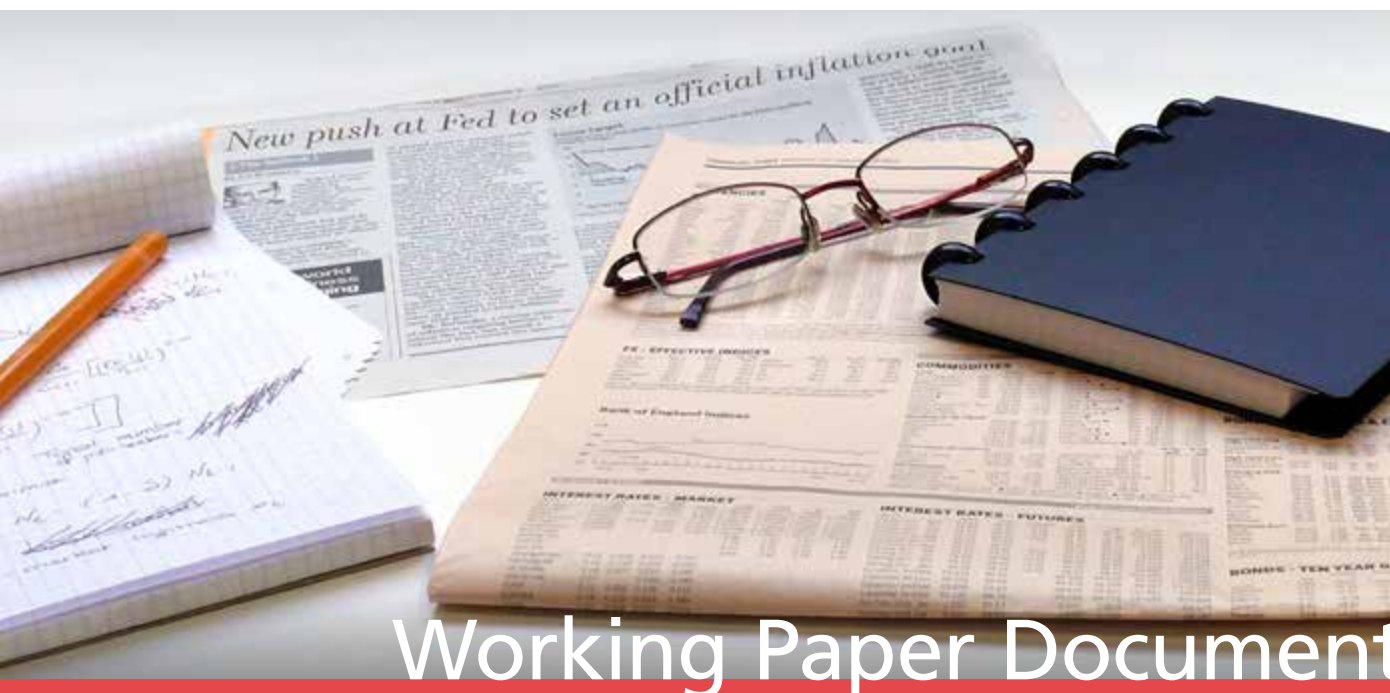The economic importance of the Belgian ports:
Flemish maritime ports, Liège port complex
and the port of Brussels – Report 2016

Working Paper Document

by François Coppens, Claude Mathys, Jean-Pierre Merckx,
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Foreword

Compiling the statistical series on the Belgian ports is not only a complex task, it is also particularly time-consuming. Moreover, publication depends on the submission of the annual accounts. In the past, it was therefore not possible to give the figures for year t-2 until May or June at the earliest. An effort was made to considerably speed up the calculations and analysis by using advanced statistical techniques combined with extensive computerisation. The aim was also to convey the central message more clearly. Consequently, the focus is on the principal branches and developments in each port. In that regard, readers will receive new, clear information. The complete tables are to be found in the annexes. Since the port studies are primarily a statistical tool for the stakeholders, all series will from now on also be circulated via the NBB website[1]. Users can download all data from the website and incorporate them in their own analyses.

Abstract

This Working Paper analyses the economic importance of the Belgian ports based largely on the annual accounts data for the year 2016. As the years prior to 2016 have been described in earlier papers in the same series, we mainly focus on the figures for 2016 and developments between 2015 and 2016.

On the back of strong growth, direct value added in the Belgian ports remained more or less stable in 2016 at around € 18 000 million (current prices) or roughly 4.3% of Belgium's GDP. Direct value added declined in the Flemish seaports, mainly in the port of Antwerp. Ghent and Zeebrugge could only partly compensate for the fall in Antwerp's value added, while Ostend showed a small decline itself. The inland ports as a whole grew over the period 2015-2016; the port of Brussels registered a decline and the Liège port complex an increase. Indirect value added is around 82% of the direct figure.

After declining from 2012, direct employment in the Belgian ports was more or less stable in 2016 at around 115 000 FTE or approximately 2.8% of Belgium's total domestic employment. Direct employment in the Flemish seaports increased, mainly in the ports of Zeebrugge, Ghent and Antwerp. Ostend showed a decline in employment. The inland ports recorded lower employment; the port of Brussels registered a decline, as did the Liège port complex. Indirect employment is around 1.2 times the direct figure.

Delving deeper into the data and trying to explain the above trends in terms of the structural composition of the Belgian ports shows that all ports are concentrated on a few sectors, and within those sectors often on just a handful of companies.

Based on the figures of the traffic, the Flemish ports can be considered as real bridgeheads for trade with the UK. Developments regarding the modalities and consequences of the Brexit therefor should be followed with the greatest attention. Given the existing import and export volumes in terms of tonnage, it seems it will mostly be a challenge in Zeebrugge and to some extent for Antwerp.

Key words: Belgian ports, microeconomic data, direct effects, indirect effects.
JEL classification: C67, C80, J21, J49, R11, R15.

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[1] http://stat.nbb.be/Index.aspx?DataSetCode=AMPORTS

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1.1 Traffic in the Belgian ports

Table 1.1 shows the traffic in the Flemish ports. Maritime traffic in the four Flemish ports increased from 274.4 million tonnes in 2015 to 282.6 million tonnes in 2016 (+3.0%). The total traffic was up in the ports of Antwerp (+2.8%), Ghent (+10.4%)[1] and Ostend (+13.1%). Zeebrugge saw a slight decline in volume in 2016 (-1.3%). In 2017 traffic increased to 294.6 million tonnes. A new all-time record for volume handled was achieved in both Antwerp and Ghent.

Table 1.1: Traffic in the Flemish Ports, 2015-2017, mio tonnes

	Antwerp	Ghent	Ostend	Zeebrugge	Total	Share (%)
2015						
Containers	113.3	0.3	0.0	15.6	129.2	47.1
Roll-on Roll-off	4.7	2.1	0.0	13.5	20.2	7.4
Conventional cargo	10.0	3.6	0.0	1.2	14.8	5.4
Liquid bulk	66.7	3.7	0.0	6.8	77.2	28.1
Dry bulk	13.8	16.7	1.2	1.3	33.1	12.0
Total 2015	208.4	26.4	1.3	38.3	274.4	100.0
2016						
Containers	117.9	0.1	0.0	14.4	132.5	46.9
Roll-on Roll-off	4.6	2.1	0.0	14.4	21.0	7.4
Conventional cargo	9.8	3.7	0.0	1.5	15.0	5.3
Liquid bulk	69.2	5.4	0.1	6.0	80.8	28.6
Dry bulk	12.6	17.7	1.3	1.5	33.2	11.8
Total 2016	214.2	29.1	1.5	37.8	282.6	100.0
2017						
Containers	123.0	0.1	0.0	15.4	138.5	47.0
Roll-on Roll-off	5.1	2.4	0.0	15.0	22.4	7.6
Conventional cargo	10.3	3.6	0.0	1.3	15.2	5.2
Liquid bulk	73.1	5.3	0.0	4.1	82.6	28.0
Dry bulk	12.2	21.1	1.3	1.3	35.9	12.2
Total 2017	223.6	32.5	1.4	37.1	294.6	100.0

Source: Port Authorities, Flemish Port Commission

Inland waterway tonnages in the port of Brussels and in the Liège port complex showed significant growths in 2016.

The port of Antwerp was the top port for container transport: 89% of containers transshipped in Flanders pass through that port. Zeebrugge has a more modest share, but mainly specialises in Roll-on Roll-off (RoRo) containers. Antwerp recorded a growth in container traffic of 4.1% in 2016 and 4.3% in 2017. After a sharp decline in 2015 (-23.8%), Zeebrugge container traffic further decreased in 2016 (-7.6%). Following previous reorganisations by container lines, leading to loss of traffic, new services were added in 2017: the NEU4 service operated by Ocean Alliance (CMA CGM), the Lift-on Lift-off (LoLo) service operated by P&O Ferries to Hull and the containerised kiwis delivered on Seatrade vessels. Therefore the trend reversed in 2017 (+6.5%).

In 2016 RoRo traffic was up 4.2%, in 2017 it rose by a further 6.3%. Zeebrugge is by far the leading Flemish RoRo port with two thirds of traffic. Besides RoRo ferry traffic, Zeebrugge

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[1] Because of rounding errors in table 1.1, the percentages computed from that table may be slightly different.

is also significant due to the transshipment of new cars: it is the largest car port in the world, handling 2.83 million vehicles. Ostend has had no RoRo traffic since 2014.

The downward trend in conventional general cargo, which has been apparent in the last few decades and was particularly strong in 2008 and 2009, has not continued since 2015. A growth of 1.7% was recorded in 2016. In the port of Antwerp, the largest Flemish port for general cargo, traffic of conventional general cargo has stood at around 10 million tonnes since 2013. In 2016 Ghent handled 3.7 million tonnes of conventional general cargo, while Zeebrugge had a relatively small share of this market segment with 1.5 million tonnes.

Liquid bulk traffic has almost doubled since 2000. Most years have seen an increase in traffic, even the crisis year of 2009. The majority of liquid bulk traffic is handled in the port of Antwerp: 69.2 of 80.8 million tonnes (2016). This mainly concerns petroleum products. In 2016 traffic in Antwerp increased by 3.8%. Liquid bulk in the port of Ghent increased sharply in 2016 (45.9%). This also concerns petroleum products. In Zeebrugge, where liquid bulk mainly involves liquefied natural gas, traffic declined by 10.7% in 2016. The sharp decline in LNG traffic (-62% in 2017) was due to high LNG prices in Japan and Korea combined with rising demand for LNG in China and India, so that most LNG was transported to Asia instead of Europe.

Following the stabilisation of volumes of dry bulk cargo handled in the Flemish ports in 2015 and 2016, this traffic rose sharply in 2017 (+8.0%). The rise is mainly due to the port of Ghent, where volumes of dry bulk handled increased from 17.7 to 21.1 million tonnes (+18.8% in 2017). This strengthens Ghent's position as the largest bulk port in Flanders. Dry bulk traffic is declining in Antwerp. Zeebrugge and Ostend each handle approximately 1.3 million tonnes of dry bulk. In both cases, this mainly involves deliveries of sand and gravel for the building industry.

In 2016, waterway traffic in the Liège port complex was up by 5.9%. The major increases concerned the transshipped volumes of containers, secondary raw materials and waste, agricultural products, wood and wood products and chemicals. Another highlight in the port's activity was a 40% rise in its container traffic in TEUs.

In 2016, waterway traffic in the port of Brussels rose by 2.1%. With this increase, the share of the main type of cargo, construction materials, remained steady with a tonnage representing more than half of the traffic, whereas the share of oil-industry products which rank next in order of importance decreased slightly. For the second year in a row, the annual record for containers handled in the port of Brussels was broken. With a rise of over 50%, a new absolute record for container shipping was posted.

1.2   Competitive position of the Belgian ports

Table 1.2 presents some figures that illustrate the competitive position of the Belgian ports. In 2016, the port of Rotterdam lost some of its strong growth from 2015 and declined from 466.4 to 461.2 million tonnes (-1.1%). The loss mainly affected dry bulk (-6.2%). Liquid bulk declined slightly (-0.5%) and containers increased slightly (+0.6%). A slight increase was recorded for RoRo and other general cargo, both with a relatively small share of the total volume.

The port of Amsterdam (North Sea Canal area, including Velsen/IJmuiden, Beverwijk and Zaanstad) saw traffic increase every year from the crisis in 2009 to 2014, but slipped back slightly in 2015 (94.9 million tonnes, -3.1%) and 2016 (95.1 million tonnes, +0.3%). In 2016 dry bulk was up (+2.5%) while conventional general cargo was down (-13.3%). Liquid bulk declined slightly (-0.5%). Dry and liquid bulk account for the majority of cargo handled in Amsterdam North Sea Canal area (93%)[2].

Zeeland Seaports (Terneuzen + Vlissingen) handled 33.2 million tonnes in 2016 (+0.5% compared to 2015). Dry and liquid bulk make up the main traffic in the port group, together

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[2]Source: (*Maritieme overslag in de Europese havens: Nederland - Amsterdam Noordzeekanaalgebied*)

Table 1.2: Competitive position of the Flemish ports, mio tonnes

	2011	2012	2013	2014	2015	2016	Change 2015-16 (%)	Share 2016 (%)
Antwerp	187.2	184.1	191.0	199.0	208.4	214.2	2.8	17.9
Ghent*	27.2	26.3	26.0	25.9	26.4	29.1	10.4	2.4
Ostend	3.8	3.2	1.8	1.4	1.3	1.5	13.1	0.1
Zeebrugge	47.0	43.5	42.8	42.5	38.3	37.8	-1.3	3.2
Flemish ports	265.1	257.2	261.6	268.9	274.4	282.5	3.0	23.6
Amsterdam	92.9	94.3	95.7	97.8	94.9	95.1	0.3	8.0
Bremen	80.6	84.0	78.8	78.3	73.4	74.2	1.0	6.2
Dunkirk	47.5	47.6	43.6	47.1	46.6	46.7	0.3	3.9
Hamburg	132.2	130.9	139.1	145.7	137.8	138.2	0.3	11.5
Le Havre	67.6	63.5	67.2	66.9	68.3	65.3	-4.5	5.5
Rotterdam	434.6	441.5	440.5	444.7	466.4	461.2	-1.1	38.5
Zeeland Seaports*	35.5	33.6	33.0	35.1	33.1	33.2	0.5	2.8
Total 11 ports	1 156	1 153	1 159	1 184	1 195	1 196	0.1	100
Total world traffic	8 785	9 197	9 514	9 843	10 023	10 287	2.6	
Share 11 ports (%)	13.2	12.5	12.2	12.0	11.9	11.6		

Sources: Port Authorities, Flemish Port Commission, UNCTAD, Review of Maritime Transport 2017.
* From December 2017, the ports of Ghent and Zeeland Seaports merged to become North Sea Port.

representing almost 71% of the total. A small loss was recorded for dry bulk: -1.2% (following a substantial loss of -9.7% in 2015). Liquid bulk increased by 10.2% (following a decline of -15.8% in 2015). Container traffic (although very modest in comparison) rose sharply, as in 2015. Other general cargo was down 11.1%. Zeeland Seaport merged with the port of Ghent to form North Sea Port at the end of 2017.

After the very strong years of 2011 and 2012, traffic began to decline in the port of Bremen from 2013. In 2015 Bremen/Bremerhaven lost further traffic (-6.2%), but in 2016 a slight recovery was recorded. The total volume handled amounted to 74.2 million tonnes in 2016, mostly consisting of containers (77% of the total, 56.8 million tonnes, 5.5 million TEU). The fluctuations in total traffic are therefore mainly due to container traffic. Reorganisations of container lines led to rises and falls in the number of container ships arriving and have a great impact on total volume.

In Hamburg, the upward trend peaked in 2014, with very strong growth in that year (+4.8%, to a total of 145.7 million tonnes). In 2015 this increase disappeared and the total volume handled declined to 137.8 million tonnes (-5.4%). Volume remained at the same level in 2016. Traffic in Hamburg is predominantly container traffic, which makes up two thirds of the total (91.7 million tonnes, 8.9 million TEU in 2016).

The total volume handled in the port of Dunkirk amounted to 46.7 million tonnes in 2016, a fraction higher than in 2015 (46.6 million tonnes). However, there were changes among the different types of cargo: dry bulk, liquid bulk and containers were up (+1.2%, +2.5% and +4.2%) while RoRo and general cargo were down (-1.7% and -6.0%).

In 2016 total traffic in Le Havre declined to 65.3 million tonnes (-4.5%). The two main types, liquid bulk and containers, have fared differently since the crisis in 2009: while container traffic has virtually returned to its pre-crisis level, liquid bulk has fallen by almost a quarter. This also means that total traffic is lower than before the crisis (65.3 million tonnes in 2016 versus 80.5 million tonnes in 2008).

Table 1.3 presents the cargo traffic by ship in the ports of Duisburg, Paris, Liège and Brussels. After a year of decline, the volume of waterborne cargo transshipped in the port of Brussels increased by 2.1% in 2016. Both the two most important categories of merchandise for the Port of Brussels, namely building materials and oil-industry products, rose by similar proportions. They account for three quarters of cargo traffic in the port of Brussels. With a 50% rise, 2016 is again a record year for containerised traffic.

Table 1.3: Competitive position of the inland ports, mio tonnes

Port	2011	2012	2013	2014	2015	2016	Change 2015-2016 (%)
Duisburg	50.4	38.2	47.2	51.1	51.9	53.1	2.3
Paris	22.3	22.6	21.2	20.3	20.2	20.3	0.6
Liège	19.5	16.5	14.9	15.0	14.6	15.5	5.9
Brussels	4.9	4.6	4.3	4.4	4.4	4.5	2.1

Source: Port of Duisburg, Ports of Paris, Liège Port Authority, Brussels Port Authority.

Waterborne traffic was up by 5.9% in 2016 in the Liège port complex, surpassing the 15 million tonnes handled in 2016. In the main categories of cargo, transshipment volumes were down for coal alone and the category covering petroleum products and coke remained stable. However, these two categories of cargo remain in third and fourth place respectively in terms of volumes handled. All other categories registered growth ranging from 2% for non-metallic mineral products (top category of cargo in terms of volume) to 40% for containers, with a sustained rise in other categories, whose results ranged between 10% and 20%.

Cargo traffic in the ports of Paris continued to grow slightly in 2016, with 20.3 million tonnes handled, mainly due to an unexpected rise in the building and public works category and rubble from the Grand Paris project. The building and public works category, which is the main category of cargo handled in the ports of Paris, rose by 2% while the second largest category, environmental, including rubble from construction sites, rose by 16%. On the other hand, agri-food traffic was down 19% due to a poor cereal crop. The metal, oil and fuels categories were also down. River traffic of shipping containers shrank by 3% despite rising in the second half of the year. Shipping conditions were also severely disrupted in the middle of 2016. In June 2016, the ports of Paris experienced severe flooding, almost entirely submerging the lower embankments of the Seine and leading the Port Authority to take exceptional measures.

In 2016, the port of Duisburg recorded a 2.3% increase in its waterway traffic. The total traffic carried by waterway, rail and road reached 133 million tonnes, and traffic volumes handled by the duisport Group were down slightly at 66.8 million tonnes. Container handling via ship, train or lorry in the duisport Group reached another record of 3.7 million TEUs. In duisport Group ports, handling volumes per ship improved by 4% to 16.2 million tonnes in 2016. For 2017, Duisport expects to record an increase in total handling volumes thanks to new tenants in the port, new rail connections and continued positive growth in rail freight to and from China.

1.3 Value added in the Belgian ports

Table 1.4 shows an overview of (direct and indirect) value added in the Belgian ports between 2011 and 2016. Table 1.5 breaks down this value added into its principal sectoral components.

The last column of the table shows the contribution of each component to the total growth over 2015-2016. The maritime and non-maritime contributions together add up to the total growth, and the same holds for all the individual components. Note that these percentages differ from each sector's own growth[3].

Between 2015 and 2016, direct value added decreased slightly from € 18 111.5 million to € 18 077.4 million, or by -0.2%. This decline followed a period of strong growth (see figure 1.1). The largest decline was observed in Antwerp (-1.0%). Brussels also recorded a small decrease, while the figure for Ostend remained more or less stable. The other ports showed a small increase in direct value added. Indirect value added was around 82% of direct value

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[3]The contribution of a sector to the total growth equals its share in 2015 times the sectoral growth over 2015-2016. See annex A.1

Table 1.4: Overview of value added, mio eur

ports	2011	2012	2013	2014	2015	2016	Contr.gr (%)[*]
Antwerp	9 757.5	10 055.9	9 800.7	10 009.2	10 998.2	10 814.7	-1.0
Ghent	3 355.1	3 194.0	3 398.3	3 617.6	3 792.2	3 859.3	0.4
Zeebrugge	983.4	951.0	988.5	954.9	979.4	1 007.2	0.2
Ostend	470.4	487.4	488.3	499.5	510.8	505.5	-0.0
Flemish ports	14 566.3	14 688.3	14 675.9	15 081.2	16 280.6	16 186.7	-0.5
Liege	1 437.6	1 219.2	1 235.1	1 165.5	1 059.1	1 163.7	0.6
Brussels	526.1	548.3	490.4	487.9	771.9	727.0	-0.2
Inland ports	1 963.8	1 767.5	1 725.5	1 653.4	1 831.0	1 890.7	0.3
Direct	16 530.1	16 455.8	16 401.4	16 734.6	18 111.5	18 077.4	-0.2
Indirect	13 377.1	13 517.9	13 340.1	13 239.9	15 014.2	14 827.4	
Total	29 907.1	29 973.6	29 741.5	29 974.5	33 125.7	32 904.8	

[*] *For details, see annex A.1*
Source: NBB.

Table 1.5: Sectoral overview of value added, mio eur

	2011	2012	2013	2014	2015	2016	Contr.gr (%)[*]
Cargo handling	1 845.1	1 953.3	2 025.4	2 080.5	2 131.9	2 209.7	0.4
Shipping companies	543.5	613.3	427.9	501.7	794.3	746.4	-0.3
Shipping agents and forwarders	727.1	712.1	755.5	714.7	773.1	720.7	-0.3
Other Maritime	992.5	1 133.5	1 155.0	1 120.7	1 213.3	1 166.7	-0.3
Maritime	4 108.1	4 412.1	4 363.8	4 417.6	4 912.5	4 843.5	-0.4
Chemicals	3 598.2	3 435.9	3 464.0	3 718.4	4 060.3	3 773.9	-1.6
Trade	2 114.1	2 119.6	1 955.8	2 062.7	2 110.9	2 255.1	0.8
Metalworking industry	1 277.2	1 162.9	1 284.3	1 348.6	1 478.8	1 532.2	0.3
Other Non-maritime	5 432.5	5 325.2	5 333.5	5 187.3	5 549.1	5 672.7	0.7
Non-maritime	12 421.9	12 043.6	12 037.6	12 317.0	13 199.0	13 233.8	0.2
Direct	16 530.1	16 455.8	16 401.4	16 734.6	18 111.5	18 077.4	-0.2
Indirect	13 377.1	13 517.9	13 340.1	13 239.9	15 014.2	14 827.4	
Total	29 907.1	29 973.6	29 741.5	29 974.5	33 125.7	32 904.8	

[*] *For details, see annex A.1*
Source: NBB.

added (2016).

Figure 1.1 shows that the decline in the port of Antwerp followed a period of strong growth. The same holds for the port of Ostend and the port of Brussels. The port of Ghent has been growing since 2012, the port of Zeebrugge since 2014. The Liège port complex increased its value added after a long period of decline.

Table 1.5 shows that the largest sectors over all ports are chemicals, cargo handling, trade and metalworking. Cargo handling was up slightly compared to 2015, and the same holds for metalworking and trade. The chemicals sector declined by -7.1% (this is its 'own-growth', to be distinguished from the contribution to total growth (-1.6%)), mainly in Antwerp. The positive result in the Liège port complex was due to strong growth in the energy sector. Ghent's positive result is due to an increase in the trade and metalworking industry.

The sectors mentioned above happen to be the most important sectors in each of the respective port areas; figure 1.2 shows value added (in 2016) for the combinations of port region and sector. The largest sector in Antwerp appears to be the chemicals industry (29.3]% of value added in 2016). The port of Ghent has three dominant sectors; trade, metalworking and (to a minor extent) car manufacturing[4]. The largest sector in the port of Zeebrugge is cargo handling, while for Ostend it is metalworking. The Liège port complex is mainly driven by the metalworking industry and the energy sector, while the port of Brussels mainly depends on other logistic services. These relations are analysed in more detail in section 2.

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[4]Note that the other non-maritime and other maritime categories are aggregates of smaller sectors.

Figure 1.1: Overview of value added in the Belgian ports, mio eur
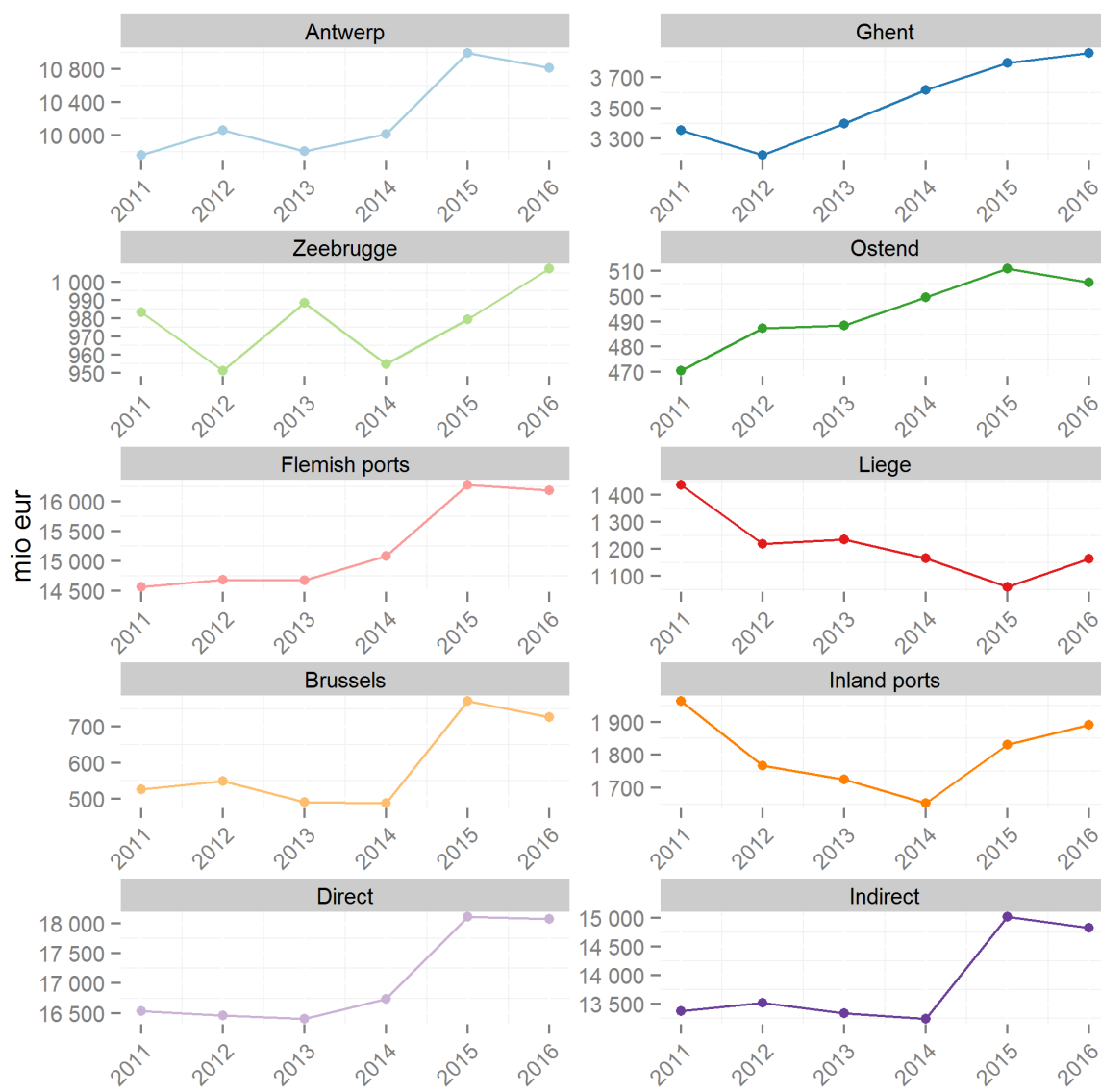
Figure 1.2: Most important sectors (in terms of value added) in the ports, 2016, (in %)

Value added for Antwerp (in %)

Value added for Ghent (in %)

Value added for Zeebrugge (in %)

Value added for Ostend (in %)

Value added for Liege (in %)

Value added for Brussels (in %)
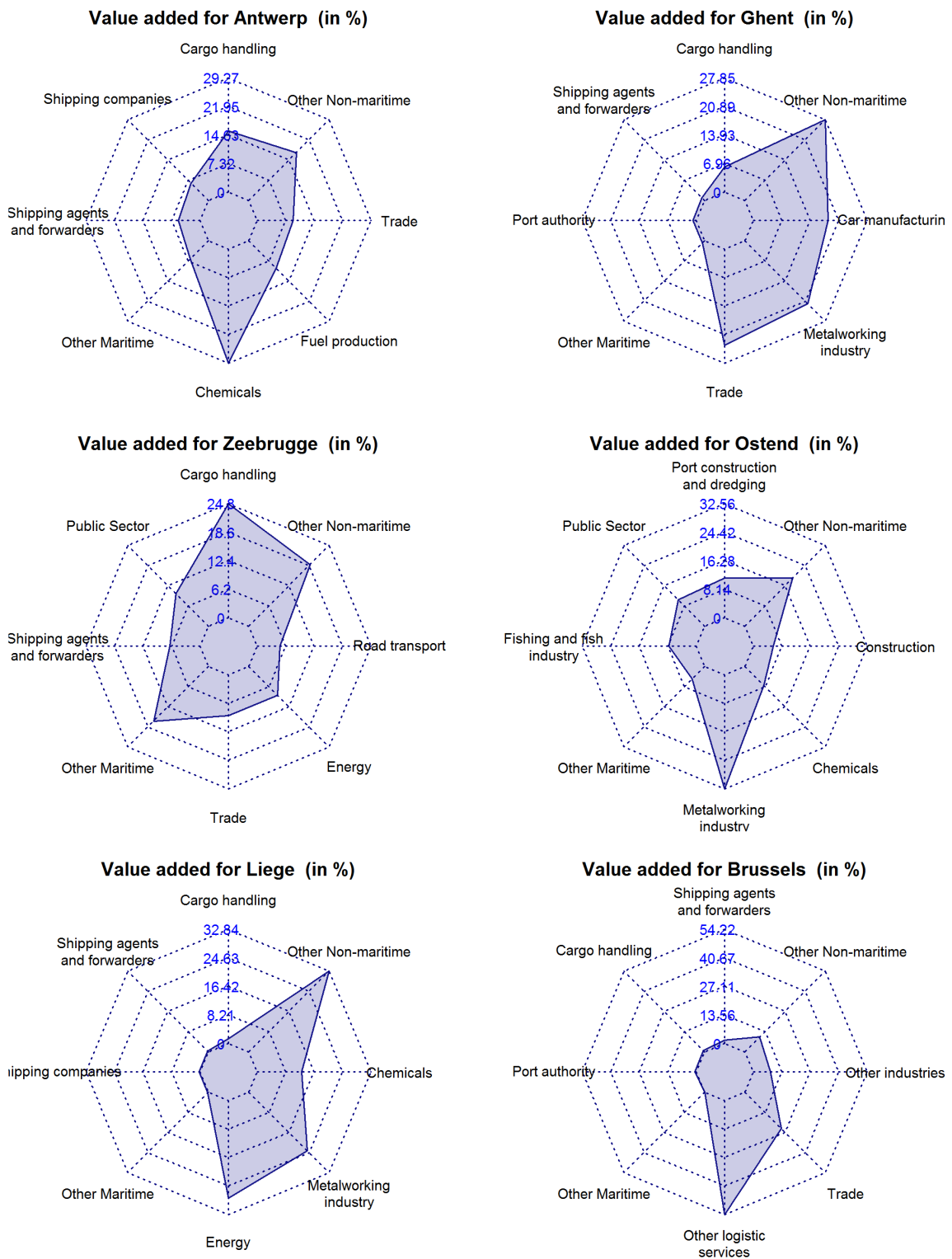
Source: NBB.

1.4 Employment in the Belgian ports

Table 1.6 shows an overview of the evolution of the (direct and indirect) employment in the Belgian ports between 2011 and 2016. Table 1.7 decomposes this employment into its principal sectoral components.

Table 1.6: Overview of employment, fte

ports	2011	2012	2013	2014	2015	2016	Contr.gr (%)[*]
Antwerp	60 132	61 294	61 539	61 112	60 732	60 849	0.1
Ghent	26 653	27 229	27 539	28 229	27 841	27 983	0.1
Zeebrugge	10 095	9 971	9 749	9 453	9 301	9 589	0.2
Ostend	4 732	5 103	5 046	5 058	5 021	4 912	-0.1
Flemish ports	101 612	103 597	103 873	103 852	102 895	103 332	0.4
Liege	9 899	9 763	9 076	8 292	8 014	7 753	-0.2
Brussels	4 313	4 580	4 181	4 182	4 189	4 054	-0.1
Inland ports	14 212	14 344	13 256	12 474	12 203	11 807	-0.3
Direct	115 824	117 941	117 129	116 326	115 098	115 139	0.0
Indirect	136 351	138 356	137 239	133 113	136 385	137 398	
Total	252 175	256 296	254 368	249 439	251 483	252 537	

[*] *For details, see annex A.1*
Source: NBB.

Table 1.7: Sectoral overview of employment, fte

	2011	2012	2013	2014	2015	2016	Contr.gr (%)[*]
Cargo handling	19 840	19 753	19 804	19 933	19 647	20 138	0.4
Shipping agents and forwarders	8 140	8 246	8 118	7 952	8 007	7 808	-0.2
Public Sector	4 477	4 386	4 438	4 369	4 185	4 130	-0.0
Other Maritime	7 387	7 626	7 415	7 018	6 890	6 924	0.0
Maritime	39 844	40 012	39 775	39 272	38 729	39 001	0.2
Chemicals	14 614	14 738	14 742	14 678	14 535	14 672	0.1
Metalworking industry	14 968	15 178	14 794	14 043	13 608	13 603	-0.0
Car manufacturing	9 380	9 893	10 104	10 146	10 534	10 278	-0.2
Other Non-maritime	37 019	38 120	37 715	38 187	37 692	37 585	-0.1
Non-maritime	75 980	77 929	77 354	77 054	76 369	76 138	-0.2
Direct	115 824	117 941	117 129	116 326	115 098	115 139	0.0
Indirect	136 351	138 356	137 239	133 113	136 385	137 398	
Total	252 175	256 296	254 368	249 439	251 483	252 537	

[*] *For details, see annex A.1*
Source: NBB.

After declining between 2012 and 2015, the direct employment stabelised at 115 139 fte. This is the result of small and opposite movements in the individual ports.

The indirect employment is around 1.2 times the direct one (2016). Note that the indirect employment multiplier is larger than one, while the indirect value added multiplier was below one. Figure 1.4 shows the most important (in terms of employment) sectors in each port. The largest sector in Antwerp is cargo handling (for value added, the chemicals sector was the largest). In Ghent, metalworking and car manufacturing remain the largest but trade is no longer on the list (as it was for value added). In Ghent, Zeebrugge, Ostend and the Liège port complex, the largest sectors in terms of value added are also the largest employers. In Brussels, other logistic services and trade are the largest in terms of employment. These relations are analysed in more detail in section 2.

Figure 1.3: Overview of employment in the Belgian ports, fte
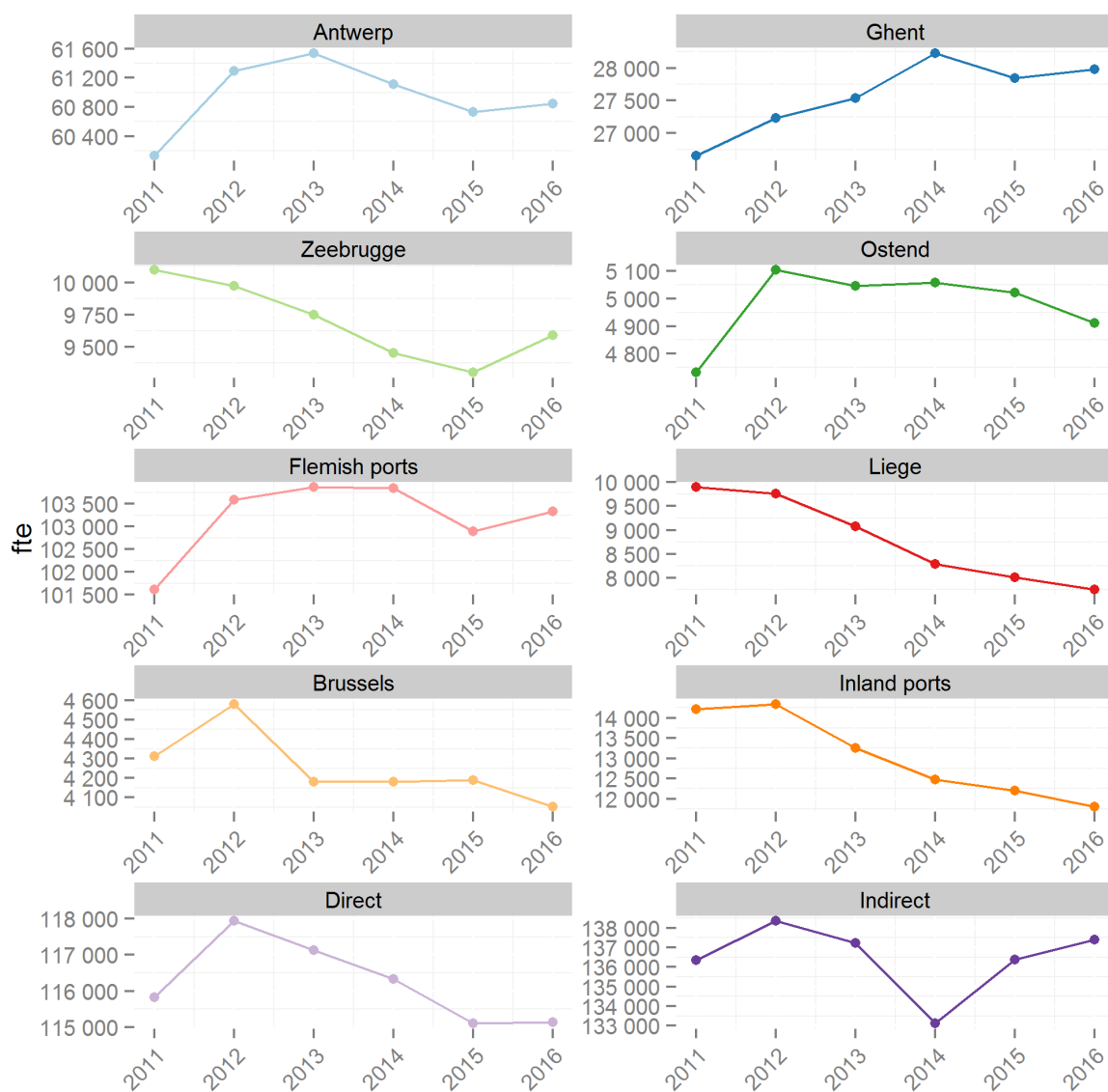
Source: NBB.

Figure 1.4: Most important sectors (in terms of employment) in the ports, 2016, (in %)

Employment for Antwerp (in %)

Employment for Ghent (in %)

Employment for Zeebrugge (in %)

Employment for Ostend (in %)

Employment for Liege (in %)

Employment for Brussels (in %)
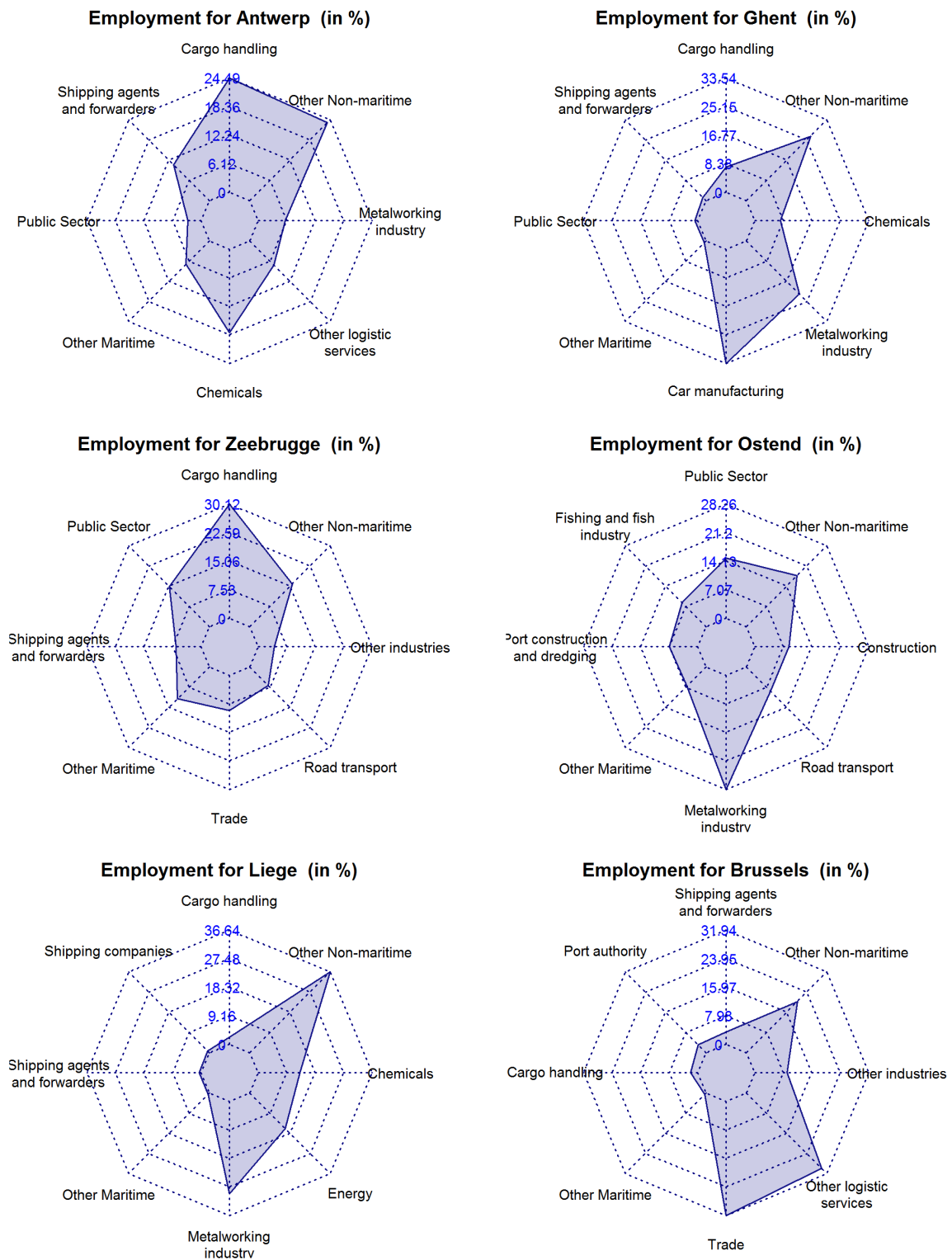
Source: NBB.

1.5 Investment in the Belgian ports

Table 1.8: Overview of investment, mio eur

ports	2011	2012	2013	2014	2015	2016	Contr.gr (%)[*]
Antwerp	2 426.7	2 337.6	2 373.0	3 319.6	3 093.0	3 428.6	8.3
Ghent	453.2	473.0	436.2	414.1	383.8	530.8	3.6
Zeebrugge	265.0	234.4	197.3	203.8	241.7	294.7	1.3
Ostend	93.3	94.1	76.3	119.5	64.0	81.4	0.4
Flemish ports	3 238.2	3 139.3	3 082.9	4 057.0	3 782.5	4 335.4	13.6
Liege	201.0	241.8	215.3	198.4	212.1	195.4	-0.4
Brussels	52.1	52.0	68.5	53.0	59.7	64.7	0.1
Inland ports	253.1	293.8	283.8	251.3	271.9	260.2	-0.3
Direct	3 491.3	3 433.1	3 366.7	4 308.3	4 054.3	4 595.6	13.4

[*] *For details, see annex A.1*
Source: NBB.

Table 1.9: Sectoral overview of investment, mio eur

|	2011	2012	2013	2014	2015	2016	Contr.gr (%)[*]
Cargo handling	787.7	724.3	596.6	683.3	692.1	808.4	2.9
Shipping companies	333.1	387.4	434.6	1 011.9	590.1	707.6	2.9
Port authority	95.9	245.3	243.3	191.3	162.3	183.4	0.5
Other Maritime	552.4	276.7	189.2	203.7	214.7	202.5	-0.3
Maritime	1 769.2	1 633.6	1 463.7	2 090.2	1 659.2	1 901.9	6.0
Chemicals	572.4	600.0	665.1	836.5	785.6	881.4	2.4
Fuel production	99.5	137.8	247.8	427.1	534.3	626.4	2.3
Energy	232.2	220.4	234.8	226.1	350.6	309.7	-1.0
Other Non-maritime	817.9	841.2	755.2	728.4	724.6	876.1	3.7
Non-maritime	1 722.1	1 799.5	1 902.9	2 218.2	2 395.1	2 693.7	7.4
Direct	3 491.3	3 433.1	3 366.7	4 308.3	4 054.3	4 595.6	13.4

[*] *For details, see annex A.1*
Source: NBB.

Direct investment in the Belgian ports increased by 13.4%. In 2016, investment reached its highest level since 2011. Furthermore, investment exceeded the € 4 billion mark for three years in a row. Investment increased in five of the six ports. It only declined in the Liège port complex where investment was at its lowest level in six years. The port was unable to maintain the recovery achieved in 2015. Investment increased in the port of Ostend, but that followed particularly low level in 2015. In the port of Brussels, it increased for the second consecutive year. Nevertheless, it failed to equal its 2013 peak. Three ports achieved a new record: Antwerp, Ghent and Zeebrugge. Factors benefiting the port of Antwerp included higher investment in shipping companies, cargo handling, chemicals and fuel production. The port of Ghent recorded its highest investment in six years in the metalworking industry and car manufacturing. There was also a substantial increase in investment in cargo handling. In the port of Zeebrugge, the increase was more patchy, but much of it was concentrated on cargo handling.

The maritime cluster contributed 6.0% to this percentage, the non-maritime cluster accounted for 7.4% of the 13.4%. In the maritime cluster, there was higher investment in the three main sectors. Moreover, cargo handling and shipping companies contributed almost 3% to the growth. Investment in cargo handling increased in every port except Ostend and Brussels. Most of the maritime shipping companies are located in the port of Antwerp where their investment was up by more than 17% in 2016. In the port of Zeebrugge, where shipping companies do not usually account for a large share, investment recorded a big rise in 2016. In the non-maritime cluster, investment in chemicals and fuel production grew strongly. That growth primarily concerned the port of Antwerp where some chemical firms modernised or extended their plants, and an oil refinery carried out major maintenance work and improvements to its

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facilities. In the rest of the non-maritime sector, the performance of car manufacturing and the metalworking industry in the port of Ghent merits a mention.

Figure 1.5: Overview of investment in the Belgian ports
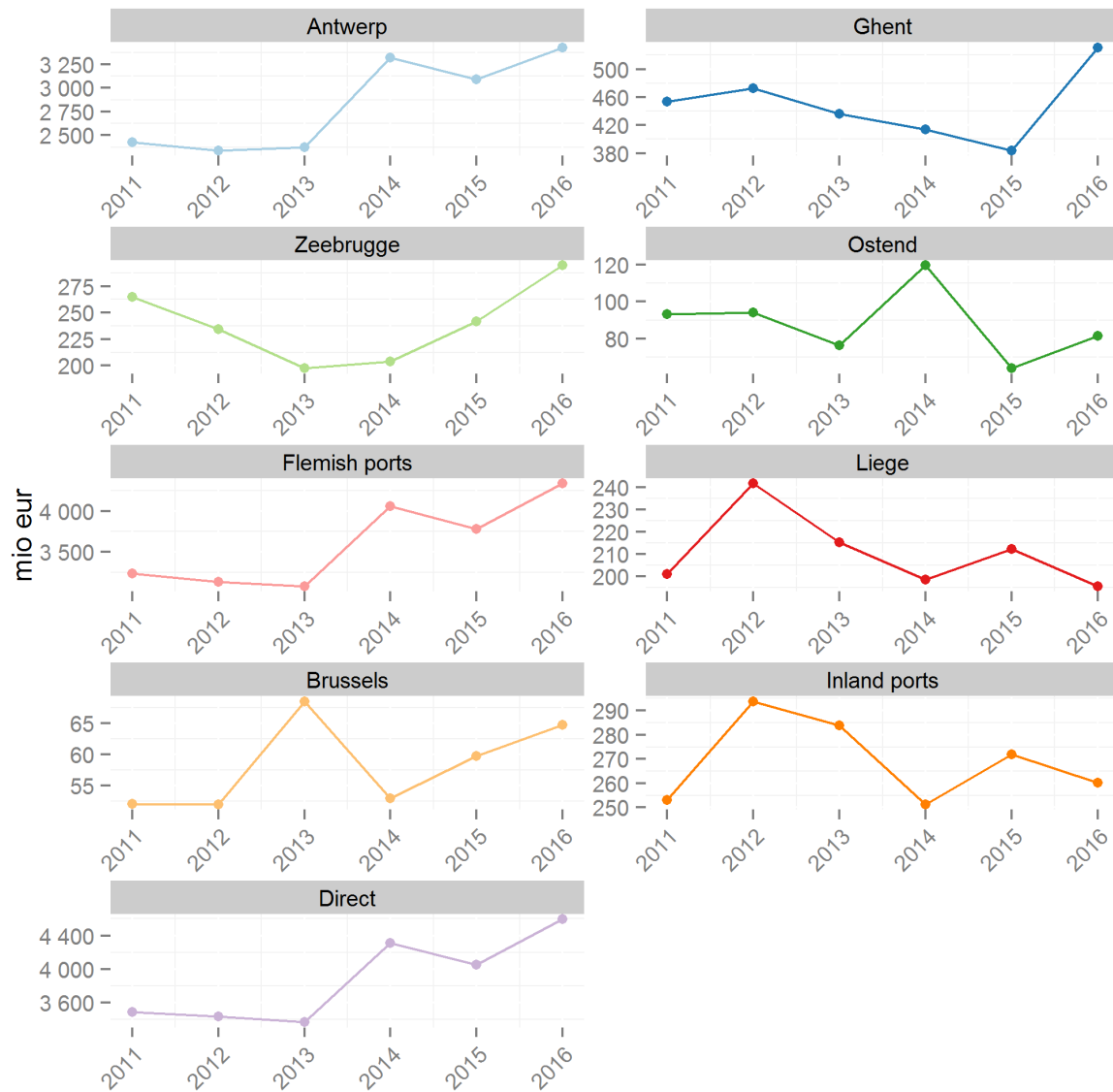
1.6 Financial ratios in the Belgian ports

In previous port studies (see e.g. (Mathys 2017)), one of the sections was devoted to the analysis of the return on equity, liquidity and solvency ratios. The return on equity indicates the return on the capital invested by the shareholders. A higher return on equity does not necessarily imply that the company's financial performance is better. A higher ratio may be the result of high financial leverage, and too high financial leverage can be dangerous for a company's solvency. Liquidity shows the firm's ability to mobilise in due time the cash resources that it needs in order to meet its short-term liabilities. Finally, the solvency ratio throws light on a company's overall financial strength. It is also seen as a test of the soundness of the capital structure, or the percentage by which the assets may be overvalued before creditors risk losing money in the event of a forced sale. The exact definitions of the ratios can be found in annex B. As in (Mathys 2017) this paper uses the globalised ratios. This means that the ratio is computed not at the individual company level, but for a group of companies. The aggregated ratio adds up the numerators and the denominators of the ratio and then divides the aggregated numerator by the aggregated denominator. Annex A.2 shows that the globalised ratio gives a larger weight to larger companies. For that reason the methodology has been changed; we no longer use a constant sample, nor do we exclude any NACE codes. The argument is that, as the globalised ratio takes company size into account, dropping some (large) companies from the sample might significantly distort the results. The globalised ratio is a weighted average of the individual companies' ratios (see annex A.2), and the weight is the size[5] therefore, companies with a higher weight have more impact on the globalised ratio, as do companies with a small weight but with an extreme value for the ratio. Figure 1.6 shows how we can disentangle these two effects; companies are ranked in descending order of weight, and on the horizontal axis we find the cumulative weight of the first n companies, so the horizontal axis goes from zero (no companies) to one (all companies). On the vertical axis you can see how the ratio changes to reach its final value (at the right of each line), starting with the first company and adding up the values for the other companies in succession. There are two lines, one for each year between 2015 and 2016. A large "horizontal shift to the right" happens when a company with a large weight is added, a large vertical shift occurs in the case of companies with "extreme" ratio values.

In the port of Antwerp, the (globalised) return on equity was 6.60 in 2015 and declined to 4.24 in 2016. These values are represented by the dots on the right-hand side of the first panel of figure 1.6. This graph shows that the two lines diverge only after a cumulative weight of around 60% on the horizontal axis, meaning that the differences are attributable to the companies with the smaller weights (because all companies were ranked in descending order of weight). The difference at the beginning (the fluctuations on the left-hand side) are caused by two larger companies (Electrabel and BASF) that swapped places in the ranking.

In the port of Brussels, the (globalised) return on equity was 13.71 in 2015 and declined to 3.91 in 2016. The difference exists from the start of the two lines and thereafter the lines are more or less parallel, meaning that the most influential company (Solvay, with a weight of around 76%, see horizontal axis) accounts for that difference.

In the port of Ghent, the (globalised) return on equity was 9.94 in 2015 and declined to 8.29 in 2016.

In the Liège port complex, the (globalised) return on equity was -2.46 in 2015 and increased to -1.19 in 2016. The major company has a weight of around 70% but does not explain the change. The change comes from companies with smaller weights, but without exceptional values for their individual ratio. The most influential company has a negative value right from the start, and the other companies cannot compensate for it.

In the port of Ostend, the (globalised) return on equity was 5.66 in 2015 and declined to

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[5]More precisely, company size is measured in terms of the ratio's denominator.

2.66 in 2016. This seems to be due to an extreme value for an individual company's ROE ratio (the jump at 0.75 on the horizontal axis). Moreover, that company (Baggerwerken Decloedt) has a relatively large weight.

In the port of Zeebrugge, the (globalised) return on equity was 7.51 in 2015 and declined to 6.83 in 2016.

In the port of Antwerp, (globalised) liquidity was 1.09 in 2015 and declined to 0.91 in 2016. Figure 1.7 shows that a decrease in the liquidity ratio for a company with a large weight (ExxonMobil) explains most of the change.

In the port of Brussels, (globalised) liquidity was 0.98 in 2015 and declined to 0.67 in 2016. The panel for Brussels in figure 1.7 shows that the decline stems from a drop in the liquidity ratio of the company with the second largest weight (Solvay).

In the port of Ghent, (globalised) liquidity was 1.32 in 2015, in more or less the same value was recorded (1.31). In the Liège port complex, (globalised) liquidity was 0.72 in 2015 and decreased slightly to 0.67 in 2016. In the port of Ostend, (globalised) liquidity was 1.22 in 2015 and increased to 1.31 in 2016. In the port of Zeebrugge, (globalised) liquidity was 1.41 in 2015 and declined to 1.36 in 2016.

In the port of Antwerp, (globalised) solvency was 34.77 in 2015 and declined to 33.69 in 2016. In the port of Brussels, (globalised) solvency increased from 45.10 in 2015 46.46 in 2016. In the port of Ghent, (globalised) solvency decreased from 45.00 in 2015 to 43.10 in 2016. In the Liège port complex, (globalised) solvency was 41.62 in 2015 and lowered to 39.23 in 2016. In the port of Ostend, (globalised) solvency was 42.73 in 2015 and shrunk to 41.24 in 2016. In the port of Zeebrugge, (globalised) solvency was 48.96 in 2015 and declined slightly to 48.37 in 2016.

1.7 Relative importance of the components of value added

Value added for a company (and by extension for a sector or a region) can be computed in two different ways. First of all, value added is the difference between the value of the outputs and the costs of the inputs required to produce them: this is the "production approach". On the other hand, the "cost approach" analyses how value added is spent; companies "add value" to their inputs and use this value either to pay their personnel (staff costs), to depreciate their assets (depreciation), to pay other charges (such as provisions) and to increase the value of the company or pay dividends to shareholders, interest payments, income taxes, etc.. (operating profit)[6]. As value added is equal to the sum of these components, every change in value added must be accompanied by a change in one or more of these elements. Figure 1.9 shows the movement in the cost components of value added between 2015 and 2016[7]. The upper panel shows the breakdown for 2015, the middle panel shows the figures for 2016, and the bottom panel (with another scale on the vertical axis) gives the breakdown of the change in value added.

Several branches have shown a significant decline in value added. This was the case for chemicals, other logistic services, port construction and dredging, and shipping companies. For all these branches, the drop in value added was led to a reduction in the operating profits. There was a significant increase in value added, in the energy sector and the metalworking industry. In the energy sector, the increase was accompanied by a higher operating profit. In the metalworking industry there was a combination of effects: operating profit increased and at the same time there was a reduction in staff costs and other charges.

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[6]For the exact definition of the components, see annex C

[7]The population and consequently the totals may be slightly different from those in other tables because the breakdown of value added is not available for all the companies.

Figure 1.6: Convergence path of return on equity
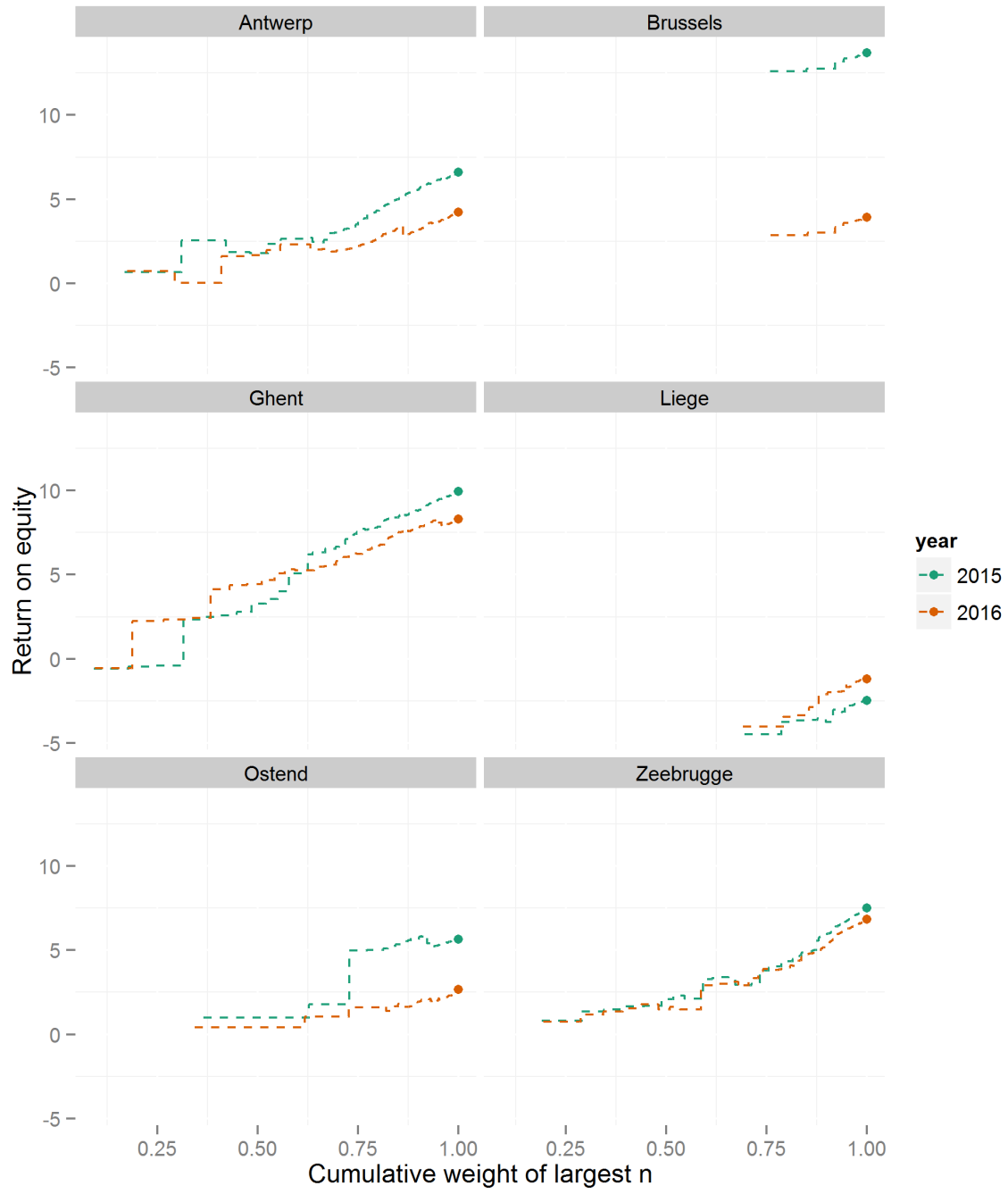
Figure 1.7: Convergence path of liquidity

Source: NBB.

Figure 1.8: Convergence path of solvency
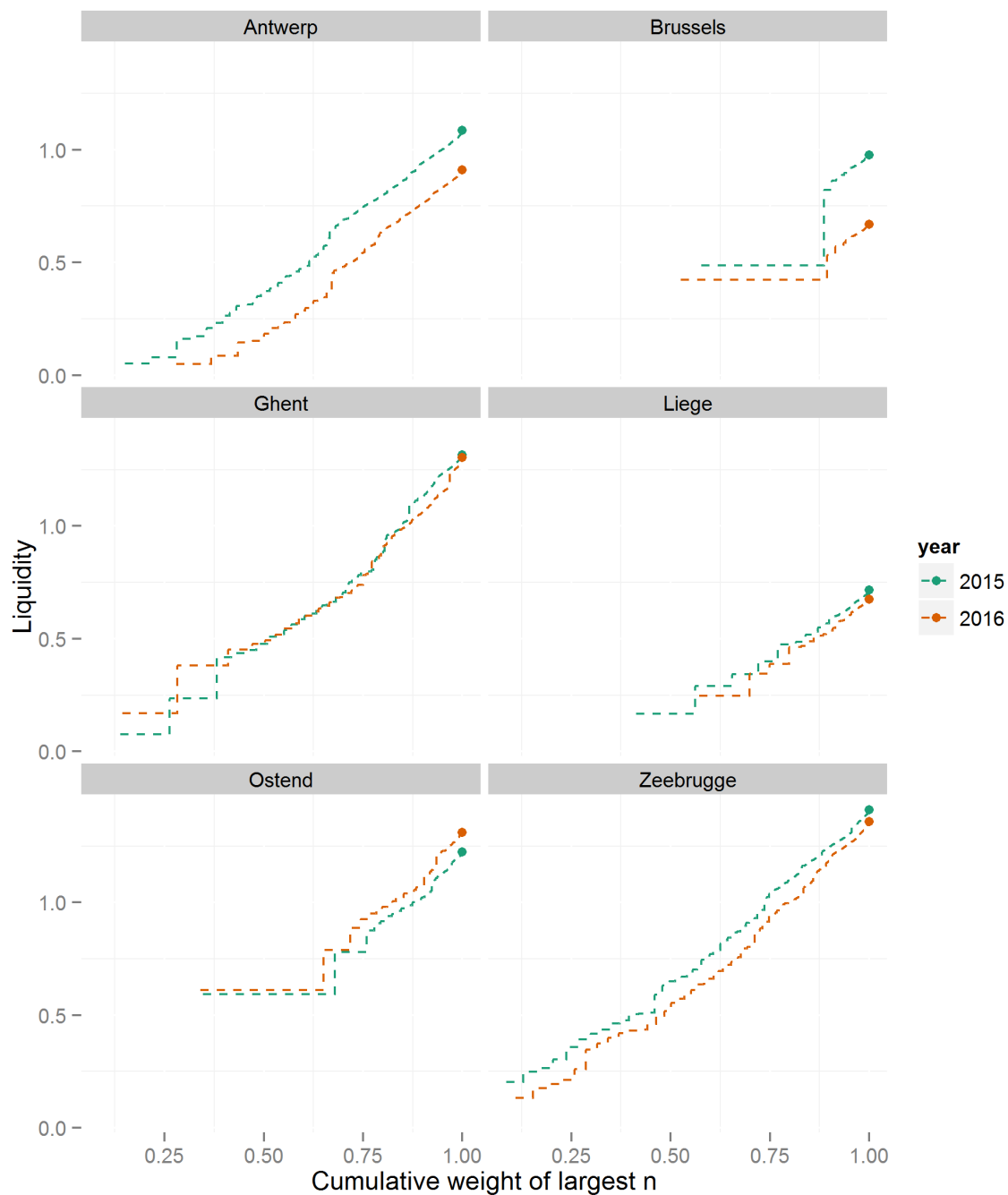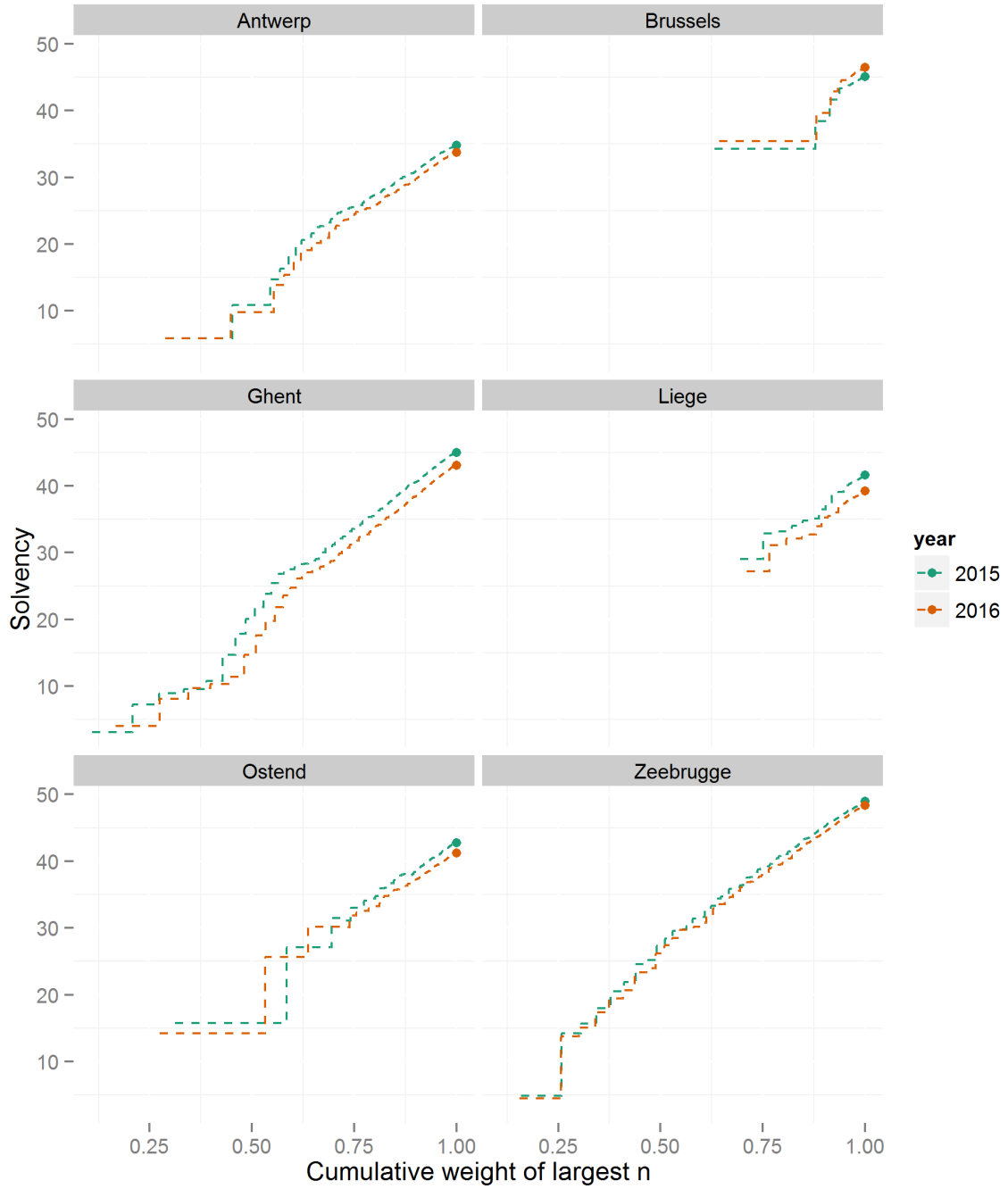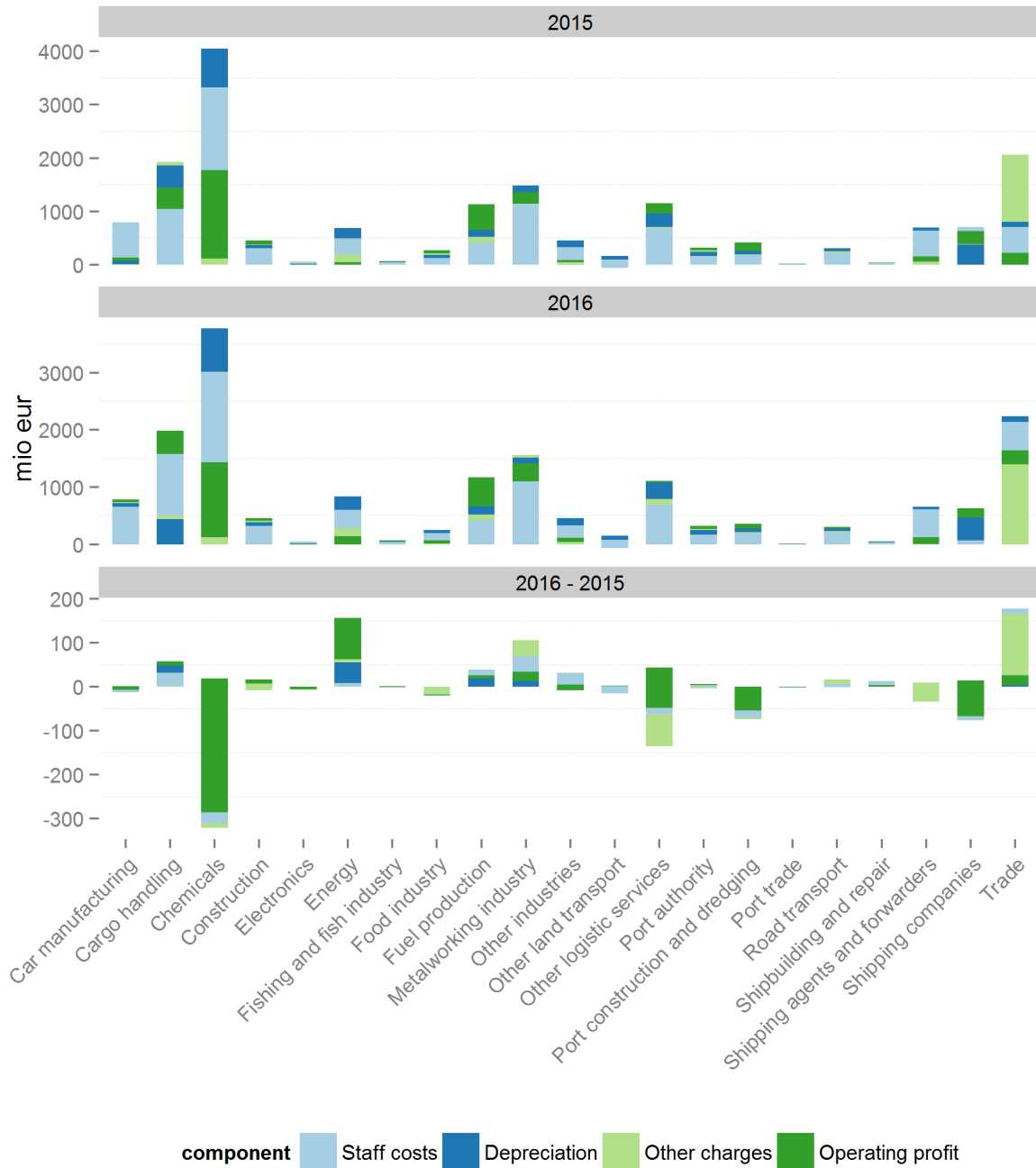
Source: NBB.

Figure 1.9: Components of value added, mio eur

Source: NBB.

1.8 Potential impact of Brexit on the Flemish ports

The purpose of this section is to have a quick look on how the Brexit could impact the activity of the Flemish ports, which hold a key position in EU-UK trade flows[8]. For that purpose, we first focus on a general Brexit overview and the overall trade exposure of Belgium with respect to the UK (subsection 1.8.1). After that, we focus on the various links between the Flemish ports and the UK (subsection 1.8.2) before going into more detail on the implications of Brexit for the ports of Zeebrugge and Antwerp (subsection 1.8.3).

1.8.1 Brexit and the Belgian economy

On 23 June 2016, the United Kingdom decided by referendum to leave the European Union. This decision has led to numerous analyses at various levels to quantify the economic effects of Brexit. As yet, we still do not have a clear view of the future EU-UK relationship.

In short, Brexit could have two main economic effects on the UK economy and its trading partners, including Belgium. Firstly, the negotiation period increases uncertainty for the trading partners. Secondly, once Brexit takes effect, it will to a greater or lesser extent change the nature and intensity of relations with other European economies. This is particularly the case for trade in goods, where the implementation of new border controls, administrative procedures and technical or safety standards could hamper trade between the UK and the EU. Barriers to trade in goods and services, the movement of people and, to some extent, the sharing of ideas may reduce economic efficiency (e.g. by shifting trade roads). We can already see some effects that Brexit is having in the UK, such as a decrease in private consumption stemming from the loss in purchasing power as a result of the depreciation of the pound sterling, which, combined with the uncertainty environment faced by companies, puts investment under pressure. In addition, exports margins are suffering from pound depreciation. Since the Flemish ports are bridgeheads for trade with the UK, developments regarding the detailed arrangements for Brexit are followed with the greatest attention. The potential consequences of Brexit therefore call for vigilance, especially for the Flemish ports which connect the Belgian production network, as well as (a large part of) the EU single market and the rest of the world, to the United Kingdom.

The United Kingdom is a very important market for many Belgian companies. In particular, in terms of the trade relationship with Belgium, the UK accounts for approximately 5% of total imports (6th largest sourcing partner) and 7% of its exports (4th largest destination market). Consequently, as we can see from graph 1.10, Belgium has the fourth largest exposure among euro zone countries and as such it may be significantly affected by a decline in demand from the United Kingdom. Moreover, around 3% of the value added produced in Belgium is generated by final demand in the UK. It is mainly Flanders that trades with the UK: in 2015, Flanders accounted for 84% of Belgian exports to the UK and 87% of Belgian imports from the UK (Flanders' fifth largest trading partner).

1.8.2 Ports play a major role in the Belgian economy, but they are not all similarly exposed to Brexit.

In 2016, the Flemish ports created € 32 905 million of total value added, represented 115 139 direct jobs and 137 398 indirect jobs, and their direct investment represented around € 4 600 million. The volume of traffic through the Flemish ports was around 283 million tonnes (295 million tonnes in 2017). However, trade flows do not have the same content in value added or employment and in view of the lack of statistical data, the reader should treat the figures with caution and avoid making a linear connection between tonnages and (local) value added or

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[8]In that respect, this section includes some of the conclusions presented in the two reports of the "Brexit High Level Group" chaired by Count Buysse.

Figure 1.10: Percentage share of various countries in United Kingdom imports
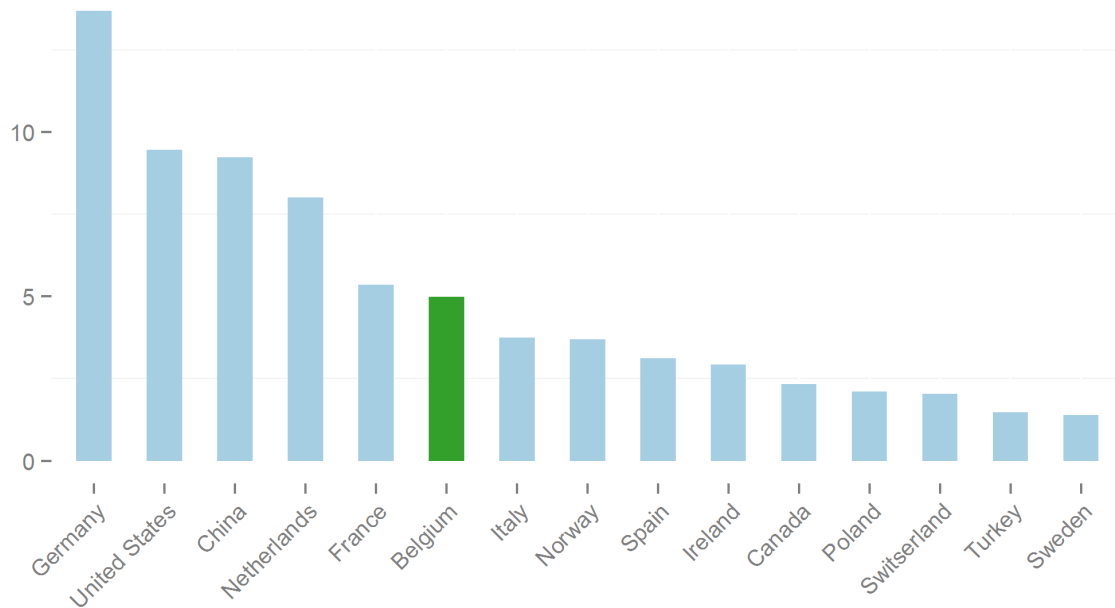
employment. The only statistical information that can provide some idea about the importance of the UK for the Flemish ports is based on tonnages indicated on the bill of lading.

Apart from these numbers, it is evident that not all ports have the same Brexit exposure.

As shown in figure 1.11, the Port of Antwerp (the second largest European port) is Belgium's leading port (with 76% of total traffic in volume). It specialises in container traffic and petrochemicals. Around 6% of its traffic is with the UK.

Brexit plays an important role for the port of Zeebrugge (Belgium's 2nd largest port with 13% of the total traffic volume). More than 46% of the total tonnage went to or came from the UK in 2017 (against 36% in 2011). This port is a gateway to the UK for many enterprises from Belgium, France, Germany, Italy, Japan, etc. More than 70 weekly services to or from the UK are scheduled in Zeebrugge.

In fact, Zeebrugge leads the way in maritime traffic between the Flemish ports and the UK, with an annual volume of 17.2 million tonnes in 2017 (33% imports, 67% exports). In addition, the port of Antwerp processed 13.8 million tonnes of UK traffic in 2017 (56% imports, 44% exports). Altogether, in 2017, Flemish ports handled more than 33 million tonnes of traffic from or to the UK. These data are relatively stable over time.

As shown in figure 1.12, it is the ports of Zeebrugge and (to a lesser extent) Antwerp that are likely to be most affected by Brexit (in terms of volume traded) in the coming months or years. The next section goes into more details on their respective trade relationships with the UK.

1.8.3 The nature of the risk is not the same for the ports of Zeebrugge and Antwerp.

As shown in figure 1.13, the breakdown of trade with the UK differs greatly between Zeebrugge and Antwerp. The share of the various components has been relatively stable since 2011. The port of Zeebrugge's trade relationship with the UK is almost exclusively composed of roll-on roll-off (RoRo), an activity where Brexit will have the greatest impact. It is important to stress that most of container shipping in Zeebrugge also has to be considered as RoRo activity. Two

Figure 1.11: Traffic in the Flemish Ports (total and with the UK)

(2017 in million tonnes)
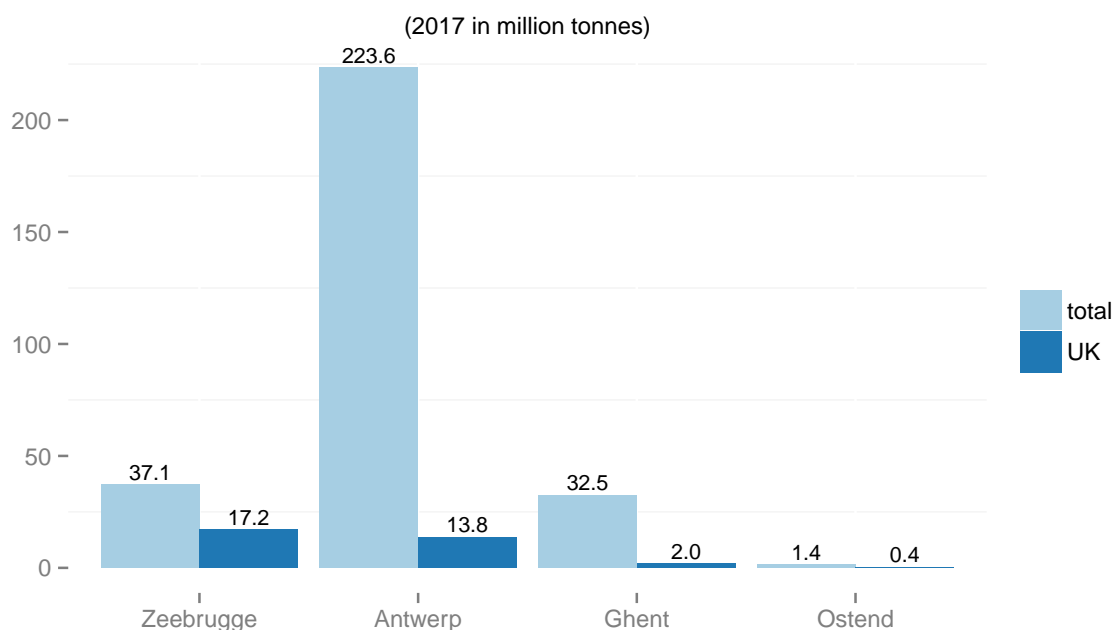
Source: Port Authorities, Flemish Port Commission.

new RoPax vessels (for cargo and passengers) operate scheduled daily services to Kingston-upon-Hull.

In the port of Antwerp, RoRo activity plays only a marginal role. It is important to mention that the container traffic with the UK, mainly with the port of Southampton, cannot be considered as RoRo. The graph also shows that liquid bulk is important for Antwerp as well. For that category of goods the port of Immingham is the principal partner.

Moreover, Zeebrugge is a world leader in the shipment of new cars (2.8 million new cars are handled annually). In particular, the UK is an important partner since no fewer than 1 million new cars were transported between the United Kingdom and Zeebrugge in 2016. As illustrated in table 1.10, this represented an increase of 80% in comparison with 2011. This table also shows that the volume of new cars shipped via Zeebrugge exceeds the figure for Antwerp. Another key point is that the RoRo activity concerning new cars in Zeebrugge includes more than 'moving' cars from the quay side to the ship; it also involves some adjustments to the cars, and that is, of course, a supplementary source of value added and employment.

Table 1.10: New cars traffic to the UK

Port	2011	2012	2013	2014	2015	2016
Zeebrugge	563 535	554 553	686 039	805 879	954 685	1 011 958
- In	162 089	135 000	153 239	216 221	256 040	274 855
- Out	401 446	419 553	532 800	589 658	698 645	737 103
Antwerp	38 866	45 270	49 923	56 538	48 960	43 132

Source: Rapport du Brexit High Level Group Belge, Janvier 2017.

Figure 1.12: Traffic with the United Kingdom of the Flemish Ports

(in million tonnes)
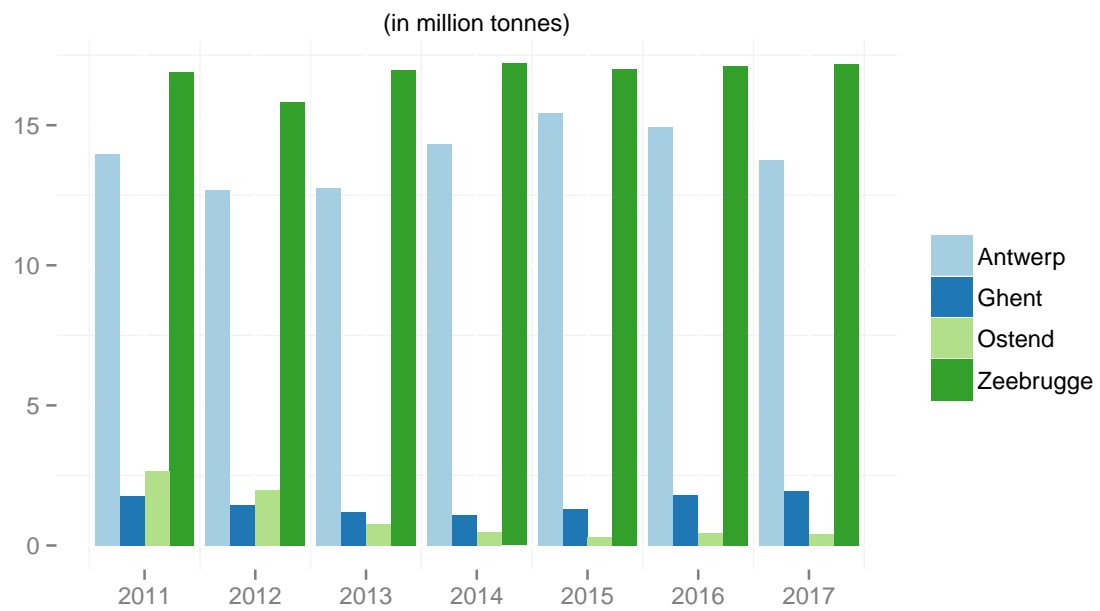
Source: Port Authorities, Flemish Port Commission.

Figure 1.13: Decomposition of UK trade relationship in Zeebrugge and Antwerp
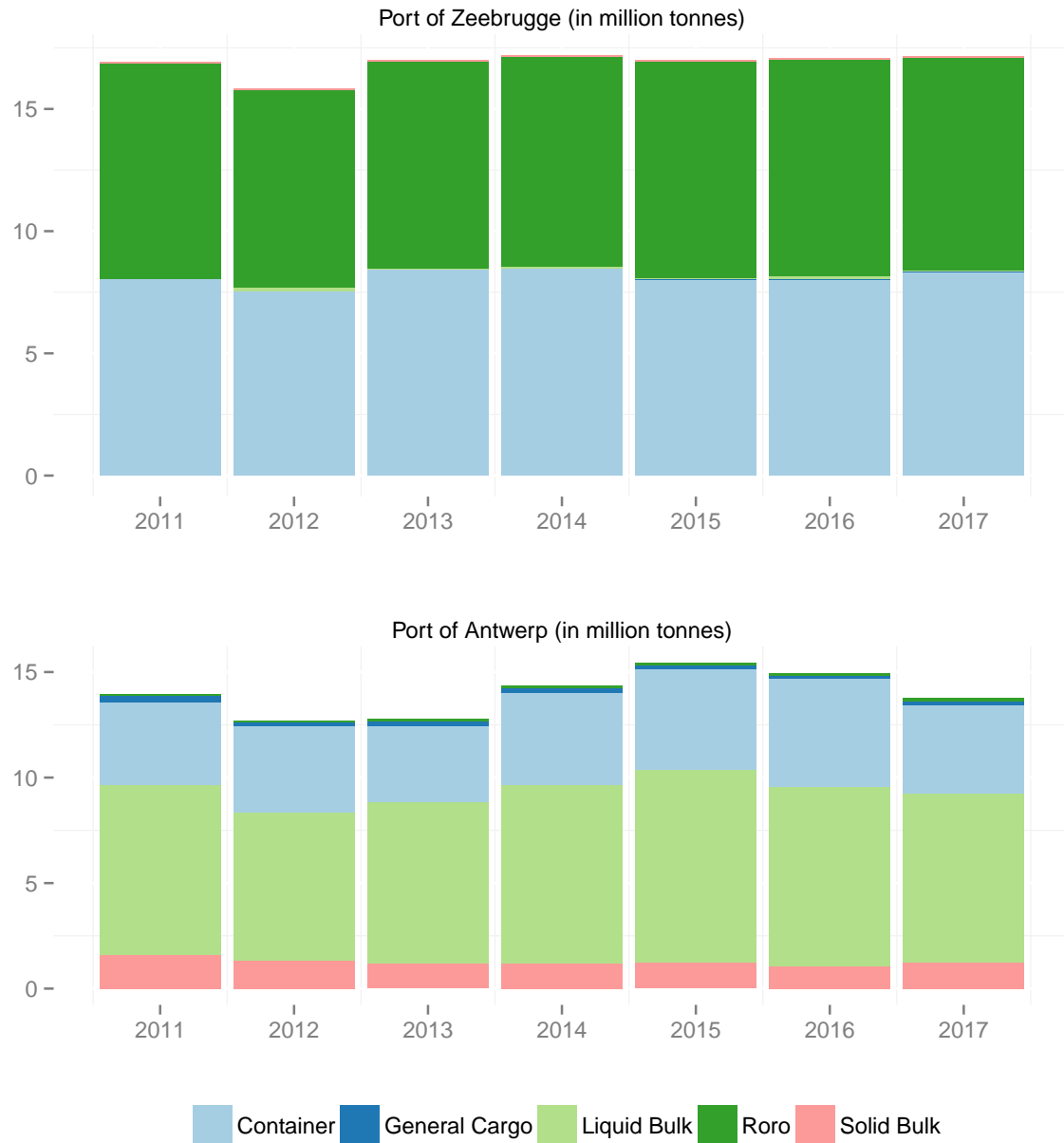
1.8.4 Concluding comments

Brexit presents particularly challenging issues for the Flemish ports, especially for Zeebrugge (46% of the total tonnage came from the UK in 2017) and to some extent for Antwerp. Until the Brexit negotiations are concluded, it is unclear what the new trade relations will look like.

Since Brexit has already created some uncertainties, it is necessary to encourage the maximum transparency and information sharing. The Brexit 'worst case scenario' (cliff edge scenario) would be damaging, to varying degrees, for all the Flemish ports in their role as the link between the EU and the UK. The introduction of tariffs and non-trade barriers between the UK and the EU could threaten the maintenance of the ports' role as the gateway to the UK.

2 Analysis by port

2.1 Port of Antwerp

2.1.1 Port developments

In 2016, the total volume handled by the port of Antwerp came to 214.2 million tonnes, setting a new record. Traffic was up by 2.8% compared to 2015. The port's overall growth in 2016 is due to the strong expansion of traffic in liquid bulk (+3.8%) and containers (+4.1%). In liquid bulk, there was strong growth in the transshipment of petroleum products (+7.1%) and — to a more modest extent — chemicals. Crude oil was down by 17.4%.

The port of Antwerp achieved a record volume of traffic for the fifth year running: 223.6 million tonnes in 2017. All forms of transshipment grew, except dry bulk (-3,7%). Container traffic grew by 4.3% in 2017 to a total of 123.0 million tonnes (10.45 million TEU, a new record). Liquid bulk increased by 5.7% compared to 2016. Roll-on roll-off traffic and other general cargo were up by 10.5% and 4.8% respectively.

The traffic mix at the port of Antwerp has changed considerably over the past 10 years. In 2007 containers accounted for almost 52% of the total volume. By 2017 that share had risen to 55%. Over those 10 years, containerisation reduced the share of conventional general cargo from 11% to less than 5%. The share of dry bulk declined from 13% to 5%. In contrast, liquid bulk increased strongly from 22% to 33% of total traffic in 2017.

In 2017 the total number of maritime vessels entering the port increased to 14 223. In the preceding years the number of vessels had declined steadily owing to the expanding scale of the container business, but since 2015 the number of vessels entering the port has grown again as a result of the increase in total traffic. The largest container ship ever to enter the port of Antwerp was the Madrid Maersk, with a capacity of 20 568 TEU. That was in June 2017.

Every year, the port of Antwerp sees a considerable number of investment projects, both large and small, aimed at maintaining, modernising or expanding the existing infrastructure. Extensive consideration has been given to the future expansion of container handling capacity. Based on the "complex projects" procedure, eight alternatives have been considered, including several designs for the Saeftinghe dock. Further decisions will be taken during 2018. Investment were also made to expand existing capacity in 2017. For example, the annual capacity of the DP World terminal was expanded from 2 to 2.8 million TEU through the purchase of new automated stack cranes (ASCs), gantry cranes and straddle carriers and the commissioning of a new storage strip.

Investment in the chemicals sector in 2017 included the largest butane tank in Europe (Oiltanking Antwerp Gas Terminal). Specialist chemicals company Lanxess plans a large-scale expansion of production of rubber chemicals, Total Refinery Antwerp is modernising its site and several international chemicals giants such as Air Liquide, BASF, ExxonMobil, Nippon Shokubai, ADPO and Oiltanking Stolthaven have invested heavily in the port in recent years.

2.1.2 Value added

Table 2.1 shows (direct and indirect) value added in the port of Antwerp over the period 2011-2016. Between 2015 and 2016, (direct) value added decreased from € 10 998.2 million to € 10 814.7 million, a fall of -1.7%. Direct value added is divided into a maritime and a non-maritime cluster, each of which is again broken down into the largest contributing sectors. In terms of (direct) value added, the port of Antwerp is mainly non-maritime (65.8%). The largest sector is chemicals, with a share of 29.3% in the port's direct value added. These percentages have declined since 2011 when they were 69% and 30.8% respectively. The second largest sector is the maritime branch cargo handling which, in terms of value added, was around half the size of the chemicals sector in 2016. More detailed tables can be found in the annexes.

The maritime cluster contributed −0.8% to the total decline, while the non-maritime sector contributed −0.9%. Indirect value added totalled around 87% of direct value added (2016).

Table 2.1: Antwerp, value added, mio eur

	2011	2012	2013	2014	2015	2016	Contr.gr (%)[*]
Cargo handling	1 373.0	1 481.2	1 563.3	1 604.8	1 665.0	1 700.0	0.3
Shipping companies	489.1	558.1	368.0	438.8	739.8	685.1	-0.5
Shipping agents and forwarders	597.3	591.3	631.6	593.1	632.8	600.7	-0.3
Other Maritime	568.6	708.6	718.3	686.3	749.7	714.8	-0.3
Maritime	3 027.9	3 339.2	3 281.2	3 323.0	3 787.3	3 700.6	-0.8
Chemicals	3 009.6	2 946.1	2 944.2	3 113.2	3 421.9	3 165.2	-2.3
Fuel production	898.5	970.8	806.2	824.9	1 064.5	1 076.5	0.1
Trade	910.8	903.6	855.1	917.0	908.1	1 004.0	0.9
Other Non-maritime	1 910.7	1 896.1	1 914.0	1 831.1	1 816.4	1 868.4	0.5
Non-maritime	6 729.6	6 716.6	6 519.6	6 686.2	7 210.9	7 114.1	-0.9
Direct	9 757.5	10 055.9	9 800.7	10 009.2	10 998.2	10 814.7	-1.7
Indirect	8 598.3	9 026.8	8 523.7	8 475.0	9 771.6	9 436.1	
Total	18 355.8	19 082.6	18 324.4	18 484.2	20 769.7	20 250.8	

[*] *For details, see annex A.1*
Source: NBB.

The last column shows the contribution of each sector to the total growth over 2015-2016. The maritime and non-maritime contributions together add up to the total growth, the same holds for all the individual components. Note that these percentages differ from each sector's own growth[9]. The difference between a sector's own growth and its contribution to total growth is illustrated in figure 2.1. The left-hand panel shows the own growth, and the right-hand panel shows the contribution to total growth (the latter takes into account the sector's own growth and its share in the port, see annex A.1 for details). This graph highlights the findings in the annex: in the upper panel, the maritime cluster's contribution to growth seems to be driven by the contribution to growth from shipping companies. In the lower panel, the non-maritime cluster's contribution to growth seems to move together with growth in the chemicals and fuel production sectors. Table 2.1 reveals that the latter are the largest non-maritime sectors (and thus have more weight according to annex A.1). In the maritime sector, the weight of shipping companies is not the largest, but that sector has extreme growth rates and its contribution is the combination of weight and growth. The largest sectoral contributions to the decrease came from the chemicals sector. The decline followed a period of strong growth between 2013 and 2015. The energy sector showed the strongest growth between 2015-2016, but because of its small share in the direct value added it only contributed marginally to the port's growth. The same holds for shipping agents and forwarders, shipping companies, trade, and port construction and dredging. In the chemicals sector it was BASF Antwerpen that recorded a drop in value added. The lower value added was due to a decline in turnover that was only partly offset by a decrease in purchase costs. In the trade sector, Kuwait Petroleum showed an increase in value added; purchase costs decreased more than turnover. On the maritime side, the shipping company Euronav recorded a decline; turnover slowed down while purchase costs were higher. The energy sector's own growth is recovering after a steady decline between 2011 and 2015. The trade sector's performance remained more or less stable between 2011-2015 but expanded strongly in 2016. In the case of shipping agents and forwarders, shipping companies, and port construction and dredging, sectoral growth was volatile over this period.

Direct value added shows a high concentration: 5% of the companies represent 80% of direct value added, while 14 companies produce half of the value added. This is illustrated in figure 2.3. The top 10 companies are listed in table 2.2.

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[9]The contribution of a sector to the total growth equals its share in 2015 times the sectoral growth over 2015-2016. See annex A.1

Figure 2.1: Value added in Antwerp
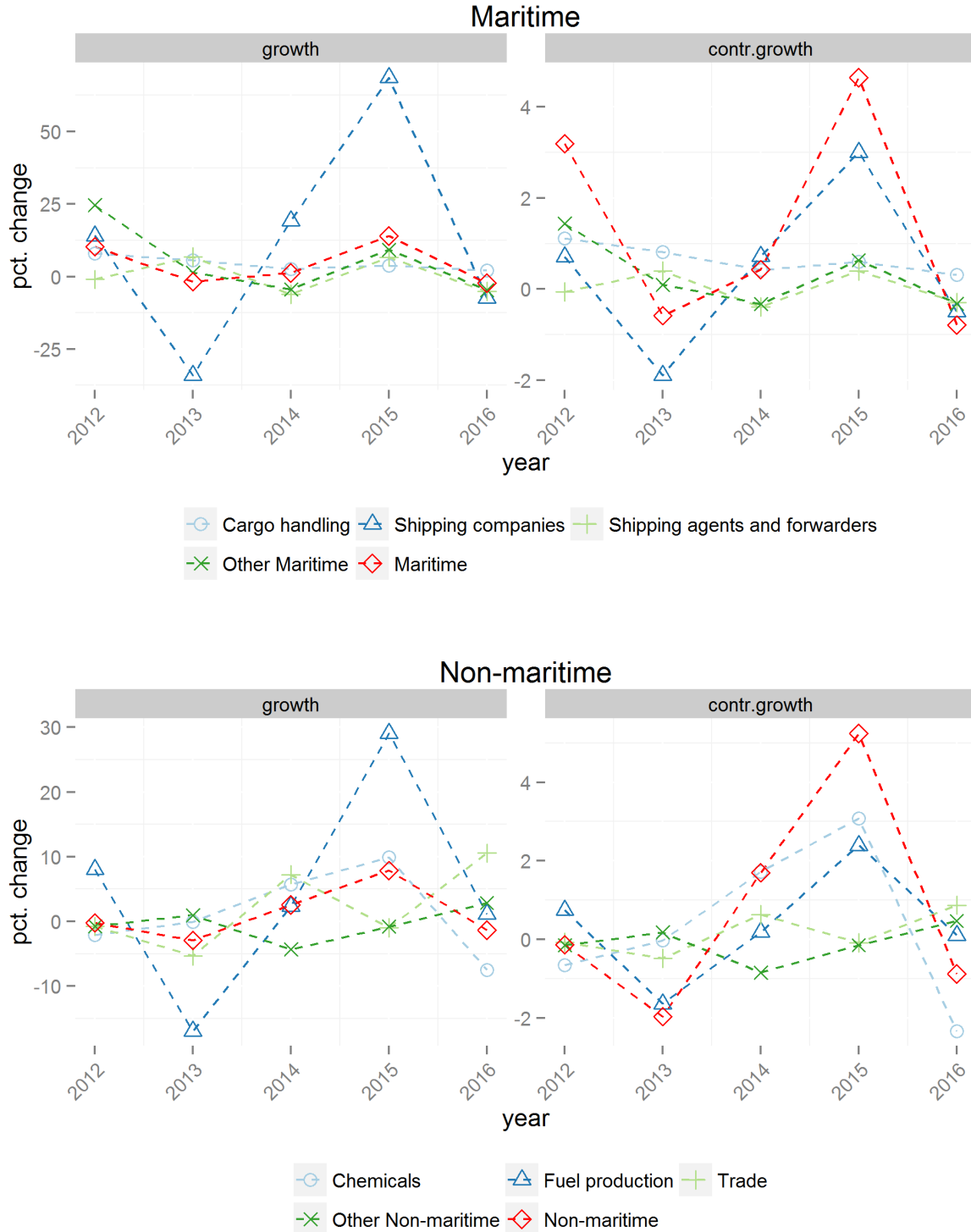
Source: NBB.

Table 2.2: Top 10 Value added, Antwerp

Rank	Name	Sector
1	B.a.s.f. Antwerpen N.v.	Chemicals
2	Exxonmobil Petroleum & Chemical	Fuel production
3	Kuwait Petroleum (belgium)	Trade
4	Centrale Der Werkgevers Aan De Haven Van Antwerpen	Cargo handling
5	Electrabel	Energy
6	Total Raffinaderij Antwerpen	Fuel production
7	Euronav	Shipping companies
8	Antwerp Port Authority	Port authority
9	Covestro	Chemicals
10	Evonik Antwerpen	Chemicals

Source: NBB.

2.1.3 Employment

Table 2.3 shows the (direct and indirect) employment in the port of Antwerp over the period 2011-2016. From 2015 to 2016, (direct) employment increased from 60 732 fte to 60 849 fte, a rise by 0.2%. Direct employment is split up into a maritime and a non-maritime cluster, each of which is again broken down into the main contributing sectors. In terms of (direct) employment, the port of Antwerp is mainly non-maritime (54.7%).

Table 2.3: Antwerp, employment, fte

	2011	2012	2013	2014	2015	2016	Contr.gr (%)[*]
Cargo handling	14 604	14 462	14 558	14 581	14 760	14 900	0.2
Shipping agents and forwarders	6 810	6 947	6 868	6 701	6 748	6 598	-0.2
Public Sector	1 808	1 822	1 867	1 828	1 745	1 748	0.0
Other Maritime	4 669	4 809	4 668	4 271	4 235	4 317	0.1
Maritime	27 890	28 041	27 961	27 381	27 488	27 562	0.1
Chemicals	10 792	10 889	10 982	10 936	10 794	10 874	0.1
Other logistic services	3 803	3 974	4 061	4 180	4 324	4 482	0.3
Metalworking industry	3 416	3 656	3 687	3 579	3 554	3 570	0.0
Other Non-maritime	14 231	14 733	14 848	15 035	14 573	14 361	-0.3
Non-maritime	32 242	33 253	33 578	33 731	33 244	33 286	0.1
Direct	60 132	61 294	61 539	61 112	60 732	60 849	0.2
Indirect	81 768	82 409	82 211	79 969	81 810	82 209	
Total	141 900	143 702	143 750	141 080	142 542	143 058	

[*] *For details, see annex A.1*
Source: NBB.

The largest sector is cargo handling (24.5%). These shares have been declining since 2011, when they amounted to 53.6% and 24.3% respectively. The second largest sector is the non-maritime sector chemicals, the share of it being 17.9%; the decline recorded in 2015 was partially made up for. The raise of employment was mainly generated by BASF. The second largest sector in the non-maritime cluster is other logistic services. It holds fourth place overall, its share being 7.4%.

As can be seen in figure 2.2, no significant changes were recorded for the most important sectors, maritime as well as non-maritime, contributions to growth were close to zero in 2016.

Other land transport has been showing a downward trend since 2014, it declined twice as much as the year before, mainly brought about by BNRC Group. In the period 2011-2016 the smaller non-maritime sector road transport was mainly volatile; its decline in 2016 is due to two companies which reduced their workforce significantly. For the first time since 2011, employment in the energy sector showed a growth, mainly generated by Electrabel.

The last column of the table shows the contribution of each component to the total growth over 2015-2016. The sum of maritime and non-maritime contributions together makes up to

the overall growth. The same holds for all individual components. It should be pointed out that these percentages differ from each sector's own growth[10]. This is illustrated in figure 2.2. The left-hand panel shows the sector's own growth, the right-hand panel shows the sector's contribution to the port's overall growth (the latter takes into account the sector's own growth and its share in the port's overall growth, see annex A.1 for details).

Both clusters contributed 0.1% to the overall increase.

The largest negative sectoral contribution came from shipping agents and forwarders. This sector also showed the strongest decline in 2015-2016. Port construction and dredging displayed a strong positive own growth but contributes only marginally to the ports overall growth because of the small share it represents.

Employment in Antwerp shows a rather high concentration: 5% of the companies represent 73% of direct employment, 20 companies accounted for half of the personnel employed. This is illustrated in figure 2.3. The top 10 companies in terms of employment are listed in table 2.4.

Table 2.4: Top 10 Employment, Antwerp

Rank	Name	Sector
1	Centrale Der Werkgevers Aan De Haven Van Antwerpen	Cargo handling
2	B.a.s.f. Antwerpen N.v.	Chemicals
3	BNRC Group	Other land transport
4	Public Sector	Public Sector
5	Antwerp Port Authority	Port authority
6	Total Raffinaderij Antwerpen	Fuel production
7	Exxonmobil Petroleum & Chemical	Fuel production
8	Evonik Antwerpen	Chemicals
9	Electrabel	Energy
10	Dredging International	Port construction and dredging

Source: NBB.

2.1.4 Investment

Table 2.5 shows direct investment in the port of Antwerp over the period 2011-2016. From 2015 to 2016, (direct) investment increased from € 3 093.0 million to € 3 428.6 million, a rise by 10.9%. Direct investment is subdivided into a maritime and a non-maritime cluster; each one is again broken down into the largest contributing sectors. In terms of (direct) investment, the port of Antwerp is mainly non-maritime (52.8%).

Table 2.5: Antwerp, investment, mio eur

	2011	2012	2013	2014	2015	2016	Contr.gr (%)[(*)]
Shipping companies	331.4	383.5	432.7	1 009.8	589.5	693.4	3.4
Cargo handling	696.3	618.6	493.1	578.6	611.9	680.4	2.2
Port authority	45.0	194.8	196.3	154.2	131.0	141.1	0.3
Other Maritime	445.2	191.1	109.4	88.4	127.8	103.8	-0.8
Maritime	1 517.8	1 387.9	1 231.5	1 831.0	1 460.2	1 618.8	5.1
Chemicals	471.8	489.9	576.9	737.3	691.9	785.6	3.0
Fuel production	90.3	127.3	239.0	417.8	525.3	616.7	3.0
Energy	74.6	76.0	74.5	108.4	166.9	130.3	-1.2
Other Non-maritime	272.1	256.5	251.1	225.2	248.7	277.2	0.9
Non-maritime	908.9	949.7	1 141.5	1 488.7	1 632.8	1 809.8	5.7
Direct	2 426.7	2 337.6	2 373.0	3 319.6	3 093.0	3 428.6	10.9

[(*)] *For details, see annex A.1*
Source: NBB.

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[10]The contribution of a sector to the total growth is equals to its 2015 share times the sectoral growth over 2015-2016. See annex A.1

Figure 2.2: Employment in Antwerp
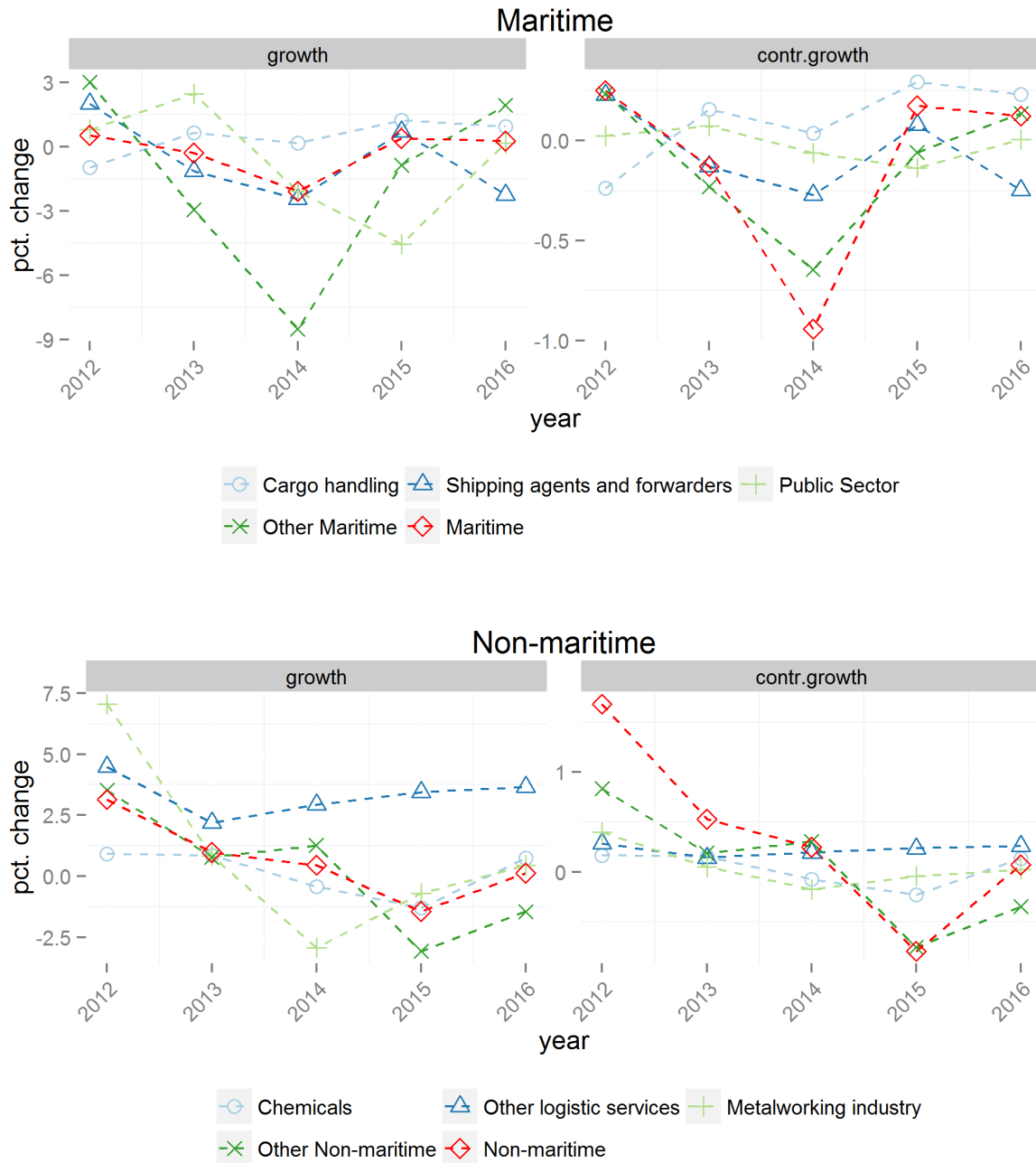
Source: NBB.

Figure 2.3: Concentration in Antwerp
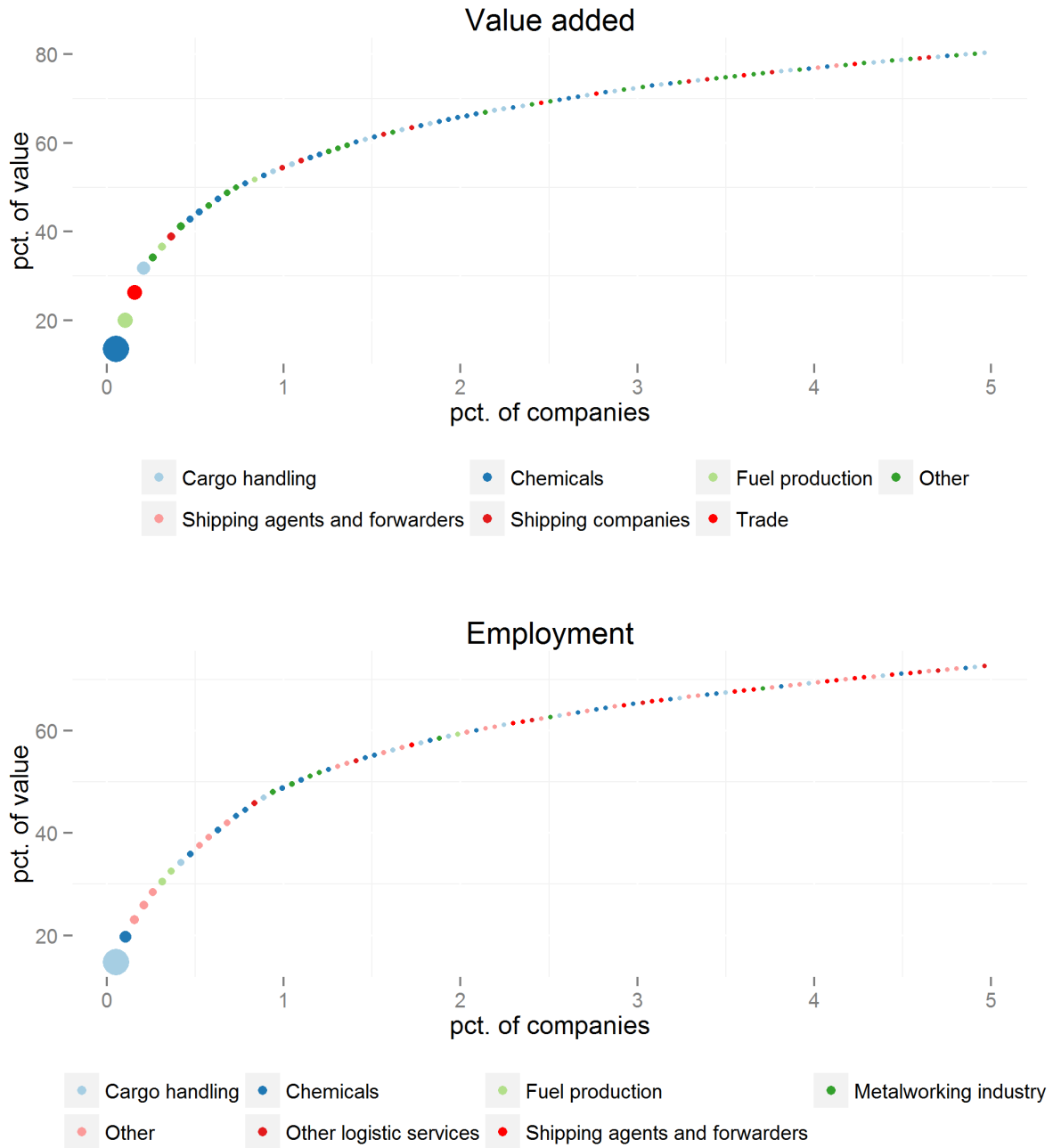
Source: NBB.

Graph 2.4 highlights the findings: in the upper panel, the maritime cluster's contribution seems to be driven by the contribution to growth from shipping companies. In the lower panel, the non-maritime cluster's contribution to growth seems to move together with growth in chemicals and fuel production sectors. Table 2.5 reveals that these latter are the largest maritime resp. non-maritime sectors (and thus have more weight according to annex A.1).

The chemical sector accounted for the largest share of investment in Antwerp; a significant increment came from two companies that more than doubled their investment in 2016. Fuel production, the second largest non-maritime sector occupied fourth place as far as investment is concerned. Investment grew from € 525.3 million to € 616.7 million and this was for a large part due to one company for periodical maintenance. Investment in the energy sector showed a downturn in 2016, but it should be pointed out that 2015 was an exceptional year, in which a lot of investment were carried out. Overall, the developments starting as of 2011 are positive. In 2016, growth since 2015 in other logistic services pursued and reached its highest level since 2011. Several companies invested significant amounts in 2016.

Table 2.6: Top 10 Investment, port of Antwerp

Rank	Name	Sector
1	Euronav	Shipping companies
2	Total Raffinaderij Antwerpen	Fuel production
3	Exxonmobil Petroleum & Chemical	Fuel production
4	B.a.s.f. Antwerpen N.v.	Chemicals
5	Nippon Shokubai Europe	Chemicals
6	Exmar Shipping	Shipping companies
7	Total Olefins Antwerp	Chemicals
8	Antwerp Port Authority	Port authority
9	Independent Belgian Refinery	Fuel production
10	Electrabel	Energy

Source: NBB.

The maritime sector shipping companies held second place in overall investment in Antwerp and showed a sustained growth since 2011. Investment went up in 2016, as was the case for port authority and to a lesser extent for cargo handling. The Antwerp Port Authority more than doubled its own investment in 2016. The end of the construction works for the Kieldrecht lock limited the growth of the sector Port authority.

Figure 2.4: Investment in Antwerp
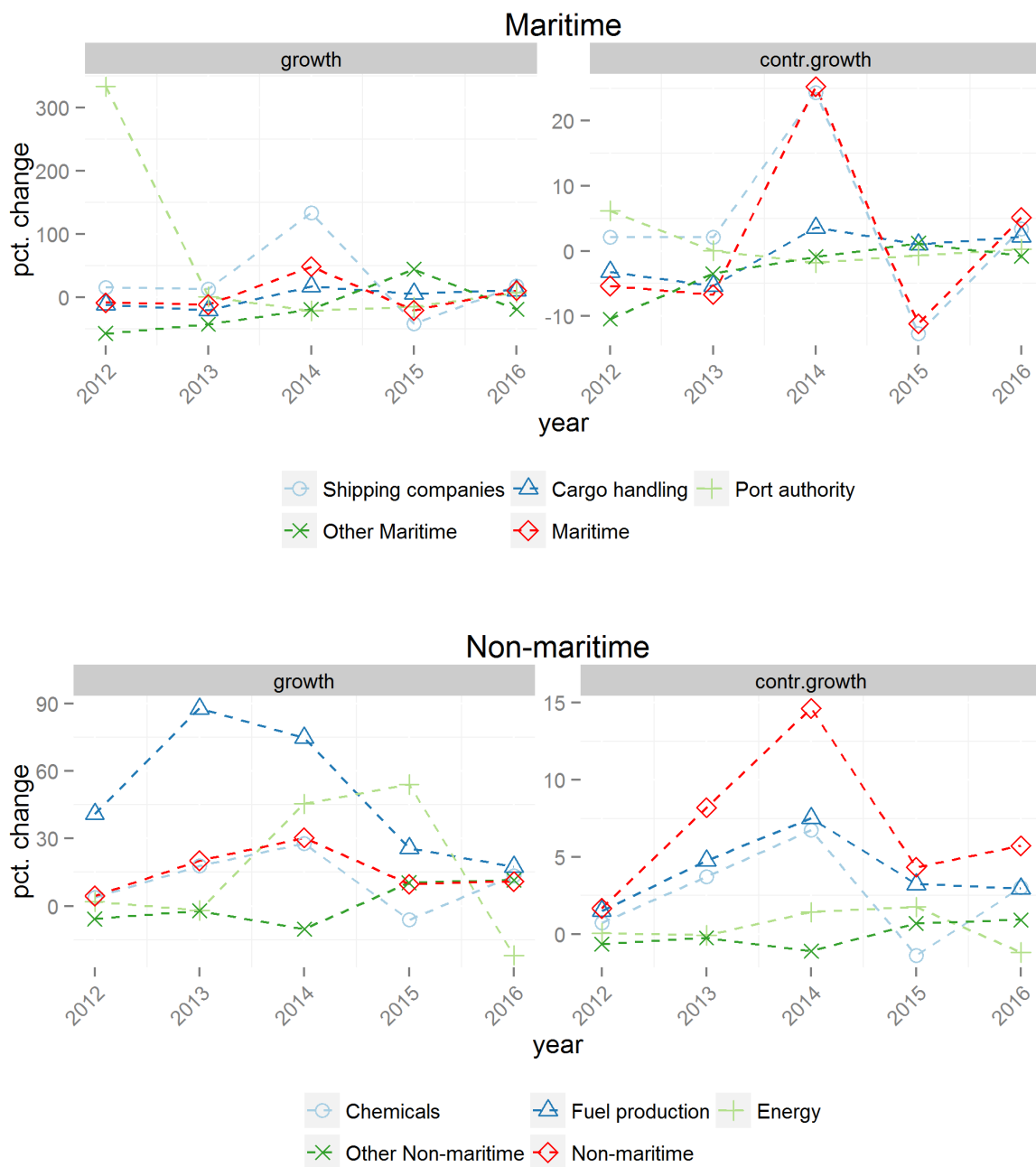
Source: NBB.

2.2 Port of Ghent

2.2.1 Port developments

In 2016 the total maritime traffic handled by the port of Ghent was substantially higher than in 2015, at 29.1 million tonnes (+10.4%). The port of Ghent is the principal Flemish port for dry bulk, with 17.7 million tonnes. This mainly concerns deliveries of iron ore, coal, cereals, construction materials and crude minerals. The RoRo traffic includes Volvo cars transported between Ghent and Göteborg.

The total traffic handled by the port of Ghent increased strongly once more in 2017: from 29.1 million tonnes in 2016 to 32.5 million tonnes (+11.7%). Dry bulk, accounting for almost 65% of the total volume, was up by 18.8% at 21.1 million tonnes. Following a strong increase in 2016, liquid bulk declined slightly in 2017 (-1.7%). RoRo and container traffic increased (up by 11.4% and 4.1% respectively) and other general cargo declined by 2.5%.

In 2017, 3 093 maritime vessels entered the port of Ghent, almost 7% more than in 2016. The size of the average vessel was 11 950 GT.

As in previous years, the principal infrastructure project for the port of Ghent in 2017 was the new lock in Terneuzen on Dutch territory. This new lock will enable the port of Ghent to receive larger vessels. In September 2017, the project was awarded to the Sassevaart consortium. The project is scheduled for completion in 2022.

Besides the major infrastructure project, 2017 also saw significant organisational developments: in December 2017, the port of Ghent and Zeeland Seaports merged to become North Sea Port. The new port handled a total volume of 66.6 million tonnes, making it the 10th largest port in Europe.

2.2.2 Value added

Table 2.7 shows (direct and indirect) value added in the port of Ghent over the period 2011-2016. Between 2015 and 2016 (direct) value added increased from € 3 792.2 million to € 3 859.3 million, contributing 1.8% to total growth. Value added is subdivided into a maritime and non-maritime cluster, each of which is again broken down into the largest contributing sectors. The increase was noticeable for both non-maritime and maritime clusters.

In terms of value added, the port of Ghent is mainly non-maritime (91.4%). The largest sector is trade (23.5%). These shares have changed slightly since 2011 when they were 89.9% and 14.9% respectively. The second and third largest sectors are the metalworking industry and car manufacturing, representing (in terms of value added) 21.7% and 18.3% respectively in 2016.

The last column of the table shows the contribution of each component to the total growth over 2015-2016. The maritime and non-maritime contributions together add up to the total growth. The same holds for all the individual components. Note that these percentages differ from each sector's own growth[11].

This is illustrated in figure 2.5. The left-hand panel shows the sector's own growth, while the right-hand panel shows the sector's contribution to the port's total growth (the latter takes into account the sector's own-growth and its share in the port, see annex A.1 for details).

This graph highlights the findings in the annex: in the upper panel, the contribution to growth of the maritime cluster seems to be driven by the contribution to growth from cargo handling. In the lower panel, the non-maritime cluster's contribution to growth seems to move together with growth in metalworking industry. Table 2.7 reveals that these sectors are amongst the largest sectors (and thus have more weight according to annex A.1).

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[11]The contribution of a sector to the total growth equals its share in 2015 times the sectoral growth over 2015-2016. See annex A.1

Figure 2.5: Value added in Ghent
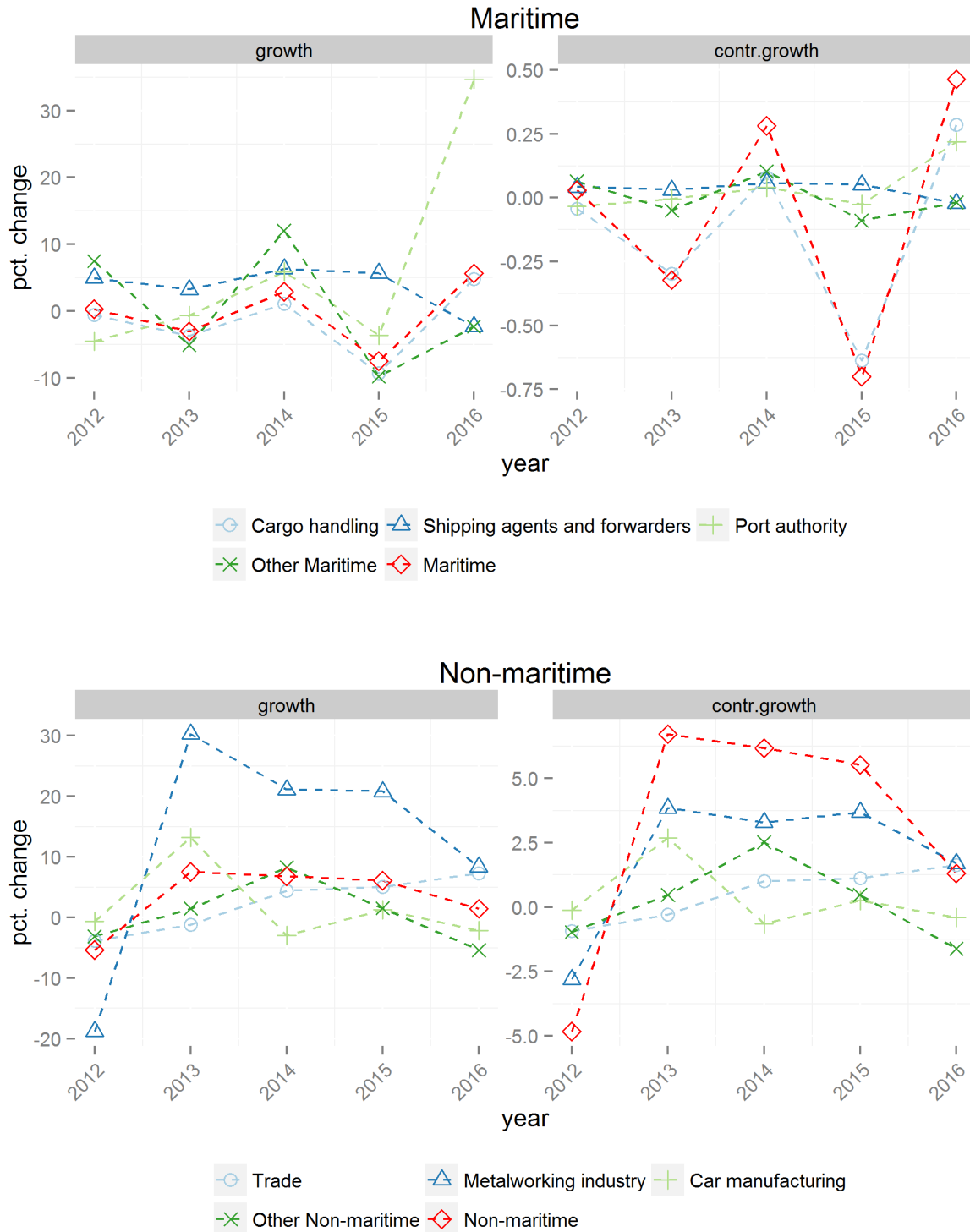
Source: NBB.

Table 2.7: Ghent, value added, mio eur

	2011	2012	2013	2014	2015	2016	Contr.gr (%)[*]
Cargo handling	255.8	254.4	244.9	247.6	224.5	235.3	0.3
Shipping agents and forwarders	28.6	30.1	31.0	33.0	34.8	34.0	-0.0
Port authority	24.7	23.6	23.4	24.8	23.9	32.2	0.2
Other Maritime	28.7	30.9	29.3	32.8	29.6	28.9	-0.0
Maritime	337.9	338.9	328.6	338.2	312.9	330.5	0.5
Trade	812.1	780.9	771.6	805.9	846.4	908.2	1.6
Metalworking industry	500.4	406.3	529.3	641.0	774.3	838.7	1.7
Car manufacturing	653.7	649.6	735.4	713.5	722.6	707.1	-0.4
Other Non-maritime	1 051.0	1 018.4	1 033.4	1 119.0	1 136.0	1 074.8	-1.6
Non-maritime	3 017.2	2 855.1	3 069.7	3 279.4	3 479.3	3 528.8	1.3
Direct	3 355.1	3 194.0	3 398.3	3 617.6	3 792.2	3 859.3	1.8
Indirect	3 424.0	3 259.6	3 565.0	3 733.5	4 047.9	4 151.2	
Total	6 779.1	6 453.6	6 963.4	7 351.0	7 840.1	8 010.5	

[*] *For details, see annex A.1*
Source: NBB.

The maritime cluster contributed 0.5% to the total increase, while the non-maritime sector contributed 1.3%.

The non-maritime trade sector expanded for the third successive year in line to € 908.2 million, representing growth of 1.6% in 2016. Percentagewise, the second largest sector, the metalworking industry, actually performed slightly better at € 838.7 million (a rise of 1.7%). Moreover, both sectors improved their market share to 23.5% and 21.7% respectively in relation to the Ghent port sector as a whole. Car manufacturing is also an important sector, accounting for € 707.1 million, slightly down in 2016 in comparison with 2015.

Cargo handling is the biggest maritime sector representing 6.1% of total activities in Ghent, made up part of the decline (−9.3%) that it experienced in 2015 and recorded 4.8% growth as can be seen in figure 2.5. Although less important, the maritime sector port authority also recorded an exceptional 34.7% increase in value added. This significant rise was generated by fees paid by sea and inland waterway transport, a side effect of the increased volume (+10%) of cargo handling in Ghent.

Value added in Ghent shows a rather high concentration: 5% of the companies represent 77% of direct value added, while 4 companies produce half of the value added. This is illustrated in figure 2.7.

Table 2.8: Top 10 Value added, Ghent

Rank	Name	Sector
1	Arcelormittal Belgium	Metalworking industry
2	Total Belgium	Trade
3	Volvo Car Belgium Nv	Car manufacturing
4	Belgian Shell	Trade
5	Volvo Group Belgium	Car manufacturing
6	Stora Enso Langerbrugge	Other industries
7	Taminco	Chemicals
8	Cri Catalyst Company Belgium	Chemicals
9	Honda Motor Europe Logistics	Trade
10	Rütgers Belgium	Chemicals

Source: NBB.

2.2.3 Employment

Table 2.9 shows employment in the port of Ghent over the period 2011-2016. Between 2015 and 2016 employment increased from 27 841 to 27 983 fte, a rise of 0.5%. Employment is further

subdivided into a maritime and non-maritime cluster, each of which is again broken down into the largest contributing sectors. In terms of employment, the port of Ghent is mainly non-maritime (91.4%).

The non-maritime sectors car manufacturing and the metalworking industry were responsible for more than half of the employment in Ghent during the last five years. The biggest sector, car manufacturing (18.3%), was down by −0.6% in 2016. This decline was due mainly to Volvo, and reversed the 2015 increase. In second place, we find the metalworking industry where employment was up (from 6 018 fte to 6 152 fte).

Direct employment in the maritime cluster recovered partially from the 2015 decline from 2 673 to 2 839 fte. Although employment was still lower than in 2014, cargo handling accounted for most of the increase, with 4.8% growth. The reason can be attributed to several companies that stepped up their employment or increased their share and a reorganisation in an important logistics group.

The last column of the table shows the contribution of each component to the total growth over 2015-2016. The maritime and non-maritime contributions together add up to the total growth. The same holds for all the individual components. Note that these percentages differ from each sector's own growth[12].

Table 2.9: Ghent, employment, fte

	2011	2012	2013	2014	2015	2016	Contr.gr (%)[(*)]
Cargo handling	2 352	2 370	2 361	2 407	1 883	2 058	0.6
Shipping agents and forwarders	320	332	338	360	354	359	0.0
Public Sector	247	243	242	235	228	217	-0.0
Other Maritime	238	246	240	221	209	206	-0.0
Maritime	3 157	3 191	3 181	3 223	2 673	2 839	0.6
Car manufacturing	8 324	8 762	9 033	9 088	9 544	9 384	-0.6
Metalworking industry	5 589	5 677	5 836	6 057	6 018	6 152	0.5
Chemicals	2 132	2 130	2 109	2 102	2 109	2 120	0.0
Other Non-maritime	7 452	7 468	7 381	7 759	7 496	7 487	-0.0
Non-maritime	23 496	24 038	24 358	25 006	25 168	25 144	-0.1
Direct	26 653	27 229	27 539	28 229	27 841	27 983	0.5
Indirect	32 998	33 735	34 182	34 439	35 404	36 210	
Total	59 652	60 964	61 721	62 668	63 245	64 192	

[(*)] *For details, see annex A.1*
Source: NBB.

This is illustrated in figure 2.6. The left-hand panel shows the sector's own-growth and the right-hand panel shows the sector's contribution to the port's total growth (the latter takes into account the sector's own-growth and its share in the port, see annex A.1 for details).

This figure highlights the findings in the annex in a graphical way: in the upper panel, the contribution to growth from the maritime cluster seems to be driven by the contribution to growth from cargo handling. In the lower panel, the non-maritime cluster's contribution to growth seems to move together with growth from metalworking industry together with car manufacturing. Table 2.9 reveals that these sectors are amongst the largest sectors (and thus have more weight according to annex A.1).

The maritime cluster contributed 0.6% to the total increase, while the non-maritime cluster contributed −0.1%.

Employment in Ghent shows a rather high concentration: 5% of the companies represent 71% of direct employment, 4 companies account for half of direct employment. This is illustrated in figure 2.7. The top 10 companies in terms of employment are listed in table 2.8.

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[12]The contribution of a sector to the total growth equals its share in 2015 times the sectoral growth over 2015-2016. See annex A.1

Figure 2.6: Employment in Ghent
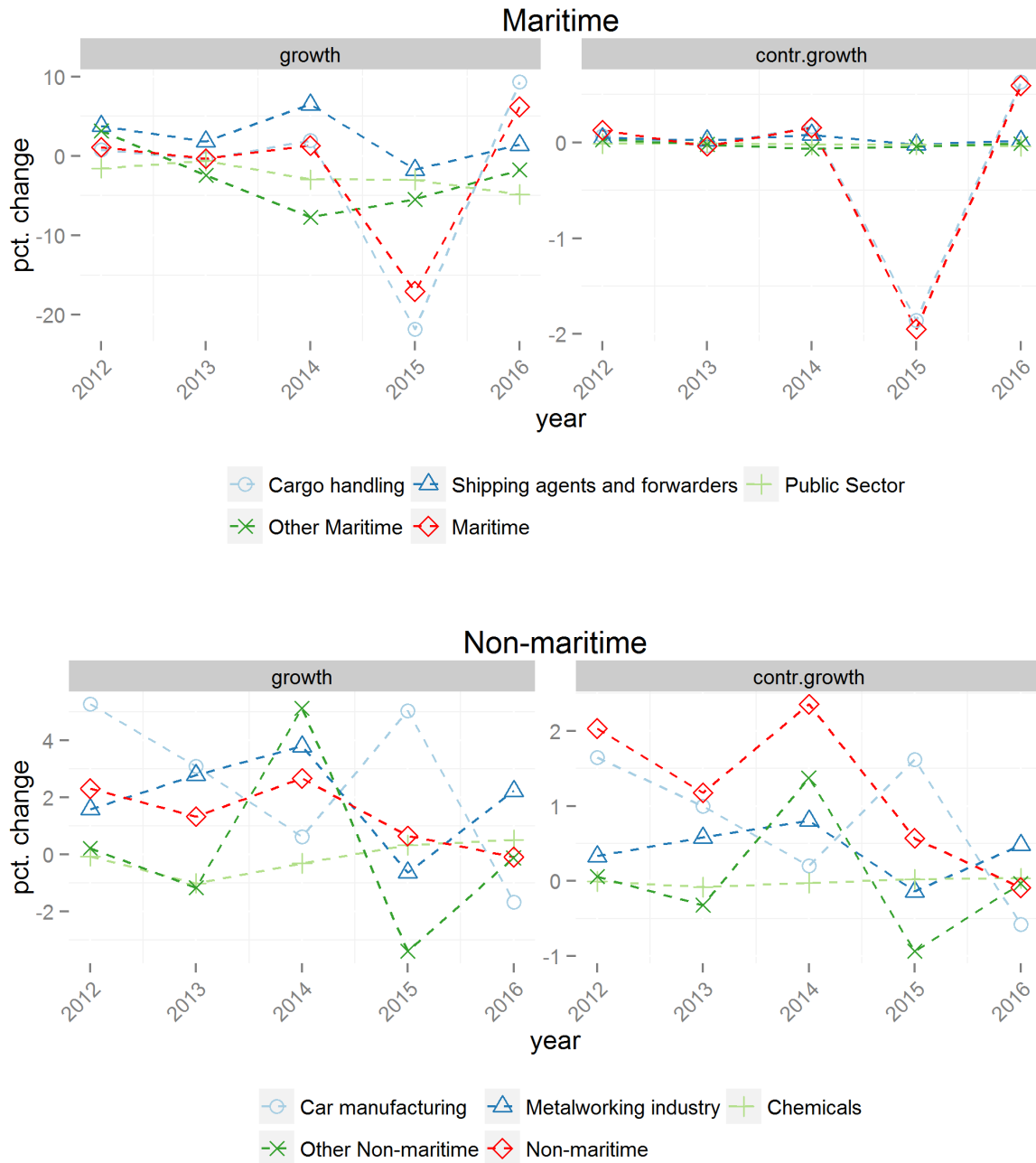
Source: NBB.

Figure 2.7: Concentration in Ghent
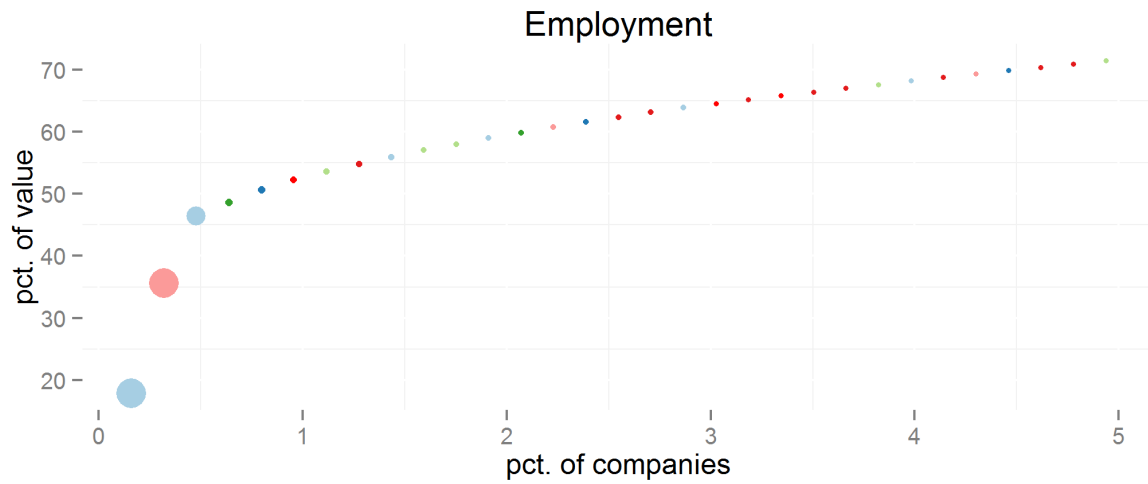
Source: NBB.

Table 2.10: Top 10 Employment, Ghent

Rank	Name	Sector
1	Volvo Car Belgium Nv	Car manufacturing
2	Arcelormittal Belgium	Metalworking industry
3	Volvo Group Belgium	Car manufacturing
4	Denys	Construction
5	Centrale Van De Werkgevers Aan De Haven Van Gent	Cargo handling
6	Honda Motor Europe Logistics	Trade
7	Taminco	Chemicals
8	Stora Enso Langerbrugge	Other industries
9	Plastal	Car manufacturing
10	Oleon	Chemicals

Source: NBB.

2.2.4 Investment

Table 2.11 shows investment in the port of Ghent over the period 2011-2016. Between 2015 and 2016 the investment increased from € 383.8 million to € 530.8 million, a rise of 38.3%. Investment is subdivided into a maritime and non-maritime cluster, each of which is again broken down into the largest contributing sectors. In terms of investment, the port of Ghent is mainly non-maritime (79.6%). The largest sector is the metalworking industry. The share of this sector has increased from 11.7% in 2011 to 23% in 2016. The second largest sector is the non-maritime branch car manufacturing, where investment was about € 6 million lower than in the metalworking industry in 2016. The largest maritime sector, cargo handling is in third place (14.4%).

The last column of the table shows the contribution of each component to the total growth over 2015-2016. Both the maritime and the non-maritime cluster made a positive contribution to investment, but the non-maritime is more than twice as much.

Figure 2.8 highlights the findings in the annex in a graphical way: in the upper panel, the contribution to growth of the maritime cluster seems to be driven by the contribution to growth from cargo handling. In the lower panel, the non-maritime cluster's contribution to growth seems to move together with growth in metalworking industry together with car manufacturing. Table 2.11 reveals that these sectors are amongst the largest sectors (and thus have more weight according to annex A.1).

All sectors made a positive contribution to investment growth in 2016. The biggest contributor in the non-maritime cluster was car manufacturing, also in the maritime cargo handling the negative contribution to growth in 2015 became positive in 2016. Here, several companies invested significantly.

Investment in the non-maritime cluster continued to grow in 2016. Percentagewise, the most significant sectors were the metalworking industry (its contribution to growth increased to 9.3%) and car manufacturing (whose contribution to growth increased to 16.3%). In the metalworking industry, the biggest investor was ArcelorMittal Belgium, whose 4-year investment programme should guarantee continuous innovation in line with the company's strategic vision (e.g. it plans to produce special steel for more eco-friendly cars). In the car manufacturing sector, Volvo Car Belgium was the largest investor, spending on the maintenance of painting robots, renovation of the window station and fitting of dashboards on the assembly lines. Other sectors contributed less to the increased investment. Note that these percentages differ from each sector's own growth[13]. The non-maritime cluster contributed 10.8% to the total growth, whereas the maritime cluster was down by 27.6%.

This is illustrated in figure 2.8. The left-hand panel shows the sector's own growth and the right-hand panel shows the sector's contribution to the port's total growth (the latter takes into

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[13]The contribution of a sector to the total growth equals its share in 2015 times the sectoral growth over 2015-2016. See annex A.1

Table 2.11: Ghent, investment, mio eur

	2011	2012	2013	2014	2015	2016	Contr.gr (%)[*]
Cargo handling	50.1	72.6	81.5	48.9	45.5	76.3	8.0
Public Sector	9.6	7.8	11.0	3.0	10.3	17.7	1.9
Port authority	9.9	6.7	6.4	6.6	8.5	8.6	0.0
Other Maritime	5.9	3.8	3.3	3.4	2.9	5.9	0.8
Maritime	75.4	90.9	102.2	61.8	67.2	108.4	10.8
Metalworking industry	53.2	68.1	67.9	75.2	86.3	122.1	9.3
Car manufacturing	87.5	71.3	34.1	50.6	53.4	116.0	16.3
Chemicals	68.6	70.1	56.6	70.3	52.4	54.3	0.5
Other Non-maritime	168.5	172.5	175.5	156.2	124.5	130.0	1.4
Non-maritime	377.8	382.1	334.0	352.3	316.6	422.4	27.6
Direct	453.2	473.0	436.2	414.1	383.8	530.8	38.3

[*] *For details, see annex A.1*
Source: NBB.

account the sector's own growth and its share in the port, see annex A.1 for details).

Table 2.12: Top 10 Investment, Ghent

Rank	Name	Sector
1	Arcelormittal Belgium	Metalworking industry
2	Volvo Car Belgium Nv	Car manufacturing
3	Public Sector	Public Sector
4	Taminco	Chemicals
5	Volvo Group Belgium	Car manufacturing
6	Total Belgium	Trade
7	Stora Enso Langerbrugge	Other industries
8	Oiltanking Ghent	Cargo handling
9	Fuji Oil Europe	Food industry
10	Sea - Invest	Cargo handling

Source: NBB.

Figure 2.8: Investment in Ghent
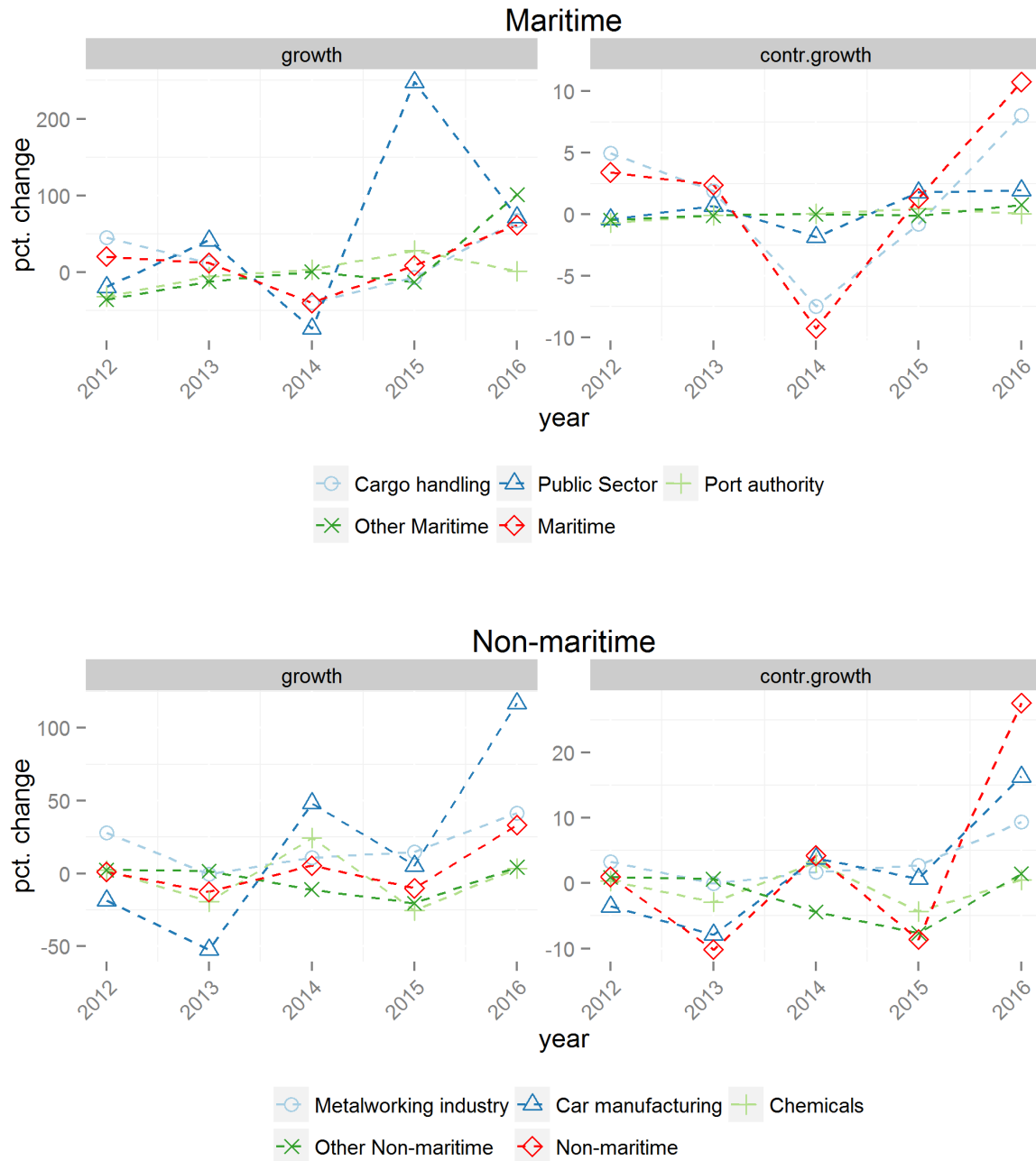
2.3 Port of Zeebrugge

2.3.1 Port developments

In 2016 the total transshipment at the port of Zeebrugge came to 37.8 million tonnes (-1.3% against 2015). Liquid bulk and containers declined, whereas RoRo, dry bulk and other general cargo increased.

Roll-on roll-off traffic was up by 6.7% at 15.0 million tonnes in 2017. As in 2016, RoRo traffic to and from Scandinavia increased strongly (+23.5%). Despite Brexit, traffic to and from the United Kingdom remained very stable. RoRo to Ireland increased. The volume of new cars handled was another all-time record. In total, Zeebrugge handled 2.83 million cars (against 2.78 million in 2016).

Container traffic increased in 2017, for both deep-sea and short-sea, to a total of 15.4 million tonnes (+6.5%) or 1.5 million TEU. This was due to the NEU4 service operated by Ocean Alliance (CMA CGM), the LoLo service operated by P&O Ferries to Hull and the containerised kiwis delivered on Seatrade vessels.

Liquid bulk declined in 2017 by 31.5% to 4.1 million tonnes, mainly as a result of the sharp fall in the volume of liquid natural gas (-62%). No improvement is expected in 2018 due to high LNG prices in Japan and Korea, combined with rising demand for LNG in China and India, so that most LNG is transported to Asia instead of Europe.

Dry bulk was down by 11.8% in 2017 at 1.3 million tonnes. The reduction in deliveries of sand and gravel was due to the completion of the works on the A11 motorway.

Conventional cargo declined in 2017 (-11.4%). The shipping of large volumes for the construction of the gas installations for the Yamal LNG project were completed in 2017. Delivery of kiwis shifted to containers. Paper is also increasingly being shipped in SECUs (Stora Enso Cargo Units) and is therefore no longer recorded in the statistics as general cargo.

In 2017, 143 cruise ships entered the port of Zeebrugge with a total of 797 264 cruise passengers on board.

In 2017, a total of 8 427 ships called in Zeebrugge. The average ship size was 24 099 GT (compared to 23 372 GT in 2016).

2.3.2 Value added

Table 2.13 shows value added in the port of Zeebrugge over the period 2011-2016. Between 2015 and 2016, direct value added increased from € 979.4 million to € 1 007.2 million, a rise of 2.8%. Direct value added is sub-divided into a maritime and non-maritime cluster, each of which is again broken down into the largest contributing sectors. In terms of value added, the port of Zeebrugge is mainly maritime (58.3%). The largest sector is cargo handling (24.8%). These shares have increased since 2011 when they were 50.9% and 19.5% respectively. The second largest sector is the maritime branch public sector and its value added figure came to around two-fifths the size of cargo handling in 2016.

The last column in the table shows the contribution of each component to total growth over 2015-2016. Value added was up in both the maritime and the non-maritime clusters. Value added generated by the non-maritime cluster rose more sharply and even though its share is smaller, its contribution to total growth was much larger. The contributions of the individual components of the maritime cluster to total growth of value added are quite low except for cargo handling, shipping agents and forwarders and port construction and dredging. The first sector contributed positively whereas the two other sectors reduced the total growth figure. The non-maritime cluster components saw no such fall in their contribution to value added growth. Most of the time, their contribution was positive, and if it was not, it was only marginally less. It should be noted that these percentages differ from each sector's own growth rates[14].

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[14]The contribution of a sector to total growth equals its share in 2015 times the sectoral growth over 2015-2016.

Table 2.13: Zeebrugge, value added, mio eur

	2011	2012	2013	2014	2015	2016	Contr.gr (%)[*]
Cargo handling	191.6	193.2	194.7	205.4	219.2	249.8	3.1
Public Sector	108.9	107.8	109.9	107.1	103.3	101.3	-0.2
Shipping agents and forwarders	49.7	58.5	69.8	68.9	84.5	66.5	-1.8
Other Maritime	150.3	151.7	159.1	160.0	171.9	169.7	-0.2
Maritime	500.6	511.2	533.5	541.4	578.9	587.4	0.9
Trade	108.8	114.7	88.1	85.7	88.1	89.7	0.2
Energy	107.3	95.0	92.5	98.4	91.3	89.6	-0.2
Road transport	65.4	61.6	57.5	47.7	45.6	50.1	0.5
Other Non-maritime	201.3	168.5	216.9	181.6	175.6	190.3	1.5
Non-maritime	482.8	439.7	455.0	413.4	400.5	419.8	2.0
Direct	983.4	951.0	988.5	954.9	979.4	1 007.2	2.8
Indirect	762.3	745.8	788.6	753.0	824.3	883.1	
Total	1 745.7	1 696.8	1 777.1	1 707.9	1 803.7	1 890.3	

[*] *For details, see annex A.1*
Source: NBB.

This is illustrated in figure 2.9. The left-hand panel shows the sector's own growth and the right-hand panel shows the sector's contribution to the port's total growth (the latter takes into account the sector's own growth and its share in the port, see annex A.1 for details).

The upper panel shows that the contribution to growth of the maritime cluster seems to be driven by the contribution from shipping agents and forwarders. This is due to the extreme volatility of the (own-) growth rates of that sector. In the lower panel, the non-maritime cluster's contribution to growth seems to move together with growth in the other non-maritime sectors. Table 2.13 learns that there are no high-weight non-maritime sectors.

The non-maritime cluster contributed 2% to total growth while the maritime sector recorded a slight 0.9% expansion.

The largest sectoral contribution to the increase came from the cargo handling sector. The Centrale der werkgevers Zeebrugge showed a big rise in staff costs. Two other firms in this sector specialised in roll-on roll-off handling also confirmed the good health of the port of Zeebrugge in that category of maritime transport. On the contrary, shipping agents and forwarders posted a drop in value added. Two major players from this sector, New class Shipping and 2XL, recorded a fall in their value added. Port construction and dredging firm Artes Depret incurred a big increase in its purchases and so its value added collapsed. In the other logistic services, ECS Corporate saw strong growth in business activity which benefited the sector's value added.

The share of cargo handling in the maritime cluster is up for the third year in a row, while the share of the public sector and shipping agents and forwarders came down between 2015 and 2016. In the non-maritime cluster, trade's share increased whereas the energy sector's share declined over the same period. Huberator was taken over by Fluxys Belgium which is in the same sector. But this company had reduced its tariffs in 2015 and 2016 and so its revenues were down even though volumes of gas carried and the volume exchanged on the ZTP gas trade point were up.

The share of maritime cluster widened between 2011 and 2015 but shrank in 2016.

The component figures of the maritime cluster show several double-digit individual growth rates in 2016. But there were also two big falls reported by shipping agents and forwarders and port construction and dredging. In 2016, the cargo handlers' rise was at its highest level for five years. Shipbuilding and repair was up for the first time in four years. In the non-maritime cluster, there was no big decline apart from the value added in the car manufacturing sector but this came on the back of four years' strong increase and the amount involved was quite small. This fall is explained by Carcenter Zeebrugge which recorded a drop in revenue and operating

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See annex A.1

Figure 2.9: Value added in Zeebrugge
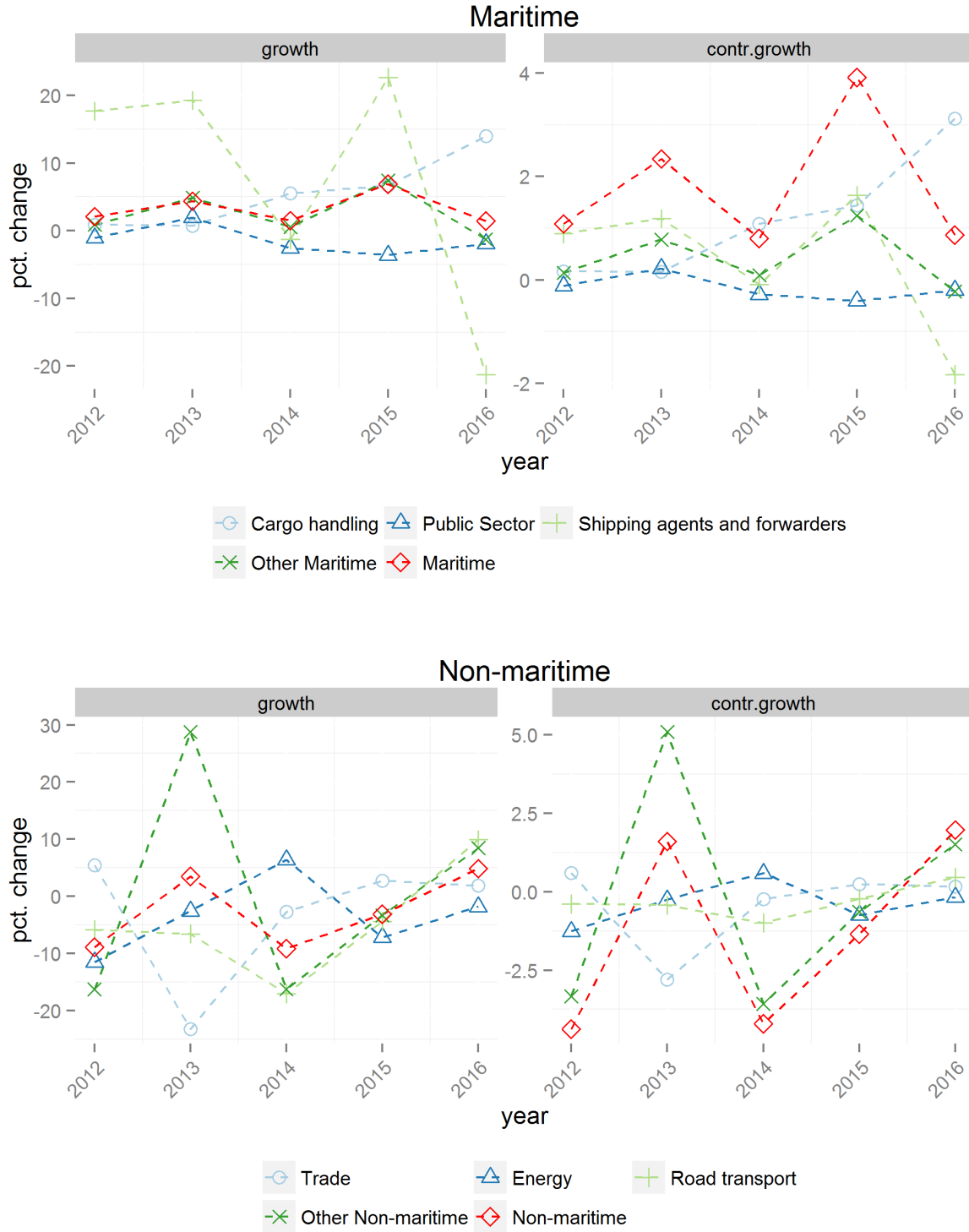
Source: NBB.

profits. Value added generated by other logistic services and the construction sectors increased strongly, by around one quarter. The rise in construction came largely from a company that had restructured and had expanded its staff base in Zeebrugge.

The contributions to growth are more homogenous between individual components of the maritime cluster for the last three years than in non-maritime clusters.

Direct value added in the port of Zeebrugge shows a rather high concentration: 5% of the companies account for 63% of direct value added, while 11 companies produce half of the value added. This is illustrated in figure 2.11.

Table 2.14: Top 10 Value added, Zeebrugge

Rank	Name	Sector
1	Centrale der werkgevers Zeebrugge	Cargo handling
2	Belgian Navy	Public Sector
3	Fluxys LNG	Energy
4	Cobelfret Ferries	Shipping companies
5	Maatschappij Van De Brugse Zeehaven	Port authority
6	Fluxys Belgium	Energy
7	P.B.I. Fruit Juice Company	Food industry
8	Public Sector	Public Sector
9	I.V.B.O.	Other industries
10	C.RO Ports Zeebrugge	Cargo handling

Source: NBB.

2.3.3   Employment

Table 2.15 shows employment in the port of Zeebrugge over the period 2011-2016. Between 2015 and 2016, the number of full-time equivalents increased from 9 301 to 9 589, a rise of 3.1%. Direct employment is sub-divided into a maritime and non-maritime cluster, each of which is again broken down into the largest contributing sectors. In terms of full-time equivalents, the port of Zeebrugge is mainly maritime (58.3%). The largest sector is cargo handling (24.8%). These shares have increased since 2011 when they were 50.9% and 19.5% respectively. The second largest sector was the maritime branch public sector and (in terms of full-time equivalents employed) was around half the size of the cargo handling sector in 2016.

The last column in the table shows the contribution of each component to total growth over 2015-2016. The contribution of the maritime cluster to employment was positive in 2016 after being negative in 2015. After four years of negative contribution, the non-maritime cluster made a positive contribution to employment. The contributions of the main individual components in the maritime cluster are quite small except for cargo handling and public sector. The number of full-time equivalents in de Centrale der werkgevers Zeebrugge was up. That explains a large part of the increase in cargo handling. But some other firms like International Car Operators had also recruited. On the contrary, the public sector's contribution was negative. The public sector (public administration and Belgian Navy) has reduced the number of full-time equivalents employed in the port of Zeebrugge. Growth in employment in the non-maritime cluster came mainly from the two most important sectors : trade and road transport. One road transport company expanded its staff base and centralised it in the port of Zeebrugge. The development of the Vlaamse Visveiling is one of the major growth factors in the trade sector. Note that these percentages differ from each sector's own growth[15].

This is illustrated in figure 2.10. The left-hand panel shows the sector's own growth and the right-hand panel shows the sector's contribution to the port's total growth (the latter takes into account the sector's own growth and its share in the port, see annex A.1 for details).

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[15]The contribution of a sector to total growth equals its share in 2015 times the sectoral growth over 2015-2016. See annex A.1

Figure 2.10: Employment in Zeebrugge
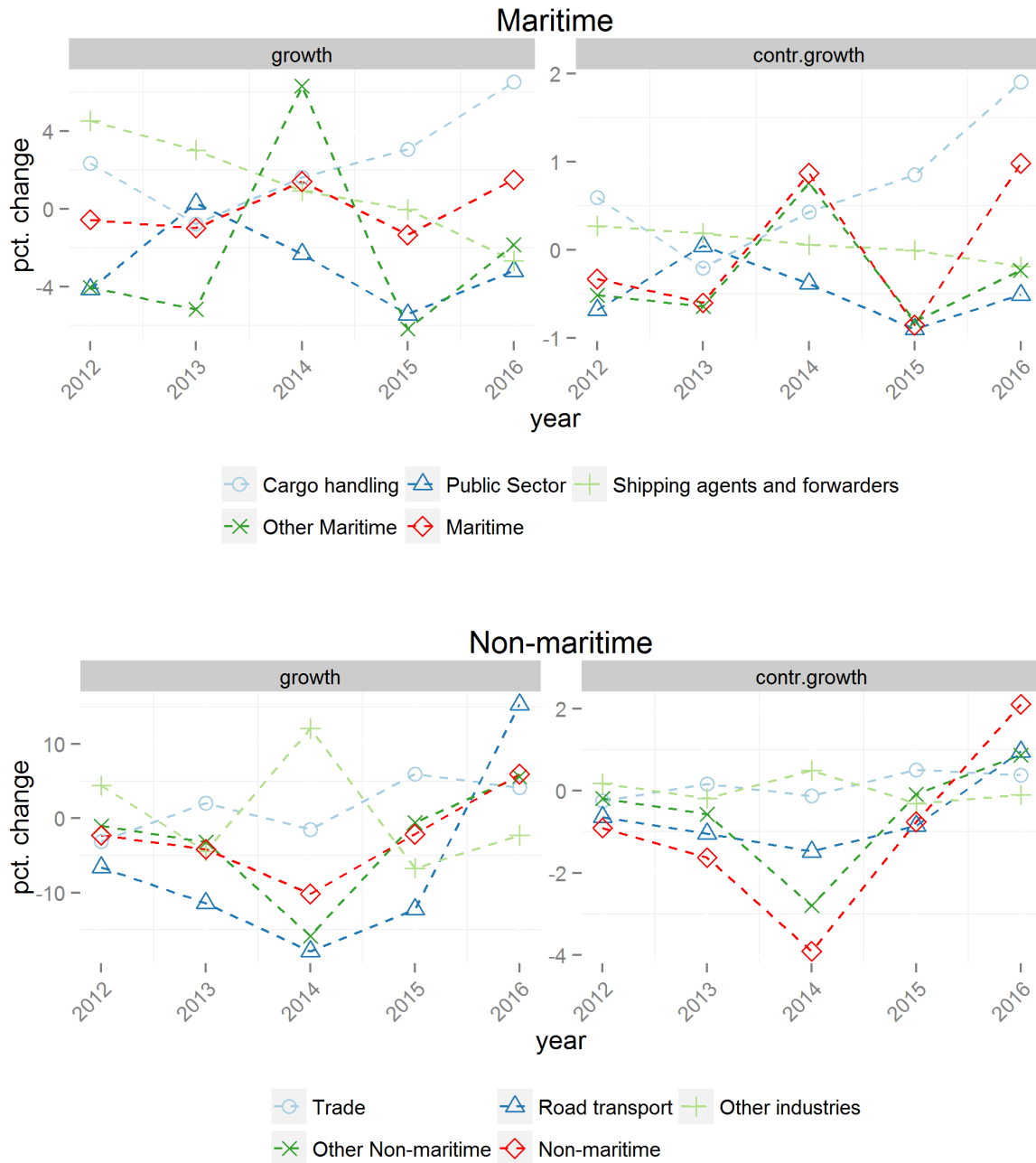
Source: NBB.

Table 2.15: Zeebrugge, employment, fte

	2011	2012	2013	2014	2015	2016	Contr.gr (%)[*]
Cargo handling	2 548	2 608	2 588	2 630	2 711	2 888	1.9
Public Sector	1 664	1 595	1 600	1 563	1 478	1 431	-0.5
Shipping agents and forwarders	605	632	652	658	658	640	-0.2
Other Maritime	1 283	1 231	1 168	1 242	1 165	1 144	-0.2
Maritime	6 099	6 067	6 007	6 092	6 012	6 103	1.0
Trade	825	799	816	803	851	886	0.4
Road transport	975	910	806	662	581	670	1.0
Other industries	400	417	399	447	417	408	-0.1
Other Non-maritime	1 797	1 778	1 721	1 449	1 441	1 522	0.9
Non-maritime	3 996	3 905	3 742	3 361	3 290	3 486	2.1
Direct	10 095	9 971	9 749	9 453	9 301	9 589	3.1
Indirect	10 508	10 371	10 118	9 951	10 193	10 512	
Total	20 603	20 342	19 867	19 404	19 494	20 101	

[*] *For details, see annex A.1*
Source: NBB.

The maritime and the non-maritime clusters contributed 1% and 2.1% respectively to the total growth.

The strongest sectoral contribution to the increase came from the main sector, i.e. cargo handling. But the largest (own-sector) growth was in the electronic industry where employment was up for two years after a collapse in 2014. Every company in this sector recruited in 2016. The second major growth area was road transport. And the major drop occurred in the shipping companies sector. The sector's main employer reduced its staff in 2015 and 2016. Several sectors in the maritime cluster reduced their employment in 2015 and 2016 : public sector, fishing and fish industry, port construction and dredging and to a lesser extent shipping agents and forwarders. The rise in cargo handling prevented the maritime cluster's employment from falling in 2016. But shipbuilding and repair and the port trade recorded higher own growth figures. The share of the maritime cluster expanded between 2011 and 2015 and shrank in 2016. The cargo handling's share has risen continually. In the non-maritime cluster, the trade's share enlarged between 2012 and 2016 whereas it declined for road transport between 2011 and 2015 and rose in 2016.

Employment in the port of Zeebrugge shows a rather high concentration: 5% of the companies represent 63% of direct employment, while 9 companies employ half of all full-time equivalents. This is illustrated in figure 2.11.

Table 2.16: Top 10 Employment, 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	Wallenius Wilhelmsen Logistics Zeebrugge	Cargo handling
7	I.V.B.O.	Other industries
8	Artes Depret	Port construction and dredging
9	Ecs European Containers	Shipping agents and forwarders
10	International Car Operators	Cargo handling

Source: NBB.

Figure 2.11: Concentration in Zeebrugge
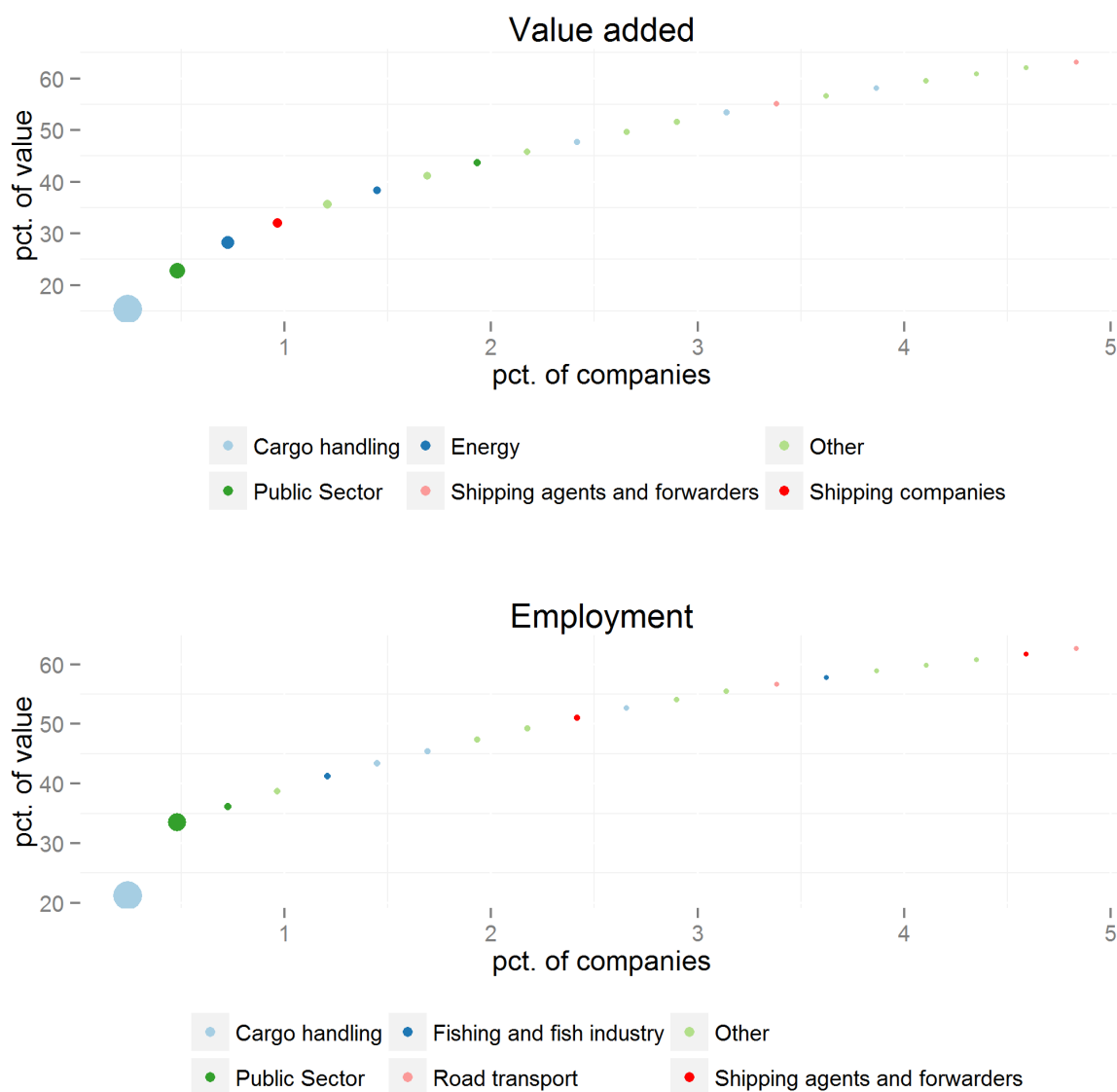
Source: NBB.

2.3.4 Investment

Table 2.17 shows investment in the port of Zeebrugge over the period 2011-2016. Between 2015 and 2016, investment increased from € 241.7 million to € 294.7 million, a growth rate of 21.9%. Investment is sub-divided into a maritime and non-maritime cluster, each of which is again broken down into the largest contributing sectors. In terms of investment, the port of Zeebrugge is mainly non-maritime (58.7%). The largest sector is energy (35.8%). These shares have increased since 2011 when they were 49.8% and 10.2% respectively. The second largest sector is the maritime cargo handling branch, which was around two-fifths the size of the energy sector in 2016.

The last column in the table shows the contribution of each component to total growth over 2015-2016. Both clusters' contributions were positive. In the maritime cluster, most of the sectors' contributions were positive whereas in the non-maritime cluster, contributions are more diverse. Energy, road transport, cargo handling and shipping companies contributed most of the growth. In the energy sector, Fluxys LNG recently built a second terminal, with construction work carried out over a period running from 2011 to the end of 2016. With this new terminal, smaller ships can be loaded and unloaded in Zeebrugge. Ship size can range from 2 000 m^3 to 217 000 m^3 of LNG. LNG can be stored in tanks in the Zeebrugge terminal and then be loaded back onto LNG ships. A fifth storage tank and compressor fitting have also been under construction. In road transport, DD trans bought containers worth € 24.1 million. In cargo handling, C.Ro Ports Zeebrugge invested a considerable amount in 2016. In shipping companies, the purchase of Ms Clementine by Cobelfret Ferries boosted the sector's investment dramatically and so pushed up the percentage contribution to growth. It is worth noting that these percentages differ from each sector's own growth[16]. The non-maritime cluster contributed 6.7% to total growth, while the maritime sector's contribution was up by 15.2%.

Table 2.17: Zeebrugge, investment, mio eur

	2011	2012	2013	2014	2015	2016	Contr.gr (%)[*]
Cargo handling	30.5	29.2	16.8	50.7	28.1	43.4	6.3
Port authority	33.6	34.0	28.3	22.0	13.4	24.2	4.5
Shipping agents and forwarders	11.9	7.3	4.6	14.7	15.1	19.3	1.7
Other Maritime	56.9	39.4	27.1	26.7	28.5	34.8	2.6
Maritime	133.0	109.9	76.8	114.1	85.1	121.7	15.2
Energy	27.1	24.4	44.0	31.7	85.4	105.5	8.3
Road transport	16.2	8.7	12.0	10.8	16.6	35.6	7.9
Trade	13.5	14.1	12.6	10.6	11.9	8.8	-1.3
Other Non-maritime	75.2	77.4	51.9	36.6	42.8	23.0	-8.2
Non-maritime	132.0	124.5	120.5	89.7	156.7	172.9	6.7
Direct	265.0	234.4	197.3	203.8	241.7	294.7	21.9

[*] *For details, see annex A.1*
Source: NBB.

This is illustrated in figure 2.12. The left-hand panel shows the sector's own-growth and the right-hand panel shows the sector's contribution to the port's total growth (the latter takes into account the sector's own growth and its share in the port's activities, see annex A.1 for details).

The upper panel of figure 2.12 shows that the contribution to growth of the maritime cluster seems to be driven by the contribution of cargo handling. In the lower panel, the non-maritime cluster's contribution to growth seems to move together with growth in the energy sector.

Beside the sectors already mentioned, the port authority recorded strong growth in investment between 2015-2016. Maatschappij van de Brugse Zeehaven built quay walls and ordered dredging works for the car industry, adapted the berths at a container terminal, tooled up a

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[16]The contribution of a sector to total growth equals its share in 2015 times the sectoral growth over 2015-2016. See annex A.1

RoRo terminal and invested in software. With all this work, the amount it invested nearly doubled. For two consecutive years, the energy sector's investment accounted for one-third of the total amount invested by the port of Zeebrugge. However, energy's share had been far smaller in previous years with shares being around one-tenth and one-fifth, depending on the year. The energy share is expected to drop next year as the project for the new terminal is finished. Trade's share is at the lowest level over the six-year period. New investment in 2016 was not sufficient to offset the closure plans in 2015. But it was investment by other land transport that collapsed the most. BNRC Group slashed its investment in the port of Zeebrugge by more than 80%. With this deep cut, other land transport's share (which had held third place in 2015) finished in the bottom five ranking in 2016. Investment by the public sector and other industries was scaled back every year between 2011 and 2016. Nevertheless, both the non-maritime cluster's and the port of Zeebrugge's total investment in 2016 reached their highest levels for six years. The maritime cluster's investment was at its highest level over the five-year period.

Table 2.18: Top 10 Investment, Zeebrugge

Rank	Name	Sector
1	Fluxys LNG	Energy
2	Dd Trans	Road transport
3	Maatschappij Van De Brugse Zeehaven	Port authority
4	C.RO Ports Zeebrugge	Cargo handling
5	2xl	Shipping agents and forwarders
6	Cobelfret Ferries	Shipping companies
7	Public Sector	Public Sector
8	International Car Operators	Cargo handling
9	P.B.I. Fruit Juice Company	Food industry
10	Cldn Cargo	Shipping agents and forwarders

Source: NBB.

Figure 2.12: Investment in Zeebrugge
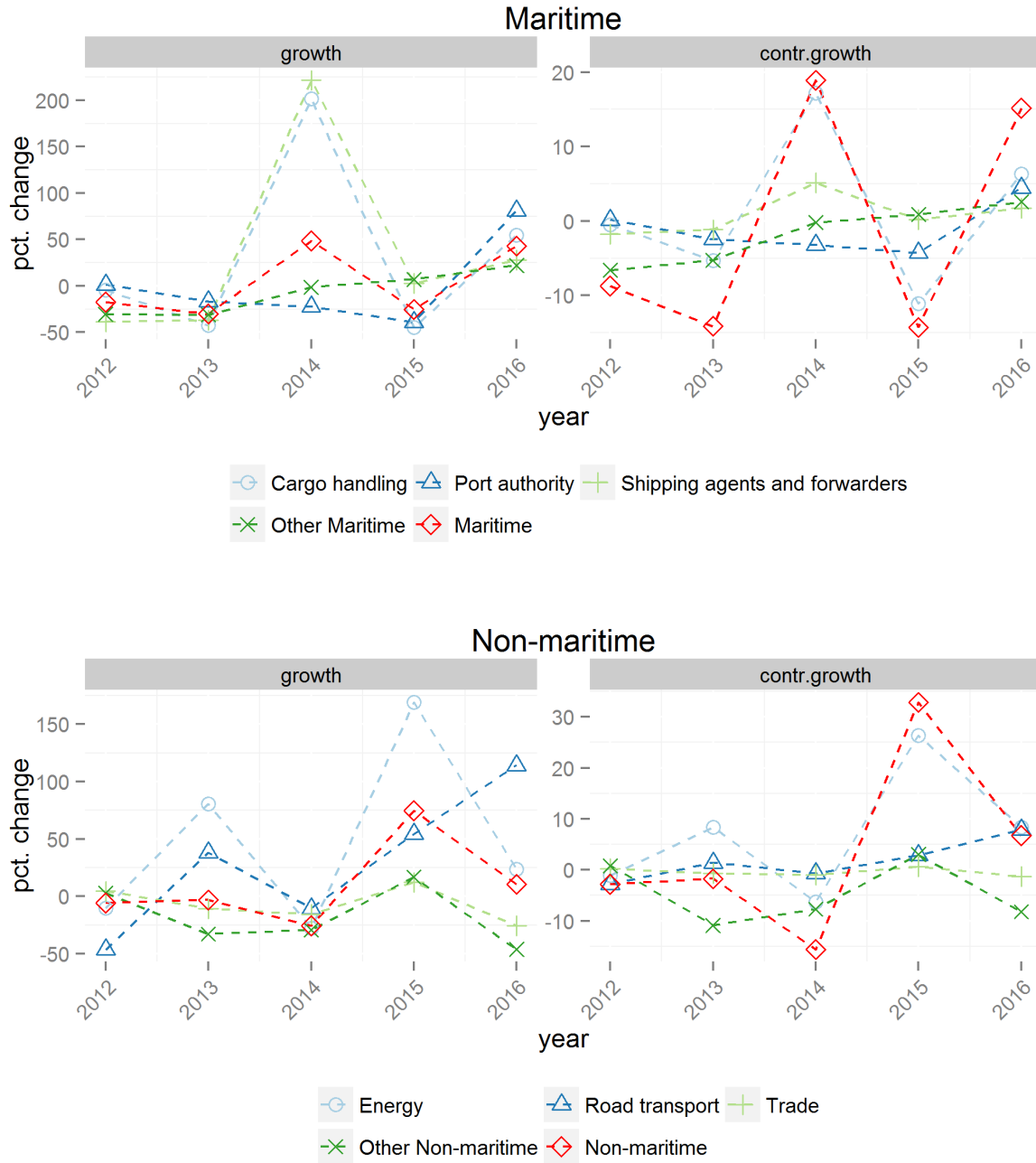
Source: NBB.

2.4 Port of Ostend

2.4.1 Port developments

In 2016 the total traffic handled by the port of Ostend increased to 1.46 million tonnes (+13.1%). The main reason was the increase in the volume of dry bulk (deliveries of sand and gravel from the sea for the construction industry). The number of passengers has been falling since 2013, owing to the loss of the RoRo business. In 2016, the number of cruise ship passengers embarking or disembarking came to 4,287.

In 2017, transshipment declined by 6.1%, to a total of 1.37 million tonnes. Dry bulk accounted for 95% of the total. In 2017, 1,982 passengers passed through the port of Ostend.

In recent years the port of Ostend has presented itself as an "Energy Port". The installation and maintenance of the 3 offshore wind parks in the North Sea (C-Power, Belwind and Northwind) is handled from Ostend. Two gigantic bases for the high-voltage stations of the Danish offshore wind park Kriegers Flak were also built in the port of Ostend in 2017. These activities generate additional shipping movements to and from the port, and also generate employment in the port area.

2.4.2 Value added

Table 2.19 shows (direct and indirect) value added in the port of Ostend over the period 2011-2016. Between 2015 and 2016 (direct) value added was down from € 510.8 million to € 505.5 million, a -1.0% decline. Value added is subdivided into a maritime and non-maritime cluster, each of which is again broken down into the largest contributing sectors. In terms of value added, the port of Ostend is mainly non-maritime (65.2%). The largest sector is the metalworking industry (32.6%). The second largest sector is the maritime branch port construction and dredging, closely followed by the public sector, in terms of value added, these were each around one third of the size of the metalworking industry in 2016.

The last column of the table shows the contribution of each component to the total growth over 2015-2016. The maritime and non-maritime contributions together add up to the total growth, and the same holds for all the individual components. Note that these percentages differ from each sector's own growth[17].

Table 2.19: Ostend, value added, mio eur

	2011	2012	2013	2014	2015	2016	Contr.gr (%)[(*)]
Port construction and dredging	55.4	57.0	59.4	57.6	70.5	57.1	-2.6
Public Sector	49.3	50.1	49.9	51.7	51.5	53.5	0.4
Fishing and fish industry	34.5	33.8	37.2	39.8	38.8	39.8	0.2
Other Maritime	22.5	27.4	24.1	23.3	25.3	25.6	0.1
Maritime	161.7	168.3	170.5	172.4	186.1	176.0	-2.0
Metalworking industry	152.9	153.7	161.5	169.6	168.3	164.6	-0.7
Chemicals	34.3	36.0	38.3	36.7	34.2	38.4	0.8
Construction	21.2	37.3	33.1	31.7	32.6	28.6	-0.8
Other Non-maritime	100.2	92.0	84.9	89.1	89.6	97.9	1.6
Non-maritime	308.7	319.0	317.8	327.1	324.8	329.5	0.9
Direct	470.4	487.4	488.3	499.5	510.8	505.5	-1.0
Indirect	349.0	371.8	373.0	365.9	394.3	382.1	
Total	819.3	859.2	861.3	865.4	905.2	887.6	

[(*)] *For details, see annex A.1*
Source: NBB.

This is illustrated in figure 2.13. The left-hand panel shows the sector's own growth, and the right-hand panel shows the contribution of the sector to the port's total growth (the latter takes into account the sector's own growth and its share in the port, see annex A.1 for details).

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[17]See annex A.1

The upper panel of figure 2.13 shows that the contribution to growth of the maritime cluster seems to be driven by the contribution of port construction and dredging. In the lower panel, the non-maritime cluster's contribution to growth seems to move together with growth in the chemicals sector.

The maritime cluster contributed -2% to the total decline, while the non-maritime sector contributed 0.9%.

The largest sectoral contributions to the decline came from the metalworking industry. The trade sector showed the strongest growth between 2015-2016, but, because of its small share in the direct value added in the port of Ostend, it only made a marginal contribution to the port's growth. The same holds for other logistic services, and energy. The contribution of chemicals was higher, as this is the second biggest non-maritime sector.

The metalworking industry continued its negative growth of 2015, and contracted more sharply in 2016. The port construction and dredging sector lost almost all of the exceptional growth recorded in 2015, and reverted to the 2014 level. The public sector had a slightly stronger own growth in 2016, whereas growth in the fishing and fish industry hardly changed.

Value added in Ostend shows a rather high concentration: 5% of the companies represent 66% of direct value added, while 3 companies produce half of the value added. This is illustrated in figure 2.15.

Table 2.20: Top 10 Value added, Ostend

Rank	Name	Sector
1	Daikin Europe N.v.	Metalworking industry
2	Baggerwerken Decloedt & Zoon	Port construction and dredging
3	Public Sector	Public Sector
4	Proviron Functional Chemicals	Chemicals
5	Biostoom Oostende	Energy
6	Verhelst Aannemingen	Construction
7	Fides Petfood	Food industry
8	Belgian Navy	Public Sector
9	Algemene Ondernemingen Soetaert	Construction
10	Wim Bosman Logistic Services	Road transport

Source: NBB.

2.4.3 Employment

Table 2.21 shows employment in the port of Ostend over the period 2011-2016. Between 2015 and 2016 employment declined from 5 021 to 4 912 fte, a fall of -2.2%. Employment is subdivided into a maritime and non-maritime cluster, each of which is again broken down into the largest contributing sectors. In terms of employment, the port of Ostend is mainly non-maritime (63%). The largest sector is the metalworking industry (28.3%). These shares have declined in comparison with the last two years, but are almost at the same level as in 2011 when they were 61.4% and 28.3% respectively. The second largest sector is the maritime public sector.

The last column of the table shows the contribution of each component to the total growth over 2015-2016. The maritime and non-maritime contributions together add up to the total growth, and the same holds for all the individual components. Note that these percentages differ from each sector's own growth[18].

This is illustrated in figure 2.14. The left-hand panel shows the sector's own growth and the right-hand panel shows the sector's contribution to the port's total growth (the latter takes into account the sector's own growth and its share in the port, see annex A.1 for details).

The maritime cluster contributed -0.8% to the total decline, while the non-maritime cluster contributed -1.3%. The largest negative sectoral contributions to the decrease came from the

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[18]The contribution of a sector to the total growth equals its share in 2015 times the sectoral growth over 2015-2016. See annex A.1

Figure 2.13: Value added in Ostend
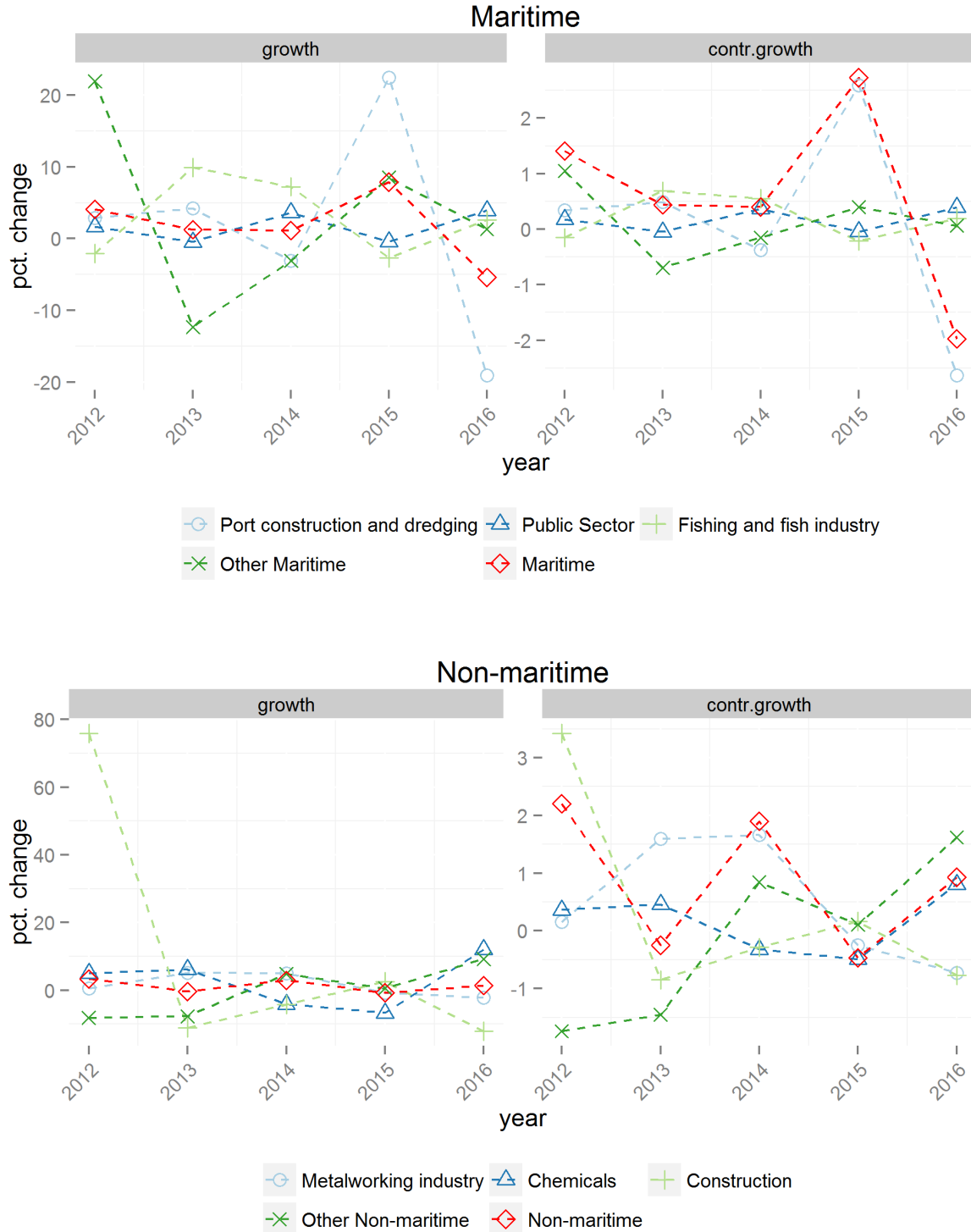
Source: NBB.

Figure 2.14: Employment in Ostend
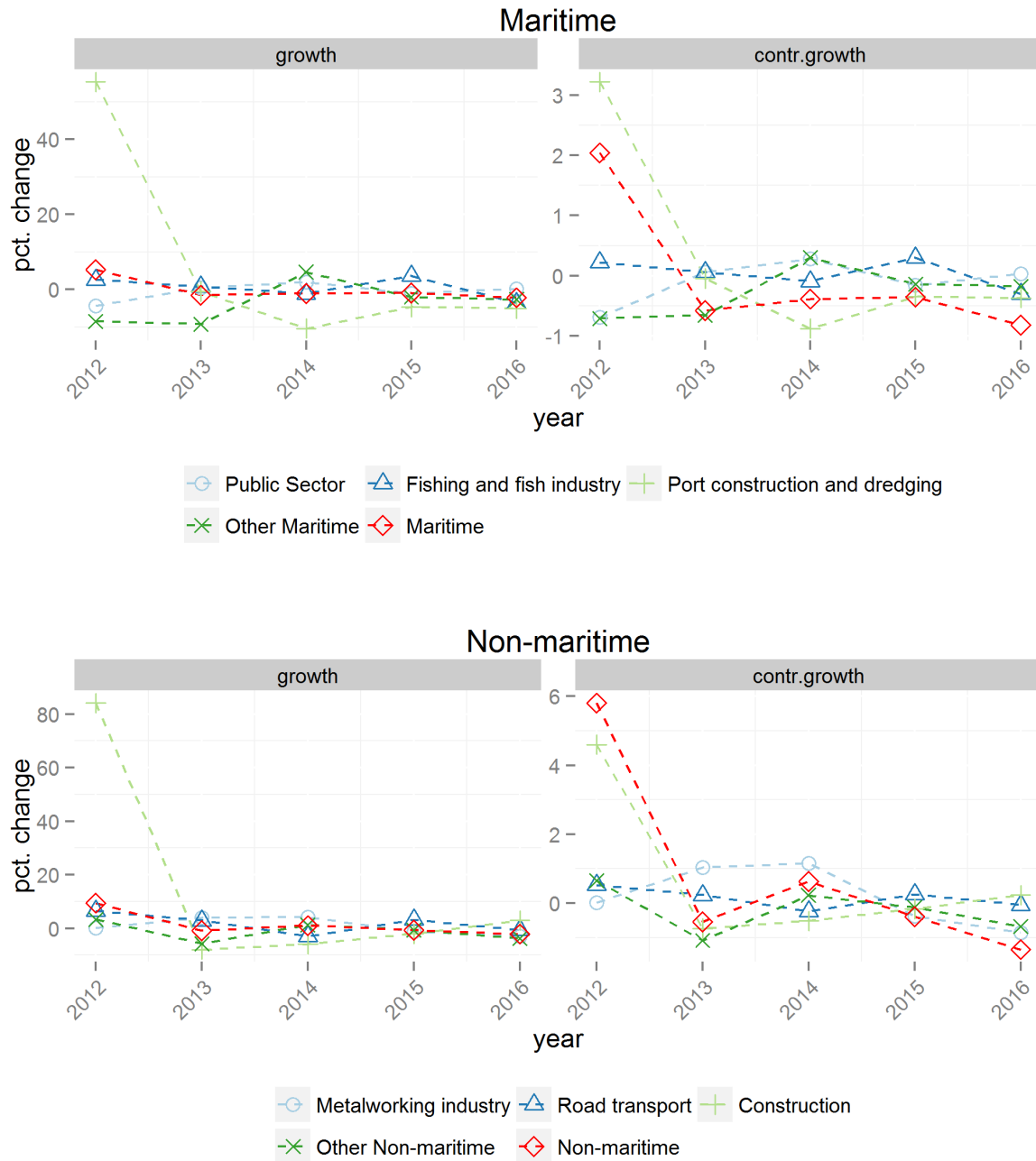
Source: NBB.

Table 2.21: Ostend, employment, fte

	2011	2012	2013	2014	2015	2016	Contr.gr (%)[*]
Public Sector	756	723	726	740	732	734	0.0
Fishing and fish industry	400	410	413	409	424	409	-0.3
Port construction and dredging	276	428	426	381	364	345	-0.4
Other Maritime	396	362	329	344	337	328	-0.2
Maritime	1 827	1 924	1 894	1 875	1 857	1 816	-0.8
Metalworking industry	1 337	1 338	1 391	1 450	1 431	1 388	-0.9
Road transport	381	406	418	406	419	417	-0.1
Construction	259	476	439	413	404	416	0.2
Other Non-maritime	927	958	903	915	909	875	-0.7
Non-maritime	2 905	3 179	3 152	3 184	3 164	3 096	-1.3
Direct	4 732	5 103	5 046	5 058	5 021	4 912	-2.2
Indirect	3 989	4 497	4 401	4 343	4 392	4 298	
Total	8 720	9 600	9 446	9 402	9 413	9 210	

[*] *For details, see annex A.1*
Source: NBB.

metalworking industry, the biggest employer in Ostend. The sector's decline was twice the 2015 figure. In terms of their growth contribution, port construction and dredging showed the biggest decline in the maritime cluster.

Cargo handling recorded a steep decline, falling to the lowest level seen in the period 2011-2016, but its contribution to the port's growth was only marginal because of the sector's small share.

Employment in Ostend shows a rather high concentration: 5% of the companies represent 64% of direct employment, while 4 companies produce half of the employment. This is illustrated in figure 2.15.

Table 2.22: Top 10 Employment, Ostend

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

Source: NBB.

2.4.4 Investment

Table 2.23 shows investment in the port of Ostend over the period 2011-2016. Between 2015 and 2016 investment increased from € 64.0 million to € 81.4 million, a rise of 27.2%. Investment is further subdivided into a maritime and non-maritime cluster, each of which is again broken down into the largest contributing sectors. In terms of investment, the port of Ostend is mainly non-maritime at 58.6%, but its share has declined since 2011 when it was 74.2%. The share of the maritime cluster (41.4%) increased substantially since 2011 when it was 25.8%.

In 2016, around two-thirds of maritime investment took place in the public sector, which was thus the largest sector (29.3%). Its share increased since 2011 when it was 4.8%. The second largest sector is non-maritime construction (25.5%). Here, investment more than doubled in comparison with the previous years. This increase was due to substantial investment done by

Figure 2.15: Concentration in Ostend

Value added

Employment

Source: NBB.

Algemene Ondernemingen Soetaert.

The other non-maritime sectors were less significant. Investment in the second largest sector, the metalworking industry, was lower than in previous years, whereas in the chemicals sector the figure was in line with last year.

The last column of the table shows the contribution of each component to the total growth over 2015-2016. The maritime and non-maritime contributions add up to the total growth, and the same holds for all the individual components. Note that these percentages differ from each sector's own growth[19].

Table 2.23: Ostend, investment, mio eur

	2011	2012	2013	2014	2015	2016	Contr.gr (%)[*]
Public Sector	4.5	10.3	12.0	13.9	13.8	23.8	15.7
Shipping agents and forwarders	0.2	0.4	1.9	0.6	2.5	3.8	2.0
Fishing and fish industry	5.0	7.1	5.8	4.0	5.2	3.3	-2.9
Other Maritime	14.4	6.6	5.1	51.9	4.5	2.8	-2.6
Maritime	24.1	24.4	24.8	70.5	26.0	33.7	12.1
Construction	6.7	11.3	9.4	13.6	8.7	20.8	18.9
Metalworking industry	14.4	16.4	15.6	11.2	12.5	8.7	-5.9
Chemicals	5.6	9.2	6.6	5.7	6.0	5.9	-0.1
Other Non-maritime	42.6	32.9	19.9	18.5	10.9	12.3	2.2
Non-maritime	69.2	69.8	51.5	48.9	38.0	47.7	15.1
Direct	93.3	94.1	76.3	119.5	64.0	81.4	27.2

[*] *For details, see annex A.1*
Source: NBB.

The left-hand panel shows the sector's own growth, and the right-hand panel shows the sector's contribution to the port's total growth (the latter takes into account the sector's own growth and its share in the port, see annex A.1 for details).

The maritime cluster contributed 12.1% to the total increase, while the non-maritime cluster contributes for 15.1%.

The largest positive sectoral contributions to the increase comes from the public sector and construction.

The top 10 companies in terms of investment are listed in table 2.24.

Table 2.24: Top 10 Investment, Ostend

| Rank	Name	Sector
1	Public Sector	Public Sector
2	Algemene Ondernemingen Soetaert	Construction
3	Daikin Europe N.v.	Metalworking industry
4	Proviron Functional Chemicals	Chemicals
5	Verhelst Aannemingen	Construction
6	Verhelst Machines	Metalworking industry
7	2xl	Shipping agents and forwarders
8	Cool Solutions	Shipping agents and forwarders
9	Fides Petfood	Food industry
10	Topasfalt	Construction

Source: NBB.

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[19]The contribution of a sector to the total growth equals its share in 2015 times the sectoral growth over 2015-2016. See annex A.1

Figure 2.16: Investment in Ostend
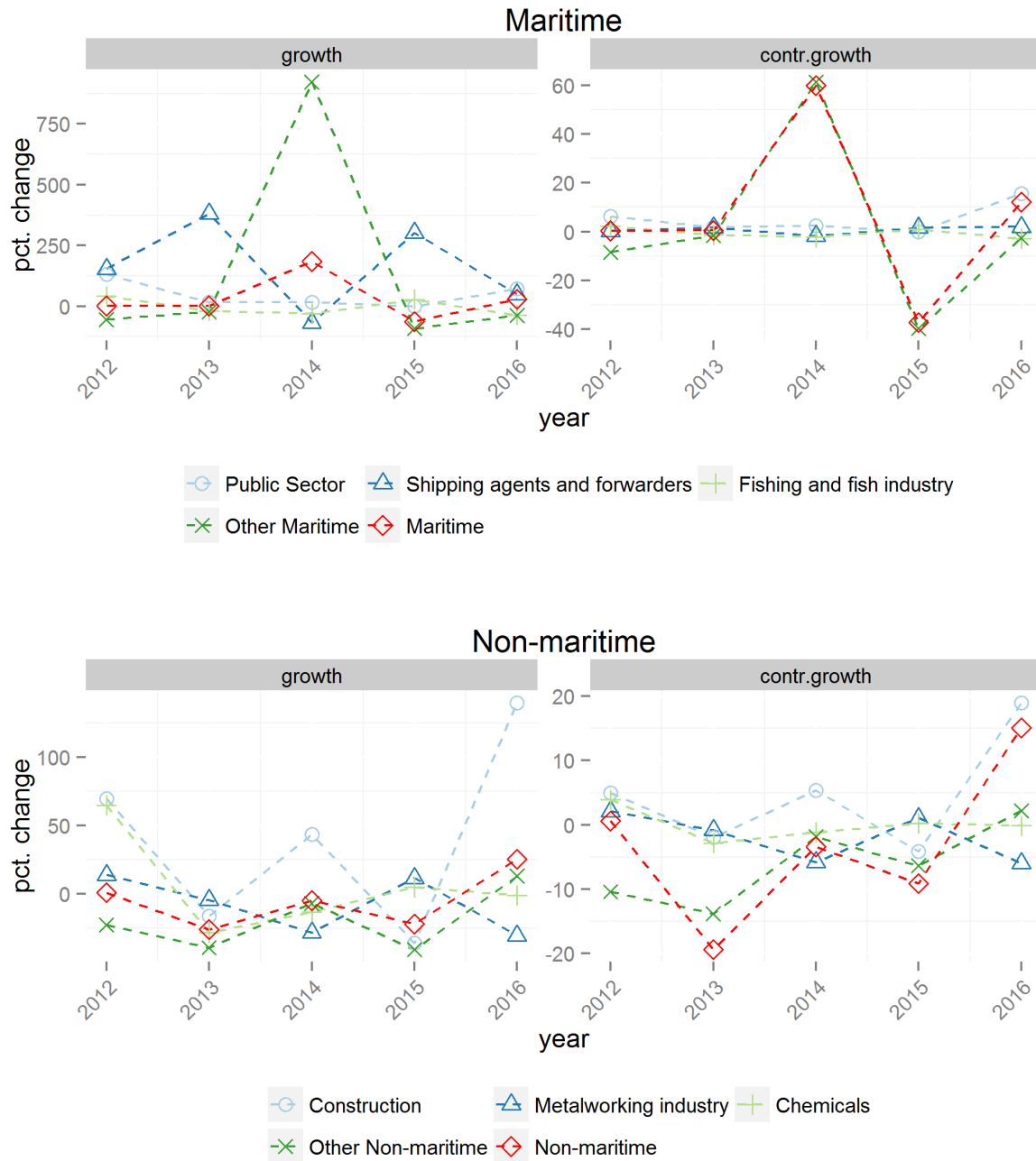
Source: NBB.

2.5 Liège Port complex

2.5.1 Port developments

The volume of waterborne traffic handled in the Liège port complex rose by 5.9% between 2015 and 2016. The main category of cargo handled — non-metallic mineral products — representing two fifths of waterborne traffic, saw favourable growth of 2% in 2016, as did the coke and petroleum products category. The third largest category, coal and lignite, declined by 4%. With 1.3 million tonnes transshipped, it is about to be caught up by the secondary raw materials and waste category, which recorded 20% growth. However, this was not the category with the most spectacular increase. The volume of containers handled at Liège's three terminals actually increased by a spectacular 40%. The Liège port complex explains these changes mainly by the increased use of the biomass power plant at Awirs and secondary raw materials and other waste by local cement works, a slight rise in activity in the steel and construction industries and more intensive use of waterborne transport at Biowanze. The cargo unloaded in the Liège port complex mainly originates from Belgium and the Netherlands. Most of the cargo loaded is also destined for Belgium and the Netherlands. The volume of waterborne cargo transshipped in the Liège port complex increased by 3% in 2017.

Development of Trilogiport continued, with the establishment within it of Tempo Log Belgium, the first company to move into Trilogiport. DP World Liège, a tri-modal platform manager, has also launched its business activities for its container terminal. Various installation and capital works were also carried out, in the ports of Monsin and Wandre in particular. Finally, management of the port of Chertal was officially handed over to the Liège Port Authority.

2.5.2 Value added

Table 2.25 shows value added in the Liège port complex over the period 2011-2016. Between 2015 and 2016, direct value added increased from € 1 059.1 million to € 1 163.7 million, a rise of 9.9%. Direct value added is subdivided into a maritime and non-maritime cluster, each of which is again broken down into the largest contributing sectors. In terms of value added, the Liège port complex is mainly non-maritime and remained stable at 97.7%. The largest sector is energy (28.1%). The energy sector's share has decreased since 2011 when it was 34.5%. The second largest sector is the non-maritime branch metalworking industry.

The last column in the table shows the contribution of each component to the total growth over 2015-2016. Value added increased in both the maritime and the non-maritime cluster; the value added of the non-maritime cluster increased more sharply and its share is greater, so that its contribution to the total growth was much larger. The contributions of the main individual components in the maritime cluster were therefore very low. Contributions to the increase were more substantial for the main components of the non-maritime cluster. Note that these percentages differ from each sector's own growth[20].

This is illustrated in figure 2.17. The left-hand panel shows the sector's own growth, and the right-hand panel shows the sector's contribution to the port's total growth (the latter takes into account the sector's own growth and its share in the port, see annex A.1 for details).

The upper panel of figure 2.17 shows that the contribution to growth of the maritime cluster seems to be driven by the shipping agents and forwarders (because of the large volatility) at the beginning and cargo handling (with a large weight) at the end. In the lower panel, the non-maritime cluster's contribution to growth seems to move together with growth in the energy sector.

The non-maritime cluster contributed 9.7% to total growth while the maritime sector contributed for 0.1%.

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[20]The contribution of a sector to the total growth equals its share in 2015 times the sectoral growth over 2015-2016. See annex A.1

Figure 2.17: Value added in Liège port complex

Source: NBB.

Table 2.25: Liège port complex, value added, mio eur

	2011	2012	2013	2014	2015	2016	Contr.gr (%)[*]
Cargo handling	14.9	14.4	14.5	13.1	14.2	15.2	0.1
Shipping agents and forwarders	11.5	8.7	4.0	3.6	3.7	4.3	0.1
Shipping companies	3.7	4.0	3.0	3.6	4.2	3.9	-0.0
Other Maritime	3.1	3.1	3.3	3.2	3.1	3.3	0.0
Maritime	33.2	30.2	24.7	23.5	25.1	26.6	0.1
Energy	496.7	388.0	382.6	324.7	252.1	326.6	7.0
Metalworking industry	383.8	338.5	333.5	274.6	275.0	278.9	0.4
Chemicals	121.1	99.4	118.7	143.1	132.4	149.4	1.6
Other Non-maritime	402.9	363.0	375.7	399.6	374.6	382.2	0.7
Non-maritime	1 404.5	1 189.0	1 210.4	1 142.0	1 034.0	1 137.1	9.7
Direct	1 437.6	1 219.2	1 235.1	1 165.5	1 059.1	1 163.7	9.9
Indirect	1 417.1	1 216.5	1 289.5	1 122.9	1 054.3	1 164.5	
Total	2 854.7	2 435.7	2 524.6	2 288.4	2 113.4	2 328.2	

[*] *For details, see annex A.1*
Source: NBB.

The largest sectoral contribution to the increase came from the energy sector, followed by fuel production. The energy sector benefited from the recovery in the production of the nuclear power plants. These production plants were shut down during much of 2015. One firm in the sector obtained more revenues from other members of the same group. Its group costs were also up, but they were not deducted from the value added. In the fuel production sector, the major company[21] gained from the higher selling price and the lower commodity price.

The shares of the individual components of the maritime cluster remained fairly stable between 2011 and 2016. In the non-maritime cluster, the shares of energy and the metalworking industry declined and converged between 2011 and 2016, whereas the shares of chemicals, construction and fuel production increased. In 2014, the shares of chemicals and construction were very similar at 12.3%. In 2015, construction accounted for a bigger share than chemicals, but in 2016 the value added of construction decreased due to changes at CBR, and the sector was overtaken by chemicals. In this sector, sales prices declined, but so did commodity prices. Moreover, some firms recorded higher other operating revenues. As a result, there was an increase in the value added of the chemicals sector. The maritime cluster's growth figure shows that the individual sectors produced quite homogenous growth during the period, except in 2013. However, the shipping companies sector followed a different trend. Cargo handling would have recorded stronger growth in 2016, but DP World Liège was not yet operating and recorded negative value added, thus reducing the direct value added of the cargo handling sector. In the non-maritime cluster, growth was more varied. The energy sector recorded particularly strong growth between 2015 and 2016, but that came after four years of decline. The metalworking industry and other non-maritime sectors remained steady between those two years, while the chemicals sector recorded slightly higher growth. Over the last three years, the growth contributions were more uniform in the maritime cluster than in the non-maritime cluster.

Direct value added in the Liège port complex shows a rather high concentration: 5% of the companies represent 72% of direct value added, while 3 companies produce half of the value added. This is illustrated in figure 2.19.

2.5.3 Employment

Table 2.27 shows employment in the Liège port complex over the period 2011-2016. Between 2015 and 2016 the number of full-time equivalents declined from 8 014 to 7 753, a fall of -3.3%. Direct employment is subdivided into a maritime and non-maritime cluster, each of which is

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[21]The financial year of this company ended during the first quarter. Changes in excise duties had an impact on the value added.

Table 2.26: Top 10 Value added, Liège port complex

Rank	Name	Sector
1	Electrabel	Energy
2	Arcelormittal Belgium	Metalworking industry
3	Prayon	Chemicals
4	Biowanze	Fuel production
5	Cockerill Maintenance & Ingenierie	Metalworking industry
6	N. et B. Knauf et Cie	Construction
7	Imerys Mineraux Belgique	Chemicals
8	Carrieres Et Fours A Chaux Dumont-Wautier	Construction
9	EDF Luminus	Energy
10	Association Intercommunale de Traitement des Déchets Liégeois	Other industries

Source: NBB.

again broken down into the largest contributing sectors. In terms of full-time equivalents, the Liège port complex is mainly non-maritime (95.9%). The largest sector is the metalworking industry (29.8%). These shares have decreased since 2011 when they were 96.2% and 45.1% respectively. The second largest sector is the non-maritime branch energy and (in terms of full-time equivalents) was around half the size of the metalworking industry in 2016.

The last column of the table shows the contribution of each component to the total growth over 2015-2016. After three years of negative contributions and one year of stagnation, the maritime cluster made a positive contribution to employment. Conversely, the non-maritime cluster made a negative contribution to employment for the fifth successive year. The contributions of the main individual components of the maritime cluster were very small. The components of the non-maritime cluster — especially the main one, the metalworking industry — made a larger contribution to the decline. The two biggest employers in this sector continued cutting jobs. The same applies to the energy sector, which is the second largest in terms of the number of employees. These companies have cut down their staff. In contrast, employment in the third largest sector — chemicals — increased again. Note that these percentages differ from each sector's own growth[22].

Table 2.27: Liège port complex, employment, fte

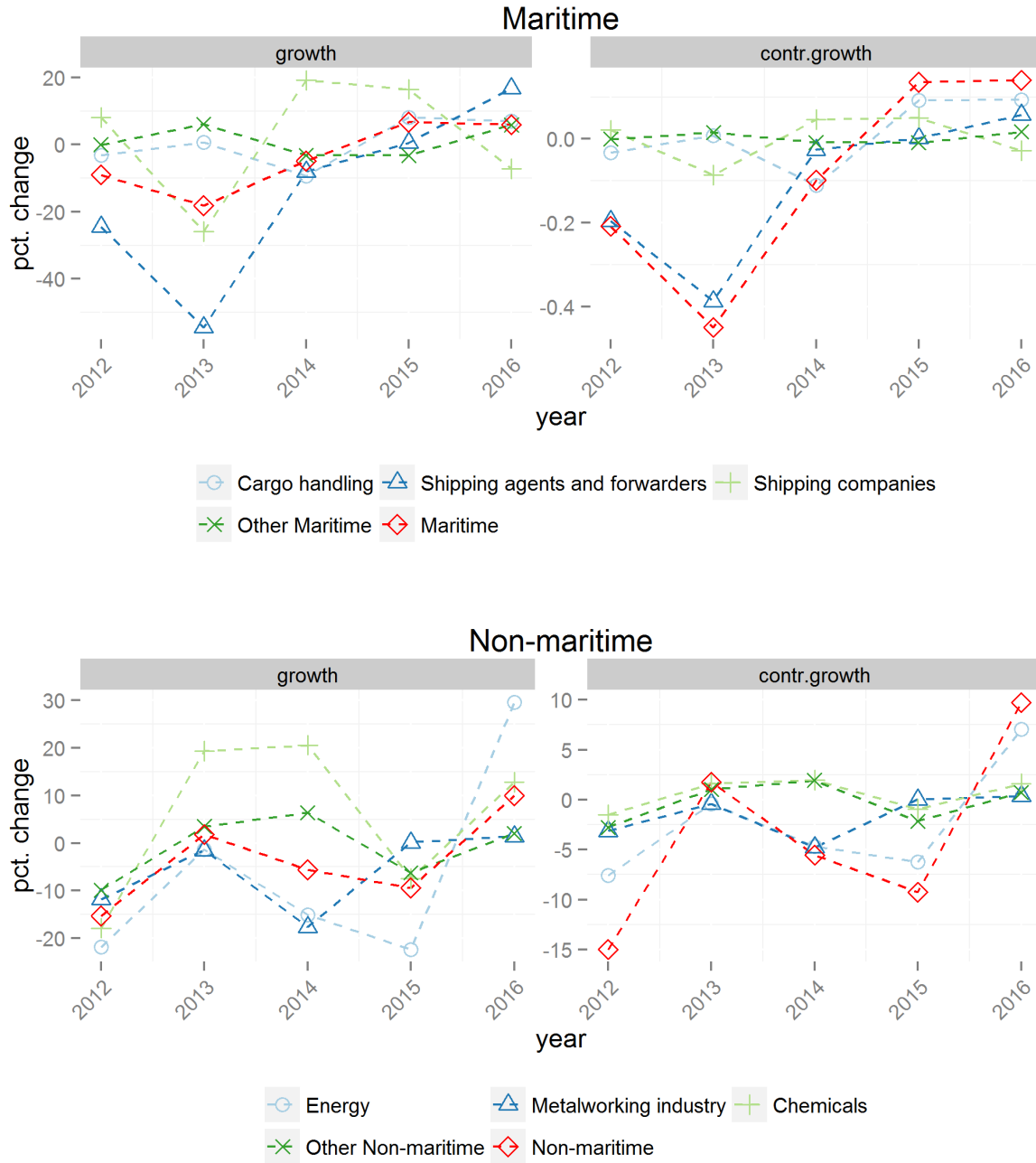|	2011	2012	2013	2014	2015	2016	Contr.gr (%)[(*)]
Cargo handling	183	166	153	153	157	174	0.2
Shipping companies	55	54	51	52	54	55	0.0
Shipping agents and forwarders	94	94	56	47	43	45	0.0
Other Maritime	46	47	45	44	43	45	0.0
Maritime	378	361	305	296	296	318	0.3
Metalworking industry	4 462	4 327	3 718	2 783	2 440	2 307	-1.7
Energy	1 192	1 215	1 246	1 293	1 293	1 251	-0.5
Chemicals	1 102	1 090	1 020	996	1 011	1 036	0.3
Other Non-maritime	2 765	2 771	2 786	2 924	2 974	2 841	-1.7
Non-maritime	9 521	9 403	8 770	7 996	7 718	7 435	-3.5
Direct	9 899	9 763	9 076	8 292	8 014	7 753	-3.3
Indirect	14 223	14 087	13 189	11 269	11 252	10 902	
Total	24 123	23 850	22 265	19 561	19 266	18 655	

[(*)] *For details, see annex A.1*
Source: NBB.

This is illustrated in figure 2.18. The left-hand panel shows the sector's own growth and the right-hand panel shows the sector's contribution to the port's total growth (the latter takes into account the sector's own growth and its share in the port, see annex A.1 for details).

The upper panel of figure 2.18 shows that the contribution to growth of the maritime cluster

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[22]The contribution of a sector to the total growth equals its share in 2015 times the sectoral growth over 2015-2016. See annex A.1

seems to be driven by the shipping agents and forwarders at the beginning and cargo handling at the end. In the lower panel, the non-maritime cluster's contribution to growth seems to move together with growth in the metalworking sector.

The maritime and the non-maritime clusters contributed 0.3% and −3.5% respectively to the total decline.

The strongest sectoral contribution to the decrease came from the main sector, namely the metalworking industry. But the largest sectoral decline occurred in the food industry, as the major company in this sector had spent two years restructuring to cope with changes in European policy on the sugar industry. This caused a substantial rise in employment in 2015 on account of the restructuring programme, followed by a big fall in 2016. In the other industries sector, the restructuring of a major company reduced the number of full-time equivalents allocated to the Liège port complex. Road transport recorded a large decline in employment in 2016, due to drastic staff cuts in one firm. In the maritime cluster, each individual sector recorded positive growth, for the first time in five years. In the main sector, cargo handling, two firms located in the Renory port area recruited new staff. Between 2011 and 2015, employment in the non-maritime cluster continued to decrease whereas employment in the maritime cluster increased over the last two years. The share of the maritime cluster expanded during the last three years. In the non-maritime cluster, the share of the metalworking industry continued to decline throughout the period, whereas the shares of energy and chemicals increased steadily, even though there was a fall in employment in the energy sector in 2016. In the chemicals sector, most firms, including the two major ones, increased their staff in 2016.

Employment in the Liège port complex shows a rather high concentration: 5% of the companies represent 63% of direct employment, while 4 companies employ half of the full-time equivalents. This is illustrated in figure 2.19.

Table 2.28: Top 10 Employment, Liège port complex

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

Source: NBB.

2.5.4 Investment

Table 2.29 shows investment in the Liège port complex over the period 2011-2016. Between 2015 and 2016, investment declined from € 212.1 million to € 195.4 million, a fall of -7.9%. Investment is subdivided into a maritime and non-maritime cluster, each of which is again broken down into the largest contributing sectors. In terms of investment, the Liège port complex is mainly non-maritime (95.7%). The largest sector is energy (34%). These shares have decreased since 2011 when they were 97.5% and 40.8% respectively. The second largest sector is the non-maritime branch metalworking industry, which was around half the size of the energy sector in 2016.

The last column of the table shows the contribution of each component to the total growth over 2015-2016. The non-maritime cluster's contribution to investment was negative, whereas the maritime cluster increased its investment. In the maritime cluster, the port authority's contribution was negative whereas the figure was positive for cargo handling, shipping agents

Figure 2.18: Employment in Liège port complex
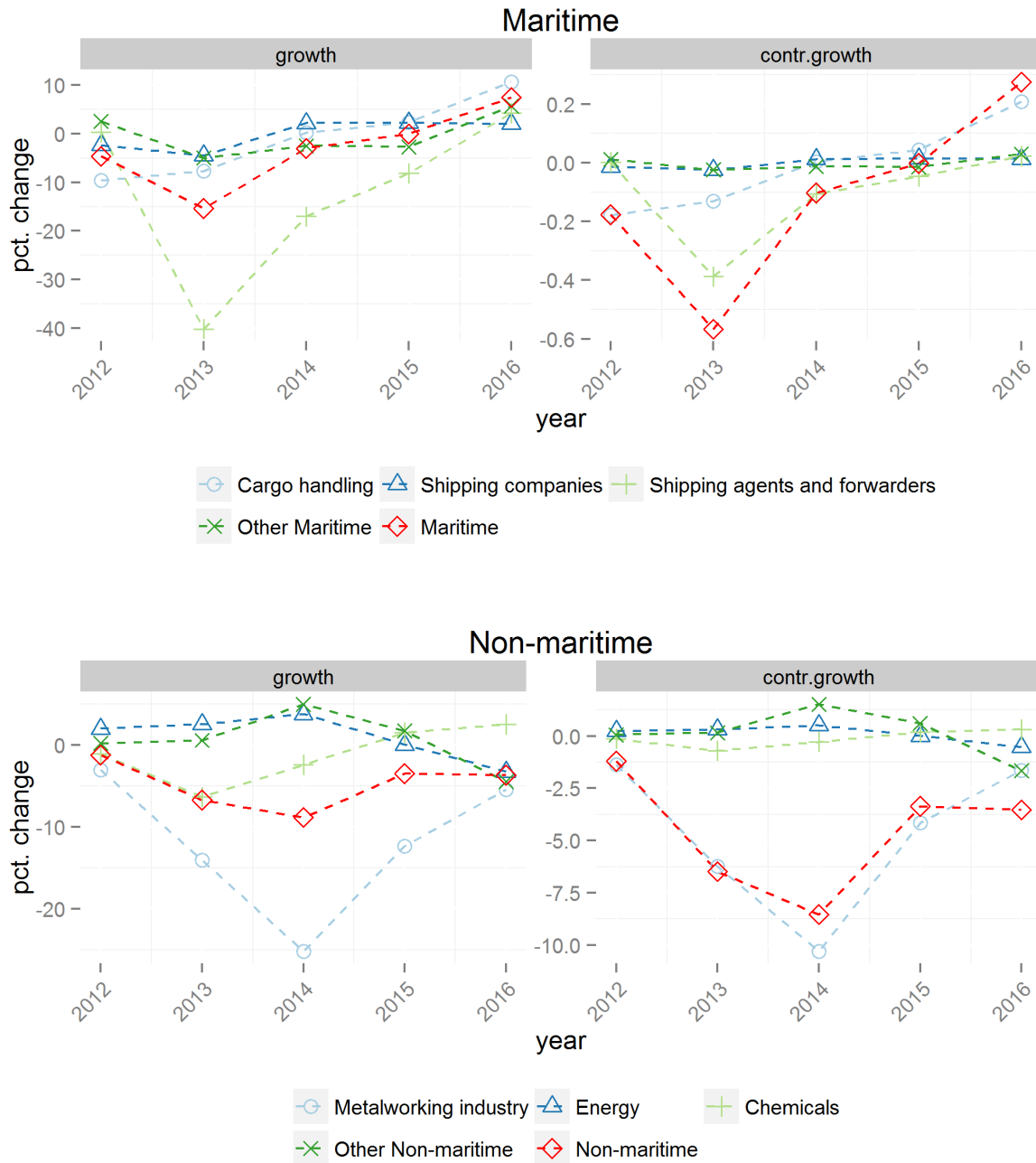
Source: NBB.

Figure 2.19: Concentration in Liège port complex

Value added

Legend:
- Chemicals
- Construction
- Energy
- Fuel production
- Metalworking industry

Employment

Legend:
- Chemicals
- Construction
- Energy
- Metalworking industry
- Other
- Other industries

Source: NBB.

and forwarders, and shipping companies. In cargo handling, some firms such as Liège Container Terminal and Trilogiport Terminal, among others, increased their investment in 2016. In the non-maritime cluster, the contribution of the main component of the cluster was down. In 2015, the energy companies carried out some additional maintenance work on nuclear plants, thus increasing the amount of investment. As no additional maintenance was carried out in 2016, investment declined. Conversely, the second largest sector, the metalworking industry, recorded increased investment. Some main players in the metalworking industry increased their investment in production facilities in 2016. Other sectors in the maritime cluster made a less significant contribution to the decline. Note that these percentages differ from each sector's own growth[23]. The maritime cluster contributed 1.7% to the total growth, whereas the non-maritime cluster's contribution was down by −9.6%.

Table 2.29: Liège port complex, investment, mio eur

	2011	2012	2013	2014	2015	2016	Contr.gr (%)[(*)]
Cargo handling	3.0	2.4	3.4	2.6	3.0	6.9	1.9
Shipping agents and forwarders	1.0	1.0	0.2	2.1	0.6	0.8	0.1
Shipping companies	0.7	0.5	0.4	0.2	0.2	0.4	0.1
Other Maritime	0.3	3.0	0.0	0.3	0.9	0.1	-0.3
Maritime	5.0	7.0	4.0	5.2	4.6	8.4	1.7
Energy	82.0	82.3	88.9	79.8	93.4	66.4	-12.7
Metalworking industry	40.6	68.3	40.1	30.5	27.9	35.2	3.4
Chemicals	21.4	26.6	21.6	18.4	31.4	31.8	0.2
Other Non-maritime	52.1	57.6	60.6	64.5	54.8	53.7	-0.5
Non-maritime	196.0	234.8	211.3	193.2	207.5	187.1	-9.6
Direct	201.0	241.8	215.3	198.4	212.1	195.4	-7.9

[(*)] *For details, see annex A.1*
Source: NBB.

This is illustrated in figure 2.20. The left-hand panel shows the sector's own growth and the right-hand panel shows the sector's contribution to the port's total growth (the latter takes into account the sector's own growth and its share in the port, see annex A.1 for details).

The shipbuilding and repair sector showed the strongest growth between 2015-2016, but the sector had limited weight and therefore almost no contribution to the total growth. The second strongest growth was achieved in electronics. One company in this sector invested in land and buildings. Higher investment in the metalworking industry ended three years of decline. Investment remained fairly steady in chemicals, construction and other industries between 2015 and 2016. Energy accounted for one-third of investment and the metalworking industry for one-sixth. These shares were especially low in 2015 and increased in 2016, not only because the sectors invested heavily in 2016 but also because direct investment was down in 2016.

2.6 Port of Brussels

2.6.1 Port developments

Traffic for the port of Brussels was up by 2.1% in 2016, including a sharp increase in container traffic. This year, the Netherlands remained the port's main commercial partner. In 2017, waterborne traffic for the port of Brussels grew even more rapidly at a rate of 8.8%. With an excellent increase of 4% expressed in TEU, 2017 was another record-breaking year for containerised traffic. The main categories of cargo handled in 2017 were once again building materials and petroleum products.

The port of Brussels carried out several maintenance projects in 2016, including work to maintain the gantry crane at the container terminal, renovation of the access ramps to the upper

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[23]The contribution of a sector to the total growth equals its share in 2015 times the sectoral growth over 2015-2016. See annex A.1

Figure 2.20: Investment in Liège port complex
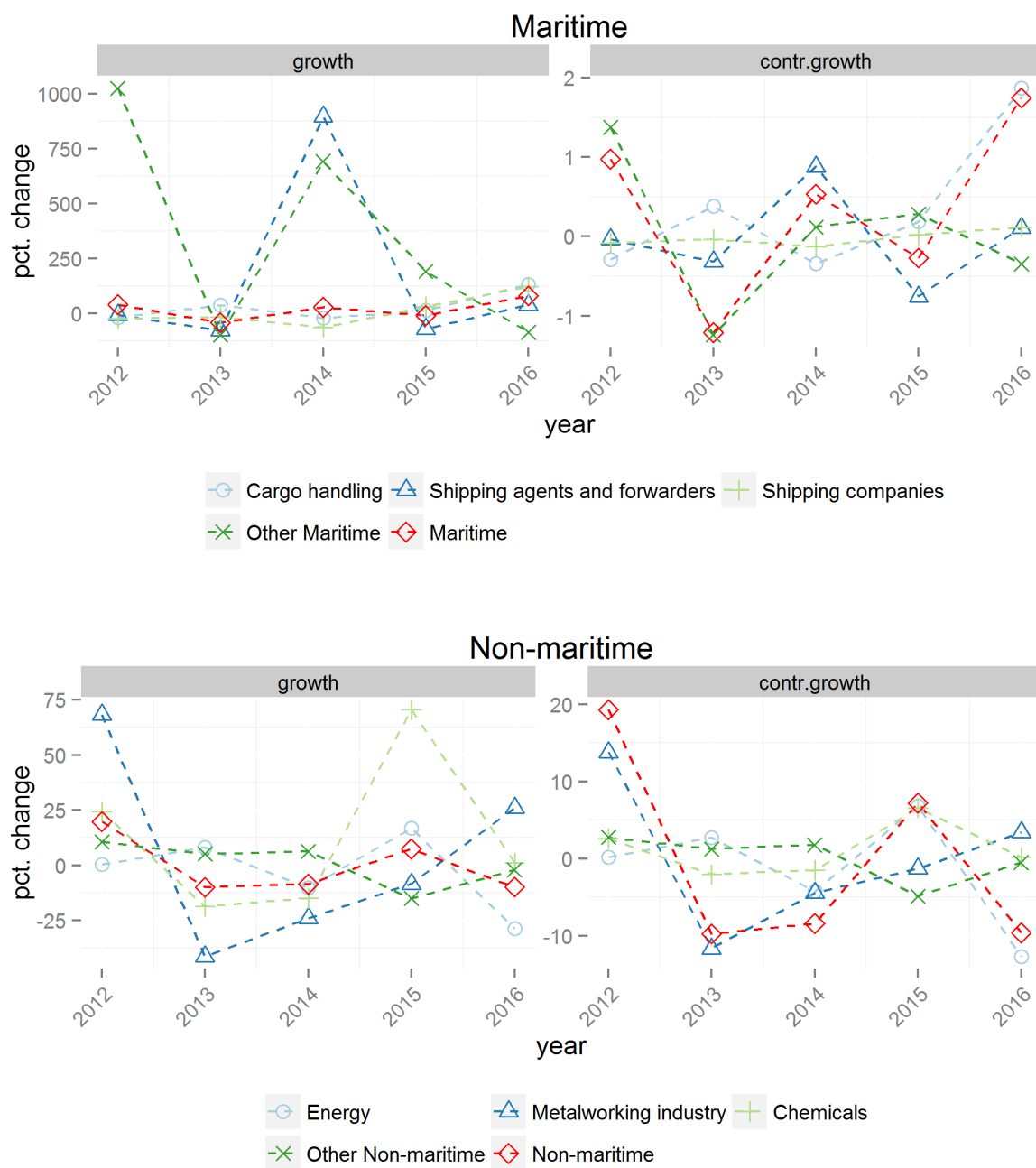
Source: NBB.

Table 2.30: Top 10 Investment, Liège port complex

Rank	Name	Sector
1	Electrabel	Energy
2	Arcelormittal Belgium	Metalworking industry
3	Prayon	Chemicals
4	EDF Luminus	Energy
5	Biowanze	Fuel production
6	Association Intercommunale de Traitement des Déchets Liégeois	Other industries
7	Cockerill Maintenance & Ingenierie	Metalworking industry
8	Raffinerie Tirlemontoise - Tiense Suikerraffinaderij	Food industry
9	Recyclage et Valorisation Technique	Other industries
10	Carrieres Et Fours A Chaux Dumont-Wautier	Construction

Source: NBB.

levels of the TIR Logistics centre and replacement of the Anderlecht Lock gates. Work also continued on the port's Construction Village and Cruise Terminal projects. The Construction Village project, situated in the Vergote basin, is designed to integrate into the fabric of the city, the distribution of building materials to businesses and individuals in charge of major upgrading projects. The project involved demolishing old buildings and levelling the cleared ground. Construction of the shell could then begin. The Cruise Terminal is designed to receive river cruise and event boats on the left bank in the outer harbour, at Rue Meudon in Neder-over-Hembeek. Work began officially in mid-2016.

2.6.2 Value added

Table 2.31 shows the value added in the port of Brussels over the period 2011-2016. Between 2015 and 2016 the direct value added declined from € 771.9 million to € 727.0 million, or by -5.8%. Direct value added is subdivided into a maritime and non-maritime cluster, each of which is again broken down into the largest contributing sectors. In terms of value added, the port of Brussels is mainly non-maritime (96.9%). The largest sector is other logistic services (54.2%). These shares have increased since 2011 when they were 91.1% and 31.8% respectively. The second largest sector is the non-maritime trade branch, which (in terms of value added) was around half the size of other logistic services in 2016.
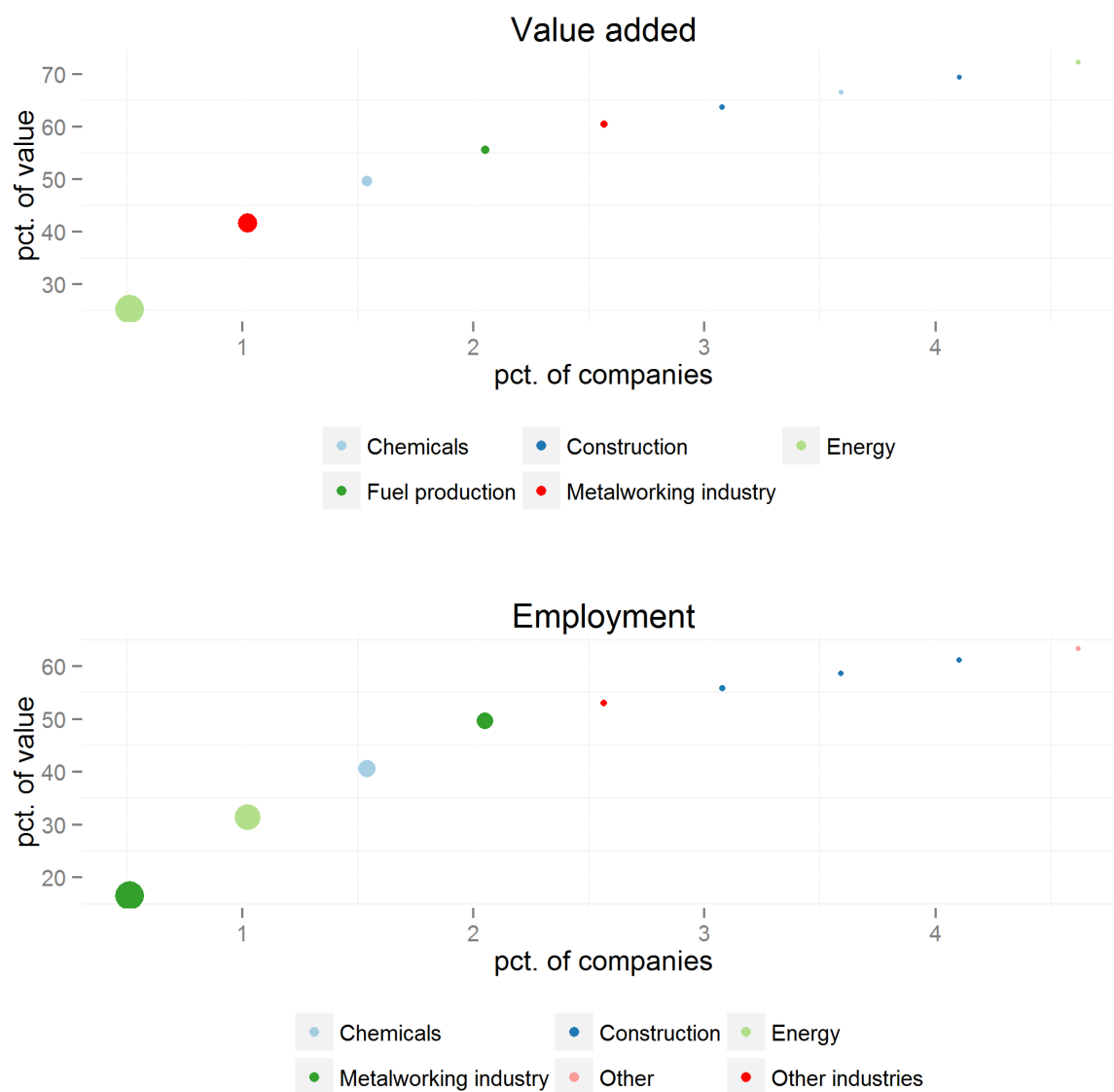
The last column of the table shows the contribution of each component to the total growth over 2015-2016. Whereas the value added of the maritime cluster hardly changed, the value added of the non-maritime cluster was down, so that its contribution to total growth was negative. The contributions of the main individual components in the maritime cluster are therefore very low or even negative. Contributions to the decline are more substantial for the two main components of the non-maritime cluster. Note that these percentages differ from each sector's own growth[24].

This is illustrated in figure 2.21. The left-hand panel shows the sector's own growth, the right-hand panel shows the sector's contribution to the port's total growth (the latter takes into account the sector's own growth and its share in the port, see annex A.1 for details).

The upper panel of figure 2.21 shows that the contribution to growth of the maritime cluster seems to be driven by the port authority. In the lower panel, the non-maritime cluster's contribution to growth seems to move together with growth in the other logistics sector.

The non-maritime cluster contributed -5.8% to the total decline, whereas the maritime sector expanded slightly.

The largest sectoral contributions to the decrease came from the other logistic services sector, followed by trade. In the first sector, the principal player recorded a rise in value added in 2015, but growth subsided in 2016. In the second sector, a company belonging to a major

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[24] A sector's contribution to the total growth equals its share in 2015 times the sectoral growth over 2015-2016. See annex A.1

Figure 2.21: Value added in Brussels
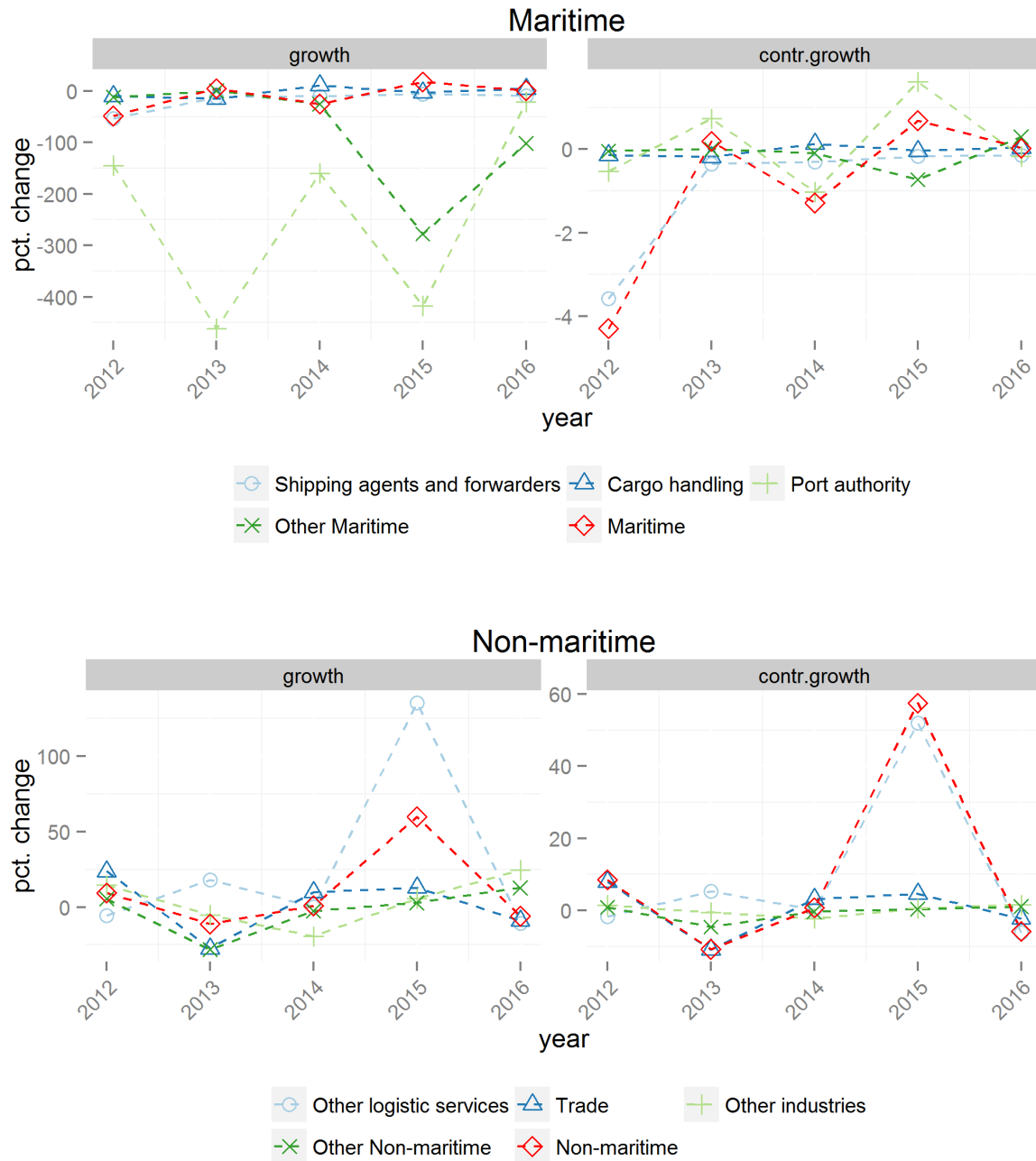
Source: NBB.

Table 2.31: Brussels, value added, mio eur

	2011	2012	2013	2014	2015	2016	Contr.gr (%)[*]
Shipping agents and forwarders	35.4	16.6	14.6	13.2	12.4	11.2	-0.1
Cargo handling	7.6	6.8	5.8	6.4	6.3	6.5	0.0
Port authority	1.9	-0.9	3.1	-1.9	6.0	4.7	-0.2
Other Maritime	1.9	1.7	1.7	1.3	-2.3	0.0	0.3
Maritime	46.8	24.2	25.3	19.0	22.3	22.5	0.0
Other logistic services	167.3	158.1	186.8	187.6	441.4	394.2	-6.1
Trade	175.7	217.5	158.0	173.7	196.2	178.5	-2.3
Other industries	51.9	59.4	56.3	45.3	47.8	59.5	1.5
Other Non-maritime	84.5	89.1	64.0	62.3	64.1	72.3	1.1
Non-maritime	479.3	524.1	465.1	468.9	749.5	704.5	-5.8
Direct	526.1	548.3	490.4	487.9	771.9	727.0	-5.8
Indirect	379.0	389.1	343.9	332.1	464.4	470.9	
Total	905.2	937.4	834.3	820.0	1 236.2	1 198.0	

[*] *For details, see annex A.1*
Source: NBB.

industrial group sold a branch and therefore showed a reduction. Another company in the same group transferred its activities to another group which is in the other logistic services sector, so the value added for that activity was also transferred. Moreover, two medium-sized companies moved outside the port area. The chemicals sector showed the strongest growth between 2015-2016, but because of its small share in the direct value added of the port of Brussels, it could not prevent the port's decline. Companies contributing to the increase included Corden Pharma Brussels, whose revenues, wages and operating result were up.

After converging between 2013 and 2015, the shares of the individual components of the maritime cluster remained stable in 2016. In the non-maritime cluster, the shares varied little between 2011 and 2014, but tended to diverge in 2015 before stabilising in 2016. The figure for the non-maritime sector shows that growth was negative in 2013, more or less stable in 2014 and that in 2015 there were growth spikes in chemicals and other logistic services. The largest growth fluctuations were seen in the maritime cluster, port trade and the other maritime sectors. The contributions to growth were more homogenous in the maritime cluster for 2016 than for the previous year, and in the non-maritime cluster they were more homogenous for 2014 and for 2016.

Value added in Brussels shows a rather high concentration: 5% of the companies represent 77% of direct value added, while 2 companies produce half of the value added. This is illustrated in figure 2.23.

Table 2.32: Top 10 Value added, Brussels

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

Source: NBB.

2.6.3 Employment

Table 2.33 shows employment in the port of Brussels over the period 2011-2016. Between 2015 and 2016 the number of full-time equivalents declined from 4 189 to 4 054, or by -3.2%. Direct employment is subdivided into a maritime and non-maritime cluster, each of which is again broken down into the largest contributing sectors. In terms of full-time equivalents, the port of Brussels is mainly non-maritime (91%). The largest sector is trade (31.9%). These shares have increased slightly since 2011 when they were 88.6% and 29.6% respectively. The second largest sector is the non-maritime branch other logistic services which (in terms of full-time equivalents) was around 95% of the size of trade in 2016.

The last column of the table shows the contribution of each component to total growth over 2015-2016. The maritime cluster's contribution to employment decreased less sharply than the contribution of the non-maritime cluster. Both clusters made a negative contribution to total growth. The contributions of the main individual components in the maritime cluster are quite low. The contribution to the decline is more substantial for the main component of the non-maritime cluster: trade. This is the first time in five years that the number of full-time equivalents in this sector has dropped below 1 300 units. The second and third components in order of importance, namely other logistic services and other industries, recorded an increase. Note that these percentages differ from each sector's own growth[25].

Table 2.33: Brussels, employment, fte

	2011	2012	2013	2014	2015	2016	Contr.gr (%)[*]
Shipping agents and forwarders	253	187	192	167	174	138	-0.8
Port authority	132	127	123	122	125	123	-0.0
Cargo handling	94	96	93	99	87	81	-0.1
Other Maritime	14	19	18	17	18	20	0.1
Maritime	492	429	426	405	403	363	-0.9
Trade	1 279	1 381	1 359	1 369	1 399	1 295	-2.5
Other logistic services	1 076	1 218	1 191	1 212	1 186	1 212	0.6
Other industries	314	324	328	343	347	367	0.5
Other Non-maritime	1 151	1 228	876	852	855	818	-0.9
Non-maritime	3 821	4 151	3 754	3 777	3 786	3 690	-2.3
Direct	4 313	4 580	4 181	4 182	4 189	4 054	-3.2
Indirect	3 967	4 222	3 840	3 710	3 825	3 759	
Total	8 280	8 802	8 021	7 892	8 014	7 812	

[*] *For details, see annex A.1*
Source: NBB.

This is illustrated in figure 2.22. The left-hand panel shows the sector's own growth, the right-hand panel shows the sector's contribution to the port's total growth (the latter takes into account the sector's own growth and its share in the port, see annex A.1 for details).

The maritime and the non-maritime clusters contributed -0.9% and -2.3% respectively to the total decline.

The largest sectoral contribution to the decrease came from the shipping agents and forwarders, followed by trade sector and the other non-maritime sectors. In the first sector, one firm sold part of its activities to a company located outside the port area. There was also some reorganisation of activities in a group that switched production to another firm or establishments outside the port. In the second shipping agents and forwarders, the biggest company moved away from Brussels. Another company cut down the number of its employees. In the other non-maritime sectors, road transport recorded a sharp decline in employment. Some firms left the port area and one went bankrupt. The shipping companies sector showed the strongest growth between 2015-2016, followed by the metalworking industry and the chemicals sector.

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[25]A sector's contribution to the total growth equals its share in 2015 times the sectoral growth over 2015-2016. See annex A.1

Figure 2.22: Employment in Brussels
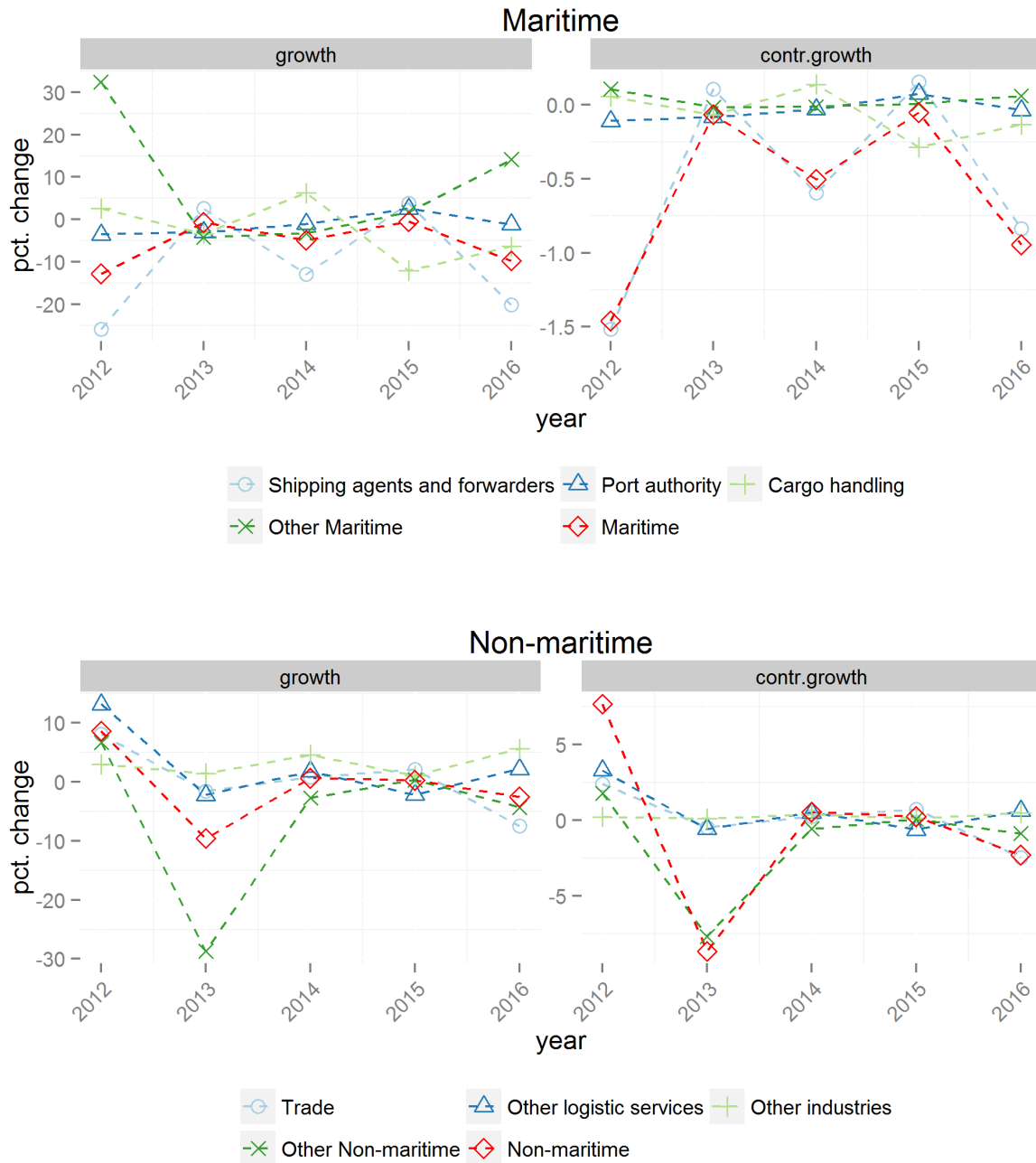
Source: NBB.

The chemicals sector recorded two strong increases in 2015 and 2016. In the non-maritime cluster, the employment of the other industry sector increased every year between 2011 and 2016. Employment in the maritime cluster only increased in one year (2015), whereas employment in the non-maritime cluster was up in three of those years.

Employment in Brussels shows a rather high concentration: 5% of the companies represent 55% of direct employment, 14 companies account for half of the employment. This is illustrated in figure 2.23.

Table 2.34: Top 10 Employment, Brussels

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

Source: NBB.

2.6.4 Investment

Table 2.35 shows investment in the port of Brussels over the period 2011-2016. Between 2015 and 2016, investment increased from € 59.7 million to € 64.7 million, or by 8.4%. Investment is subdivided into a maritime and non-maritime cluster, each of which is again broken down into the largest contributing sectors. In terms of investment, the port of Brussels is mainly non-maritime (83.1%). The largest sector is trade (30.2%). These shares have increased since 2011 when they were 73.3% and 18.5% respectively. The second largest sector is the non-maritime branch other industries, which was two-thirds the size of trade in 2016.

The last column of the table shows the contribution of each component to the total growth over 2015-2016. The maritime cluster's contribution to investment was negative, whereas in the non-maritime cluster investment was up. In the maritime cluster, the port authority's contribution was positive, whereas it was negative for cargo handling and shipping agents and forwarders. The contributions of three of the four main components of the non-maritime cluster increased. In trade, one firm invested a large amount in land and buildings, installations, machines and equipment. Another company improved a plant and made preparations for relocating. In other industries, the major investor was Aquiris which invested mainly in land and buildings. In the food industry (other non-maritime), Ceres invested in the safety and the maintenance of its production facilities. The growth contribution of other logistic services was negative, and recorded a substantial fall. Much of that decline was attributable to developments in two firms. The first concerned the sector's biggest company, which reduced its investment in 2016. The second firm had made a particularly heavy investment in 2015 but did not repeat that in 2016. Except for the port authority, the main actor in the maritime cluster, investment was down in every individual component of the maritime cluster. Note that these percentages differ from each sector's own growth[26].

This is illustrated in figure 2.24. The left-hand panel shows the sector's own growth, the right-hand panel shows the sector's contribution to the port's total growth (the latter takes into account the sector's own growth and its share in the port, see annex A.1 for details).

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[26]A sector's contribution to the total growth equals its share in 2015 times the sectoral growth over 2015-2016. See annex A.1

Figure 2.23: Concentration in Brussels
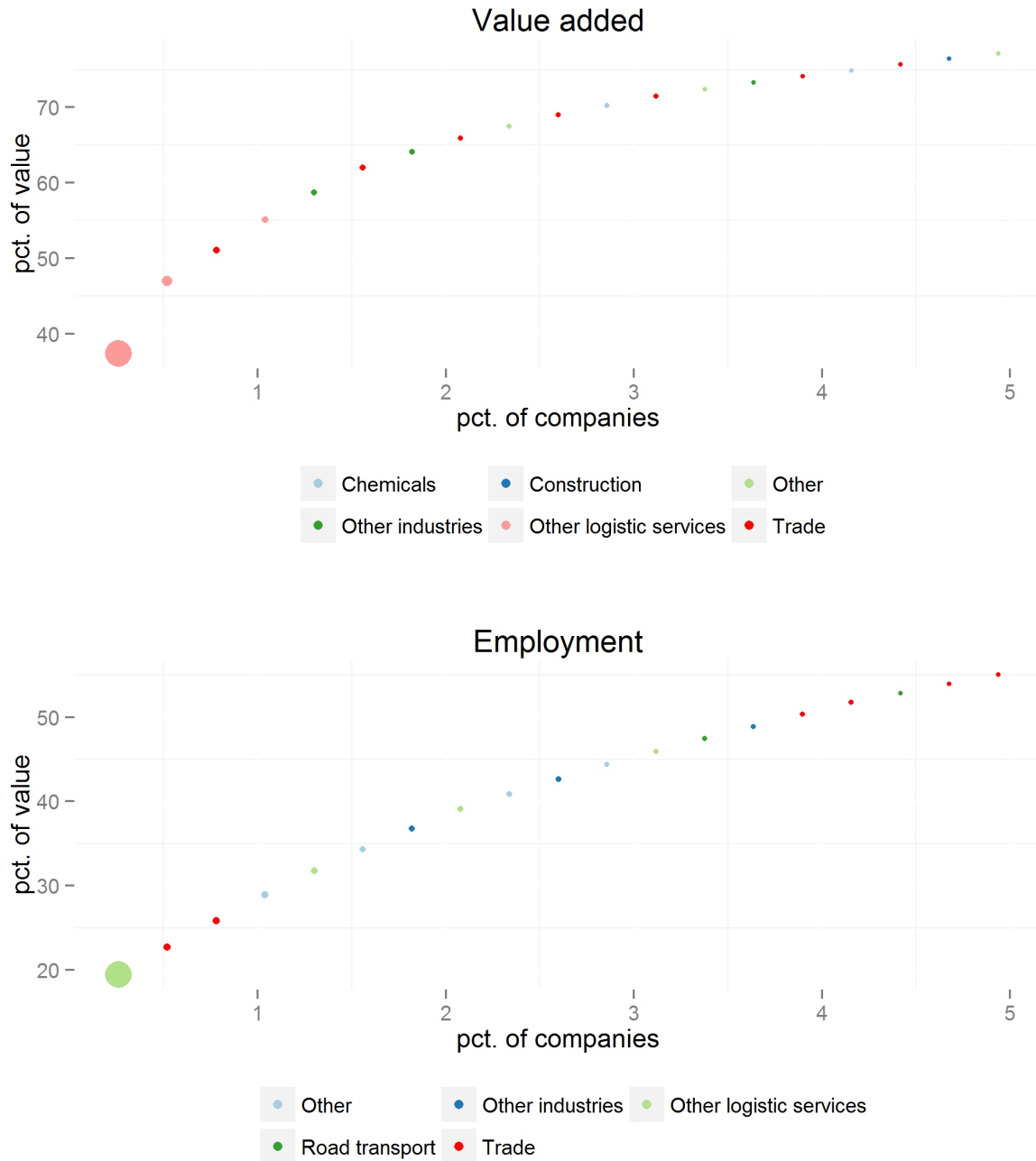
Source: NBB.

Figure 2.24: Investment in Brussels
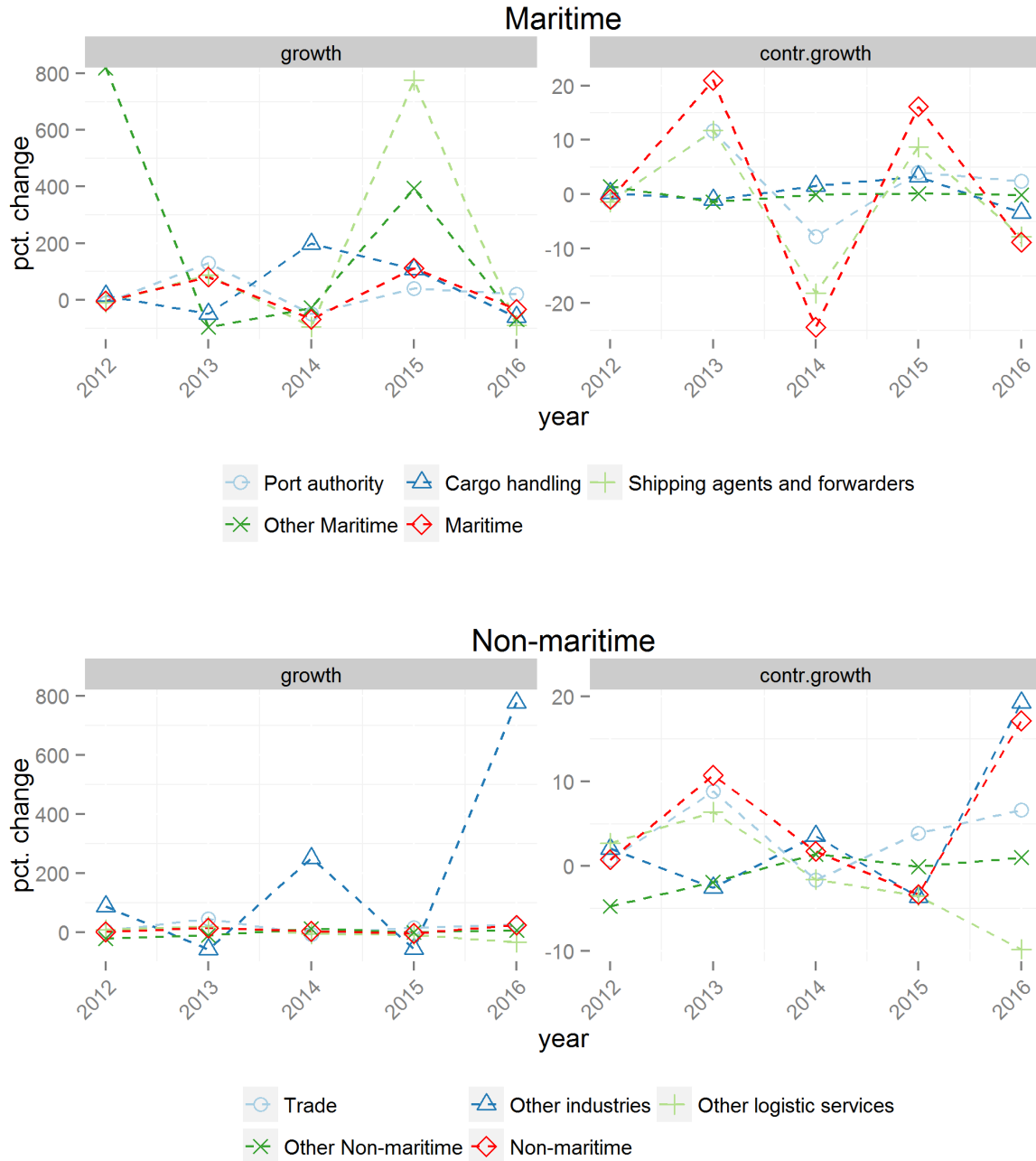
Source: NBB.

Table 2.35: Brussels, investment, mio eur

	2011	2012	2013	2014	2015	2016	Contr.gr (%)[*]
Port authority	5.3	4.6	10.7	5.4	7.5	9.0	2.5
Cargo handling	0.9	1.1	0.5	1.6	3.3	1.3	-3.4
Shipping agents and forwarders	7.7	7.0	13.1	0.6	5.2	0.6	-7.8
Other Maritime	0.0	0.8	0.0	0.0	0.1	0.0	-0.1
Maritime	13.9	13.4	24.4	7.6	16.2	10.9	-8.8
Trade	9.7	10.1	14.6	13.5	15.6	19.5	6.6
Other industries	1.2	2.3	1.0	3.4	1.5	13.0	19.3
Other logistic services	15.8	17.2	20.5	19.4	17.6	11.7	-9.8
Other Non-maritime	11.5	9.0	8.0	9.0	9.0	9.6	1.0
Non-maritime	38.2	38.6	44.2	45.4	43.6	53.8	17.2
Direct	52.1	52.0	68.5	53.0	59.7	64.7	8.4

[*] *For details, see annex A.1*
Source: NBB.

The non-maritime cluster contributed 17.2% to the total growth, whereas the maritime cluster was down by −8.8%.

The other industries sector showed the strongest growth between 2015-2016, followed by food industries. Shipping agents and forwarders recorded the biggest decline in investment, followed by port trade, though the latter represents only a small share in the direct investment in the port of Brussels and therefore has little impact. The construction sector's own growth has declined continuously since 2011. In the other logistic services sector, there was little change between 2011-2015, but investment declined in 2016. In the case of shipping agents and forwarders, shipping companies, and port construction and dredging, own growth was volatile over that period. Trade accounted for three-tenths of investment and the other industries sector for one-fifth. These shares were especially high in 2016, not only because of heavy investment in 2016 but also because investment in the third major sector (other logistic services) was at its lowest level for last six years.

Table 2.36: Top 10 Investment, Brussels

Rank	Name	Sector
1	Aquiris	Other industries
2	Brussels Port Authority	Port authority
3	Inovyn Belgium	Trade
4	Solvay	Other logistic services
5	Etablissements Van Damme	Trade
6	Ceres	Food industry
7	Loxam	Other logistic services
8	Bruxelles Energie - Brussel Energie	Other industries
9	Plastic Omnium Advanced Innovation And Research	Other logistic services
10	Van Humbeek Freres	Trade

Source: NBB.

3   Summary

On the back of strong growth, direct value added in the Belgian ports remained more or less stable in 2016 at around € 18 000 million (current prices) or 4.3% of Belgium's GDP. Indirect value added is around 82% of direct value added, at € 15 000 million (3.5% of Belgian GDP).

Direct value added decreased slightly in the Flemish seaports from around € 16 281 million in 2015 to around € 16 187 million in 2016, when it represented 6.5% of the Flemish region's GDP. The respective shares of the ports of Antwerp, Ghent, Zeebrugge and Ostend in regional GDP stood at 4.3%, 1.6%, 0.4% and 0.2% in 2016. The port of Antwerp recorded a decline (of around € -183 million) which was only partly offset by increases in Ghent and Zeebrugge (around € +67 million and € +28 million respectively), while Ostend showed a small decline (€ -5 million).

Antwerp's reduction in value added was due to the chemical sector. This sector accounts for around 29% of Antwerp's direct value added. The increase in Ghent is attributable to higher amount in the trade sector and the metalworking industry, respectively producing around 24% and 22% of total value added in the port of Ghent. Zeebrugge's increase was driven by the growth of the cargo handling sector, which represented around 25% of its value added. Ostend's decline is explained by a reduction in the port construction and dredging sector, which accounts for around 11% of its value added. These figures illustrate the sectoral concentration in the Flemish ports. That concentration is also evident at company level: In Antwerp, 5% of companies produce 80% of the total value added; for Ghent this percentage is slightly lower (77%), while in Zeebrugge and Ostend the figures are 63% and 66% respectively.

The inland ports as a whole registered a small increase in value added, from around € 1 831 million in 2015 to around € 1 891 million in 2016. The port of Brussels registered a decline (€ -45 million), while the Liège port complex recorded an increase (€ +105 million). In 2016, the former produced 1.0% of the GDP of Brussels Capital Region, and the latter produced 1.2% of the GDP of the Walloon region.

Liège's increase in value added occurred mainly in the energy sector, which accounts for around 28% in total value added in Liège. As in other ports, there is a high concentration; 5% of companies produce 72% of direct value added. The reduction in value added in the port of Brussels is attributable to the other logistics sector, accounting for 54% of direct value added. In Brussels, 5% of companies produce 77% of total value added.

After a modest but steady decline between 2012 and 2015 (-0.8% annually), direct employment seems to floor at around 115 000 FTE or 2.8% of Belgium's domestic employment. Indirect employment is around 1.2 times the direct employment figure, at 138 000 FTE (3.4% of Belgium's total employment).

Direct employment increased slightly in the Flemish seaports from 102 895 FTE in 2015 to 103 332 FTE in 2016. In 2016, this represented 4.3% of the Flemish region's total employment. The ports of Antwerp, Ghent, Zeebrugge and Ostend accounted for 2.5%, 1.2%, 0.4%, and 0.2% respectively of regional employment in 2016. The ports of Antwerp (+117 FTE), Ghent (+142 FTE) and Zeebrugge (+288 FTE) recorded an increase, while Ostend showed a small decline (-109 FTE). In terms of employment, Antwerp's largest sectors are cargo handling and chemicals with a share of 24% and 18% respectively. The 5% largest companies represent 73% of Antwerp's direct employment. In Ghent, car manufacturing (34%) and the metalworking industry (22%) are the largest employers. 5% of the companies represent 71% of the direct employment. In Zeebrugge, cargo handling and the public sector are the biggest employers, with shares of 30% and 15% respectively. In Ostend, the largest sector in terms of employment is the metalworking industry, with 28%, while 64% of employment is concentrated on the top 5% of employment.

The inland ports as a whole registered a small decline in employment, from 12 203 FTE in 2015 to 11 807 FTE in 2016. The port of Brussels registered a decline (-135 FTE), as did

the Liège port complex (-261 FTE). In 2016, the former accounted for 0.7% of employment in the Brussels Capital Region, while the latter represented 0.7% of employment in the Walloon region.

In Liège, the decrease in employment occurred mainly in the metalworking industry and the energy sector; these sectors respectively represent around 30% and 16% of direct employment in Liège. 5% of companies produce 63% of direct employment. The reduction in employment in Brussels is attributable to trade, accounting for 32% of total employment. In Brussels, 5% of companies produce 55% of direct employment.

Direct investment in the Belgian ports increased from € 4 054 million in 2015 to € 4 596 million in 2016. There is no information on the nature of these investments, so their indirect effects are difficult to estimate. All ports except Liège registered an increase.

The (globalised) return on equity decreased in all ports except Liège. In the Liège port complex there was an increase, but the ratio nevertheless remained negative, owing to the negative ratio of the dominant company. There was a significant drop in Ostend and Brussels; in both cases, this was caused by the fall in the ratio of a single company. The (globalised) liquidity ratio remained stable except in Antwerp and Brussels. In both cases, the decline in the ratio was due to a significant fall recorded by a single major player. The globalised solvency ratio remained stable in all Belgian ports.

Delving deeper into the data and trying to explain the above trends in terms of the structural composition of the Belgian ports shows that all ports are concentrated on a few sectors, and within those sectors often on just a handful of companies.

Based on the figures of the traffic, the Flemish ports can be considered as real bridgeheads for trade with the UK. Developments regarding the modalities and consequences of the Brexit therefor should be followed with the greatest attention. Given the existing import and export volumes in terms of tonnage, it seems it will mostly be a challenge in Zeebrugge and to some extent for Antwerp.

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A   Technical annexes

A.1   Contribution to growth

Let s be a sector in port p and let $v_{sp}(y)$ be the value of some variable for that that sector s in port p in year y. v could be value added, employment, ... Then the total for 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:

$$
\begin{aligned}
g_{*p}(y) &= \frac{v_{*p}(y) - v_{*p}(y-1)}{v_{*p}(y-1)} \\
&= \sum_{s \in p} \frac{v_{sp}(y) - v_{sp}(y-1)}{v_{*p}(y-1)} \\
&= \sum_{s \in p} \frac{v_{sp}(y) - v_{sp}(y-1)}{v_{*p}(y-1)} \underbrace{\frac{v_{sp}(y-1)}{v_{sp}(y-1)}}_{=1 \text{ if } v_{sp}(y-1) \neq 0} \\
&= \sum_{s \in p} \overbrace{\underbrace{\frac{v_{sp}(y) - v_{sp}(y-1)}{v_{sp}(y-1)}}_{=g_{sp}(y),\ \text{see supra}} \underbrace{\frac{v_{sp}(y-1)}{v_{*p}(y-1)}}_{\alpha_{sp}(y-1)}}^{\substack{\text{sum of sectoral contributions} \\ \text{sectoral contribution}}}
\end{aligned}
$$

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 te sector for that port (if $\forall s \in p, v_{sp}(y-1) \geq 0$).

So we find that[27] 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 own-growth of the sector. 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 $y - 1$.

A.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[28]:

---

[27]If $\forall s \in p, v_{sp}(y-1) > 0$.
[28]For more detail see (Carlino et al. 2017, see (M2) on p. 16)

$$
\begin{aligned}
r_s &= \frac{\sum_{c \in s} n_c}{\sum_{c \in s} d_c} \\[2ex]
&= \frac{\sum_{c \in s} n_c}{D_s}, (\text{ where } D_s = \sum_{c \in s} d_c) \\[2ex]
&= \frac{\sum_{c \in s} n_c \frac{d_c}{d_c}}{D_s}, (\text{ if } d_c \neq 0) \\[2ex]
&= \frac{\sum_{c \in s} d_c \frac{n_c}{d_c}}{D_s} \\[2ex]
&= \sum_{c \in s} \frac{d_c}{D_s} \frac{n_c}{d_c} \\[2ex]
&= \sum_{c \in s} \omega_c \frac{n_c}{d_c}, (\text{ where } \omega_c = \frac{d_c}{D_s}) \\[2ex]
&= \sum_{c \in s} \omega_c r_c
\end{aligned}
$$

So we find that:

$$
r_s = \sum_{c \in s} \overbrace{\underbrace{\omega_c r_c}_{\text{contribution of company } c}}^{\text{sum of individual contributions}}
$$

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 ratio's 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.

B   Definition of financial ratios

Ratio		Items used in annual accounts
Return on equity after tax		
	Numerator (N)	9904
	Denominator (D)	10/15
	Ratio	$N/D \times 100$
Liquidity in the broad sense		
	Numerator (N)	3+40/41+50/53+54/58+490/1
	Denominator (D)	42/48+492/3
	Ratio	N/D
Solvency		
	Numerator (N)	10/15
	Denominator (D)	10/49
	Ratio	$N/D \times 100$

C   Cost approach to value added

Component	Items used in annual accounts
Staff costs	62
Depreciations	630
Other charges	631/4+635/8+640/8+649
Recurrent operating profit	9901-740+66A-76A

D   Detailed tables by port area

D.1   Port of Antwerp

D.1.1   Value added

Table D.1: Value added in Antwerp (mio eur)

	2011	2012	2013	2014	2015	2016	$\sigma_{2016,s}$	$\alpha_{2016,s}$	$\bar{\alpha}_s$
Cargo handling	1 373.0	1 481.2	1 563.3	1 604.8	1 665.0	1 700.0	15.7	2.1	4.4
Shipping companies	489.1	558.1	368.0	438.8	739.8	685.1	6.3	-7.4	7.0
Shipping agents and forwarders	597.3	591.3	631.6	593.1	632.8	600.7	5.6	-5.1	0.1
Port construction and dredging	131.4	247.1	272.9	236.2	308.3	278.6	2.6	-9.6	16.2
Port authority	233.6	256.0	243.5	251.0	252.4	247.9	2.3	-1.8	1.2
Public Sector	141.6	148.7	151.3	150.8	143.6	145.3	1.3	1.1	0.5
Shipbuilding and repair	42.9	37.3	32.0	35.9	31.9	30.9	0.3	-3.1	-6.3
Port trade	18.3	18.7	17.7	11.0	12.2	10.2	0.1	-16.2	-11.0
Fishing and fish industry	0.8	0.8	0.9	1.4	1.2	1.8	0.0	47.3	16.8
Maritime	3 027.9	3 339.2	3 281.2	3 323.0	3 787.3	3 700.6	34.2	-2.3	4.1
Chemicals	3 009.6	2 946.1	2 944.2	3 113.2	3 421.9	3 165.2	29.3	-7.5	1.0
Fuel production	898.5	970.8	806.2	824.9	1 064.5	1 076.5	10.0	1.1	3.7
Trade	910.8	903.6	855.1	917.0	908.1	1 004.0	9.3	10.6	2.0
Other logistic services	454.9	485.8	505.5	502.1	537.3	544.1	5.0	1.3	3.6
Energy	530.1	418.9	393.6	321.8	281.5	342.8	3.2	21.8	-8.3
Metalworking industry	227.6	252.4	248.7	250.3	248.5	234.9	2.2	-5.5	0.6
Other industries	130.6	133.7	139.4	144.5	149.8	165.2	1.5	10.3	4.8
Construction	133.4	136.7	154.0	160.0	158.9	158.2	1.5	-0.4	3.5
Road transport	140.1	151.7	141.3	141.6	143.7	140.7	1.3	-2.1	0.1
Other land transport	135.2	155.3	166.9	155.0	147.9	134.0	1.2	-9.4	-0.2
Car manufacturing	86.5	103.4	93.3	86.5	77.1	77.3	0.7	0.3	-2.2
Food industry	63.7	47.5	63.1	59.3	61.6	61.3	0.6	-0.4	-0.8
Electronics	8.6	10.6	8.3	10.1	10.1	10.0	0.1	-1.0	3.1
Non-maritime	6 729.6	6 716.6	6 519.6	6 686.2	7 210.9	7 114.1	65.8	-1.3	1.1
Direct	9 757.5	10 055.9	9 800.7	10 009.2	10 998.2	10 814.7	100.0	-1.7	2.1
Indirect	8 598.3	9 026.8	8 523.7	8 475.0	9 771.6	9 436.1			
Total	18 355.8	19 082.6	18 324.4	18 484.2	20 769.7	20 250.8			

Source: NBB.

Where $\sigma_{2016,s} = 100 \times \frac{v_{2016,s}}{v_{2016,Direct}}$ is the share of sector s (in %) in 2016, $\alpha_{2016,s} = 100 \times \frac{v_{2016} - v_{2015}}{v_{2015}}$ is the growth of sector s (in %) between 2015 en 2016, $\bar{\alpha}_s = 100 \times \left(\left(\frac{v_{2016}}{v_{2011}} \right)^{1/5} - 1 \right)$ is the (geometric) average growth of sector s (in %) between 2011 en 2016.

D.1.2   Employment

Table D.2: Employment in Antwerp (fte)

	2011	2012	2013	2014	2015	2016	$\sigma_{2016,s}$	$\alpha_{2016,s}$	$\bar{\alpha}_s$
Cargo handling	14 604	14 462	14 558	14 581	14 760	14 900	24.5	0.9	0.4
Shipping agents and forwarders	6 810	6 947	6 868	6 701	6 748	6 598	10.8	-2.2	-0.6
Public Sector	1 808	1 822	1 867	1 828	1 745	1 748	2.9	0.2	-0.7
Port authority	1 692	1 698	1 703	1 606	1 564	1 584	2.6	1.2	-1.3
Port construction and dredging	1 094	1 475	1 513	1 260	1 313	1 420	2.3	8.1	5.4
Shipping companies	1 169	968	915	929	902	863	1.4	-4.3	-5.9
Shipbuilding and repair	587	540	410	371	353	356	0.6	0.7	-9.5
Port trade	111	115	115	92	89	82	0.1	-8.4	-5.9
Fishing and fish industry	16	14	13	14	13	12	0.0	-2.7	-5.0
Maritime	27 890	28 041	27 961	27 381	27 488	27 562	45.3	0.3	-0.2
Chemicals	10 792	10 889	10 982	10 936	10 794	10 874	17.9	0.7	0.2
Other logistic services	3 803	3 974	4 061	4 180	4 324	4 482	7.4	3.7	3.3
Metalworking industry	3 416	3 656	3 687	3 579	3 554	3 570	5.9	0.4	0.9
Fuel production	2 687	2 678	2 607	2 626	2 706	2 787	4.6	3.0	0.7
Trade	2 315	2 328	2 260	2 403	2 210	2 212	3.6	0.1	-0.9
Other land transport	2 174	2 435	2 506	2 439	2 317	2 071	3.4	-10.6	-1.0
Road transport	2 048	2 148	2 049	2 154	2 039	1 923	3.2	-5.7	-1.2
Construction	1 260	1 354	1 703	1 723	1 670	1 751	2.9	4.9	6.8
Other industries	1 151	1 133	1 179	1 200	1 231	1 237	2.0	0.5	1.4
Energy	1 042	1 030	993	946	920	1 019	1.7	10.7	-0.5
Car manufacturing	1 005	1 080	1 020	1 004	941	846	1.4	-10.1	-3.4
Food industry	393	416	403	407	405	381	0.6	-5.9	-0.6
Electronics	157	133	127	133	133	135	0.2	1.6	-3.0
Non-maritime	32 242	33 253	33 578	33 731	33 244	33 286	54.7	0.1	0.6
Direct	60 132	61 294	61 539	61 112	60 732	60 849	100.0	0.2	0.2
Indirect	81 768	82 409	82 211	79 969	81 810	82 209			
Total	141 900	143 702	143 750	141 080	142 542	143 058			

Source: NBB.

Where $\sigma_{2016,s} = 100 \times \frac{v_{2016,s}}{v_{2016,Direct}}$ is the share of sector s (in %) in 2016, $\alpha_{2016,s} = 100 \times \frac{v_{2016} - v_{2015}}{v_{2015}}$ is the growth of sector s (in %) between 2015 en 2016, $\bar{\alpha}_s = 100 \times \left(\left(\frac{v_{2016}}{v_{2011}} \right)^{1/5} - 1 \right)$ is the (geometric) average growth of sector s (in %) between 2011 en 2016.

D.1.3 Investment

Table D.3: Investment in Antwerp (mio eur)

	2011	2012	2013	2014	2015	2016	$\sigma_{2016,s}$	$\alpha_{2016,s}$	$\bar{\alpha}_s$
Shipping companies	331.4	383.5	432.7	1 009.8	589.5	693.4	20.2	17.6	15.9
Cargo handling	696.3	618.6	493.1	578.6	611.9	680.4	19.8	11.2	-0.5
Port authority	45.0	194.8	196.3	154.2	131.0	141.1	4.1	7.7	25.7
Shipping agents and forwarders	60.9	48.2	29.5	32.7	35.1	37.2	1.1	6.0	-9.4
Port construction and dredging	342.7	93.2	14.8	27.4	70.6	34.4	1.0	-51.3	-36.9
Public Sector	36.6	44.5	58.5	26.5	19.8	29.3	0.9	47.9	-4.3
Shipbuilding and repair	4.5	4.6	6.0	1.3	1.9	2.5	0.1	26.0	-11.4
Port trade	0.6	0.6	0.5	0.4	0.3	0.5	0.0	60.9	-3.9
Fishing and fish industry	0.1	0.0	0.0	0.0	0.0	0.0	0.0	-76.8	-36.9
Maritime	1 517.8	1 387.9	1 231.5	1 831.0	1 460.2	1 618.8	47.2	10.9	1.3
Chemicals	471.8	489.9	576.9	737.3	691.9	785.6	22.9	13.6	10.7
Fuel production	90.3	127.3	239.0	417.8	525.3	616.7	18.0	17.4	46.8
Energy	74.6	76.0	74.5	108.4	166.9	130.3	3.8	-21.9	11.8
Other logistic services	75.9	81.2	78.7	69.8	85.2	115.9	3.4	36.0	8.8
Trade	54.3	54.1	54.1	56.1	53.8	48.0	1.4	-10.7	-2.4
Road transport	18.4	27.1	22.4	33.9	24.8	32.2	0.9	29.9	11.8
Other industries	62.1	28.5	28.1	19.6	23.2	24.5	0.7	5.8	-16.9
Metalworking industry	10.7	13.7	15.6	11.4	13.0	14.2	0.4	9.2	5.7
Other land transport	10.0	14.6	15.7	12.2	4.8	13.7	0.4	185.2	6.6
Food industry	17.6	15.3	15.7	12.9	23.1	13.3	0.4	-42.6	-5.5
Construction	12.4	13.1	11.4	8.7	15.1	12.7	0.4	-16.1	0.4
Car manufacturing	8.7	7.9	8.5	0.6	5.7	2.7	0.1	-52.5	-20.8
Electronics	2.0	0.9	1.0	0.0	0.0	0.0	0.0	Inf	
Non-maritime	908.9	949.7	1 141.5	1 488.7	1 632.8	1 809.8			
Direct	2 426.7	2 337.6	2 373.0	3 319.6	3 093.0	3 428.6			

Source: NBB.

Where $\sigma_{2016,s} = 100 \times \frac{v_{2016,s}}{v_{2016,Direct}}$ is the share of sector s (in %) in 2016, $\alpha_{2016,s} = 100 \times \frac{v_{2016} - v_{2015}}{v_{2015}}$ is the growth of sector s (in %) between 2015 en 2016, $\bar{\alpha}_s = 100 \times \left(\left(\frac{v_{2016}}{v_{2011}} \right)^{1/5} - 1 \right)$ is the (geometric) average growth of sector s (in %) between 2011 en 2016.

D.2 Port of Ghent

D.2.1 Value added

Table D.4: Value added in Ghent (mio eur)

	2011	2012	2013	2014	2015	2016	$\sigma_{2016,s}$	$\alpha_{2016,s}$	$\bar{\alpha}_s$
Cargo handling	255.8	254.4	244.9	247.6	224.5	235.3	6.1	4.8	-1.7
Shipping agents and forwarders	28.6	30.1	31.0	33.0	34.8	34.0	0.9	-2.3	3.5
Port authority	24.7	23.6	23.4	24.8	23.9	32.2	0.8	34.7	5.4
Public Sector	19.4	21.3	21.1	21.1	21.4	21.2	0.5	-0.9	1.8
Shipbuilding and repair	4.3	3.8	3.4	4.1	4.0	3.9	0.1	-3.3	-2.2
Shipping companies	4.8	5.6	4.7	7.4	3.8	3.4	0.1	-11.8	-6.9
Port trade	0.1	0.2	0.2	0.3	0.4	0.4	0.0	24.4	26.8
Fishing and fish industry	-0.0	-0.0	0.0	0.0	0.0	0.0	0.0		
Maritime	337.9	338.9	328.6	338.2	312.9	330.5	8.6	5.6	-0.4
Trade	812.1	780.9	771.6	805.9	846.4	908.2	23.5	7.3	2.3
Metalworking industry	500.4	406.3	529.3	641.0	774.3	838.7	21.7	8.3	10.9
Car manufacturing	653.7	649.6	735.4	713.5	722.6	707.1	18.3	-2.1	1.6
Chemicals	399.5	319.1	323.7	384.5	428.5	372.9	9.7	-13.0	-1.4
Other industries	159.5	171.5	162.5	178.1	146.2	149.3	3.9	2.2	-1.3
Construction	98.1	107.3	104.3	122.0	118.1	123.1	3.2	4.2	4.6
Other logistic services	93.6	126.3	138.9	141.8	138.3	114.0	3.0	-17.6	4.0
Food industry	82.6	74.3	91.9	104.4	112.4	104.3	2.7	-7.2	4.8
Road transport	66.6	62.6	63.4	66.4	70.7	72.2	1.9	2.1	1.6
Energy	75.0	66.5	53.8	36.2	38.1	57.6	1.5	51.0	-5.2
Fuel production	30.5	50.5	54.7	41.4	38.6	41.8	1.1	8.5	6.5
Electronics	31.2	27.4	28.5	34.1	35.5	30.0	0.8	-15.4	-0.8
Other land transport	14.4	12.7	11.6	10.1	9.7	9.6	0.2	-1.1	-7.9
Non-maritime	3 017.2	2 855.1	3 069.7	3 279.4	3 479.3	3 528.8	91.4	1.4	3.2
Direct	3 355.1	3 194.0	3 398.3	3 617.6	3 792.2	3 859.3	100.0	1.8	2.8
Indirect	3 424.0	3 259.6	3 565.0	3 733.5	4 047.9	4 151.2			
Total	6 779.1	6 453.6	6 963.4	7 351.0	7 840.1	8 010.5			

Source: NBB.

Where $\sigma_{2016,s} = 100 \times \frac{v_{2016,s}}{v_{2016,Direct}}$ is the share of sector s (in %) in 2016, $\alpha_{2016,s} = 100 \times \frac{v_{2016} - v_{2015}}{v_{2015}}$ is the growth of sector s (in %) between 2015 en 2016, $\bar{\alpha}_s = 100 \times \left(\left(\frac{v_{2016}}{v_{2011}} \right)^{1/5} - 1 \right)$ is the (geometric) average growth of sector s (in %) between 2011 en 2016.

D.2.2 Employment

Table D.5: Employment in Ghent (fte)

	2011	2012	2013	2014	2015	2016	$\sigma_{2016,s}$	$\alpha_{2016,s}$	$\bar{\alpha}_s$
Cargo handling	2 352	2 370	2 361	2 407	1 883	2 058	7.4	9.3	-2.6
Shipping agents and forwarders	320	332	338	360	354	359	1.3	1.4	2.3
Public Sector	247	243	242	235	228	217	0.8	-4.8	-2.6
Port authority	156	156	156	148	148	148	0.5	-0.1	-1.1
Shipbuilding and repair	61	61	58	52	53	51	0.2	-4.6	-3.6
Shipping companies	20	27	25	18	5	4	0.0	-26.4	-29.5
Port trade	1	1	1	3	3	3	0.0	3.8	28.1
Fishing and fish industry	0	0	0	0	0	0	0.0		
Maritime	3 157	3 191	3 181	3 223	2 673	2 839	10.1	6.2	-2.1
Car manufacturing	8 324	8 762	9 033	9 088	9 544	9 384	33.5	-1.7	2.4
Metalworking industry	5 589	5 677	5 836	6 057	6 018	6 152	22.0	2.2	1.9
Chemicals	2 132	2 130	2 109	2 102	2 109	2 120	7.6	0.5	-0.1
Trade	2 211	2 246	2 106	2 072	1 841	1 854	6.6	0.7	-3.5
Construction	1 230	1 252	1 240	1 460	1 452	1 518	5.4	4.5	4.3
Other logistic services	1 063	1 061	1 101	1 159	1 166	1 151	4.1	-1.3	1.6
Other industries	927	963	968	1 019	991	923	3.3	-6.8	-0.1
Road transport	767	709	749	783	749	758	2.7	1.2	-0.2
Food industry	587	590	601	632	650	636	2.3	-2.1	1.6
Electronics	240	245	235	253	267	258	0.9	-3.1	1.5
Energy	160	166	170	180	185	197	0.7	6.6	4.3
Other land transport	232	200	174	160	153	149	0.5	-2.2	-8.5
Fuel production	35	36	39	42	42	42	0.2	1.0	3.9
Non-maritime	23 496	24 038	24 358	25 006	25 168	25 144	89.9	-0.1	1.4
Direct	26 653	27 229	27 539	28 229	27 841	27 983	100.0	0.5	1.0
Indirect	32 998	33 735	34 182	34 439	35 404	36 210			
Total	59 652	60 964	61 721	62 668	63 245	64 192			

Source: NBB.

Where $\sigma_{2016,s} = 100 \times \frac{v_{2016,s}}{v_{2016,Direct}}$ is the share of sector s (in %) in 2016, $\alpha_{2016,s} = 100 \times \frac{v_{2016}-v_{2015}}{v_{2015}}$ is the growth of sector s (in %) between 2015 en 2016, $\bar{\alpha}_s = 100 \times \left(\left(\frac{v_{2016}}{v_{2011}} \right)^{1/5} - 1 \right)$ is the (geometric) average growth of sector s (in %) between 2011 en 2016.

D.2.3 Investment

Table D.6: Investment in Ghent (mio eur)

	2011	2012	2013	2014	2015	2016	$\sigma_{2016,s}$	$\alpha_{2016,s}$	$\bar{\alpha}_s$
Cargo handling	50.1	72.6	81.5	48.9	45.5	76.3	14.4	67.6	8.8
Public Sector	9.6	7.8	11.0	3.0	10.3	17.7	3.3	72.1	13.0
Port authority	9.9	6.7	6.4	6.6	8.5	8.6	1.6	1.5	-2.8
Shipping agents and forwarders	4.2	2.3	1.8	1.9	1.8	4.4	0.8	148.3	0.8
Shipping companies	0.5	1.0	1.3	1.0	0.2	0.7	0.1	270.4	9.7
Shipbuilding and repair	1.1	0.4	0.2	0.4	0.9	0.6	0.1	-33.9	-11.9
Port trade	0.0	0.0	0.0	0.1	0.0	0.1	0.0	283.7	39.1
Fishing and fish industry	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Maritime	75.4	90.9	102.2	61.8	67.2	108.4	20.4	61.4	7.5
Metalworking industry	53.2	68.1	67.9	75.2	86.3	122.1	23.0	41.5	18.1
Car manufacturing	87.5	71.3	34.1	50.6	53.4	116.0	21.8	117.1	5.8
Chemicals	68.6	70.1	56.6	70.3	52.4	54.3	10.2	3.5	-4.6
Trade	24.5	29.1	35.2	43.6	31.8	33.9	6.4	6.6	6.7
Food industry	15.2	16.2	17.3	15.1	22.7	24.0	4.5	5.8	9.6
Other logistic services	22.6	15.3	20.3	26.5	15.4	19.8	3.7	28.6	-2.6
Other industries	15.2	20.2	24.5	19.3	21.4	18.9	3.6	-11.8	4.4
Construction	28.3	18.6	12.3	10.7	14.4	9.4	1.8	-34.5	-19.8
Road transport	12.0	9.5	17.5	14.6	9.7	9.3	1.8	-3.6	-4.9
Energy	35.4	35.6	27.2	5.9	4.4	6.3	1.2	42.2	-29.2
Other land transport	11.4	23.9	17.3	16.5	0.8	4.6	0.9	465.8	-16.4
Fuel production	2.8	3.0	3.0	2.2	1.7	2.0	0.4	14.1	-6.4
Electronics	1.2	1.1	0.9	1.8	2.2	1.8	0.3	-15.9	9.1
Non-maritime	377.8	382.1	334.0	352.3	316.6	422.4			
Direct	453.2	473.0	436.2	414.1	383.8	530.8			

Source: NBB.

Where $\sigma_{2016,s} = 100 \times \frac{v_{2016,s}}{v_{2016,Direct}}$ is the share of sector s (in %) in 2016, $\alpha_{2016,s} = 100 \times \frac{v_{2016}-v_{2015}}{v_{2015}}$ is the growth of sector s (in %) between 2015 en 2016, $\bar{\alpha}_s = 100 \times \left(\left(\frac{v_{2016}}{v_{2011}} \right)^{1/5} - 1 \right)$ is the (geometric) average growth of sector s (in %) between 2011 en 2016.

D.3 Port of Zeebrugge

D.3.1 Value added

Table D.7: Value added in Zeebrugge (mio eur)

	2011	2012	2013	2014	2015	2016	$\sigma_{2016,s}$	$\alpha_{2016,s}$	$\bar{\alpha}_s$
Cargo handling	191.6	193.2	194.7	205.4	219.2	249.8	24.8	14.0	5.5
Public Sector	108.9	107.8	109.9	107.1	103.3	101.3	10.1	-1.9	-1.4
Shipping agents and forwarders	49.7	58.5	69.8	68.9	84.5	66.5	6.6	-21.3	6.0
Shipping companies	44.1	43.8	50.0	50.0	48.3	53.6	5.3	11.0	4.0
Fishing and fish industry	45.1	42.0	40.5	43.5	47.0	49.7	4.9	5.9	2.0
Port authority	35.2	34.1	32.5	36.7	35.8	35.0	3.5	-2.3	-0.1
Port construction and dredging	15.3	20.0	24.6	18.6	30.4	19.6	1.9	-35.5	5.0
Shipbuilding and repair	10.1	11.1	10.8	10.1	9.4	10.6	1.1	12.4	1.0
Port trade	0.6	0.6	0.7	1.1	1.0	1.1	0.1	14.4	15.0
Maritime	500.6	511.2	533.5	541.4	578.9	587.4	58.3	1.5	3.2
Trade	108.8	114.7	88.1	85.7	88.1	89.7	8.9	1.9	-3.8
Energy	107.3	95.0	92.5	98.4	91.3	89.6	8.9	-1.8	-3.5
Road transport	65.4	61.6	57.5	47.7	45.6	50.1	5.0	9.9	-5.2
Other industries	34.5	34.1	38.6	43.3	39.9	39.9	4.0	-0.1	2.9
Food industry	24.3	27.7	32.4	35.7	33.8	35.7	3.5	5.7	8.0
Other logistic services	15.2	19.6	24.5	26.6	26.6	33.8	3.4	26.8	17.3
Chemicals	28.0	25.4	30.7	36.1	34.0	33.2	3.3	-2.6	3.4
Construction	26.1	22.1	24.1	23.8	25.3	31.3	3.1	24.0	3.7
Other land transport	11.0	9.5	7.2	6.7	6.2	6.2	0.6	-0.0	-11.0
Metalworking industry	6.6	5.6	4.0	5.1	4.9	5.4	0.5	10.4	-3.9
Electronics	54.8	23.6	54.5	3.0	3.3	3.5	0.3	6.8	-42.2
Car manufacturing	0.6	0.9	1.1	1.3	1.5	1.4	0.1	-9.8	16.7
Non-maritime	482.8	439.7	455.0	413.4	400.5	419.8	41.7	4.8	-2.8
Direct	983.4	951.0	988.5	954.9	979.4	1 007.2	100.0	2.8	0.5
Indirect	762.3	745.8	788.6	753.0	824.3	883.1			
Total	1 745.7	1 696.8	1 777.1	1 707.9	1 803.7	1 890.3			

Source: NBB.

Where $\sigma_{2016,s} = 100 \times \frac{v_{2016,s}}{v_{2016,Direct}}$ is the share of sector s (in %) in 2016, $\alpha_{2016,s} = 100 \times \frac{v_{2016}-v_{2015}}{v_{2015}}$ is the growth of sector s (in %) between 2015 en 2016, $\bar{\alpha}_s = 100 \times \left(\left(\frac{v_{2016}}{v_{2011}} \right)^{1/5} - 1 \right)$ is the (geometric) average growth of sector s (in %) between 2011 en 2016.

D.3.2 Employment

Table D.8: Employment in Zeebrugge (fte)

	2011	2012	2013	2014	2015	2016	$\sigma_{2016,s}$	$\alpha_{2016,s}$	$\bar{\alpha}_s$
Cargo handling	2 548	2 608	2 588	2 630	2 711	2 888	30.1	6.5	2.5
Public Sector	1 664	1 595	1 600	1 563	1 478	1 431	14.9	-3.2	-3.0
Shipping agents and forwarders	605	632	652	658	658	640	6.7	-2.7	1.1
Fishing and fish industry	561	550	516	533	525	523	5.5	-0.4	-1.4
Port construction and dredging	177	176	168	213	194	185	1.9	-4.3	0.9
Shipping companies	253	211	191	212	173	147	1.5	-15.2	-10.3
Shipbuilding and repair	149	153	149	136	128	138	1.4	8.2	-1.6
Port authority	134	132	134	135	133	136	1.4	2.7	0.4
Port trade	9	10	9	14	13	15	0.2	9.0	9.6
Maritime	6 099	6 067	6 007	6 092	6 012	6 103	63.6	1.5	0.0
Trade	825	799	816	803	851	886	9.2	4.2	1.4
Road transport	975	910	806	662	581	670	7.0	15.4	-7.2
Other industries	400	417	399	447	417	408	4.3	-2.3	0.4
Construction	367	341	351	336	346	353	3.7	2.0	-0.8
Food industry	260	273	293	300	310	337	3.5	8.8	5.3
Chemicals	231	237	246	263	234	248	2.6	5.8	1.4
Other logistic services	177	193	206	169	190	214	2.2	12.6	3.9
Energy	127	129	125	134	126	124	1.3	-1.6	-0.4
Other land transport	177	149	108	107	97	96	1.0	-1.1	-11.5
Metalworking industry	93	93	76	85	78	80	0.8	2.6	-3.1
Electronics	354	351	306	43	46	55	0.6	18.8	-31.1
Car manufacturing	10	12	11	13	13	14	0.2	14.2	6.7
Non-maritime	3 996	3 905	3 742	3 361	3 290	3 486	36.4	6.0	-2.7
Direct	10 095	9 971	9 749	9 453	9 301	9 589	100.0	3.1	-1.0
Indirect	10 508	10 371	10 118	9 951	10 193	10 512			
Total	20 603	20 342	19 867	19 404	19 494	20 101			

Source: NBB.

Where $\sigma_{2016,s} = 100 \times \frac{v_{2016,s}}{v_{2016,Direct}}$ is the share of sector s (in %) in 2016, $\alpha_{2016,s} = 100 \times \frac{v_{2016}-v_{2015}}{v_{2015}}$ is the growth of sector s (in %) between 2015 en 2016, $\bar{\alpha}_s = 100 \times \left(\left(\frac{v_{2016}}{v_{2011}} \right)^{1/5} - 1 \right)$ is the (geometric) average growth of sector s (in %) between 2011 en 2016.

D.3.3 Investment

Table D.9: Investment in Zeebrugge (mio eur)

	2011	2012	2013	2014	2015	2016	$\sigma_{2016,s}$	$\alpha_{2016,s}$	$\bar{\alpha}_s$
Cargo handling	30.5	29.2	16.8	50.7	28.1	43.4	14.7	54.7	7.3
Port authority	33.6	34.0	28.3	22.0	13.4	24.2	8.2	81.3	-6.3
Shipping agents and forwarders	11.9	7.3	4.6	14.7	15.1	19.3	6.5	27.7	10.1
Shipping companies	0.3	1.6	0.2	0.8	0.2	13.0	4.4	8 366.2	115.3
Public Sector	42.0	20.0	16.4	13.4	9.0	7.5	2.6	-16.1	-29.1
Fishing and fish industry	10.8	15.2	7.7	8.8	12.7	5.6	1.9	-55.8	-12.3
Shipbuilding and repair	2.5	1.5	1.0	2.5	3.7	5.0	1.7	35.3	14.5
Port construction and dredging	1.1	1.1	1.6	1.3	3.0	3.6	1.2	18.8	27.3
Port trade	0.2	0.0	0.2	0.0	0.0	0.2	0.1	4 655.0	-3.3
Maritime	133.0	109.9	76.8	114.1	85.1	121.7	41.3	43.1	-1.7
Energy	27.1	24.4	44.0	85.4	85.4	105.5	35.8	23.6	31.2
Road transport	16.2	8.7	12.0	10.8	16.6	35.6	12.1	114.4	17.1
Trade	13.5	14.1	12.6	10.6	11.9	8.8	3.0	-25.7	-8.2
Other logistic services	6.3	3.3	8.6	6.2	6.3	5.0	1.7	-21.7	-4.7
Food industry	6.4	15.2	4.7	5.9	3.7	4.3	1.4	14.1	-7.8
Other industries	20.3	19.8	9.6	6.3	6.0	4.2	1.4	-30.3	-27.1
Chemicals	4.5	3.3	3.1	4.3	3.6	3.4	1.2	-4.4	-5.4
Other land transport	25.0	25.2	16.5	10.4	19.8	3.0	1.0	-84.9	-34.6
Construction	6.4	5.3	3.3	2.6	2.5	2.6	0.9	2.2	-16.7
Car manufacturing	0.0	0.1	0.3	0.0	0.1	0.2	0.1	60.1	77.6
Metalworking industry	0.4	0.5	0.3	0.3	0.3	0.2	0.1	-28.3	-12.2
Electronics	5.9	4.6	5.5	0.5	0.4	0.2	0.1	-53.8	-50.8
Non-maritime	132.0	124.5	120.5	89.7	156.7	172.9			
Direct	265.0	234.4	197.3	203.8	241.7	294.7			

Source: NBB.

Where $\sigma_{2016,s} = 100 \times \frac{v_{2016,s}}{v_{2016,Direct}}$ is the share of sector s (in %) in 2016, $\alpha_{2016,s} = 100 \times \frac{v_{2016}-v_{2015}}{v_{2015}}$ is the growth of sector s (in %) between 2015 en 2016, $\bar{\alpha}_s = 100 \times \left(\left(\frac{v_{2016}}{v_{2011}} \right)^{1/5} - 1 \right)$ is the (geometric) average growth of sector s (in %) between 2011 en 2016.

D.4 Port of Ostend

D.4.1 Value added

Table D.10: Value added in Ostend (mio eur)

	2011	2012	2013	2014	2015	2016	$\sigma_{2016,s}$	$\alpha_{2016,s}$	$\bar{\alpha}_s$
Port construction and dredging	55.4	57.0	59.4	57.6	70.5	57.1	11.3	-19.1	0.6
Public Sector	49.3	50.1	49.9	51.7	51.5	53.5	10.6	3.9	1.7
Fishing and fish industry	34.5	33.8	37.2	39.8	38.8	39.8	7.9	2.6	2.9
Shipbuilding and repair	13.3	13.4	14.3	14.0	14.2	15.4	3.0	8.4	3.0
Shipping agents and forwarders	4.6	7.0	4.5	2.9	5.0	4.0	0.8	-20.6	-2.5
Port authority	2.0	3.6	2.3	2.4	2.7	2.9	0.6	6.6	7.9
Cargo handling	2.2	3.2	2.2	3.1	2.7	2.8	0.6	5.4	4.8
Shipping companies	0.5	0.2	0.7	0.9	0.7	0.6	0.1	-21.4	2.8
Port trade	0.0	0.0	0.0	0.0	0.0	0.0	0.0	84.2	0.1
Maritime	161.7	168.3	170.5	172.4	186.1	176.0	34.8	-5.4	1.7
Metalworking industry	152.9	153.7	161.5	169.6	168.3	164.6	32.6	-2.2	1.5
Chemicals	34.3	36.0	38.3	36.7	34.2	38.4	7.6	12.1	2.3
Construction	21.2	37.3	33.1	31.7	32.6	28.6	5.7	-12.1	6.2
Road transport	25.2	23.7	25.0	22.8	25.0	26.1	5.2	4.4	0.7
Energy	22.0	19.0	13.4	18.8	16.6	20.0	4.0	20.1	-1.9
Food industry	11.2	12.2	12.3	11.6	14.5	16.7	3.3	15.2	8.3
Trade	14.6	15.3	15.6	14.3	12.1	13.3	2.6	10.2	-1.9
Other logistic services	18.1	14.3	12.1	13.5	11.8	13.0	2.6	10.4	-6.5
Other industries	6.6	4.7	4.3	7.2	7.0	8.0	1.6	14.2	3.9
Car manufacturing	2.4	2.1	2.2	0.8	2.7	0.8	0.2	-68.2	-19.1
Electronics	-0.1	0.0	0.0	0.0	0.0	0.0	0.0		
Other land transport	0.0	0.6	0.0	0.0	0.0	0.0	0.0		
Non-maritime	308.7	319.0	317.8	327.1	324.8	329.5	65.2	1.5	1.3
Direct	470.4	487.4	488.3	499.5	510.8	505.5	100.0	-1.0	1.4
Indirect	349.0	371.8	373.0	365.9	394.3	382.1			
Total	819.3	859.2	861.3	865.4	905.2	887.6			

Source: NBB.

Where $\sigma_{2016,s} = 100 \times \frac{v_{2016,s}}{v_{2016,Direct}}$ is the share of sector s (in %) in 2016, $\alpha_{2016,s} = 100 \times \frac{v_{2016}-v_{2015}}{v_{2015}}$ is the growth of sector s (in %) between 2015 en 2016, $\bar{\alpha}_s = 100 \times \left(\left(\frac{v_{2016}}{v_{2011}} \right)^{1/5} - 1 \right)$ is the (geometric) average growth of sector s (in %) between 2011 en 2016.

Table D.11: Employment in Ostend (fte)

	2011	2012	2013	2014	2015	2016	$\sigma_{2016,s}$	$\alpha_{2016,s}$	$\bar{\alpha}_s$
Public Sector	756	723	726	740	732	734	14.9	0.2	-0.6
Fishing and fish industry	400	410	413	409	424	409	8.3	-3.6	0.4
Port construction and dredging	276	428	426	381	364	345	7.0	-5.1	4.6
Shipbuilding and repair	234	212	223	221	218	225	4.6	3.3	-0.7
Cargo handling	60	52	51	63	50	38	0.8	-24.3	-8.8
Port authority	43	44	42	38	37	34	0.7	-7.3	-4.1
Shipping agents and forwarders	59	53	12	20	31	28	0.6	-8.0	-13.6
Shipping companies	1	1	1	2	1	2	0.0	90.3	12.1
Port trade	0	0	0	0	0	0	0.0		
Maritime	1 827	1 924	1 894	1 875	1 857	1 816	37.0	-2.2	-0.1
Metalworking industry	1 337	1 338	1 391	1 450	1 431	1 388	28.3	-3.0	0.8
Road transport	381	406	418	406	419	417	8.5	-0.6	1.8
Construction	259	476	439	413	404	416	8.5	2.9	10.0
Chemicals	318	320	311	312	309	304	6.2	-1.8	-0.9
Trade	190	182	193	197	208	200	4.1	-3.8	1.0
Food industry	133	135	130	142	143	135	2.8	-5.7	0.3
Other logistic services	136	170	127	96	105	109	2.2	3.7	-4.4
Other industries	57	50	56	79	68	65	1.3	-3.5	2.9
Energy	63	62	55	56	46	36	0.7	-21.8	-10.4
Car manufacturing	29	29	30	32	29	26	0.5	-11.7	-2.5
Electronics	1	0	0	0	0	0	0.0		
Other land transport	0	9	0	0	0	0	0.0		
Non-maritime	2 905	3 179	3 152	3 184	3 164	3 096	63.0	-2.1	1.3
Direct	4 732	5 103	5 046	5 058	5 021	4 912	100.0	-2.2	0.8
Indirect	3 989	4 497	4 401	4 343	4 392	4 298			
Total	8 720	9 600	9 446	9 402	9 413	9 210			

Source: NBB.

Where $\sigma_{2016,s} = 100 \times \frac{v_{2016,s}}{v_{2016,Direct}}$ is the share of sector s (in %) in 2016, $\alpha_{2016,s} = 100 \times \frac{v_{2016}-v_{2015}}{v_{2015}}$ is the growth of sector s (in %) between 2015 en 2016, $\bar{\alpha}_s = 100 \times \left(\left(\frac{v_{2016}}{v_{2011}} \right)^{1/5} - 1 \right)$ is the (geometric) average growth of sector s (in %) between 2011 en 2016.

D.4.3 Investment

Table D.12: Investment in Ostend (mio eur)

	2011	2012	2013	2014	2015	2016	$\sigma_{2016,s}$	$\alpha_{2016,s}$	$\bar{\alpha}_s$
Public Sector	4.5	10.3	12.0	13.9	13.8	23.8	29.3	72.6	39.8
Shipping agents and forwarders	0.2	0.4	1.9	0.6	2.5	3.8	4.6	49.9	88.7
Fishing and fish industry	5.0	7.1	5.8	4.0	5.2	3.3	4.1	-35.9	-8.1
Port construction and dredging	2.0	3.2	0.2	46.4	0.1	1.3	1.6	984.4	-9.1
Shipbuilding and repair	3.2	0.9	2.0	1.6	2.9	1.1	1.3	-63.8	-19.9
Port authority	2.0	2.0	1.5	2.9	1.1	0.4	0.5	-63.9	-27.7
Cargo handling	6.8	0.4	1.3	0.9	0.3	0.0	0.1	-85.1	-63.3
Port trade	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2 094.2	
Shipping companies	0.3	0.0	0.1	0.2	0.0	0.0	0.0	-75.1	-53.6
Maritime	24.1	24.4	24.8	70.5	26.0	33.7	41.4	29.8	6.9
Construction	6.7	11.3	9.4	13.6	8.7	20.8	25.5	139.8	25.6
Metalworking industry	14.4	16.4	15.6	11.2	12.5	8.7	10.6	-30.5	-9.6
Chemicals	5.6	9.2	6.6	5.7	6.0	5.9	7.3	-1.3	1.1
Trade	5.2	5.6	4.7	7.4	3.6	3.0	3.6	-17.9	-10.6
Road transport	6.6	6.6	5.6	1.8	2.4	2.6	3.2	8.1	-17.3
Other industries	4.6	0.6	1.2	1.4	0.6	2.5	3.1	321.2	-11.6
Food industry	1.2	0.9	1.4	3.7	1.3	1.9	2.4	45.8	10.9
Other logistic services	11.1	16.8	6.4	3.8	2.7	1.2	1.4	-57.7	-36.4
Energy	13.2	2.1	0.2	0.2	0.2	1.1	1.4	361.6	-38.6
Car manufacturing	0.3	0.2	0.2	0.1	0.0	0.1	0.1	52.4	-28.2
Electronics	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Other land transport	0.4	0.0	0.1	0.0	0.0	0.0	0.0		
Non-maritime	69.2	69.8	51.5	48.9	38.0	47.7			
Direct	93.3	94.1	76.3	119.5	64.0	81.4			

Source: NBB.

Where $\sigma_{2016,s} = 100 \times \frac{v_{2016,s}}{v_{2016,Direct}}$ is the share of sector s (in %) in 2016, $\alpha_{2016,s} = 100 \times \frac{v_{2016}-v_{2015}}{v_{2015}}$ is the growth of sector s (in %) between 2015 en 2016, $\bar{\alpha}_s = 100 \times \left(\left(\frac{v_{2016}}{v_{2011}} \right)^{1/5} - 1 \right)$ is the (geometric) average growth of sector s (in %) between 2011 en 2016.

D.5 Liège port complex

D.5.1 Value added

Table D.13: Value added in Liege (mio eur)

	2011	2012	2013	2014	2015	2016	$\sigma_{2016,s}$	$\alpha_{2016,s}$	$\bar{\alpha}_s$
Cargo handling	14.9	14.4	14.5	13.1	14.2	15.2	1.3	7.0	0.4
Shipping agents and forwarders	11.5	8.7	4.0	3.6	3.7	4.3	0.4	16.7	-18.0
Shipping companies	3.7	4.0	3.0	3.6	4.2	3.9	0.3	-7.2	0.6
Port authority	2.5	2.6	2.7	2.6	2.6	2.6	0.2	1.3	0.5
Shipbuilding and repair	0.5	0.5	0.6	0.6	0.5	0.6	0.1	30.2	3.2
Maritime	33.2	30.2	24.7	23.5	25.1	26.6	2.3	5.9	-4.3
Energy	496.7	388.0	382.6	324.7	252.1	326.6	28.1	29.6	-8.0
Metalworking industry	383.8	338.5	333.5	274.6	275.0	278.9	24.0	1.4	-6.2
Chemicals	121.1	99.4	118.7	143.1	132.4	149.4	12.8	12.8	4.3
Construction	152.8	136.3	137.5	175.8	143.5	133.8	11.5	-6.7	-2.6
Fuel production	42.4	34.6	59.7	39.2	40.4	69.6	6.0	72.4	10.4
Other industries	69.6	57.5	59.6	61.3	63.9	65.1	5.6	1.9	-1.3
Trade	92.0	87.5	67.4	66.0	60.0	61.4	5.3	2.3	-7.8
Other logistic services	11.2	11.6	11.8	19.4	27.1	27.2	2.3	0.3	19.3
Food industry	20.5	23.1	29.4	26.9	28.4	15.4	1.3	-45.6	-5.5
Electronics	5.5	4.6	3.3	4.2	6.1	4.8	0.4	-21.4	-2.6
Road transport	7.5	6.5	5.7	5.3	4.3	3.9	0.3	-9.1	-12.4
Other land transport	1.0	0.9	1.0	1.1	0.6	0.6	0.1	7.4	-8.6
Car manufacturing	0.4	0.4	0.4	0.4	0.3	0.4	0.0	19.3	-2.9
Non-maritime	1 404.5	1 189.0	1 210.4	1 142.0	1 034.0	1 137.1	97.7	10.0	-4.1
Direct	1 437.6	1 219.2	1 235.1	1 165.5	1 059.1	1 163.7	100.0	9.9	-4.1
Indirect	1 417.1	1 216.5	1 289.5	1 122.9	1 054.3	1 164.5			
Total	2 854.7	2 435.7	2 524.6	2 288.4	2 113.4	2 328.2			

Source: NBB.

Where $\sigma_{2016,s} = 100 \times \frac{v_{2016,s}}{v_{2016,Direct}}$ is the share of sector s (in %) in 2016, $\alpha_{2016,s} = 100 \times \frac{v_{2016} - v_{2015}}{v_{2015}}$ is the growth of sector s (in %) between 2015 en 2016, $\bar{\alpha}_s = 100 \times \left(\left(\frac{v_{2016}}{v_{2011}} \right)^{1/5} - 1 \right)$ is the (geometric) average growth of sector s (in %) between 2011 en 2016.

D.5.2 Employment

Table D.14: Employment in Liege (fte)

	2011	2012	2013	2014	2015	2016	$\sigma_{2016,s}$	$\alpha_{2016,s}$	$\bar{\alpha}_s$
Cargo handling	183	166	153	153	157	174	2.2	10.6	-1.1
Shipping companies	55	54	51	52	54	55	0.7	2.1	-0.1
Shipping agents and forwarders	94	94	56	47	43	45	0.6	4.2	-13.8
Port authority	36	38	36	35	34	35	0.5	2.9	-0.6
Shipbuilding and repair	10	9	9	9	9	10	0.1	16.7	-0.1
Maritime	378	361	305	296	296	318	4.1	7.5	-3.4
Metalworking industry	4 462	4 327	3 718	2 783	2 440	2 307	29.8	-5.4	-12.4
Energy	1 192	1 215	1 246	1 293	1 293	1 251	16.1	-3.3	1.0
Chemicals	1 102	1 090	1 020	996	1 011	1 036	13.4	2.5	-1.2
Construction	1 049	1 075	1 058	1 017	1 038	1 026	13.2	-1.2	-0.4
Other industries	737	739	737	729	716	688	8.9	-3.9	-1.4
Trade	387	387	386	395	401	379	4.9	-5.6	-0.5
Other logistic services	138	123	175	345	359	366	4.7	2.1	21.5
Fuel production	124	122	122	125	125	125	1.6	0.1	0.3
Food industry	94	98	99	111	154	101	1.3	-34.8	1.5
Electronics	69	73	68	71	74	73	0.9	-0.5	1.2
Road transport	140	130	115	105	91	66	0.9	-27.2	-14.0
Other land transport	16	14	15	17	9	10	0.1	6.2	-9.2
Car manufacturing	11	10	9	9	7	8	0.1	13.0	-6.8
Non-maritime	9 521	9 403	8 770	7 996	7 718	7 435	95.9	-3.7	-4.8
Direct	9 899	9 763	9 076	8 292	8 014	7 753	100.0	-3.3	-4.8
Indirect	14 223	14 087	13 189	11 269	11 252	10 902			
Total	24 123	23 850	22 265	19 561	19 266	18 655			

Source: NBB.

Where $\sigma_{2016,s} = 100 \times \frac{v_{2016,s}}{v_{2016,Direct}}$ is the share of sector s (in %) in 2016, $\alpha_{2016,s} = 100 \times \frac{v_{2016} - v_{2015}}{v_{2015}}$ is the growth of sector s (in %) between 2015 en 2016, $\bar{\alpha}_s = 100 \times \left(\left(\frac{v_{2016}}{v_{2011}} \right)^{1/5} - 1 \right)$ is the (geometric) average growth of sector s (in %) between 2011 en 2016.

D.5.3 Investment

Table D.15: Investment in Liege (mio eur)

	2011	2012	2013	2014	2015	2016	$\sigma_{2016,s}$	$\alpha_{2016,s}$	$\bar{\alpha}_s$
Cargo handling	3.0	2.4	3.4	2.6	3.0	6.9	3.6	132.6	18.2
Shipping agents and forwarders	1.0	1.0	0.2	2.1	0.6	0.8	0.4	38.6	-4.1
Shipping companies	0.7	0.5	0.4	0.2	0.2	0.4	0.2	121.3	-7.8
Port authority	0.2	3.0	0.0	0.3	0.8	0.1	0.0	-91.0	-20.4
Shipbuilding and repair	0.0	0.0	0.0	0.0	0.0	0.0	0.0	614.2	5.4
Maritime	5.0	7.0	4.0	5.2	4.6	8.4	4.3	79.8	10.8
Energy	82.0	82.3	88.9	79.8	93.4	66.4	34.0	-28.8	-4.1
Metalworking industry	40.6	68.3	40.1	30.5	27.9	35.2	18.0	26.0	-2.8
Chemicals	21.4	26.6	21.6	18.4	31.4	31.8	16.2	1.2	8.2
Construction	22.3	17.8	31.2	30.5	15.7	16.0	8.2	2.3	-6.4
Other industries	10.5	14.8	14.5	14.5	13.6	13.2	6.8	-2.9	4.8
Fuel production	6.4	7.6	5.9	7.2	7.2	7.7	4.0	6.9	3.8
Trade	5.7	4.5	2.7	6.7	7.0	5.9	3.0	-15.4	0.5
Food industry	1.6	1.7	1.9	1.9	4.2	4.2	2.2	1.4	22.1
Other logistic services	2.3	7.7	1.9	1.9	4.3	3.6	1.8	-18.0	8.9
Electronics	0.7	2.4	0.5	0.6	0.7	1.6	0.8	144.2	20.0
Road transport	1.8	0.5	1.2	0.5	1.7	1.0	0.5	-40.3	-10.1
Other land transport	0.8	0.5	0.9	0.7	0.3	0.3	0.2	0.9	-17.0
Car manufacturing	0.0	0.0	0.1	0.0	0.0	0.0	0.0	-75.7	-18.2
Non-maritime	196.0	234.8	211.3	193.2	207.5	187.1			
Direct	201.0	241.8	215.3	198.4	212.1	195.4			

Source: NBB.

Where $\sigma_{2016,s} = 100 \times \frac{v_{2016,s}}{v_{2016,Direct}}$ is the share of sector s (in %) in 2016, $\alpha_{2016,s} = 100 \times \frac{v_{2016} - v_{2015}}{v_{2015}}$ is the growth of sector s (in %) between 2015 en 2016, $\bar{\alpha}_s = 100 \times \left(\left(\frac{v_{2016}}{v_{2011}} \right)^{1/5} - 1 \right)$ is the (geometric) average growth of sector s (in %) between 2011 en 2016.

D.6 Port of Brussels

D.6.1 Value added

Table D.16: Value added in Brussels (mio eur)

	2011	2012	2013	2014	2015	2016	$\sigma_{2016,s}$	$\alpha_{2016,s}$	$\bar{\alpha}_s$
Shipping agents and forwarders	35.4	16.6	14.6	13.2	12.4	11.2	1.5	-9.0	-20.5
Cargo handling	7.6	6.8	5.8	6.4	6.3	6.5	0.9	4.5	-2.9
Port authority	1.9	-0.9	3.1	-1.9	6.0	4.7	0.6	-21.4	19.5
Port trade	0.5	0.0	0.0	0.0	0.1	0.1	0.0	56.0	
Shipbuilding and repair	0.0	0.0	0.0	0.1	0.1	0.1	0.0	-34.7	
Public Sector	0.2	0.2	0.2	0.2	0.1	0.1	0.0	-39.4	-19.6
Shipping companies	1.3	1.5	1.5	1.0	-2.5	-0.2	-0.0	-93.2	
Maritime	46.8	24.2	25.3	19.0	22.3	22.5	3.1	0.9	-13.6
Other logistic services	167.3	158.1	186.8	187.6	441.4	394.2	54.2	-10.7	18.7
Trade	175.7	217.5	158.0	173.7	196.2	178.5	24.6	-9.0	0.3
Other industries	51.9	59.4	56.3	45.3	47.8	59.5	8.2	24.5	2.8
Construction	30.9	34.8	16.0	15.6	14.3	19.2	2.6	34.1	-9.1
Chemicals	5.6	9.8	8.5	4.9	9.2	14.9	2.0	61.3	21.4
Road transport	23.7	21.6	17.1	18.2	18.1	14.6	2.0	-19.3	-9.2
Food industry	16.9	14.8	13.8	14.8	12.9	13.0	1.8	0.2	-5.1
Metalworking industry	5.8	6.3	7.3	8.1	7.8	9.6	1.3	24.0	10.6
Energy	1.3	1.5	1.1	0.7	1.6	0.8	0.1	-47.7	-8.3
Other land transport	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.9	-19.2
Electronics	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Inf	
Non-maritime	479.3	524.1	465.1	468.9	749.5	704.5	96.9	-6.0	8.0
Direct	526.1	548.3	490.4	487.9	771.9	727.0	100.0	-5.8	6.7
Indirect	379.0	389.1	343.9	332.1	464.4	470.9			
Total	905.2	937.4	834.3	820.0	1 236.2	1 198.0			

Source: NBB.

Where $\sigma_{2016,s} = 100 \times \frac{v_{2016,s}}{v_{2016,Direct}}$ is the share of sector s (in %) in 2016, $\alpha_{2016,s} = 100 \times \frac{v_{2016} - v_{2015}}{v_{2015}}$ is the growth of sector s (in %) between 2015 en 2016, $\bar{\alpha}_s = 100 \times \left(\left(\frac{v_{2016}}{v_{2011}} \right)^{1/5} - 1 \right)$ is the (geometric) average growth of sector s (in %) between 2011 en 2016.

D.6.2 Employment

Table D.17: Employment in Brussels (fte)

	2011	2012	2013	2014	2015	2016	$\sigma_{2016,s}$	$\alpha_{2016,s}$	$\bar{\alpha}_s$
Shipping agents and forwarders	253	187	192	167	174	138	3.4	-20.2	-11.3
Port authority	132	127	123	122	125	123	3.0	-1.2	-1.3
Cargo handling	94	96	93	99	87	81	2.0	-6.4	-2.8
Shipping companies	5	16	15	14	15	18	0.4	23.8	29.5
Port trade	6	0	0	0	1	1	0.0	0.0	
Public Sector	3	3	3	3	2	1	0.0	-50.0	-19.7
Shipbuilding and repair	0	0	0	0	0	0	0.0		
Maritime	492	429	426	405	403	363	9.0	-9.8	-5.9
Trade	1 279	1 381	1 359	1 369	1 399	1 295	31.9	-7.4	0.3
Other logistic services	1 076	1 218	1 191	1 212	1 186	1 212	29.9	2.2	2.4
Other industries	314	324	328	343	347	367	9.0	5.6	3.1
Road transport	367	350	280	286	305	242	6.0	-20.6	-8.0
Construction	507	549	263	247	239	240	5.9	0.5	-13.9
Food industry	148	148	150	140	128	122	3.0	-4.6	-3.8
Metalworking industry	71	87	86	89	87	106	2.6	21.4	8.4
Chemicals	40	70	74	69	79	91	2.3	16.3	17.9
Energy	15	22	20	20	16	15	0.4	-6.7	0.1
Other land transport	3	3	2	1	1	1	0.0	-0.2	-19.8
Electronics	0	0	0	0	0	0	0.0		
Non-maritime	3 821	4 151	3 754	3 777	3 786	3 690	91.0	-2.5	-0.7
Direct	4 313	4 580	4 181	4 182	4 189	4 054	100.0	-3.2	-1.2
Indirect	3 967	4 222	3 840	3 710	3 825	3 759			
Total	8 280	8 802	8 021	7 892	8 014	7 812			

Source: NBB.

Where $\sigma_{2016,s} = 100 \times \frac{v_{2016,s}}{v_{2016,Direct}}$ is the share of sector s (in %) in 2016, $\alpha_{2016,s} = 100 \times \frac{v_{2016} - v_{2015}}{v_{2015}}$ is the growth of sector s (in %) between 2015 en 2016, $\bar{\alpha}_s = 100 \times \left(\left(\frac{v_{2016}}{v_{2011}} \right)^{1/5} - 1 \right)$ is the (geometric) average growth of sector s (in %) between 2011 en 2016.

D.6.3 Investment

Table D.18: Investment in Brussels (mio eur)

	2011	2012	2013	2014	2015	2016	$\sigma_{2016,s}$	$\alpha_{2016,s}$	$\bar{\alpha}_s$
Port authority	5.3	4.6	10.7	5.4	7.5	9.0	13.9	19.4	11.4
Cargo handling	0.9	1.1	0.5	1.6	3.3	1.3	2.0	-60.4	7.2
Shipping agents and forwarders	7.7	7.0	13.1	0.6	5.2	0.6	0.9	-89.3	-40.9
Shipping companies	0.0	0.8	0.0	0.0	0.0	0.0	0.0	-33.3	Inf
Port trade	0.0	0.0	0.0	0.0	0.1	0.0	0.0	-82.1	
Public Sector	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Shipbuilding and repair	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-100.0	
Maritime	13.9	13.4	24.4	7.6	16.2	10.9	16.9	-32.5	-4.7
Trade	9.7	10.1	14.6	13.5	15.6	19.5	30.2	25.4	15.1
Other industries	1.2	2.3	1.0	3.4	1.5	13.0	20.1	778.4	60.4
Other logistic services	15.8	17.2	20.5	19.4	17.6	11.7	18.1	-33.4	-5.8
Food industry	2.4	1.2	1.8	1.3	2.3	4.5	6.9	97.2	13.3
Construction	2.9	2.9	2.7	2.2	1.9	1.8	2.7	-6.1	-9.5
Road transport	4.4	2.1	2.3	3.5	2.7	1.7	2.7	-35.7	-17.1
Metalworking industry	1.1	1.9	0.7	1.4	1.4	1.1	1.6	-24.9	-0.3
Chemicals	0.5	0.8	0.4	0.4	0.4	0.5	0.8	20.8	-2.1
Other land transport	0.1	0.1	0.1	0.0	0.0	0.0	0.0	-5.2	-26.7
Electronics	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Energy	0.0	0.1	0.0	0.1	0.3	0.0	0.0	-100.0	
Non-maritime	38.2	38.6	44.2	45.4	43.6	53.8			
Direct	52.1	52.0	68.5	53.0	59.7	64.7			

Source: NBB.

Where $\sigma_{2016,s} = 100 \times \frac{v_{2016,s}}{v_{2016,Direct}}$ is the share of sector s (in %) in 2016, $\alpha_{2016,s} = 100 \times \frac{v_{2016} - v_{2015}}{v_{2015}}$ is the growth of sector s (in %) between 2015 en 2016, $\bar{\alpha}_s = 100 \times \left(\left(\frac{v_{2016}}{v_{2011}} \right)^{1/5} - 1 \right)$ is the (geometric) average growth of sector s (in %) between 2011 en 2016.

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