. "Is euro area lowflation here to stay? Insights from a time-varying parameter model with survey data", by A. Stevens and J. Wauters, *Research series*, October 2018.
356. "A price index with variable mark-ups and changing variety", by T. Demuyne and M. Parenti, *Research series*, October 2018.
357. "Markup and price dynamics: Linking micro to macro", by J. De Loecker, C. Fuss and J. Van Biesebroeck, *Research series*, October 2018.
358. "Productivity, wages and profits: Does firms' position in the value chain matter?", by B. Mahy, F. Rycx, G. Vermeylen and M. Volral, *Research series*, October 2018.
359. "Upstreamness, social upgrading and gender: Equal benefits for all?", by N. Gagliardi, B. Mahy and F. Rycx, *Research series*, December 2018.
360. "A macro-financial analysis of the corporate bond market", by H. Dewachter, L. Iania, W. Lemke and M. Lyrio, *Research series*, December 2018.

361. "Some borrowers are more equal than others: Bank funding shocks and credit reallocation", by O. De Jonghe, H. Dewachter, K. Mulier, S. Ongena and G. Schepens, *Research series*, December 2018.
362. "The origins of firm heterogeneity: A production network approach", by A. B. Bernard, E. Dhyne, G. Magerman, K. Manova and A. Moxnes, *Research series*, January 2019.
363. "Imperfect competition in firm-to-firm trade", by A. Ken Kikkawa, G. Magerman and E. Dhyne, *Research series*, January 2019.
364. "Forward guidance with preferences over safe assets", by A. Rannenberg, *Research series*, January 2019.
365. "The distinct effects of information technologies and communication technologies on the age-skill composition of labour demand", by S. Blanas, *Research series*, January 2019.
366. "A survey of the long-term impact of Brexit on the UK and the EU27 economies", by P. Bisciari, *Document series*, January 2019.
367. "A macroeconomic model with heterogeneous and financially-constrained intermediaries", by Th. Lejeune and R. Wouters, *Research series*, February 2019.
368. "The economic importance of the Belgian ports: Flemish maritime ports, Liège port complex and the port of Brussels – Report 2017", by E. Gueli, P. Ringoot and M. Van Kerckhoven, *Document series*, March 2019.
369. "Does banks' systemic importance affect their capital structure and balance sheet adjustment processes?", by Y. Bakkar, O. De Jonghe and A. Tarazi, *Research series*, March 2019.
370. "A model for international spillovers to emerging markets", by R. Houssa, J. Mohimont and C. Otrók, *Research series*, April 2019.
371. "Estimation methods for computing a branch's total value added from incomplete annual accounting data", S. Vansteelandt, F. Coppens, D. Reynders, M. Vackier and L. Van Belle, *Research series*, April 2019.
372. "Do SVARs with sign restrictions not identify unconventional monetary policy shocks?", by J. Boeckx, M. Dossche, A. Galesi, B. Hofmann and G. Peersman, *Research series*, June 2019.
373. "Research and development activities in Belgium: A snapshot of past investment for the country's future", by S. Vennix, *Research series*, July 2019.
374. "State dependent fiscal multipliers with preferences over safe assets" by A. Rannenberg, *Research series*, July 2019.
375. "Inequality, the risk of secular stagnation and the increase in household debt", by A. Rannenberg, *Research series*, August 2019.
376. "Welfare effects of business cycles and monetary policies in a small open emerging economy", by J. Mohimont, *Research series*, October 2019.
377. "Learning about demand abroad from wholesalers: a B2B analysis", by W. Connell, E. Dhyne and H. Vandenbussche, *Research series*, November 2019.
378. "Measuring trade in value added with Firm-level Data", by R. Bems and A. K. Kikkawa, *Research series*, November 2019.
379. "Scrapping the entitlement to unemployment benefits for young labor market entrants: An effective way to get them to work?", by B. Cockx, K. Declercq, M. Dejemeppe, L. Inga and B. Van der Linden, *Research series*, December 2019.
380. "The impact of Brexit uncertainties on international trade: Evidence from Belgium", by E. E. Schmitz, *Research series*, December 2019.
381. "The heterogeneous employment outcomes of first- and second-generation immigrants in Belgium", by C. Piton and F. Rycx, *Research series*, January 2020.
382. "A Dane in the making of European Monetary Union – A conversation with Niels Thygesen", by I. Maes and S. Péters, *Research series*, May 2020.
383. "Multi-product exporters: Costs, prices and markups on foreign vs domestic markets", by Catherine Fuss, *Research series*, June 2020.
384. "The economic importance of the Belgian maritime and inland ports – Report 2018", by I. Rubbrecht and K. Burggraeve, *Document series*, July 2020.

National Bank of Belgium  
Limited liability company  
RLP Brussels – Company's number: 0203.201.340  
Registered office: boulevard de Berlaimont 14 – BE-1000 Brussels  
[www.nbb.be](http://www.nbb.be)

Editor  
**Pierre Wunsch**  
Governor of the National Bank of Belgium

© Illustrations: National Bank of Belgium

Layout: Analysis and Research Group  
Cover: NBB CM – Prepress & Image

Published in July 2020