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Market Functioning in Belgium

Horizontal Screening of the Sectors

Price Observatory
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1 Introduction

When the markets function efficiently, business companies may have greater incentives to innovate and to reduce their long-term production costs. Consumers may benefit from it through a reduction in the prices or an improvement in the quality of the products and services the business firms offer. This can lead to a more effective allocation of companies' resources, which makes the economy more competitive.

The horizontal screening of sectors analyses different market dimensions such as market concentration, international openness and profit margins in order to detect market failures in Belgian sectors. It thus represents a first stage in the analysis and understanding of the functioning of the goods and services markets in Belgium. This report sets out the results of this approach.

Yet, this horizontal approach is not entirely sufficient, especially, when the particularities of different sectors should be taken into account. That is why, following the results of the screening and the information obtained from other sources[1], the Price Observatory carries out in-depth analyses of some specific economic sectors such as sugar manufacture and the operation of cinemas. The screening results can also be used by other institutions, such as those responsible for regulation and competition in Belgian markets.

The Price Observatory performs this screening impartially and objectively as it is independent of the institutions that supervise and regulate the markets. As a member of National Accounts Institute (NAI) , it has access to the most detailed companies data which are used with due regard to confidentiality.

The aim of this report is to present the results of the 2016 screening version (2010-2014 data). The detailed methodology is explained in the previous reports (2014 and 2015 screenings)[2]. Section 2 presents the methodology and the data sources used in this horizontal screening of sectors. Section 3 provides the results for the industries and service sectors. Section 4 covers the profitability and its evolution in the different sectors.

This screening report was written by Lidia Tsyganok, Erwin Van Hirtum, Lucas Mariën and Jean-Yves Jaucot.

[1] In particular the differences in consumer price changes between Belgium and its neighbouring countries, the attention points of international organisations, such as the European Commission and the OCDE, as well as contextual information.

[2] 2014 Screening; 2015 Screening.

Five advantages of the screening

1) **Very detailed segmentation of the different markets in the Belgian economy**. The screening analyses the sectors by defining them according to the most detailed NACE classification possible.

2) **Full and most reliable companies data** is used. The screening indicators are calculated by combining together information from several official data sources.

3) **The interconnections between groups of business companies** are taken into account. In a globalised world, several companies may have the same owner or belong to the same group. This aspect of (multinational) entreprise groups is taken into account in the screening.

4) **The Price Cost Margin indicator** is calculated to reflect in the best possible way the reality of the sector. It is based on the data from the Structural Business Survey, taking into consideration as many firms as possible in each sector (including SMEs).

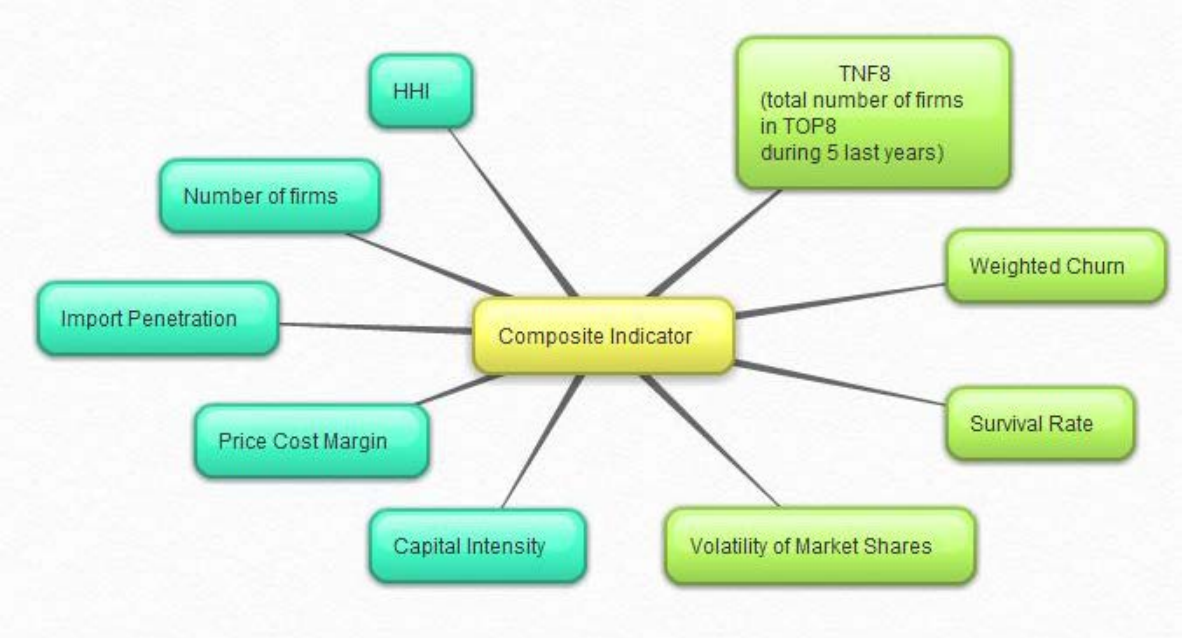
5) **The different market functioning indicators are calculated for several years.** Thus, their evolution over time can also be analysed.

Horizontal screening analyses 623 sectors (including 386 service sectors) which generate 813 billion EUR in the Belgian market and uses data from 590,088 business companies.

2 Methodology

2.1 Approach

The objective is to screen "horizontally" all the market sectors in the Belgian economy[3] in order to detect market failures in the sectors and to identify those that could be subject of a more detailed market functioning analysis. The main tool used in this screening exercise is a composite indicator that summarises the information on several aspects of the market functioning. Its aim is to provide an overview of the market performance of the different sectors so that they can be compared with each other. As in the previous screening exercises, the composite indicator was created from nine market indicators, which can be classified into two groups: five indicators of market structure and four indicators of market dynamics[4].



The indicators of market structure include **the Herfindahl-Hirshman Index (HHI)**, calculated as the sum of squares of the market shares of all the firms in a sector. This indicator measures the concentration of businesses in the market, as does the indicator of the **number of firms**. The **capital intensity**, that is the capital stock required to enter and to produce the goods and the services on the market, is another indicator of market structure, alongside with the **Price Cost Margin (PCM)** that measures the margin generated by the companies' operational activities. The last indicator of market structure is **import penetration** which is measured as the ratio between the value of the products imported by this sector and the apparent consumption value of all the products in this sector in Belgium. Currently, this indicator is only available for the industries.

The indicators of market dynamics include **the weighted churn rate**, which measures the importance of firms leaving or entering the market in terms of market shares, **the survival rate**, which measures the persistence of the same companies in the same market over several consecutive years, **the turnover rate**

[3] In this text, the term "sector" is used as a synonym of the term "branch of activity" used in the National Accounts and it is thus different from the term "institutional sector" from the National Accounts. The terms "market sectors" and "branches of market activity" are thus used and considered as synonyms in the text below.

[4] For more details on the different indicators, see Annex 1 and 2014 Screening.

of the firms in the top eight in terms of turnover during the last five years (TNF8 for Total Number of Different Firms Index), and **the volatility of the market shares** of all the firms from one year to another.

These nine indicators of market functioning are normalised and aggregated into one composite indicator. Normalisation makes it possible to compare these variables having very different measurement scales. The "min-max"[5] method is chosen for this normalisation step, since it does not affect the ranking and the relative distances of the indicators' original values. After normalisation, the values of each indicator are rescaled to be between 0 and 1, where a value close to 1 indicates a higher risk of market failure.

The normalised indicators are then aggregated into a composite indicator. Three methods are used: the simple mean, the geometric mean and the Benefit of the Doubt (BoD) method[6]. Although the first method is easy to understand and to interpret, it has a number of disadvantages. Firstly, the same weights are given to each available indicator, without considering its relative importance or its potential interactions with the other indicators. Secondly, an extreme value may have a considerable impact on the final score, as the marginal rate of substitution between the indicators is one, which means that if an indicator decreases by one unit and another increases by one unit, the final score for the composite indicator remains unchanged. The geometric mean allows to take into account this issue, although the weighting remains the same for all sectors and all indicators. In the Benefit of the Doubt method, the weighting of the different indicators is determined endogenously and generally differs from one sector to another.

In the analysis, all the market sectors of the Belgian economy were divided into two main groups: industrial sectors and service sectors. This segmentation is crucial in the indicators normalisation stage (where the minimum and maximum values of an indicator are those of the industries for a given industrial sector and those of the services when normalising a service sector) and in the aggregation stage using the Benefit of the Doubt method (where the issue of "benchmarks" or "reference sectors" to which a sector's performance is compared is also very important). The sectors division into two main groups - industrial sectors and service sectors –is primarily due to the availability of data for the import penetration indicator and to previous screenings performed by the Price Observatory and by other institutions[7].

[5] According to this method, the indicators are normalised using the following formula:

$$Y_{ni} = \frac{Y_i - Y_{min}}{Y_{max} - Y_{min}}$$

where Y_{ni} is the indicator Y normalised for the sector i, Y_i is the original value of the indicator for the sector i, Y_{min} the minimum effective value of the indicator Y and Y_{max} the maximum effective value of the indicator Y. For indicators for which a value close to 0 indicates a potential risk of market failure, the normalised value is equal to ($1-Y_n$). For indicators of the number of firms, capital intensity and weighted churn rate, the values are log-transformed before being normalised using the min-max method. This is done since these indicators have a very concentrated distribution with a number of extreme values that may affect normalisation. In addition, a non-linear normalisation is more relevant for some indicators from an economic point of view. For example, for the number of firms, the indicator should lose more points (the increase in competition and market functioning is higher) when moving from 1 to 50 firms than from 3,000 to 3,500 firms.

[6] Cherchye, L., Moesen, W., Rogge, N., Van Puyenbroeck, T. (2007), "An Introduction to 'Benefit of the Doubt' Composite Indicators", *Social Indicators Research*, Vol. 82, No.1, pp. 111-145.

[7] For example, European Commission (2007) "Implementing the new methodology for product market and sector monitoring: results of a first sector screening", SEC(2007) 1517 (Brussels, Commission of the European Communities) and European Commission (2007) "Guiding principles for product market and sector monitoring", European Economy, Occasional Papers 34, June.

The final ranking of the composite indicator compares very heterogeneous sectors with each other. For the interpretation of the results, the sectors were grouped together within broad categories, such as, for instance, food industries, chemical industries or network services.

The screening results depend on the underlying hypotheses defined above, in particular the aggregation of indicators within the composite indicator. For this reason, not only is each component of the composite indicator is specifically analysed, but each modelling hypothesis also undergoes a sensitivity analysis.

To take into account the sectors' economic importance, the final ranking of the composite indicator is analysed in parallel with their turnover in the Belgian market. Furthermore, in the future the emphasis could be on the evolution of the indicators over time and - as far as it is possible - on comparing them with international reference values (*benchmark*).

2.2 Statistical data sources

To calculate the indicators, the Price Observatory uses the following statistical sources with annual data broken down to firms or product level:

1. The business register, managed by DG Statistique - Statistics Belgium.
2. The annual accounts of firms, from the Central Balance Sheet Office of the NBB.
3. The VAT-based turnover from DG Statistique - Statistics Belgium.
4. Import and export data from the NBB[8].
5. The structural business survey from DG Statistique - Statistics Belgium.

A unique NACE[9] code is assigned to each company[10] in the DG Statistique - Statistics Belgium business register. This code determines the sector of activity to which the company belongs. The analysis is carried out at the most detailed level available, that is at NACE 5 level for the sectors where such a sub-division exists and at NACE 4 level for the other sectors[11]. It is important to note that the definition of NACE sectors does not systematically correspond to that of the relevant markets where the competition really takes place.

“Domestic turnover” is an important variable in the screening. Five out of the nine indicators are based exclusively on this variable (the HHI, the weighted churn, the volatility of the market shares, the TNF8 and the survival rate). The indicator of the number of firms is directly derived from this variable. It also plays a role in the calculation of the import penetration. This variable represents the annual turnover per firm in the domestic market. For a certain year, it is calculated as the difference between the company's total turnover and the total value of the goods it exports.

The company’s total turnover reflects its total annual turnover and is calculated from one of the following two sources, listed and selected in order of data reliability and availability:

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[8] At the moment, this is only data on the import and export of goods. The possibility of adding data on the import and export of services is currently being studied.

[9] NACE is the classification of economic activities in Europe. As in other European countries, the Belgian version (NACE-BEL) includes a more detailed division (up to five digits). The firm's unique NACE code is determined by the activity that creates the majority of its added value.

[10] The terms “firm” and “company” means here the legal entity.

[11] The terms “sector” and “branch of activity” are used for this more detailed level. The term “NACE division” is used for the two-digit NACE level.

- the turnover according to section 70 of the company's annual accounts[12].
- the annual turnover according to VAT.

The value of exported goods per firm is computed from the micro-data of the exports issued by the NBB.

This calculation method gives the most reliable annual turnover possible per firm for as many firms as possible.

All the indicators are calculated from five-year data from 2010 to 2014 inclusive[13], with the data for the most recent year (2014) used in the analysis below[14].

The firms are grouped together according to the data on enterprise groupings in the EuroGroups Register, a Eurostat project. This register makes it possible to group together and consider as an individual business those businesses that belong to the same business group within a certain branch of activity.

In principle, the indicators are calculated exclusively for market activities. To define the branches of market activity in the Belgian economy, this study uses the NACE code assigned to each firm depending on the branch of activity to which it belongs, as well as the institutional sector code assigned by the NAI[15].

In the national accounts a distinction must be made between market output and non-market output[16]. Market output includes goods and services provided at economically significant prices or exchanged in a similar way. In theory, market output is produced by market producers, which can be divided into three categories: non-financial companies (sector code S.11), financial institutions (S.12) and households (S.14). Non-market output includes goods and services provided free of charge or at a price that is not economically significant. They are produced only by non-market producers, comprising the State (S.13) or non-profit institutions for households (S.15).

The branches of activity that generate (almost) exclusively non-market output are excluded. These are, for instance, NACE divisions 84 “Public administration” and 85 “Education”, as well as sectors 4910 “Passenger rail transport, interurban” and 4931 “Urban and suburban passenger land transport”.

Furthermore, despite a primarily market output, a number of other branches of activity are excluded from the analysis because their specific characteristics make them difficult to compare with the other sectors. This is the case for NACE sectors 01 to 09 “Agricultural, forestry, fishing” and 86 “Human health activities”. Likewise, sectors 3211 “Striking of coins”, 3512 and 3513 “Transmission and distribution of electricity”, 3522 “Distribution of gaseous fuels through mains”, 36 “Water collection, treatment and supply”, 37 “Sewerage” and 92 “Gambling and betting activities” are not included due to the specific nature of their regulatory framework. This obviously does not exclude studying the functioning of these markets.

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[12] According to the Minimum Standard Chart of Accounts (MSCA).

[13] The previous years are not taken into consideration due to the complexity of integrating data on companies groupings. The method for calculating indicators requires exhaustive data, which was not yet sufficiently available for 2015 at the time of writing (October 2016).

[14] This means that five values were calculated for each static indicator and for each sector. With regard to the indicators of weighted churn and the market shares volatility, four values were calculated (from 2011 to 2014 inclusive, each time in comparison with the previous year). The survival rate and the TNF8 are given a r value per sector based on five-year data.

[15] Since 1st September 2014, the national accounts of EU Member States must be prepared in accordance with the new version of the European system of national accounts, i.e. ESA 2010 (see Regulation 549/2013 on the European system of national and regional accounts in the European Union).

[16] For the sake of simplicity, a third type of output, i.e. output for own final use, is disregarded.

NACE divisions 87 “Residential care activities”, 88 “Social work activities without accommodation”, 90 “Creative, arts and entertainment activities”, 91 “Libraries, archives, museums and other cultural activities”, 93 “Sports activities and amusement and recreation activities” and 94 “Activities of membership organisations” were not included in the previous screenings. It is often difficult to clearly distinguish the market and non-market activities of these branches. This is why, as a rule, this screening takes into account sectors whose market activity represented at least 80% of turnover at NACE 4/5 level in 2014 and whose turnover was at least 25 million EUR. Using this criterion, 39 sectors out of a total of 94 in the above-mentioned divisions were included. This screening embraces 8, 3, 10, 1, 13 and 4 sectors respectively from these divisions.

Although the functioning of these sectors deserves special attention, all branches of activity in the financial sector are excluded due to their specific nature and the fact that the data from the main financial companies cannot be consulted and processed in the usual ways as they use specific models for their annual accounts. Therefore, all the sectors of the following NACE divisions were also excluded : 64 “Financial service activities, except insurance and pension funding”, 65 “Insurance, reinsurance and pension funding, except compulsory social security” and 66 “Activities auxiliary to financial services and insurance activities”.

Furthermore, some 134 firms were excluded from the analysis as their activity is not part of the Belgian economy. These are, on the one hand, all the firms of NACE division 99 “Activities of extraterritorial organisations and bodies” and, on the other hand, all the firms in the institutional sector S.2 “Rest of the world”, belonging mainly to the market sector.

The vast majority of the remaining sectors produce solely market output. In a small number of sectors, some of the non-market output is produced by firms from the public authorities or non-profit sector, i.e. sectors S.13 or S.15. The proportion of this non-market output is limited[17]. All these sectors are retained in their entirety, including the non-market output.

After excluding these sectors, 780 sectors remain for 2014, representing a total turnover of 834.1 billion EUR and 643,069 firms.

A series of additional sectors was excluded to guarantee the reliability and the representativeness of the indicators. The approach and the criteria used are identical to the previous screening. The technical details are described in the appendix 2 on data cleansing. Finally, a total of 623 sectors remain after the data cleansing, i.e. 350 NACE 4 sectors and 273 NACE 5 sectors, representing 590,988 companies and 812.7 billion EUR, i.e. 97.4% of the initial total of 834.1 billion EUR.

Two sectors have only one or two firms, namely, NACE 1395 and NACE 38221. These sectors appear in some parts of this study. For the confidentiality reasons, no data is provided for these sectors, while for a number of other sectors, the data on domestic turnover can not be provided (but an interval allowing to have an idea on the importance of the sector is yet indicated).

[17] In total, seven sectors have a proportion of over 20%, i.e. sectors 24460 “Processing of nuclear fuel” (50.4% in 2014), 38110 “Collection of non-hazardous waste” (27.1%), 38219 “Other treatment and disposal of non-hazardous waste” (28.9%), 3822 “Treatment and disposal of hazardous waste” (34.1%), 39 “Remediation and other waste management services” (20.9%), 6020 “Television programming and broadcasting activities” (50.2%) and 63110 “Data processing, hosting and related activities” (23.4%).[18] Contrary to the previous screening, the sector 1041 “Manufacture of oils and fats” and the sector 38222 “Treatment and disposal of hazardous waste” are no longer in the TOP 30 (they are ranked on 50th and 37th position). However, these two sectors represented more than 2 billion EUR.

3 Results

This section presents the results of the analyses of the 237 industrial sectors and 386 service sectors. The values of the indicators are available for all sectors (except when there are too few firms and data confidentiality cannot be guaranteed) in the appendix to this report.

The results presented primarily cover the 30 industrial sectors and the 50 service sectors (referred to below as TOP 30 and TOP 50 respectively) with the highest composite indicator and, therefore, a higher risk of market failure.

The approach chosen for the aggregation of the composite indicator is that of the simple mean; the other approaches (geometric mean and the BoD method) produce similar results.

Furthermore, the sectors that do not emerge from the analysis of the composite indicator, but are highlighted by one or more individual indicators, are also subject to particular attention in the analysis below, as a sector's score for the composite indicator can be reduced by good performances in one or more indicators and can therefore hide certain failures.

3.1 Industrial sectors

A segmentation was established based on the ranking of the 30 industrial sectors with the worst performance according to the composite indicator (TOP 30). The aim of the segmentation was to group relatively comparable sectors together and improve the clarity of the results interpretation. This segmentation depends on the sectors ranking and therefore vary from one screening exercise to another.

The analysed industrial sectors are classified in the following groups:

- the network industries (NACE 35 to 39), with six sectors in the TOP 30;
- the food and beverages industries (NACE 10 and 11), with five sectors;
- the manufacture of metals, metal products and other mineral products (NACE 23 to 25), with 12 sectors;
- the other manufacturing industries (grouping the industrial NACE divisions that are not included in one of the previous categories), with seven sectors.

It is important to note that the number of sectors varies significantly from one segment to another; for example, the network industries are composed of a total of 19 sectors, while the food and beverages industries comprise 35 sectors. Furthermore, the different sectors can be very varied in terms of economic importance, so, for example, the five food industry sectors have a higher turnover than the six network industry sectors included in this TOP. It would therefore be wrong to draw conclusions on an area of activity according to the absolute number of sectors in the TOP 30.

These 30 sectors represent 4.7% of the total domestic turnover of all industrial sectors. There are ten new sectors in the TOP 30 compared with the previous screening. These ten new sectors have a total domestic turnover of 1.5 billion EUR. The ten sectors they replaced in the classification represented 3.1 billion EUR[18].

[18] Contrary to the previous screening, the sector 1041 “Manufacture of oils and fats” and the sector 38222 “Treatment and disposal of hazardous waste” are no longer in the TOP 30 (they are ranked on 50th and 37th position). However, these two sectors represented more than 2 billion EUR.

The different categories mentioned above are covered in more detail in the sub-sections below[19].

3.1.1 Network industries

The network industries (NACE 35 to 39) have six sectors in the TOP 30 of industrial sectors according to the composite indicator (see table 1). They represent just 1% of the total domestic turnover of all the network industries.

Four sectors are involved in the treatment and disposal of waste (NACE 38), including 38212 "Physico-chemical treatment of sludge and liquid waste" and 38213 "Treatment and disposal of non-hazardous waste, except sludge and liquid waste"[20]. Out of these six sectors, only 38213 and 38211 "Pre-treatment before disposal of non-hazardous waste" were not included in the TOP 30 of the 2015 screening[21].

Table 1. List of sectors included in the TOP 30 industrial sectors - Network industries

Electricity, gas, steam and air conditioning supply (NACE 35)	Waste collection, treatment and disposal activities (NACE 38)
3521 - Manufacture of gas, 3530 - Steam and air conditioning supply	38211 - Pre-treatment before disposal of non-hazardous waste, 38212 - Physico-chemical treatment of sludge and liquid waste, 38213 - Treatment and disposal of non-hazardous waste, except sludge and liquid waste, 38221 - Pre-treatment before disposal of hazardous waste

Sources: DG Statistique - Statistics Belgium, NBB, own calculations

For all these sectors, graph 1 represents each indicator's contribution to the gap between the final score for the sector and the average score for all industrial sectors. The indicators that make a positive contribution are those for which the analysed sector performs less well than the average, which helps to push the value of the composite indicator upwards. Conversely, the indicators with a negative contribution are those for which the sector performs better than the average, which reduces the risk of market failures. So, for example, sector 38213 "Treatment and disposal of non-hazardous waste, except sludge and liquid waste" has an extremely positive contribution from the import penetration indicator (to the right of the graph), with a rate close to 0. It therefore performs less well than the average with regard to this indicator (average of 0.48) and most other indicators. On the other hand, this sector performs better than the average for the HHI (0.14 compared with 0.28 on average) and the survival rate (0.65 compared with 0.71 on average) (to the left of the graph). In this graph, the sectors are classified according to their importance in terms of domestic turnover.

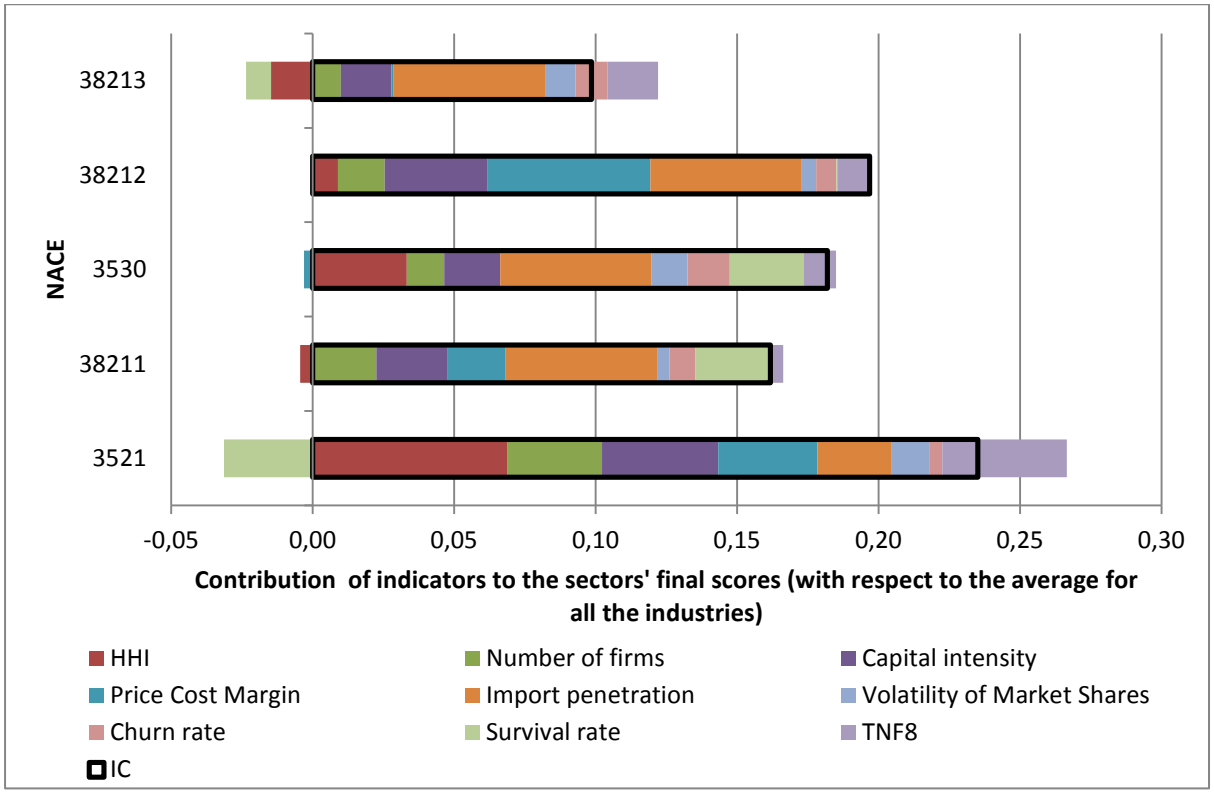
Due to the nature of their activities, these sectors are characterised by a high capital intensity and a low import penetration. They also comprise a small number of businesses (a maximum of 25 firms) and are highlighted by their high level of stability.

[19] The statistics describing the indicators for these different categories are compared in appendix 3. The results for each sector can be found in the separate Excel file.

[20] For data confidentiality reasons, the results of the sector 38221 "Pre-treatment before disposal of hazardous waste"are not published or presented in this report.

[21] 2015 Screening.

Graph 1. Contribution of individual indicators to the sectors' final score - Network industries



Note: Some sectors do not appear on this graph for confidentiality reasons

Note: The contribution of each indicator should be understood as the gap between the normalised score of each indicator in the sector and the average score of all the industrial sectors weighted by the indicator's contribution to the final score. The area in black represents the gap between the sector's composite indicator score and the average of the composite indicators for the industrial sectors. The indicators with a positive contribution are those for which the analysed sector performs less well than the average. Conversely, the indicators with a negative contribution are those for which the sector performs better than the average.

Sources: DG Statistique - Statistics Belgium, NBB, own calculations

All these sectors have a Price Cost Margin (PCM) indicator that is much higher than the average for the industrial sectors (9.7%), with the exception of 3530 "Steam and air conditioning supply" and 38213 "Treatment and disposal of non-hazardous waste, except sludge and liquid waste", whose PCM remains high but is closer to the average (10.1% and 8.4% respectively). So, for example, the sector 38212 "Physico-chemical treatment of sludge and liquid waste" has a PCM of 35%.

Despite the fact they do not have a high score of the composite indicator, some other network industries can still be relatively problematic with regard to one or several aspects of market structure or market dynamics.

For example, sectors 3523 "Trade of gas through mains" (HHI of 0.74), 3511 "Production of electricity" (0.6) and 3831 "Dismantling of wrecks" (0.58) have a high concentration but are not included in the TOP 30. The other waste treatment and disposal sectors (NACE 38) and 3514 "Trade of electricity" have a high capital intensity. Sector 3511 "Production of electricity" has a low volatility (0.02) compared with the average for industrial sectors (0.13).

3.1.2 Food and beverages industries

Three beverages production sectors (NACE 11) are part of the TOP 30 of industrial sectors (see table 2): 1103 "Manufacture of cider and other fruit wines", 1106 "Manufacture of malt" and 1107 "Manufacture of soft drinks; production of mineral waters and other bottled waters". Two sectors come from the food industry (NACE 10): 1042 "Manufacture of margarine and similar edible fats" and 1062 "Manufacture of

starches and starch products"[22]. These five sectors represent 9.7% of the domestic turnover of all food and beverages industries.

Table 2. List of sectors included in the TOP 30 industrial sectors - Food and beverages industries

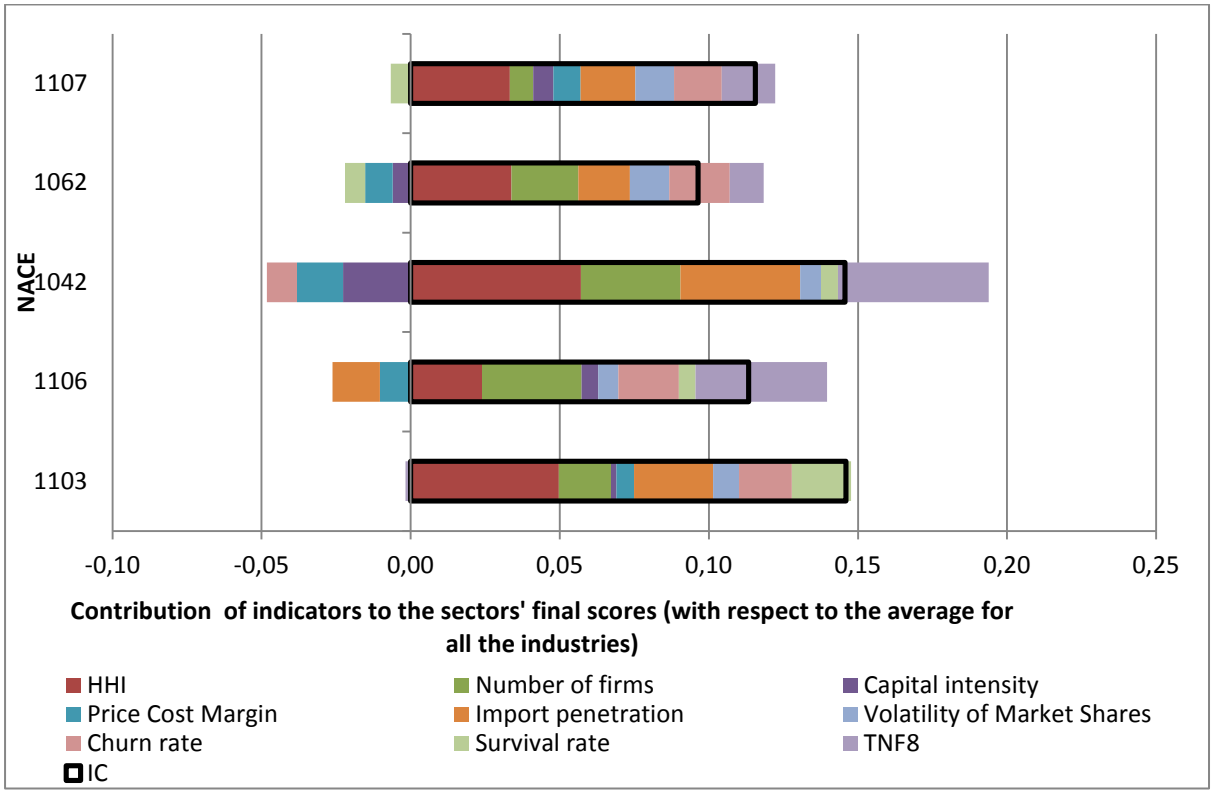
Manufacture of food products (NACE 10)	Manufacture of beverages (NACE 11)
1042 - Manufacture of margarine and similar edible fats, 1062 - Manufacture of starches and starch products	1103 - Manufacture of cider and other fruit wines, 1106 - Manufacture of malt, 1107 - Manufacture of soft drinks; production of mineral waters and other bottled waters

Sources: DG Statistique - Statistics Belgium, NBB, own calculations

Two of these five sectors (1062 and 1106) were not included in the TOP 30 industrial sectors in the 2015 screening. Yet, the sector 1062 "Manufacture of starches and starch products" was already highlighted as potentially problematic in the 2014 screening.

These five sectors are characterised by a high concentration and a small number of firms (see graph 2). The importance of the concentration should however be nuanced. For example, the main firm of the sector 1103 "Manufacture of cider and other fruit wines" produces not only cider but also non-alcoholic drinks and wine. Due to the diversification of its product range, it is thus subject to competition from soft drinks manufacturers (1107) and wine producers (1102).

Graph 2. Contribution of individual indicators to the sectors' final score - Food and drink industries



Note: The contribution of each indicator should be understood as the gap between the normalised score of each indicator in the sector and the average score of all the industrial sectors weighted by the indicator's contribution to the final score. The area in black represents the gap between the sector's composite indicator score and the average of the composite indicators for the industrial sectors. The indicators with a positive contribution are those for which the analysed sector performs less well than the average. Conversely, the indicators with a negative contribution are those for which the sector performs better than the average.
Sources: DG Statistique - Statistics Belgium, NBB, own calculations

[22] Sector 1062 also includes businesses manufacturing rice-, potato- and corn-based starch products.

The intensity of foreign competition in these sectors seems moderate (excluding 1106 “Manufacture of malt”, which has an import penetration of 0.62). The stability indicators (volatility rate and churn rate) are relatively low and also help to push their final score up.

Only two of these sectors have a PCM higher than the average for industrial sectors (9.7%). These are 1107 “Manufacture of soft drinks; production of mineral waters and other bottled waters” and 1103 “Manufacture of cider and other fruit wines”, with a PCM of 13.7% and 12.3% respectively. Conversely, the sector 1042 “Manufacture of margarine and similar edible fats” has a PCM much lower than the average (3%). With regard to capital intensity, these sectors have a value that is either lower than or very close to the average for industrial sectors (0.2).

Besides the TOP 30 sectors, other sectors of the food and beverages industries seem to be potentially problematic with regard to one or more characteristics of their market and are highlighted by one or more individual indicators. For example, the sectors 1081 “Manufacture of sugar” (HHI of 0.55), 1104 “Manufacture of other non-distilled fermented beverages”(0.91) and 1041 “Manufacture of oils and fats” (0.74) are heavily concentrated and composed of a small number of firms. With regard to the manufacture of sugar, the Price Observatory carried out an in-depth study about the market functioning of this sector[23]. This study revealed that the high level of regulation in the sector (at European Union level), particularly due to the existence of production quotas, entails a high concentration and a significant stability in this market over time. This study also confirms the sector's high profitability level compared with neighbouring countries and with the food industry as a whole. However, the liberalisation planned for the end of 2017 should have an impact on the functioning of this market.

Three sectors are highlighted by capital intensity and PCM indicator: 1105 “Manufacture of beer” (capital intensity of 0.34 and PCM of 24%), 1032 “Manufacture of fruit and vegetable juice” (capital intensity of 0.88 and PCM of 19%) and 10712 “Manufacture of bread; manufacture of fresh pastry goods and cakes” (capital intensity of 0.36 and PCM of 19%). The sector 1104 “Manufacture of other non-distilled fermented beverages” also has a high PCM (29%). The sectors 1092 “Manufacture of prepared pet foods” and 1105 “Manufacture of beer” are put forward for their market share stability, with a volatility of 0.01 and 0.02 respectively.

3.1.3 Manufacture of basic metals, metal products and other mineral products

The category of basic metals, metal products and other mineral products (NACE 23 to 25) is the most represented in the TOP 30 industrial sectors, with 12 sectors (see table 3), nine of which are involved in the manufacture of other non-metal mineral products (NACE 23) and three in the manufacture of basic metals (NACE 24). These sectors represent 18.9% of the total domestic turnover for this category (NACE 23 to 25).

With the exception of 2311 “Manufacture of flat glass”, 2452 “Casting of steel” and 2454 “Casting of other non-ferrous metals”, the other sectors were already highlighted in the previous screening.

Out of the nine NACE 23 sectors, the largest three (in terms of domestic turnover) are 2352 “Manufacture of lime and plaster”, 23321 “Manufacture of bricks” and 2365 “Manufacture of fibre cement”.

[23] Link to the Study on the manufacture of sugar.

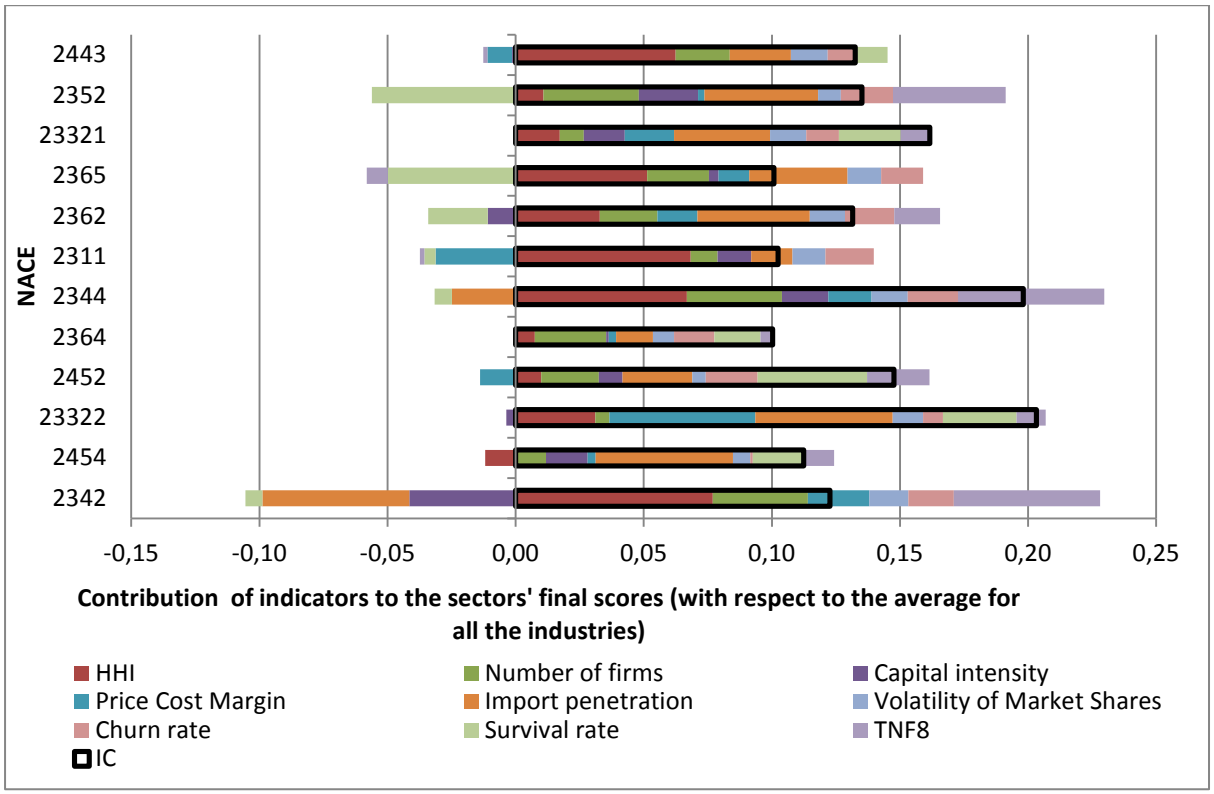
Table 3. List of sectors included in the TOP 30 industrial sectors - Manufacture of basic metals, metal products and other mineral products

Manufacture of other non-metallic mineral products (NACE 23)	Manufacture of basic metals (NACE 24)
2311 - Manufacture of flat glass, 23321 - Manufacture of bricks, 23322 - Manufacture of tiles and other construction products in baked clay, 2342 - Manufacture of ceramic sanitary fixtures, 2344 - Manufacture of other technical ceramic products, 2352 - Manufacture of lime and plaster, 2362 - Manufacture of plaster products for construction purposes, 2364 - Manufacture of mortars, 2365 - Manufacture of fibre cement	2443 - Lead, zinc and tin production, 2452 - Casting of steel, 2454 - Casting of other non-ferrous metals

Sources: DG Statistique - Statistics Belgium, NBB, own calculations

As it can be seen in graph 3, most of these sectors have a capital intensity higher than the average for industrial sectors (0.2). For example, the sector 2352 "Manufacture of lime and plaster" has a capital intensity of 0.51. On the other hand, the sectors 2362 "Manufacture of plaster products for construction purposes" and 23322 "Manufacture of bricks, tiles and construction products in baked clay" have a capital intensity lower than the average (0.07 and 0.11 respectively).

Graph 3. Contribution of individual indicators to the sectors' final score - Manufacture of basic metals, metal products and other mineral products



Note: The contribution of each indicator should be understood as the gap between the normalised score of each indicator in the sector and the average score of all the industrial sectors weighted by the indicator's contribution to the final score. The area in black represents the gap between the sector's composite indicator score and the average of the composite indicators for the industrial sectors. The indicators with a positive contribution are those for which the analysed sector performs less well than the average. Conversely, the indicators with a negative contribution are those for which the sector performs better than the average.
Sources: DG Statistique - Statistics Belgium, NBB, own calculations

These sectors are characterised by a high concentration and small number of firms. Only one of them, 23321 "Manufacture of bricks" is composed of more than 30 firms. These sectors are also very stable and most of them have a very low import penetration rate.

The PCM indicator for the sectors 23322 "Manufacture of tiles and other construction products in baked clay" (34%) and 23321 "Manufacture of bricks" (18%) is high compared with the average for industrial sectors (9.7%). However, these sectors may have high capital costs which are not included in the calculation of the PCM as used in the composite indicator[24]. Conversely, the sectors 2443 "Lead, zinc and tin production", 2452 "Casting of steel" and 2311 "Manufacture of flat glass" have a PCM much lower than the average for industrial sectors.

In addition to these TOP 30 sectors, other sectors are put forward by one or more indicators. So, the sector 2351 "Manufacture of cement" is very stable (volatility of 0.03) and has a relatively high capital intensity (0.29). The sectors 2445 "Other non-ferrous metal production" (HHI of 0.62), 2540 "Manufacture of weapons and ammunition" (HHI of 0.5) and 2444 "Copper production" (HHI of 0.47) have a high concentration.

3.1.4 Other manufacturing industries

The seven remaining TOP 30 sectors are included in this category of other manufacturing industries (see table 4). The most represented NACE divisions are the manufacture of chemicals and chemical products (NACE 20) and the manufacture of electrical equipment (NACE 27), with two sectors each[25].

Table 4. List of sectors included in the TOP 30 industrial sectors - Other manufacturing industries

Manufacture of paper and paper products (NACE 17)	Manufacture of chemicals and chemical products (NACE 20)	Manufacture of electrical equipment (NACE 27)	Other
1722 - Manufacture of household and sanitary goods and of toilet requisites	2011 - Manufacture of industrial gases, 2017 - Manufacture of synthetic rubber in primary forms	2720 - Manufacture of batteries and accumulators, 2731 - Manufacture of fibre optic cables	1395 - Manufacture of non-wovens and articles made from non-wovens, except apparel, 28293 - Manufacture of projection equipment of liquids and powders

Sources: DG Statistique - Statistics Belgium, NBB, own calculations

The sectors with the highest domestic turnovers are 1722 "Manufacture of household and sanitary goods and of toilet requisites", 2011 "Manufacture of industrial gases" and 2017 "Manufacture of synthetic rubber in primary forms".

The concentration is very high for these seven sectors and the number of firms is under 15 (see graph 4). They are also characterised by low volatility and weighted churn rates.

Three of these sectors have a relatively high Price Cost Margin indicator: 2017 "Manufacture of synthetic rubber in primary forms", (PCM of 30%), 28293 "Manufacture of projectors of liquid or powder matters" (19%) and 2720 "Manufacture of batteries and accumulators" (20%). Conversely, the sectors 1722 "Manufacture of household and sanitary goods and of toilet requisites" (7%) and 2731 "Manufacture of fibre optic cables" (3%) have a relatively low PCM compared with the average for industrial sectors (9.7%).

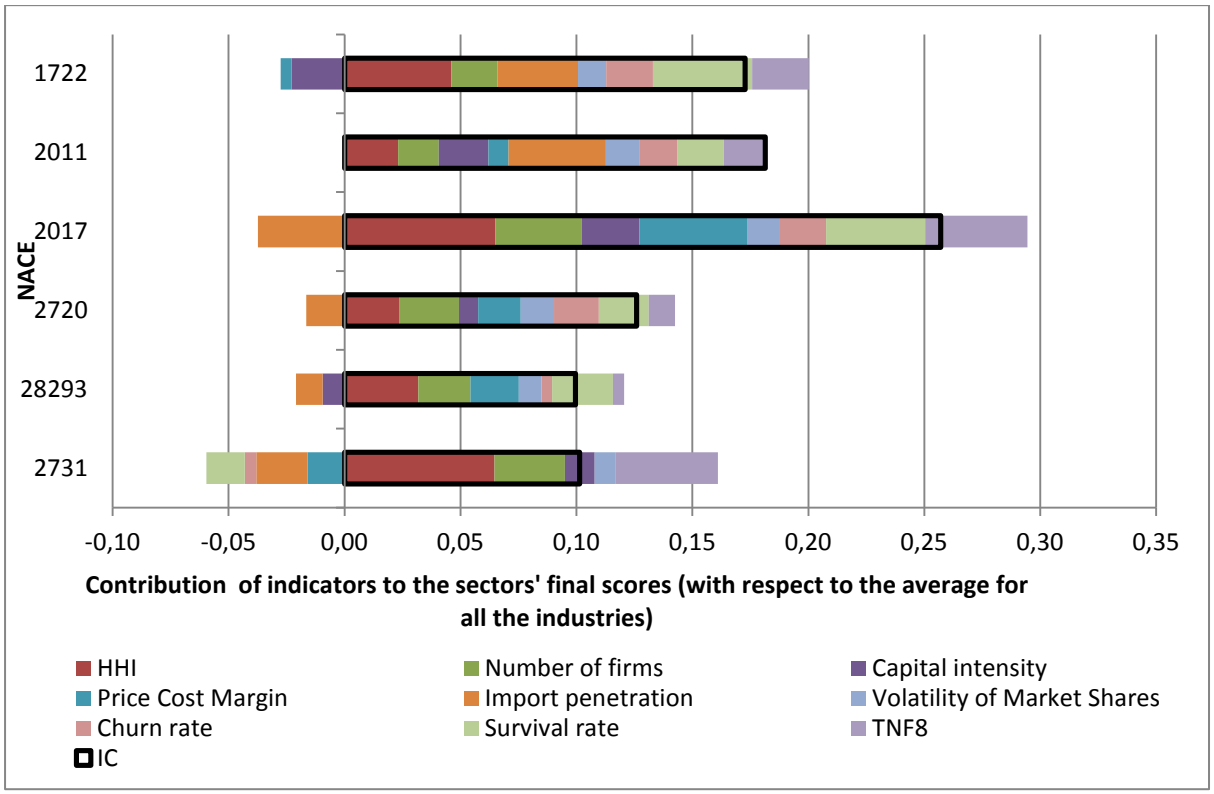
[24] See part 4 and appendix 3 for further details.

[25] For the confidentiality reasons, the results for the sector 1395 "Manufacture of non-wovens and articles made from non-wovens, except apparel" are not presented and published in this report.

Several of these sectors are characterised by an important international openness, for example, the sectors 2017 “Manufacture of synthetic rubber in primary forms” (0.81) and 2731 “Manufacture of fibre optic cables” (0.68). This foreign competition may weaken their place in this list of sectors with a higher market failure risk.

Four of these seven sectors were already included in the TOP 30 of the 2015 screening: 1722 “Manufacture of household and sanitary goods and of toilet requisites”, 2011 “Manufacture of industrial gases”, 2017 “Manufacture of synthetic rubber in primary forms” and 2731 “Manufacture of fibre optic cables”.

Graph 4. Contribution of individual indicators to the sectors' final score - Other manufacturing industries



Note: The contribution of each indicator should be understood as the gap between the normalised score of each indicator in the sector and the average score of all the industrial sectors weighted by the indicator's contribution to the final score. The area in black represents the gap between the sector's composite indicator score and the average of the composite indicators for the industrial sectors. The indicators with a positive contribution are those for which the analysed sector performs less well than the average. Conversely, the indicators with a negative contribution are those for which the sector performs better than the average.
Sources: DG Statistique - Statistics Belgium, NBB, own calculations

Some of the sectors out of this TOP 30 are put forward by one or more individual indicators. For example, sector 3313 “Repair of electronic and optical equipment” is extremely concentrated (HHI of 0.81) and stands out due to its low market shares volatility rate (0.02). Other sectors, such as 3020 “Manufacture of railway locomotives and rolling stock” (HHI of 0.76) and 2640 “Manufacture of consumer electronics” (HHI of 0.74) are heavily concentrated. The sector 1811 “Printing of newspapers” is highlighted by its capital intensity (0.42) and its PCM (17%), as is the sector 21201 “Manufacture of pharmaceutical preparations” (capital intensity of 0.25 and PCM indicator of 29%). The sector 27401 “Manufacture of lamps” has a relatively high PCM indicator (27%), as does 2813 “Manufacture of other pumps and compressors” (27%) and 1414 “Manufacture of underwear” (26%). As to the sector 1920 “Manufacture of refined petroleum products”, it is highlighted due to its low volatility rate (0.01).

18 industrial sectors which emerge from the various screenings performed by the Price Observatory

Over the last few years, the Price Observatory published three versions of horizontal screening of market sectors: the 2014 screening (covering the period 2009-2012), the 2015 screening (2009-2013) and the current 2016 screening (2010-2014). Among the 30 industrial sectors emerging from each screening, 18 can be found in all three versions (see table below), including four from the network industries, three from the food and drink industries, seven from the metals and other mineral products industry and four from other manufacturing industries.

Network industries

- 38212 – Physico-chemical treatment of sludge and liquid waste
- 3530 - Steam and air conditioning supply
- 38221 – Pre-treatment before disposal of hazardous waste
- 3521 - Production of gas

Food and beverages

- 1107 - Manufacture of soft drinks; production of mineral waters and other bottled waters
- 1042 - Manufacture of margarine and similar edible fats
- 1103 - Manufacture of cider and other fruit wines

Manufacture of basic metals and other mineral products

- 2443 - Lead, zinc and tin production
- 2352 - Manufacture of lime and plaster
- 23321 - Manufacture of bricks
- 2365 - Manufacture of fibre cement
- 2362 - Manufacture of plaster products for construction purposes
- 2344 - Manufacture of other technical ceramic products
- 2342 - Manufacture of ceramic sanitary fixtures

Other manufacturing industries

- 1722 - Manufacture of household and sanitary goods and of toilet requisites
- 2011 - Manufacture of industrial gases
- 2017 - Manufacture of synthetic rubber in primary forms
- 2731 - Manufacture of fibre optic cables

3.2 Service sectors

Based on the composition of the TOP 50 of the worst performing service sectors according to the composite indicator, the following segmentation is used to analyse the results:

- the network services, with 12 sectors in the TOP 50. This category includes the transport and auxiliary transport service sectors, as well as postal and telecommunications activities (NACE 49 to 53 and NACE 61).
- the trade sectors, represented by 11 sectors in the TOP 50. These are wholesale and retail trade sectors (NACE 46 and 47)[26].
- the rental and leasing services (NACE 77), with 8 sectors.
- the personal services, with 11 sectors. This category includes accommodation, food and beverage services and other services to individuals (NACE 55 to 56 and 84 to 96).
- the construction sectors (NACE 41 to 43), with three sectors.
- the other services (containing the NACE divisions not included in one of the categories mentioned above) with five sectors.

These 50 sectors (TOP 50) represent 5.9% of the total domestic turnover of all service sectors. There are 16 new sectors in the TOP 50 compared with the previous screening. These have a total domestic turnover of 9.6 billion EUR. The sectors leaving the TOP 50 represented 5.1 billion EUR[27].

3.2.1 Network services

Among 12 network services included in the TOP 50 service sectors with the highest risk of market failure, three are from telecommunications (NACE 61) (see table 5). These three sectors were already highlighted in the previous screening. The same applies to 5310 "Postal activities under universal service obligation". The other network services are from transport (such as 5121 "Freight air transport") or auxiliary transport services (such as 5221 "Service activities incidental to land transportation").

Table 5. List of sectors included in the TOP 50 service sectors - Network services

Transport (NACE 49 to 51)	Warehousing and support activities for transportation (NACE 52)	Postal and courier activities (NACE 53)	Telecommunications (NACE 61)
4920 - Freight rail transport, 4950 - Transport via pipeline, 5020 - Sea and coastal freight water transport , 5030 - Inland passenger water transport, 5040 - Inland freight water transport, 5121 - Freight air transport	5221 - Service activities incidental to land transportation, 5222 - Service activities incidental to water transportation	5310 - Postal activities under universal service obligation	6110 -Wired telecommunications activities, 6120 - Wireless telecommunications activities, 6130 - Satellite telecommunications activities

Sources: DG Statistique - Statistics Belgium, NBB, own calculations

[26] The trade sectors analysed in the screening exercise also include firms working in e-commerce, provided that they carry out their activities in Belgium and that this is reflected in their accounts.

[27] The largest sectors with respect to domestic turnover are 5223 "Service activities incidental to air transportation" and 77399 "Renting and leasing of other machinery and equipment". These two sectors represented together more than 2 billion EUR.

Among these, only the sectors 5020 “Sea and coastal freight water transport” and 5221 “Service activities incidental to land transportation” were not included in the results of the previous, 2015 screening.

These 12 sectors represent 35.6% of the total domestic turnover of all network services.

The sectors with the highest domestic turnover are the wired (NACE 6110) and wireless (NACE 6120) telecommunications sectors. These sectors are characterised by a high concentration, a high capital intensity, a small number of operators and a high level of stability of their market shares (see graph 5).

The allocation of a 3G operating licence to a new operator in 2011 could have reduced the high concentration within the mobile telephony sector, but this operator had its licence withdrawn by the BIPT in 2014.

Furthermore, the Price Observatory reports on consumption prices highlighted the fact that the telecommunications services have contributed to the inflation differential of services to the disadvantage of Belgium compared with its main neighbour countries. That is why the Price Observatory performs an analyse of this sector.

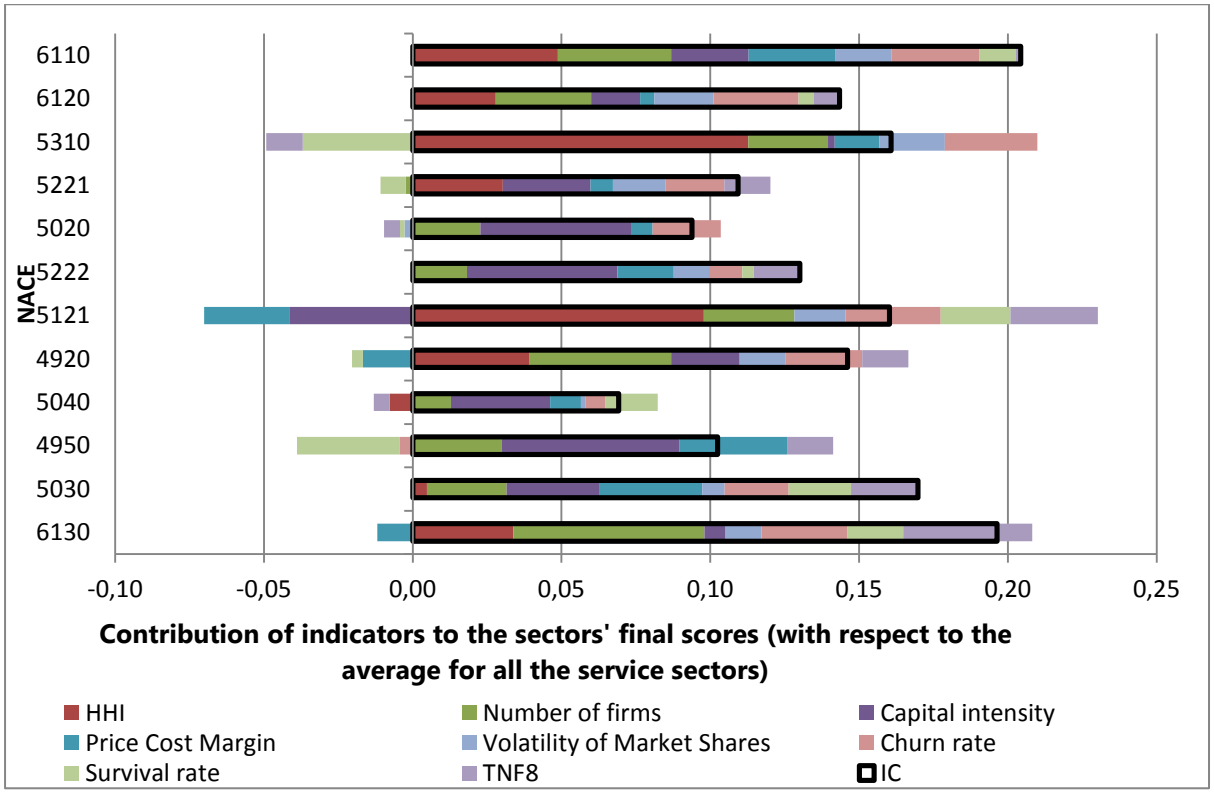
The European Commission's Consumer Markets Scoreboard[28] also revealed that Belgian consumers are relatively dissatisfied with the various telecommunications services when we consider other aspects of the market dimension, such as the choice and the transparency of the offered services and how easy it is to change operator[29].

The sector 5310 “Postal activities under universal service obligation” also has a high turnover and is heavily concentrated due to the presence of a historic operator (HHI of 0.98).

[28] Consumer Markets Scoreboard.

[29] Another sector revealed by this screening as one of the sectors with a potential market failure problem is shown to be problematic in the 2016 Consumer Scoreboard. This sector is car rental and leasing services.

Graph 5. Contribution of individual indicators to the sectors' final score - Network services



Note: The contribution of each indicator should be understood as the gap between the normalised score of each indicator in the sector and the average score of all the services weighted by the indicator's contribution to the final score. The area in black represents the gap between the sector's composite indicator score and the average of the composite indicators for the services sectors. The indicators with a positive contribution are those for which the analysed sector performs less well than the average. Conversely, the indicators with a negative contribution are those for which the sector performs better than the average. Sources: DG Statistique - Statistics Belgium, NBB, own calculations

The transport and auxiliary transport service sectors, which are included in the TOP 50, have a high capital intensity with the exception of the sector 5121 "Freight air transport". Besides this sector and the 4920 "Freight rail transport", all of them have a PCM indicator higher than the average of all the service sectors (12.8%). However, it is important to be cautious as some of these sectors have high capital costs (see part 4).

Some other sectors stand out from the analysis of individual indicators. For example, the sector 5223 "Service activities incidental to air transportation" is concentrated (HHI of 0.26) and is characterised by a high capital intensity (2.1) and PCM (27%). The sector 5210 "Warehousing and storage" has a high capital intensity (0.78), while the 52249 "Handling other than in harbours" is relatively concentrated (0.24). The sector 5110 "Passenger air transport" is highlighted in the ranking of the companies' churn (0.01).

3.2.2 Trade

The TOP 50 of the service sectors according to the composite indicator is composed of 11 trade sectors (NACE 46 and 47): seven come from wholesale trade (NACE 46) and four from retail trade (NACE 47). The high number of sectors in this category must be put into context and compared with the 160 trade sectors analysed in this screening exercise. In addition, these 11 sectors represent only 1.9% of the domestic turnover of all the trade sectors.

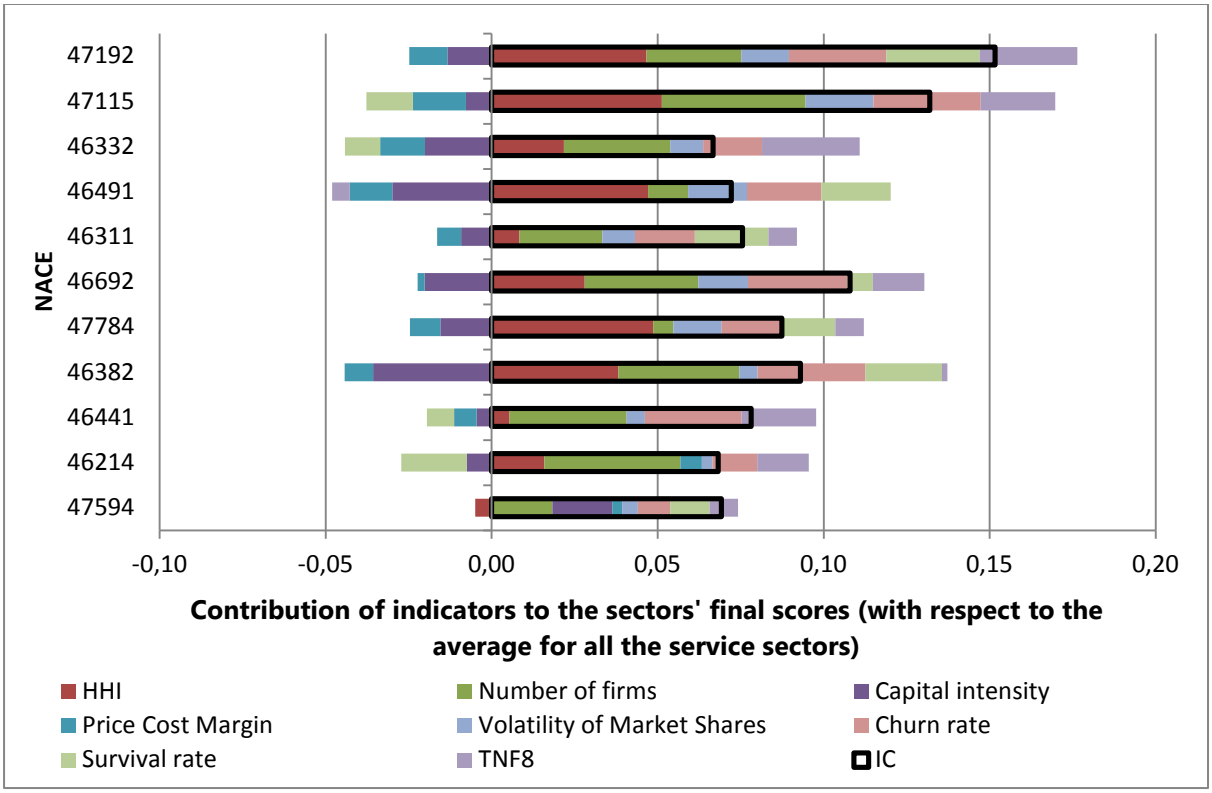
Table 6. List of sectors included in the TOP 50 service sectors - Trade

Wholesale trade (NACE 46)	Retail trade (NACE 47)
46214 - Wholesale of other agricultural products , 46311 - Wholesale trade of potatoes for consumption, 46332 - Wholesale of edible oils and fats, 46382 - Wholesale of food products based on potatoes, 46441 - Wholesale of china and glassware, 46491 - Wholesale of books, newspapers and periodicals, 46692 - Wholesale of school and office supplies	47115 - Retail sale in non-specialised stores with food, beverages or tobacco predominating (sales area≥2500m²) , 47192 - Other retail sale in non-specialised stores (sales area ≥ 2500m²), 47594 - Retail sale of music instruments in specialised stores, 47784 - Retail sale of drugstore articles, of cleaning and polishing preparations in specialised stores

Sources: DG Statistique - Statistics Belgium, NBB, own calculations

Among these wholesale trade sectors (NACE 46), the sectors 46332 "Wholesale of edible oils and fats" and 46491 "Wholesale of books, newspapers and periodicals" have the highest domestic turnovers. These sectors are marked by a high concentration, a high degree of stability and a small number of firms (see graph 6). However, their PCM indicator is lower than the average of the service sectors (12.8%).

Graph 6. Contribution of individual indicators to the sectors' final score - Trade



Note: The contribution of each indicator should be understood as the gap between the normalised score of each indicator in the sector and the average score of all the services weighted by the indicator's contribution to the final score. The area in black represents the gap between the sector's composite indicator score and the average of the composite indicators for the services sectors. The indicators with a positive contribution are those for which the analysed sector performs less well than the average. Conversely, the indicators with a negative contribution are those for which the sector performs better than the average.
Sources: DG Statistique - Statistics Belgium, NBB, own calculations

The retail trade sectors (NACE 47) in the TOP 50 having the highest domestic turnover are the sector 47192 "Other retail sale in non-specialised stores (sales area ≥ 2,500m²)" and the 47115 "Retail sale in non-specialised stores with food, beverages or tobacco predominating (sales area ≥ 2,500m²)"[30]. These sectors are highlighted for their concentration and stability, although their capital intensity and PCM are lower than the average of the service sectors.

Most of these sectors have a Price Cost Margin indicator lower than the average of the service sectors (12.8%). Only the sectors 46214 "Wholesale of other agricultural products" and 47594 "Retail business of musical instruments in specialised stores" have a high and positive contribution from this indicator, with a PCM of 18% and 15% respectively.

All these sectors have a capital intensity lower than the average of the service sectors (0.32), apart from 47594 "Retail business of musical instruments in specialised stores" (0.37).

Some of the trade sectors not present in the TOP 50 of the service sectors are put forward by one or more individual indicators. So, for example, the sectors 47792 "Retail sale of second-hand clothes in stores" and 4721 "Retail sale of fruit and vegetables in specialised stores" are shown to have a high capital intensity (0.94 and 0.67 respectively).

The largest sectors (in terms of domestic turnover) characterised by a high concentration, are the sectors 4618 "Agents specialised in the sale of other particular products" (HHI of 0.39), 4743 "Sale of audio and video equipment in specialised stores" (0.37) and 46736 "Wholesale of sanitary equipment" (0.22).

The sectors 47114 "Retail sale in non-specialised stores with food, beverages or tobacco predominating (sales area between 400m² and less than 2,500m²)", 4635 "Wholesale of tobacco products" and 4754 "Retail sale of electrical household appliances in specialised stores" are highlighted due to their low market shares volatility.

No trade sector is revealed among the 50 service sectors with the highest PCM indicator.

3.2.3 Renting and leasing

Among the 50 service sectors with the highest market failure risk, the rental and leasing activities division (NACE 77) is represented by eight sectors (see table 7). These sectors have a total domestic turnover of 59.1% of that of all rental and leasing activities.

Four sectors are from NACE 773 "Renting and leasing of other machinery, equipment and tangible goods", such as the renting and leasing of office machinery and equipment (including computers) (NACE 7733) and the renting and leasing of water transport equipment (NACE 7734). Three sectors are from NACE 772 "Renting and leasing of personal and household goods" such as the leasing of tableware, electrical and household equipment (NACE 77293) and the leasing of medical and paramedical equipment (NACE 77295). The remaining sector is NACE 7711 "Renting and leasing of cars and light motor vehicles". All these eight sectors were already part of the TOP 50 of the 2015 screening.

[30] Yet, it is important to be cautious as there is a certain degree of porosity between the different NACE 4711 sub-sectors. The competition may take place at a more aggregated level in these sectors. An analysis based on the results of the previous screening exercise showed that by screening at NACE -4 level, sector 4711 did not come out as potentially problematic with regard to its market functioning.

Table 7. List of sectors included in the TOP 50 service sectors – Renting and leasing

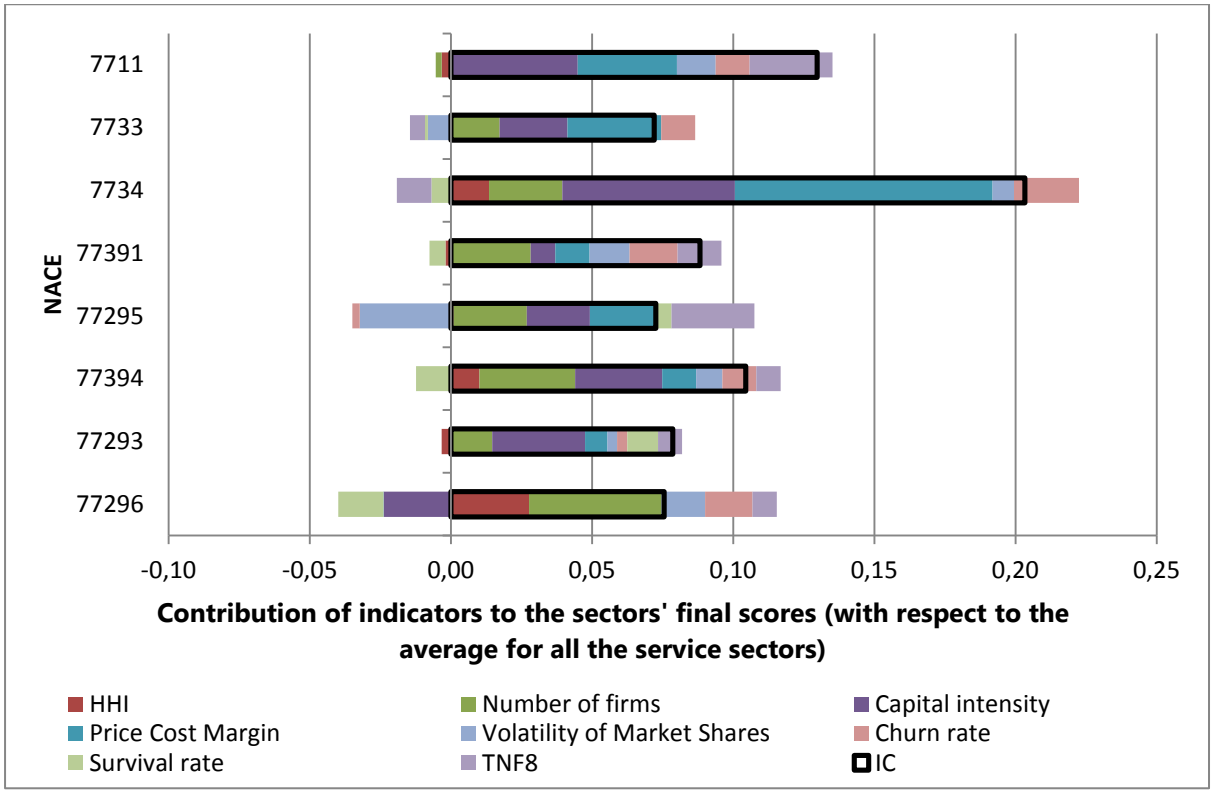
Renting and leasing of motor vehicles (NACE 771)	Renting and leasing of personal and household goods (NACE 772)	Renting and leasing of other machinery, equipment and tangible goods (NACE 773)
7711 - Renting and leasing of cars and light motor vehicles	77293 - Renting and leasing of tableware, glassware, cutlery, articles for kitchen and electrical household appliances, 77295 - Renting and leasing of medical and paramedical materials, 77296 - Renting and leasing of flowers and plants	7733 - Renting and leasing of office machinery and equipment (including computers), 7734 - Renting and leasing of water transport equipment, 77391 - Renting and leasing of slot machines, gaming machines and vending machines, 77394 - Renting and leasing of containers used for residential and non-residential purposes and the like

Sources: DG Statistique - Statistics Belgium, NBB, own calculations

These sectors are characterised by a high capital intensity and a PCM higher than the average of the service sectors (12.8%) (see graph 7), with the exception of the sector 77296 "Renting and leasing of flowers and plants". The high PCM in these sectors can be nuanced by the existence of high capital costs, although these costs are not taken into account in the calculations of the current PCM indicator (see part 4 of this report). For example, the sector 7711 "Renting and leasing of cars and light motor vehicles", the largest sector in terms of domestic turnover, has a PCM of 41% and a capital intensity of 1.5. At the end of 2014, this car rental and leasing sector saw the arrival on the market of collaborative car-sharing platforms. This new, less capital-intensive C2C business model will probably force the traditional car rental and leasing service to adapt by diversifying its offer and stepping up its collaboration with other additional means of transport. The car rental and leasing sector could experience a reduction in its profit margins if it does not change rapidly to deal with this new type of competition.

However, as with the majority of the sectors in this category, the sector 7711 is less concentrated than the average of the service sectors (HHI of 0.07 compared with 0.1). Only the sectors 7734 "Renting and leasing of water transport equipment", 77394 "Renting and leasing of containers used for residential and non-residential purposes and the like" and 77296 "Renting and leasing of flowers and plants" have a relatively high HHI (0.2, 0.17 and 0.31 respectively).

Graph 7. Contribution of individual indicators to the sectors' final score – Renting and leasing



Note: The contribution of each indicator should be understood as the gap between the normalised score of each indicator in the sector and the average score of all the services weighted by the indicator's contribution to the final score. The area in black represents the gap between the sector's composite indicator score and the average of the composite indicators for the services sectors. The indicators with a positive contribution are those for which the analysed sector performs less well than the average. Conversely, the indicators with a negative contribution are those for which the sector performs better than the average.
Sources: DG Statistique - Statistics Belgium, NBB, own calculations

Besides the sectors in the TOP 50 of the service sectors, others stand out as having a high capital intensity. These are the sectors 7732 “Renting and leasing of construction and civil engineering machinery and equipment” (0.97) and 77399 “Renting and leasing of other machinery, equipment and material goods” (1.4). The sector 7740 “Leasing of intellectual property and similar products, except copyrighted works” is concentrated (HHI of 0.7) and comprises a small number of firms. It is also revealed as having a very high PCM (0.72).

3.2.4 Personal services

There are 11 sectors from services to individuals (NACE 55 to 56 and NACE 84 to 96) in the TOP 50 of the worst performing service sectors according to the composite indicator. These sectors represent 10.3% of the total domestic turnover of this category.

Three sectors are from accommodation (NACE 55) and two from residential care activities (NACE 87). The largest in terms of domestic turnover are the sectors 88995 "Adapted work companies", 96011 "Activities of industrial laundries" and 96031 "Funeral and related activities".

Table 8. List of sectors included in the TOP 50 service sectors - Services to individuals

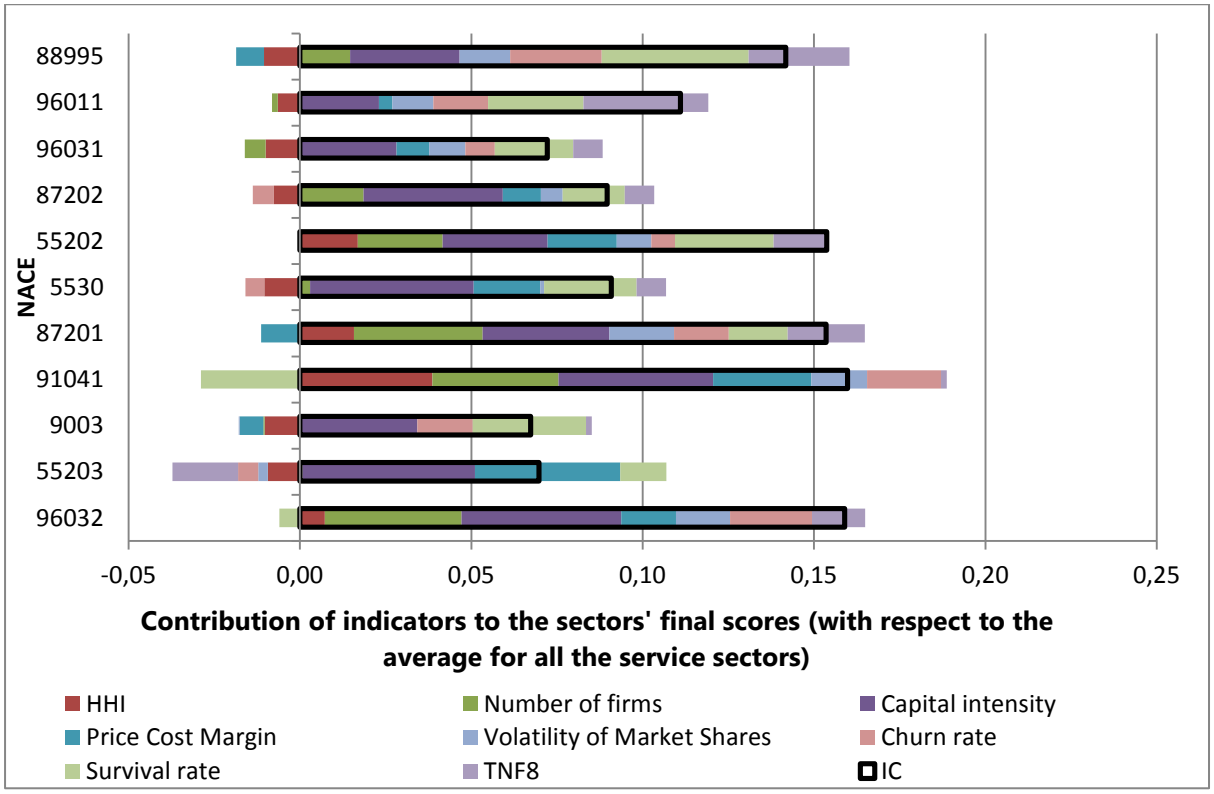
Accommodation (NACE 55)	Residential care activities (NACE 87)	Other personal services
55202 - Holiday resorts and villages, 55203 - Holiday cottages, apartments and furnished apartments for holidays, 5530 - Camping grounds, recreational vehicle parks and trailer parks	87201 - Residential care activities for juvenile mental retardation, 87202 - Residential care activities for adult mental retardation	88995 - Activities of adapted work enterprises, 9003 - Artistic creation, 91041 - Operation of botanical and zoological gardens and nature reserves, 96011 - Industrial washing and (dry-) cleaning of textile and fur products, 96031 - Funeral activities, 96032 - Activities related to the management of cemeteries and services of crematoria

Sources: DG Statistique - Statistics Belgium, NBB, own calculations

These sectors are characterised by a high capital intensity (see graph 8), for example the sectors 55203 "Holiday cottages, apartments and furnished apartments for holidays" and 5530 "Camping grounds, recreational vehicle parks and trailer parks". Although most of them are less concentrated than the average of the service sectors, these sectors generally comprise a small number of firms (except the 96031 "Funeral and related activities") and are put forward by the stability indicators as being relatively more stable than the average for service sectors.

Only three of these sectors have a PCM lower than the average of the service sectors (12.8%). These are the sectors 9003 "Artistic creation", 88995 "Activities of adapted work enterprises" and 87201 "Residential care activities for juvenile mental retardation". Conversely, the three accommodation sectors (NACE 55) have a high PCM. This indicator does not take into account the capital costs, so this observation may be nuanced by the existence of higher capital costs than those of other service sectors (see part 4).

Graph 8. Contribution of individual indicators to the sectors' final score – Personal services



Note: The contribution of each indicator should be understood as the gap between the normalised score of each indicator in the sector and the average score of all the services weighted by the indicator's contribution to the final score. The area in black represents the gap between the sector's composite indicator score and the average of the composite indicators for the services sectors. The indicators with a positive contribution are those for which the analysed sector performs less well than the average. Conversely, the indicators with a negative contribution are those for which the sector performs better than the average.
Sources: DG Statistique - Statistics Belgium, NBB, own calculations

Several of the personal services not included in the TOP 50 of services with the highest risk of market failure still have a high PCM indicator. These are namely the sectors 90012 "Performances by artistic units" (38%), 88911 "Activities of crèches and children's nurseries" (30%) and 96021 "Hairdressing" (30%). The sector 5629 "Other food service activities" is put forward because of its concentration (HHI of 0.22) and its low volatility (0.06). A number of personal services stand out have a high capital intensity, such as for example the sectors 90041 "Operation of theatres, concert halls and similar" (1.7) and 5510 "Hotels and similar accommodation" (1.1).

3.2.5 Construction

Three construction sectors are present in the TOP 50 of the service sectors. They comprise one civil engineering sector (NACE 42) and two specialised construction works sectors (NACE 43). These three sectors represent 4.7% of the total domestic turnover of construction. 42911, "Dredging works", is the most important in terms of domestic turnover.

Table 9. List of sectors included in the TOP 50 of service sectors - Construction

Civil engineering (NACE 42)	Specialised construction activities (NACE 43)
42911 - Dredging works	43343 - Glazing 43993 - Construction of decorative fireplaces and open fires

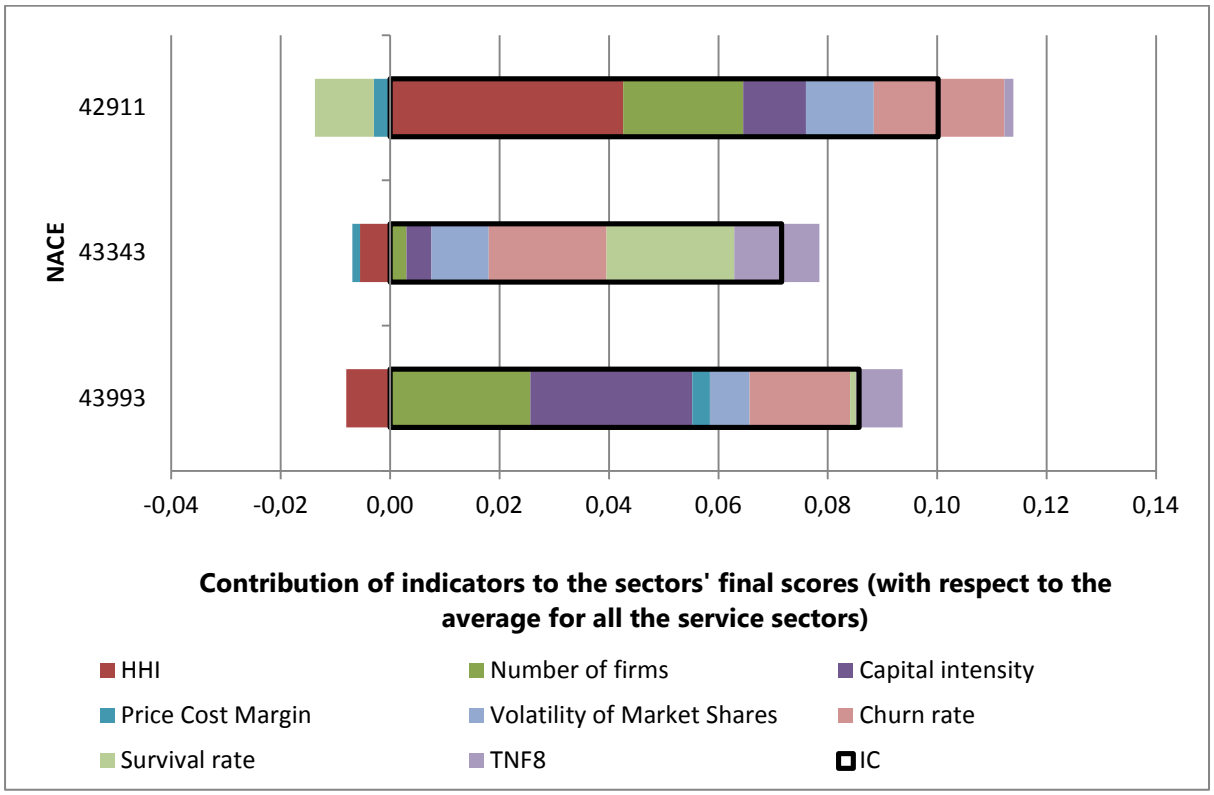
Sources: Statistics Belgium, NBB, own calculations

These three sectors are made up of a limited number of companies compared to the average of the services, but only the sector 42911 "Dredging works" is highly concentrated (HHI of 0.43): the other two have a HHI lower than the average of the services (0.05 and 0.03). These sectors are put forward for their

stability: all three have a low companies churn rate , it is lower than 0.02. The capital intensity is high for the sectors 43993 “Construction of decorative fireplaces and open fires” and 42911 “Dredging works” but it is lower than the average of services for the sector 43343 “Glazing”.

The sector 43993, “Construction of decorative fireplaces and open fires” has a PCM of 15%, whereas the other two sectors have a slightly lower PCM than the average of the services sector (12.8%).

Graph 9. Contribution of the individual indicators to the sectors' final score - Construction



Note: The contribution of each indicator should be understood as the gap between the normalised score of each indicator in the sector and the average score of all the services weighted by the indicator's contribution to the final score. The area in black represents the gap between the sector's composite indicator score and the average of the composite indicators for the services sectors. The indicators with a positive contribution are those for which the analysed sector performs less well than the average. Conversely, the indicators with a negative contribution are those for which the sector performs better than the average. Sources: Statistics Belgium, NBB, own calculations

Among the construction sectors which are not present in the TOP 50, the sector 4213 “Construction of bridges and tunnels” emerges as having a high concentration (HHI of 0.21).

The other indicators do not highlight the construction sectors, apart from a relatively high capital intensity for the sectors 41102 “Development of non-residential real estate” (1.5) and 42219 “Construction of utility projects for fluids n.e.c.” (0.69).

3.2.6 Other Services

Among the five remaining sectors of the TOP 50 of the service sectors presenting the highest risk of market failure, there are three media services: 5812 “Publishing of directories and mailing lists”, 5914 “Motion picture projection activities” and 6020 “Television programming and broadcasting activities”. The other two sectors are 68202 “Renting and operating of social housing” and 71201 “Technical testing of motor vehicles”. These five sectors were already highlighted in the 2015 screening.

Table 10. List of sectors included in the TOP 50 of service sectors - Other service sectors

Media services (NACE 58 to 60)	Other services
5812 - Publishing of directories and mailing lists, 5914 - Motion picture projection activities, 6020 - Television programming and broadcasting activities	68202 - Renting and operating of social housing, 71201 -Motor Vehicles Technical Control

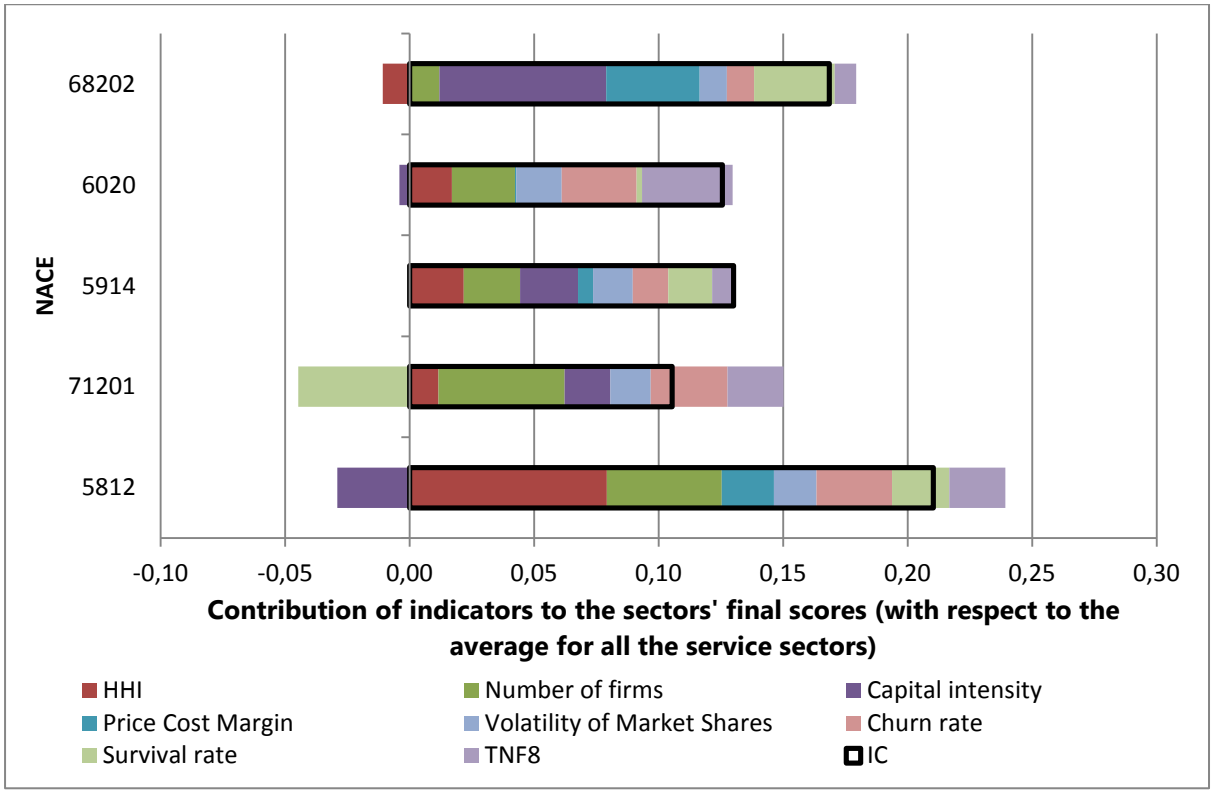
Sources: Statistics Belgium, NBB, own calculations

In terms of domestic turnover, the most important sectors are 68202 "Renting and operating of social housing" and 6020 "Television programming and broadcasting activities". The sector 68202 is characterised by high capital intensity, high stability and a high PCM (43%). However, it has a lower HHI (0.01) than the average of the services (0.10).

These sectors consist of a limited number of companies and are characterised by high stability. The sectors 5812 "Publishing of directories and mailing lists" (29%) and 5914 "Motion picture projection activities" (17%) also have a higher PCM than the average of the services (12.8%). These findings, as well as other information, motivated the Price Observatory to analyse this last sector in more detail[31]. The conclusions of this study show that the concentration (both vertical and horizontal) of this market allows some companies to grow and to take advantage of important economies of scale for some costs, but also to take on a larger number of films and to pool the risks of failure associated with their activity. The high concentration level in the cinema operators sector could drive a wedge between small and large operations and create difficult market access for film producers and distributors. From the viewpoint of the cinema goer, the dominance of these groups could go hand in hand with the risk of having predominantly commercial films and less cultural diversity. Moreover, the prices charged in these establishments are often higher than in small cinemas.

[31] Study on the motion picture projection activities in Belgium.

Graph 10. Contribution of the individual indicators to the sectors' final score - Other service sectors



Note: The contribution of each indicator should be understood as the gap between the normalised score of each indicator in the sector and the average score of all the services weighted by the indicator's contribution to the final score. The area in black represents the gap between the sector's composite indicator score and the average of the composite indicators for the services sectors. The indicators with a positive contribution are those for which the analysed sector performs less well than the average. Conversely, the indicators with a negative contribution are those for which the sector performs better than the average.
Sources: Statistics Belgium, NBB, own calculations

Apart from these sectors present in the TOP 50, others may be put forward by one or more individual indicators. As such, several sectors have a high concentration, such as the sectors 7211 “Research and experimental development on biotechnology” (HHI of 0.56), 7912 “Tour operator activities” (0.36) and 45111 “Wholesale trade of motor vehicles and other light-duty motor vehicles” (0.27). As for the PCM ranking, it highlights in particular the sectors 68203 “Renting and operating of own or leased non-residential real estate, except land” (49%), 68201 “Renting and operating of own or leased real estate, except social housing” (45%) and 69101 “Legal activities” (36%). Some sectors, including 7312 “Advertising” and 7820 “Temporary employment agency activities” are highlighted for their stability.

26 service sectors which emerge from the various screenings performed by the Price Observatory

Over the last few years, the Price Observatory published three versions of horizontal screening of market sectors. Among the 50 sectors which emerge from each screening, 26 sectors are common to all three versions (see table below) : nine are from network services, six from renting services, four from individual services, one from trade and construction, and five sectors from other services.

Network services

- 6110 - Wired telecommunications activities
- 6120 - Wireless telecommunications activities
- 5310 - Postal activities under universal service obligation
- 5222 - Service activities incidental to water transportation
- 5121 - Freight air transport
- 4920 - Freight rail transport
- 4950 - Transport via pipeline
- 5030 - Inland passenger water transport
- 6130 - Satellite telecommunications

Renting and leasing

- 7711 - Renting and leasing of cars and light motor vehicles
- 77391 – Renting and leasing of slot machines, gaming machines and vending machines
- 77295 – Renting and leasing of medical and paramedical material
- 77394 - Renting and leasing of containers used for residential and non-residential purposes and the like
- 77293 – Renting and leasing of tableware, glassware, cutlery, articles for kitchen and electrical household appliances
- 77296 – Renting and leasing of flowers and plants

Trade

- 47115- Retail sale in non-specialised stores with food, beverages or tobacco predominating (sales area > 2500m²)

Construction

- 42911 - Dredging works

Personal services

- 96011 - Industrial washing and (dry-)cleaning of textile and fur products
- 55202 - Holiday centres and villages
- 5530 - Camping grounds, recreational vehicle parks and trailer parks
- 96032 - Activities related to the management of cemeteries and services of crematoria

Other Services

- 68202 - Renting and operating of social housing
- 6020 - Television programming and broadcasting activities
- 5914 - Motion picture projection activities
- 71201 - Motor Vehicles Technical Control
- 5812 - Publishing of directories and mailing lists

4 Profitability analysis of the market sectors

In this horizontal screening, the profitability of the sectors is estimated using the Price Cost Margin (PCM) indicator. This assesses the gross profit of a given sector, in other words the operating profitability of the companies which comprise the sector[32]. This indicator is calculated using data from the Structural Business Survey (SBS), taking into account the largest possible number of companies (including SMEs), over the period from 2008 to 2014.

This section aims firstly to analyse the profitability of the market sectors of the Belgian economy and its evolution over this period. Secondly, it aims to analyse the interaction between the PCM and the other indicators of the market functioning. Finally, the results are nuanced, in particular by analysing the importance of capital costs in the profitability of the sectors.

4.1 Evolution of profitability

Industrial sectors

The average PCM of industrial sectors over the period 2008-2014 amounts to 9.2%. The manufacture of beverages (NACE 11) (14%), the manufacture of tobacco products (NACE 12) (17.3%), printing and service activities related to printing (NACE 18) (15%), the pharmaceutical industries (NACE 21) (21.6%) and waste collection, treatment and disposal activities (NACE 38) (14.3%) present the highest levels of PCM.

By looking at the results at the most detailed sectorial level, one can observe that the main sectors with a high PCM throughout the period (see table 11) are in particular the manufacture of medicines (36.8%), dangerous waste collection, treatment and disposal activities (22.7%), the manufacture of beer (22.6%) and the craft manufacture of bread and fresh pastry (18.4%).

During this period, various NACE divisions had a relatively low PCM. Among these, one can find refinery activities (NACE 19) (1.2%), the automotive industry (NACE 29) (2.6%), the remediation activities (NACE 39) (3%) and the metallurgy (NACE 24) (4.7%).

Various metallurgy sectors, such as steelmaking (0.5%) and copper metallurgy (2.6%), also emerge from the most detailed analysis at the sectorial level. Among the other least profitable sectors (see table 11), one can also find petroleum refining activities (1.2%), the manufacture of oils and fats (1.5), the processing and preserving of meat (2.5%) and the manufacture of feed for farm animals (2.5%).

[32] The operating profitability of a given sector is thus calculated as follows:

$$PCM_S = \sum_{i \in S}^{N} m_i PCM_i = \sum_{i \in S}^{N} m_i \frac{SALES_i - COST_i}{SALES_i}$$

- where $SALES_i$ is the turnover of the company *i*.
- $COST_i$ represents the costs of the company i associated with the purchase of commercial goods and other goods and with wages.
- and m_i represents the market share of a company i (calculated based on SALES).

Table 11. List of sectors with the highest and lowest average PCM, industrial sectors, average 2008-2014

Highest average PCM			Lowest average PCM		
NACE	**Sector**	**PCM 2008-2014 (%)**	**NACE**	**Sector**	**PCM 2008-2014 (%)**
21201	Manufacture of pharmaceuticals	36,81	2410	Manufacture of basic iron and steel and of ferro-alloys	0,55
38222	Treatment and disposal of hazardous waste	22,71	2013	Manufacture of other inorganic basic chemicals	0,56
1105	Manufacture of beer	22,65	1920	Manufacture of coke oven products	1,22
10712	Artisanal manufacture of bread; artisanal manufacture of fresh pastry goods and cakes	18,40	1041	Manufacture of oils and fats	1,58
2660	Manufacture of irradiation, electromedical and electrotherapeutic equipment	17,34	1011	Processing and preserving of meat	2,50
1200	Manufacture of tobacco products	17,29	1091	Manufacture of prepared feeds for farm animals	2,54
2733	Manufacture of wiring devices	16,70	2444	Copper production	2,57
23321	Manufacture of bricks	16,45	3900	Remediation activities and other waste management services	3,01
1081	Manufacture of sugar	15,83	1061	Manufacture of grain mill products	3,10
38323	Recovery of inert waste	15,25	3514	Trade of electricity	3,39

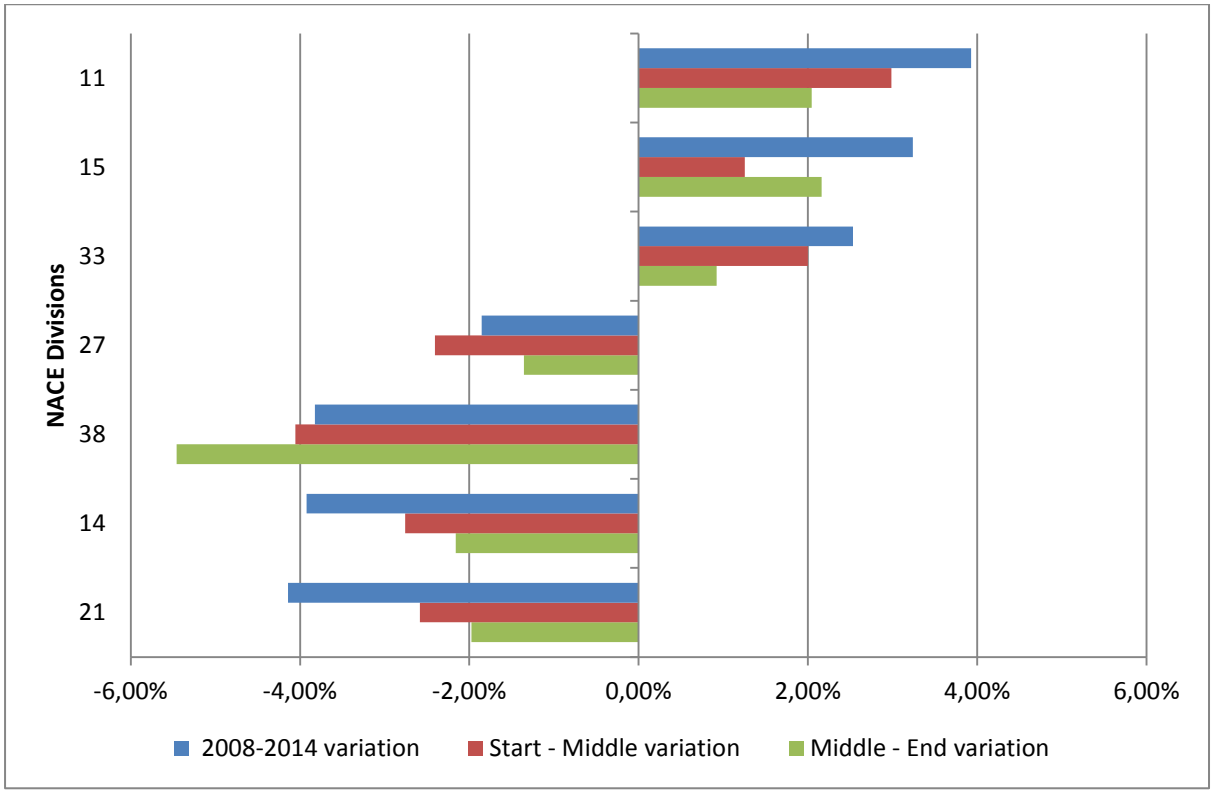
Sources: Statistics Belgium, NBB, own calculations

The period 2008-2014 was marked by an unfavourable macro-economic context. Profitability decreased slightly between 2008 (average of 9.2%) and 2012 (average of 8.5%). It subsequently recovered to its initial level (average of 9.4% in 2014). Only 42% of the 237 analysed industrial sectors had a 2012 PCM higher than that of 2008, whereas almost half had a 2014 PCM higher than that of 2008[33].

By comparing the averages at the start (2008-2009), the middle (2010-2011-2012) and the end (2013-2014) of the period for the various NACE divisions, it can be observed that the manufacture of wearing apparel (NACE 14), the pharmaceutical industries (NACE 21), the manufacture of electrical equipment (NACE 27) and waste collection, treatment and disposal activities (NACE 38) experienced a reduction of their average PCM throughout the analysed period (see graph 11). Conversely, increases were observed throughout the period for the manufacture of beverages (NACE 11), the leather industry (NACE 15) and the repair and installation of machinery and equipment (NACE 33).

[33] The same observation can be made by comparing the 2014 PCM with the average PCM for the period 2008 to 2010.

Graph 11. Evolution of the Price Cost Margin per NACE division[34], industrial sectors, 2008-2014



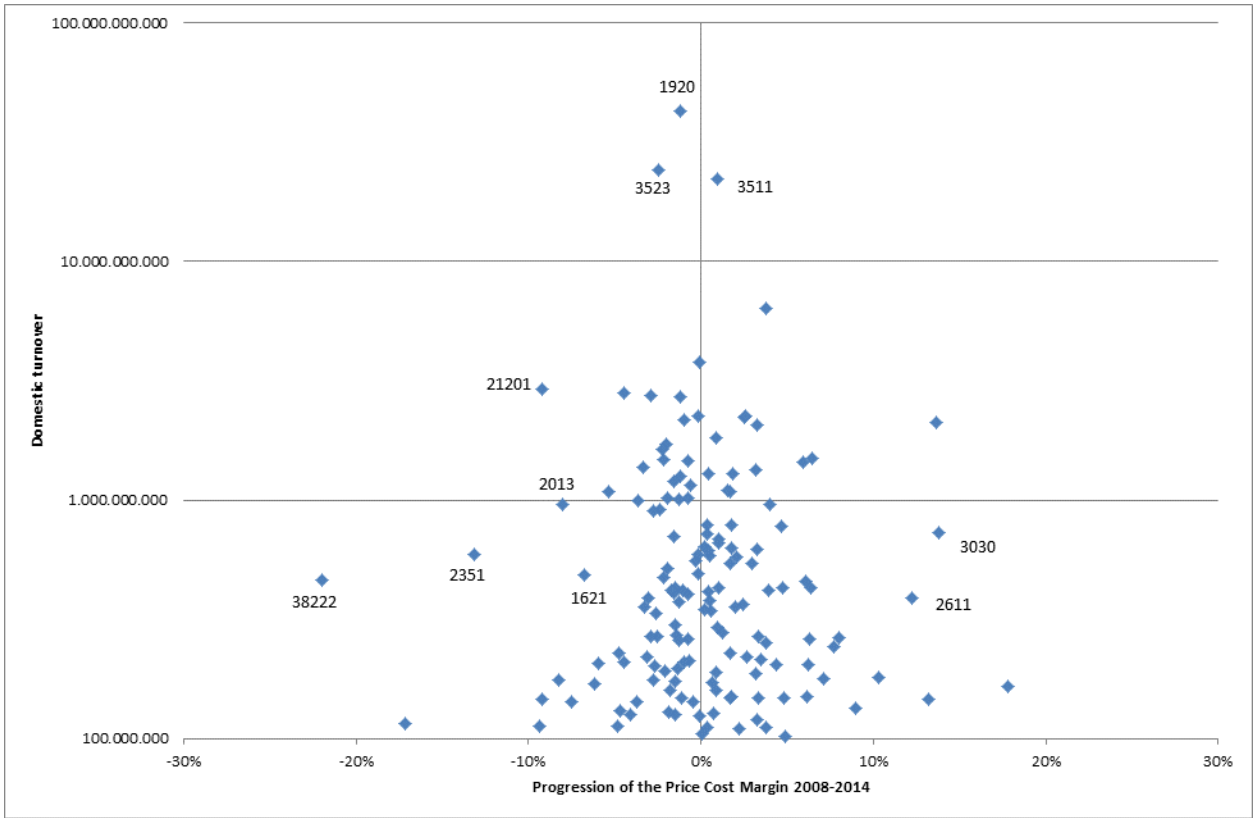
Note: the evolution is expressed in terms of the absolute variation between the 2014 PCM and the 2008 PCM. The evolution is therefore measured in percentage points. The start period is the average for the years 2008 and 2009. The middle period is the average for 2010 to 2012. The end period includes the years 2013 and 2014.
Sources: Statistics Belgium, NBB, own calculations

In terms of the sectors, the largest reductions of PCM are observed specifically for the sectors 1621 "Manufacture of veneer sheets and wood-based panels" (from 14.3% in 2008 to 7.5% in 2014), 21201 "Manufacture of medicines" (from 38.7% to 29.5%), 2351 "Manufacture of cement" (from 18.3% to 5.2%), and 38222 "Treatment and disposal of hazardous waste" (from 23% to 1.7%) (see graph 12). These findings are confirmed when the evolution of the averages at the start and end of the period is analysed.

Among the sectors which experienced a strong increase in their PCM between 2008 and 2014, one can find in particular the sectors 2219 "Manufacture of other rubber products" (from 7.1% in 2008 to 13.3% in 2014), 2611 "Manufacture of electronic components" (from 13.7% to 25.9%) and 3030 "Manufacture of air and spacecraft" (from 6.2% to 20%).

[34] See annex 5 for the list of NACE divisions and their titles.

Graph 12. Evolution of the Price Cost Margin, industrial sectors, 2008-2014



Note: the evolution is expressed in terms of the absolute variation between the 2014 PCM and the 2008 PCM. It is therefore measured in percentage points.
Sources: Statistics Belgium, NBB, own calculations

Services sectors

The average PCM of the services over the period 2008-2014 is higher than for the industrial sectors (12.1%, versus 9.2%). Some NACE divisions have a much higher PCM than the average during this period, such as accommodation (NACE 55) (23% on average over the period 2008-2014), real estate activities (NACE 68) (32.5%), legal and accounting activities (NACE 69) (24.9%), veterinary activities (NACE 75) (39.6%) and renting and leasing activities (NACE 77) (28%). By looking at the results at the most detailed sectorial level, the sectors with the highest average PCM are specifically renting and operating non-residential real estate (46.3%), renting and leasing of cars (39.6%), renting and leasing of residential real estate (37.9%), wired telecommunications (36.7%) and legal activities (34,4%) (see table 12).

During this period, various NACE divisions had a relatively low PCM. Specifically, these were wholesale and retail trade, repair of motor vehicles and motorcycles (NACE 45) (average PCM of 6.7%), wholesale trade (NACE 46) (6.1%), scientific research and development (NACE 72) (-11.5%), security and investigation activities (NACE 80) (6.7%) and associations of membership organisations (NACE 94) (-5.6%).

As such, several sectors of wholesale trade emerge from the analysis of the most detailed sectorial level, including wholesale trade of sanitary equipment (-7.3%), wholesale trade of diamonds (0.1%) and wholesale trade of fuels (1.3%). Among the other sectors with the lowest average PCM, one can find in particular the wholesale trade of cars and light vehicles (1.3%).

Table 12. List of sectors with the highest and lowest average PCM, services sectors, average 2008-2014

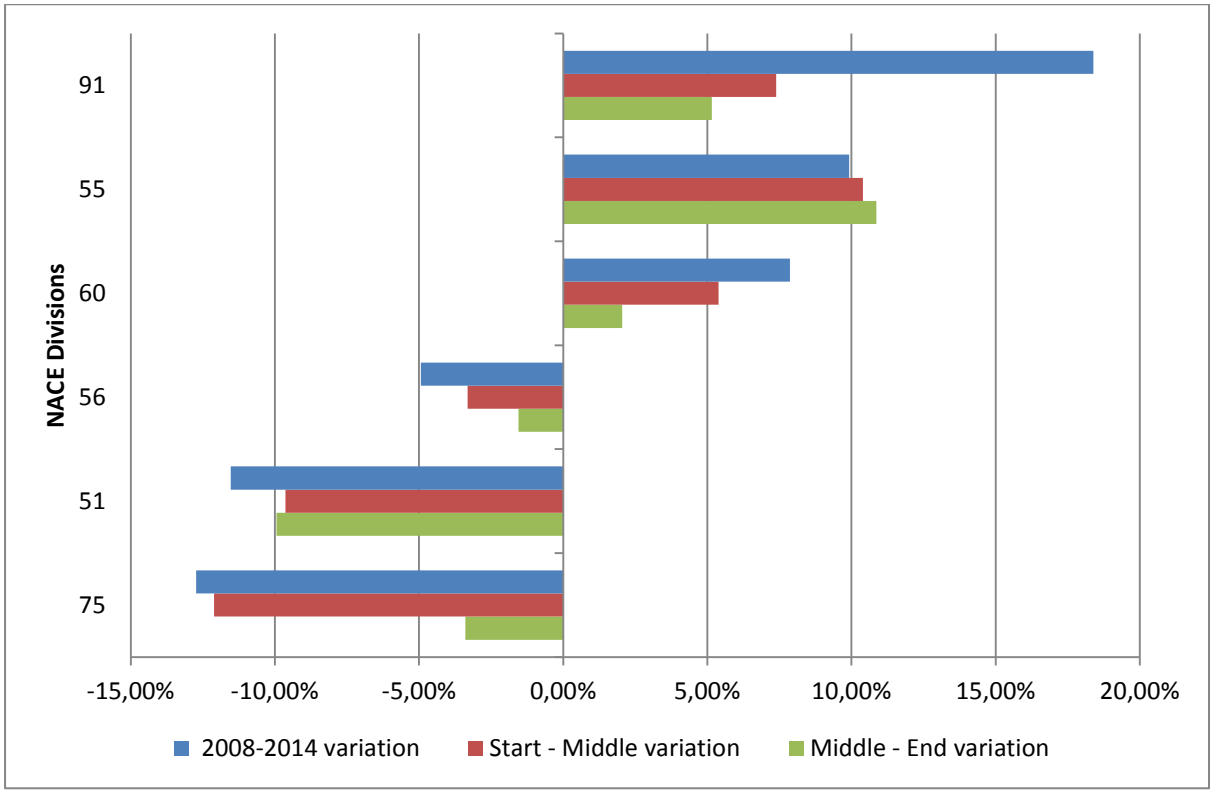
Highest average PCM			Lowest average PCM		
NACE	**Sector**	**PCM 2008-2014 (%)**	**NACE**	**Sector**	**PCM 2008-2014 (%)**
68203	Renting and operating of non-residential own or leased real estate, except land	46,39	46736	Wholesale of sanitary equipment	-7,37
7711	Renting and leasing of cars and light motor vehicles	39,66	9411	Activities of business and employers membership organisations	0,43
7500	Veterinary activities	39,63	46761	Wholesale of diamonds and other gems	1,05
68201	Renting and operating of residential own or leased real estate, except social housing	37,99	45111	Wholesale of cars and other light motor vehicles (< 3.5 tonnes)	1,26
6110	Wired telecommunications activities	36,75	4671	Wholesale of solid, liquid and gaseous fuels and related products	1,37
68202	Accounting, bookkeeping and tax accounting activities	35,24	7830	Other human resources provision	1,58
6311	Data processing, hosting and related activities	34,71	46769	Wholesale of other intermediate products n.e.c.	1,78
69101	Activities of lawyers	34,43	4791	Retail sale via mail order houses or via Internet	1,81
5222	Service activities incidental to water transportation	34,28	46332	Wholesale of edible oils and fats	2,17
96021	Hairdressing	32,23	46491	Wholesale of books, newspapers and periodicals	2,28

Sources: Statistics Belgium, NBB, own calculations

As was the case for the industrial sectors, a slight reduction in the average profitability of services was observed in the middle of the analysed period - with the years 2010 and 2011 representing a dip. Profitability subsequently recovered to its 2008 level. In 2014, more than half of the 385 analysed services had a higher PCM than in 2008.

By comparing the averages at the start (2008-2009), the middle (2010-2011-2012) and the end (2013-2014) of the period for the various NACE divisions, it was observed that air transport (NACE 51), restaurants (NACE 56) and veterinary activities (NACE 75) experienced a reduction of their average PCM throughout the analysed period. Conversely, some NACE divisions experienced an increase in their PCM throughout this period, including accommodation (NACE 55), programming and broadcasting activities (NACE 60) and libraries, archives, museums and other cultural activities (NACE 91).

Graph 13. Evolution of the Price Cost Margin per NACE division35, services sectors, 2008-2014



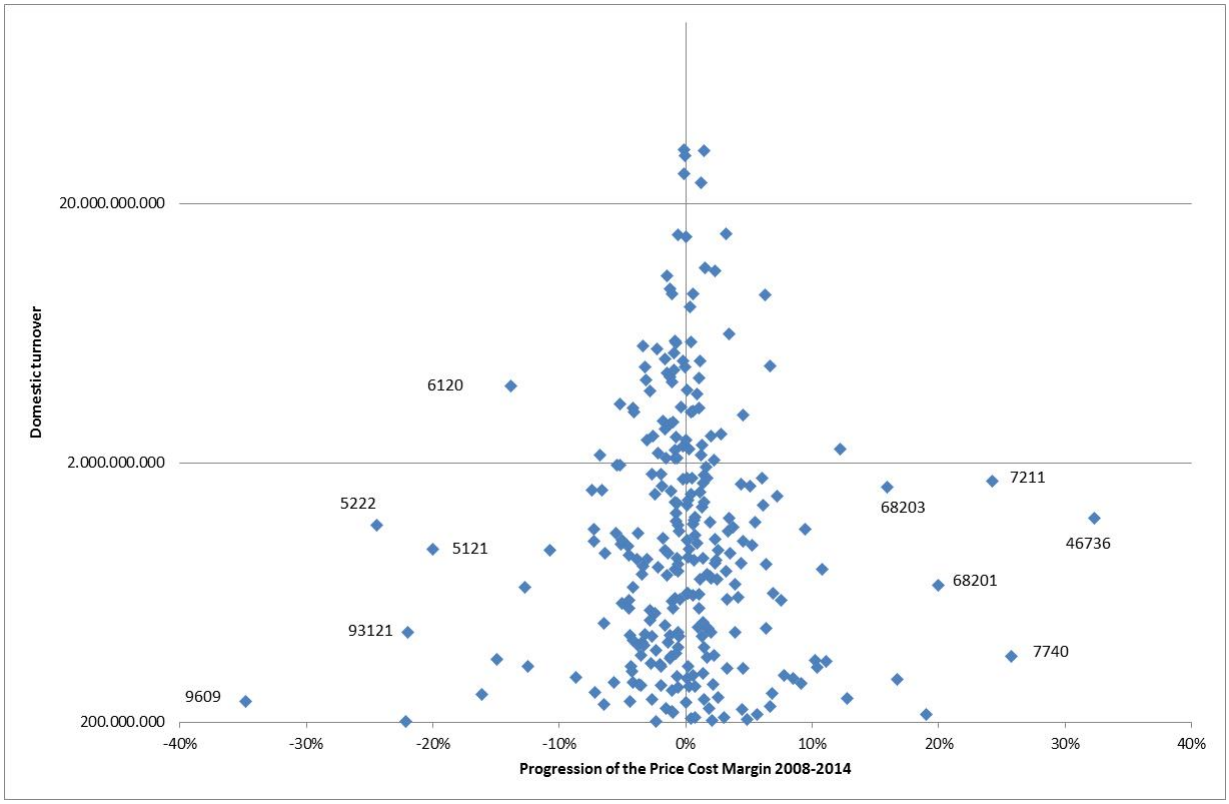
Note: the progression is expressed in terms of the absolute variation between the 2014 PCM and the 2008 PCM. The progression is therefore measured in percentage points.
Sources: Statistics Belgium, NBB, own calculations

The main sectors which experienced a strong reduction of their PCM throughout this period are 5121 "Freight air transport" (from 9.1% in 2008 to -10.8% in 2014), 5222 "Service activities incidental to water transportation" (from 52.8% to 28.4%), 6120 "Wireless telecommunications" (from 30.6% to 16.7%), 93121 "Activities of sports clubs" (from 7% to -14.8%) and 9609 "Other personal service activities" (from 85.5% to 50.7%). These findings also hold true by comparing the average at the start of the period (2008-2009) to that of the end of the period (2013-2014).

The main sectors which experienced an increase of their PCM throughout this period are in particular 46736 "Wholesale of sanitary equipment" (from -33.5% to -1.2%), 68201 "Renting and operating of own or leased real estate" (from 25% to 45%), 68203 "Renting and operating of own or leased non-residential real estate" (from 33.5% to 49.4%) and 7211 "Research and experimental development on biotechnology" (from 12.5% to 36.7%).

[35] See annex 5 for the list of NACE divisions and their titles.

Graph 14. Evolution of the Price Cost Margin, services sectors, 2008-2014



Note: the evolution is expressed in terms of the absolute variation between the 2014 PCM and the 2008 PCM. It is therefore measured in percentage points.
Sources: Statistics Belgium, NBB, own calculations

4.2 Interaction with other indicators of market functioning

Table 13 indicates the correlation coefficients between the PCM indicator and the other indicators of the market functioning used in the screening. As expected[36], there is a significant correlation between the PCM and capital intensity. It is higher in the services sectors (0.54 in 2014) than in the industrial sectors (0.23).

The correlations with other indicators of the market functioning are relatively weak (see table 13). As such, for the services sectors, the PCM is positively correlated - both in 2014 and for the average of the years 2012 to 2014 - with the number of companies, the rate of volatility, the companies churn rate and the total number of firms index (TNF8). There is also a negative correlation with the survival rate.

The significance of the correlation between the PCM and the stability indicators is due in particular to the values of the indicators for real estate activities (NACE 68) and legal activities (NACE 69), for which some sectors have extreme values for the PCM and for the volatility.

[36] Bearing in mind that the gross profit of a given sector is intended to finance and pay back the capital used in the production process.

Table 13. Correlation coefficients between the PCM and the other indicators of the screening, 2014 and average for 2012-2014)

	Industrial sectors				Services			
	2014		Average 2012-2014[a]		2014		Average 2012-2014[a]	
	Pearson correlation	Spearman correlation	Pearson correlation	Spearman correlation	Pearson correlation	Spearman correlation	Pearson correlation	Spearman correlation
HHI	0.09	-0.02	0.02	-0.06	0.00	**-0.22**	-0.10	**-0.24**
Capital intensity	**0.23**[b]	**0.27**	**0.28**	**0.30**	**0.54**	**0.56**	**0.59**	**0.61**
Number of firms	0.10	0.02	0.11	0.06	**0.14**	**0.19**	**0.15**	**0.20**
Import penetration	-0.03	-0.01	0.03	0.04				
Market shares volatility	-0.01	-0.00	0.02	0.04	**0.29**	**0.26**	**0.19**	**0.18**
Weighted churn	0.02	-0.06	-0.01	-0.00	**0.19**	**0.23**	0.09	0.11
Survival rate	0.08	0.07	0.02	0.09	**-0.17**	**-0.16**	-0.13	**-0.13**
Total number of firms index (TNF8)	**-0.18**	-0.07	-0.10	-0.04	**0.19**	**0.18**	**0.20**	**0.16**

[a] The average PCM over the period 2012-2014 is compared with the average values of various indicators over this same period, except for the survival rate and the TNF8 which do not have annual values but are calculated for the entire period 2010-2014.
[b] The values in bold are statistically significant (at 5% level).
Sources: Statistics Belgium, NBB, own calculations

4.3 Integration of capital costs

The Price Cost Margin indicator, as used in this horizontal screening, assesses the gross profit of various companies in a given sector. This approach does not take into account the costs associated with the use of capital[37], which may lead to an overestimate of the real operational profitability of some sectors.

An alternative approach has therefore been developed to take these capital costs into consideration in the gross profit of given sectors. The technical and methodological aspects of this alternative PCM are explained in annex 4. This alternative PCM indicator is calculated exclusively using the annual accounts of companies, whereas the initial PCM is calculated on the basis of the Structural Business Survey (SBS), in other words a broader sample of companies[38]. This might generate significant differences in the results.

In total, three indicators are taken into account in this section:

- The PCM-SBS: which is the initial approach based on the data from the Structural Business Survey and used in the composite indicator of the horizontal screening of sectors;
- The PCM-AA: which is exclusively constructed on the basis of the data from companies with annual accounts (AA);

[37] Capital costs are the costs that the company should "self-charge" and which correspond to the loss of value caused by the use and / or aging of the capital goods that the company uses and which it acquired in the past through investments. It is not easy to calculate capital costs, as defined: while it is relatively easy to objectively measure investment expenditure, it is difficult to determine in a precise and objective way the cost of the use of these investments, namely capital costs.

[38] In addition to companies who file in annual accounts, the Structural Business Survey (SBS) also makes it possible to take smaller sized businesses into consideration. As such, twice as many companies come into play in the calculation of the initial PCM (SBS) compared with the alternative approach based exclusively on annual accounts. For more details on the advantages of the SBS as a source of data, see annex 3 of the screening 2015.

- The PCM-ALT: which represents the alternative approach, structured by integrating capital costs in the PCM-AA.

In the analysis below, the comparison between the initial approach of the PCM and the alternative approach which takes into account the costs of capital, will pertain exclusively to the results of 2014.

Industrial sectors

For the industrial sectors, the median value[39] of the alternative approach in 2014 is 3.7%, versus 8.6% for the initial PCM. The impact is therefore significant. The sectors which are capital intense are, of course, more impacted by this inclusion of the costs of capital in the calculation of the PCM, such as, for example, the printing and service activities related to printing (NACE 18), the pharmaceutical industries (NACE 21), the manufacture of other non-metallic mineral products (NACE 23) and the waste collection, treatment and disposal activities (NACE 38).

Among the most important sectors which have a high initial PCM in 2014 (see table 1 of annex 4), some are heavily impacted by the integration of capital costs. This is notably the case for 21201 "Manufacture of medicines", which goes from an initial PCM of 29.5% to an alternative PCM of -0.3%, and for 23321 "Manufacture of bricks" (from 18.3% to 6.7%). However, other sectors are only moderately impacted, such as 2611 "Manufacture of electronic components" and 1105 "Manufacture of beer".

By integrating the capital costs into the profit margin and by limiting the analysis to the sectors with a considerable domestic turnover, one can find in particular 2611 "Manufacture of electronic components" (alternative PCM of 20.9%), 1105 "Manufacture of beer" (19%) and 1200 "Manufacture of tobacco products" (13.3%) among the sectors with a high alternative PCM (see table 14).

Table 14. Ranking of sectors according to the alternative PCM, industrial sectors with a domestic turnover > 200 million EUR, 2014

NACE	Sector	Alternative PCM 2014 (Capital costs) (%)	PCM 2014 – Annual accounts (%)	PCM 2014 – Structural Business Survey (%)
2611	Manufacture of electronic components	20.86	26.15	25.89
1105	Manufacture of beer	19.00	28.54	24.24
27402	Manufacture of electric lighting equipment	17.04	21.54	12.03
2660	Manufacture of irradiation, electromedical and electrotherapeutic equipment	13.76	24.28	14.57
1200	Manufacture of tobacco products	13.35	20.16	18.40
1091	Manufacture of prepared feeds for farm animals	12.87	14.29	3.01
3030	Manufacture of air and spacecraft and related machinery	11.81	19.02	20.07
2540	Manufacture of weapons and ammunition	11.40	14.76	11.79
1107	Manufacture of soft drinks; production of mineral waters and other bottled waters	10.82	15.67	13.79
3020	Manufacture of railway locomotives and rolling stock	10.15	11.07	9.59
	Total industrial sectors (mean)	2.25	9.18	9.38
	Total industrial sectors (median)	3.71	8.75	8.56

Sources: Statistics Belgium, NBB, own calculations

[39] Given the presence of extreme values, the median is preferred over the average here.

Services sectors

With regards to the services sectors, the median value of the alternative PCM in 2014 is of 4.0%, versus 9.7% for the initial PCM. The transport sectors (NACE 49-51), accommodation (NACE 55), real estate activities (NACE 68) and renting (NACE 77) are the most impacted by the integration of capital costs in the calculation of PCM, due to their high capital intensity.

Among the sectors which have a high initial PCM, those who are most impacted by the integration of capital costs are in particular 7711 "Renting and leasing of motor vehicles", which goes from 41.6% to 4.9%, and 6110 "Wired telecommunications" (from 36.7% to 6.9%). Yet, the sectors 69101 "Activities of lawyers" and 69102 "Activities of notaries" are only slightly impacted: the difference in their scores between the initial approach and the alternative approach can mainly be explained by the difference in the sources of the data used and not by the inclusion of the costs of capital[40].

By taking the capital costs into account in the profit margin, the sectors which have a high alternative PCM in 2014 are specifically 68203 "Renting and operating of non-residential own or leased real estate, except land" (47.2%), 69102 "Activities of notaries" (20.2%) and 69101 "Activities of lawyers" (18.6%).

Table 15. Ranking of sectors according to the alternative PCM, services sectors with a domestic turnover > 600 million EUR, 2014

NACE	Sector	Alternative PCM 2014 (Capital costs) (%)	PCM 2014 – Annual accounts (%)	PCM 2014 – Structural Business Survey (%)
68203	Renting and operating of non-residential own or leased real estate, except land	47.18	72.47	49.38
42219	Construction of utility projects for fluids n.e.c.	44.39	54.32	19.79
68201	Renting and operating of residential own or leased real estate, except social housing	34.68	72.75	45.06
69102	Activities of notaries	20.16	21.06	34.92
5310	Postal activities under universal service obligation	18.64	22.49	25.09
69101	Activities of lawyers	18.62	20.21	36.22
8299	Other business support service activities n.e.c.	14.19	17.32	17.69
47761	Retail sale of flowers, plants, seeds and fertilizers in specialised stores	13.51	16.27	12.48
41101	Development of residential building projects	12.54	18.99	15.31
46496	Wholesale of sport and camping, except cycles	12.19	12.61	3.76
	Total services (mean)	5.46	11.42	12.75
	Total services (median)	4.04	7.19	9.69

Sources: Statistics Belgium, NBB, own calculations

[40] Given the presence of numerous actors who do not file annual accounts, these sectors are characterised by a considerable difference between the PCM based on the Structural Business Survey (more representative) and the PCM based only on the annual accounts.

5 Conclusion

The main objective of this screening is to identify the potential market failures in different market sectors. However, one should be cautious when interpreting the results. They do not represent a final judgement, but provide a list of candidates for a more in depth analysis. Only such an in depth analysis of a given sector will make it possible to set the context, the definition of the relevant market and the dynamics of its demand and supply. In fact, a competitive and dynamic market does not automatically lead to an efficient market functioning[41]. That is why public authorities have an important role to play in terms of analysing and regulating markets for goods and services.

The results of this screening are consistent with those published last year, and are in line with some cases analysed by European competition authorities. For example, various sectors among those of telecommunications, transports, non-metallic mineral products or renting services are specifically highlighted in this screening.

An analysis of the profitability of market sectors and its evolution was also carried out, for the period from 2008 to2014. The pharmaceutical industries, real estate activities and legal and accounting activities emerge as having high profitability, in contrast to metallurgy and wholesale trade. These results were subsequently mitigated by the inclusion of the capital costs.

By combining the results of the screening with those of the profitability analysis, various sectors appear to be eligible for further detailed analysis, such as network industries or the manufacture of beer.

Since the horizontal screening is carried out annually, various improvements are planned for the future, both in terms of data sources, the modelling approach and the selected indicators. For example, the work of integrating the capital costs into the calculation of the sectors price cost margin will be pursued. A particular attention could be given to the linkage of the results of the screening with the price evolution of goods and services.

[41] For example, the economies of scale, network effects or externalities can make a large market concentration or a heavy regulation of the market more efficient.

6 Annexes

Annex 1: Definitions of the indicators

Static indicators

Number of companies

The indicator of the number of companies counts the number of Belgian companies active in the domestic market in a given sector. The reason for its inclusion is that the sectors which do not include many companies are subject to a higher risk of price fixing agreement or other kinds of collusion.

Herfindahl-Hirshman Index (HHI)

The Herfindahl-Hirshman Index is defined as the sum of the squares of the market share of all of the companies in a given sector. The value of the HHI is situated between $1/N$ and 1, where *N* is the amount of companies in the sector. A large disparity in market shares indicates a higher concentration and a higher HHI.

In the event of a monopoly, the HHI will have a value of 1. The HHI is frequently used to assess the concentration (or asymmetry) of a given sector. Despite the complexity of the link between the degree of concentration (as measured by the HHI) and the market power, it is generally acknowledged that market power goes hand in hand with a higher concentration of companies. This can lead to a less competitive environment.

Import penetration

The import penetration of a given sector is defined in this study as the ratio between the value of the products imported by this sector and the apparent consumption value of all the products in this sector in Belgium.

Or IMP_p, the value of the products imported p linked to the sector S[42], whereas the import penetration IP_S for the sector S is equal to:

$$IP_S = \frac{\sum_{p \in S} IMP_p}{\sum_{i \in S} CA.intérieur_i + \sum_{p \in S} IMP_p}.$$

A high coefficient indicates that a sector has significant exposure to competition from foreign companies offering similar products in the domestic market. This opening up to international trade weakens unprofitable domestic firms.

More openness can therefore go hand in hand with stronger competition in the domestic market, under certain conditions. The sector analysis pertains to the sectors which are characterised by a lack of openness, or limited openness. Import penetration makes it possible to nuance the results of other indicators, and more particularly those related to HHI (concentration in the domestic market) and to the "Number of companies" (number of companies active in the domestic market).

[42] Imported products which are immediately re-exported are subtracted from the value of the imported product p linked to sector *S*.

Capital intensity

The capital intensity of a sector can be approximated as the capital required to generate 1 euro of total operating result. This indicator is calculated as the ratio of the total capital stock of the sector (K_S) and the total operating result (Y_S) of all of the companies in sector *S*.

$$CAPINT_S = \frac{K_S}{Y_S}$$

In theory, the values for the indicator can vary from 0 to infinity. New companies or small-sized firms encounter all the more difficulties in establishing themselves or remaining in the market when the ratio between the capital stock and the total operating result is high. This may lead to potential competition problems in sectors with high capital intensity.

PCM - Price Cost Margin

This indicator reflects the margin of a given sector. For a company *i*, this margin (indicated as *L* below) is defined as the difference between the price (*p*) and the marginal cost (*MC*) of production divided by the price:

$$L_i = \frac{p_i - MC_i}{p_i}$$

In other words, it measures by how much the price of a product is higher than the marginal cost of its production. For example, if a company sells a product for 100 EUR, which entailed a production cost of 90 EUR, it will have a margin of 10% on this product.

At the sector level, this margin is calculated by weighting the market shares of the various companies in the sector in question:

$$L_S = \sum_{i \in S}^{N} m_i \, \frac{p_i - MC_i}{p_i}$$

Where m_i is the market share of the company *i* belonging to sector *S*.

In practice, the calculation of the margin is not straightforward, as it requires data on the price and marginal costs of various firms. A direct approach collecting such micro-economic data for every company would be burdensome. That is why numerous researchers have used an indirect approach to estimate the margin using econometric models. These models measure the impact of short-term fluctuations in production and all of the factors of production at the sectorial level.

In the context of this screening, the margin L_S was estimated for each sector *S* by the Price Cost Margin indicator, PCM_S. This indicator represents the ratio between two variables (for the numerator, the gross operating surplus, and for the denominator, the turnover[43]) calculated in the context of the Structural Business Survey[44]. Using the Structural Business Survey makes it possible to cover a sector more effectively by also taking into account small businesses which do not complete annual accounts in the full format. This PCM does not take the cost of capital into account. That is why the Price Observatory has calculated an alternative PCM which integrates the cost of capital but which, up until now, only encompasses companies which file full-format accounts with the Central Balance Sheet Office.

[43] Compared with the 2014 screening, the denominator no longer takes into account the changes in inventories of finished goods (71) and capitalised internal activities (72).

[44] These variables are defined in the context of European Regulation 250/2009.

Dynamic indicators

Companies weighted churn

The weighted churn of companies for the year t is defined as the sum of the market shares for the year $(t-1)$ of the companies which exit the market in the year t and the market shares of the companies who enter the market in the year t.

$$WCHURN_{St} = \sum_{i \in \{Ex_t\}} m_{i,t-1} + \sum_{i \in \{En_t\}} m_{it}$$

In theory, the scores vary between 0 and 2. A score higher than 1 indicates that one or more important companies (in terms of market share) have entered the market or have exited it. Conversely, a zero score shows high stability in the make-up of a sector and means that no firm has entered or exited the market during the analysed period.

The churn rate of companies analyses the dynamic progression of a given sector's composition, by studying the entering and exiting companies. Accordingly, a low value could represent an indication of significant level of barriers to entry or to exit of the market.

Survival rate

The survival rate analyses the changes in the demographic of a given sector. A high survival rate would indicate high stability in the demography of a given sector, with few new firms and a strong level of survival among firms already present in the market. This high stability could result in a potential risk linked to repeated interactions between firms, especially in sectors where there are not many firms.

In fact, given that the various actors in the market know each other and can better grasp the strategic behaviour of competitors, anti-competitive arrangements could be facilitated by this stability. The survival rate also reveals the level of barriers to entry and exit of a sector.

Conversely, a low value of the indicator would suggest the sector had a dynamic make-up, with multiple entries and exits. The entry of new firms would make it more difficult for firms already present in the market to collude with each other.

The survival rate can be approached in various ways. Each method highlights certain aspects and ignores others. In this study, the indicator chosen to evaluate the survival rate is the ratio of the number of companies active during the entire period analysed (2010-2014) with the number of companies active during the final year of the period (2014):

$$Taux_de_survie = \frac{\sum_{i=1}^{N} \prod_{t=1}^{T} x_i^t}{\sum_{i=1}^{N} x_i^T}$$

Where x_i^t for a firm i is equal to 1 if this firm was active (in other words, with a positive domestic turnover) in the year t and otherwise 0.

Specifically, it involves measuring the proportion of firms active in 2014 which were active throughout the period studied (2010-2014)[45]. Through its denominator, this ratio is influenced by the number of firms who have entered the market during the period studied. By definition, the value of the indicator is always between 0 and 1: where a value of 1 corresponds to high stability in the demographic of a sector

[45] In contrast to the previous screening, the survival rate now takes account of companies without accounts, due to a change in the date of closure of the accounts, among other reasons.

(all the companies active in the sector in 2014 were already active in the market for the four previous years).

Volatility of market shares

The market shares volatility analyses the dynamic evolution of a sector, via the relative stability of the market shares of the various companies present in the market. It measures the quantity of the market shares transferred from firms in decline to the developing ones. A ratio which is not very high would indicate a high stability in the division of market shares within a given sector from one year to another, which could signal potential competition problems and collusion between firms. Besides collusion, the existence of barriers to entry may limit the creation of new firms and therefore contribute to a certain stability in the division of market shares within the sector.

The approach used to measure the rate of volatility corresponds to the sum of the absolute value in the change of market share of each company (based on their domestic turnover) in a sector, divided by two:

$$Volatility_S^t = \sum_{i \in S} \frac{\left| m_i^t - m_i^{t-1} \right|}{2}$$

Where m_i^t is the market share (calculated in relation to the domestic turnover of the sector) of the firm i at point in time t.

The volatility rate may be a value between 0 and 1. The volatility rate of a given year needs to be qualified by the average volatility over a longer period. Moreover, a high value for the volatility rate does not automatically mean that the market functions effectively. It could be due to an economic downturn, or changes in legislation, or restructuring within the sector.

Turnover rate of companies (TNF8)

The turnover rate of companies (TNF8) calculates the turnover of companies among the eight most important (in terms of sales turnover) in a given sector between 2009 and 2013. Although the sector includes at least 8 companies, the values for this indicator range from 8 (status quo, the same firms in the TOP 8 of the sector during the period in question) and 40 (complete change of firms). A high value for the indicator could suggest a high level of turbulence and, potentially, a higher level of competition.

Annex 2: Data cleansing

Table 1 below provides an overview of the criteria used for the sector selection and the impact of each criterion on the number of sectors, firms and turnover. The criteria used are broadly identical to those used in the previous screening (except for the criterion 3). The detailed description of each criterion can be found in Annex 2 of the previous report. The relative impact of the criteria is comparable to that of the previous screening, except for the criterion 5.a where it is higher (23 sectors instead of 12, 37,000 firms instead of 1,000 and EUR 17,2 billion of turnover instead of EUR 500 million). A further research indicates that the application of this criterion did not significantly influence the results of the screening. Indeed, the majority of the impact is in the seven sectors, none of which, if the sector would have been selected, would obtain a high value of the composite indicator.

Table 1. Sector selection: criteria and their impact

Criteria			**# Sect.**	**# Enter-prises**	**Total turnover (billons EUR)**
1	Sectors without companies having turnover in the annual accounts	NACE 4	11	129	136.7
		NACE 5	6	223	82.5
		Total	**17**	**352**	**219.2**
2	Small sectors (the smallest decile of the remaining companies) whose annual account turnover is less than 25% compared to the total turnover	NACE 4	21	6.000	575.7
		NACE 5	15	2.869	330.4
		Total	**36**	**8.869**	**906.1**
3	Sectors with 1 or more indicators missing (+ 1 sector with negative extreme value for PCM)	NACE 4	4	357	233.6
		NACE 5	2	32	76.6
		Total	**6**	**389**	**310.2**
4	Non appropriate NACE 4 sectors, i.e. NACE 4 sectors with a more detailed division NACE 5	NACE 4	75	5.366	2,685.2
5	Small sectors (the smallest decile of the remaining firms) with an insufficient statistical basis for the PCM based on the structural business survey				
5.a	Small sectors with a share of more than 40% in the sales in the structural survey - enterprises whose NACE code differs from that of the structural survey, according to the NAI	NACE 4	16	36.550	16,686.2
5.b	Small sectors NACE 5 with insufficient reliability in terms of turnover and weighted churn rate	NACE 5	7	555	536.4
		Total	**23**	**37.105**	**17,222.6**
Total excluded sectors		NACE 4	52	43,036	17,632.2
		NACE 5	105	9,045	3,711.2
		Total	**157**	**52,081**	**21,343.4**
Total retained sectors		NACE 4	350	290,058	470,304.1
		NACE 5	273	300,930	342,426.9
		Total	**623**	**590,988**	**812,731.0**

Source : Own calculations

Annex 3: Descriptive statistics of the indicators

Industrial sectors

Table 1 shows, for each of the categories of industrial sectors as defined in the "Results" section of the report, the descriptive statistics of the various indicators. Network industries, by the very nature of their activities, are characterised by higher capital intensity, a higher concentration than the average for industrial sectors, as well as by a very low import penetration rate. Moreover, the indicator of the profit margin is higher for this category on average. The food and beverage industries are characterised by a higher average number of companies per sector. The capital intensity is higher on average in the sectors of metallurgy and other minerals than in the food and beverage industries. For the other indicators, there is no significant difference between the various categories.

Table 1. Descriptive statistics - Industrial sectors

Indicators	Categories	Mean	Standard deviation	Median	Q1	Q3
Number of firms	**Industrial sectors (Total)**	155.78	414.72	42	19	117
	Food and beverages industries	206.34	674.54	49	20	117
	Other manufacturing industries	149.12	335.24	53.5	22	138
	Network industries	77.16	85.61	38	14	139
	Manufacture of basic metals, metal products and other mineral products	168.37	452.29	25	10	73
HHI	**Industrial sectors (Total)**	0.28	0.23	0.21	0.09	0.4
	Food and beverages industries	0.31	0.24	0.21	0.13	0.5
	Other manufacturing industries	0.25	0.21	0.18	0.09	0.36
	Network industries	0.37	0.3	0.28	0.09	0.58
	Manufacture of basic metals, metal products and other mineral products	0.31	0.25	0.27	0.1	0.43
Capital intensity	**Industrial sectors (Total)**	0.2	0.23	0.14	0.09	0.23
	Food and beverages industries	0.18	0.15	0.16	0.09	0.21
	Other manufacturing industries	0.16	0.12	0.12	0.08	0.2
	Network industries	0.57	0.52	0.38	0.26	0.99
	Manufacture of basic metals, metal products and other mineral products	0.22	0.23	0.18	0.11	0.24
Price Cost Margin	**Industrial sectors (Total)**	0.1	0.07	0.09	0.06	0.12
	Food and beverages industries	0.09	0.06	0.08	0.05	0.11
	Other manufacturing industries	0.1	0.06	0.09	0.06	0.13
	Network industries	0.12	0.11	0.08	0.05	0.14
	Manufacture of basic metals, metal products and other mineral products	0.09	0.06	0.09	0.06	0.12
Import penetration	**Industrial sectors (Total)**	0.48	0.33	0.53	0.14	0.78
	Food and beverages industries	0.4	0.25	0.36	0.23	0.61
	Other manufacturing industries	0.59	0.31	0.66	0.42	0.83
	Network industries	0.06	0.18	0	0	0
	Manufacture of basic metals, metal products and other mineral products	0.4	0.33	0.33	0.08	0.7

Indicators	Categories	Mean	Standard deviation	Median	Q1	Q3
Volatility of market shares	**Industrial sectors (Total)**	0.13	0.13	0.1	0.06	0.16
	Food and beverages industries	0.13	0.17	0.08	0.04	0.18
	Other manufacturing industries	0.14	0.12	0.12	0.07	0.18
	Network industries	0.1	0.13	0.09	0.04	0.11
	Manufacture of basic metals, metal products and other mineral products	0.11	0.12	0.08	0.06	0.13
Weighted churn	**Industrial sectors (Total)**	0.06	0.12	0.02	0	0.07
	Food and beverages industries	0.09	0.19	0.01	0	0.07
	Other manufacturing industries	0.06	0.1	0.03	0	0.07
	Network industries	0.06	0.16	0.01	0.01	0.03
	Manufacture of basic metals, metal products and other mineral products	0.05	0.11	0.01	0	0.05
TNF8	**Industrial sectors (Total)**	11.74	2.6	12	10	13
	Food and beverages industries	11	2.38	11	10	13
	Other manufacturing industries	12.03	2.36	12	11	13
	Network industries	11.42	3.69	12	10	14
	Manufacture of basic metals, metal products and other mineral products	11.59	2.82	12	10	13
Survival rate	**Industrial sectors (Total)**	0.71	0.14	0.73	0.63	0.81
	Food and beverages industries	0.69	0.14	0.71	0.62	0.77
	Other manufacturing industries	0.72	0.14	0.73	0.65	0.81
	Network industries	0.62	0.19	0.63	0.5	0.71
	Manufacture of basic metals, metal products and other mineral products	0.74	0.13	0.76	0.67	0.82

Sources: DG Statistique - Statistics Belgium, own calculations

Services sectors

Table 2 shows, for each of the categories of services sectors, the descriptive statistics of the various indicators. On average, the rental and leasing sectors are made up of a more limited number of companies and are characterised by a higher capital intensity and profit margin indicator than the other categories. Network services are more concentrated on average and are characterised by a higher average capital intensity. The trade sectors are stable on average. However, the average for the PCM indicator is weaker here compared with the other categories. The construction sectors are less concentrated on average and more unstable than the other categories.

Table 2. Descriptive statistics - Services sectors

Indicators	Categories	Mean	Standard deviation	Median	Q1	Q3
Number of firms	**Services (Total)**	1435.41	3091.86	474	164	1223
	Other services	2168.97	4452.21	746	284	1951
	Trade	731.08	912	408.5	120.5	987.5
	Construction	2518.1	3766.94	807	189	3180
	Renting and leasing	209.12	195.07	147	75	327
	Personal services	2144.21	4122.38	506	189	1611
	Network services	797.08	1570.76	167.5	64	618.5
HHI	**Services (Total)**	0.1	0.13	0.05	0.02	0.12
	Other services	0.09	0.13	0.04	0.01	0.09
	Trade	0.1	0.1	0.06	0.02	0.13
	Construction	0.06	0.08	0.02	0.01	0.06
	Renting and leasing	0.15	0.16	0.1	0.07	0.18
	Personal services	0.07	0.08	0.02	0.01	0.1
	Network services	0.22	0.26	0.11	0.06	0.33
Capital intensity	**Services (Total)**	0.32	0.56	0.12	0.06	0.27
	Other services	0.35	0.74	0.12	0.06	0.26
	Trade	0.11	0.13	0.08	0.05	0.13
	Construction	0.23	0.27	0.13	0.09	0.25
	Renting and leasing	0.81	0.84	0.59	0.4	0.94
	Personal services	0.63	0.54	0.45	0.2	0.96
	Network services	0.71	0.85	0.41	0.17	0.77
Price Cost Margin	**Services (Total)**	0.13	0.11	0.1	0.05	0.17
	Other services	0.16	0.11	0.13	0.07	0.23
	Trade	0.07	0.04	0.06	0.04	0.09
	Construction	0.12	0.05	0.12	0.1	0.15
	Renting and leasing	0.31	0.21	0.26	0.19	0.35
	Personal services	0.18	0.14	0.16	0.09	0.29
	Network services	0.17	0.13	0.17	0.07	0.23

Indicators	Categories	Mean	Standard deviation	Median	Q1	Q3
Volatility	**Services (Total)**	0.15	0.1	0.12	0.09	0.17
	Other services	0.16	0.13	0.14	0.1	0.18
	Trade	0.12	0.06	0.11	0.08	0.15
	Construction	0.21	0.13	0.17	0.13	0.22
	Renting and leasing	0.18	0.19	0.13	0.1	0.16
	Personal services	0.15	0.08	0.14	0.1	0.19
	Network services	0.12	0.1	0.1	0.06	0.15
Churn rate	**Services (Total)**	0.09	0.1	0.06	0.03	0.1
	Other services	0.09	0.11	0.06	0.05	0.1
	Trade	0.07	0.06	0.05	0.03	0.09
	Construction	0.13	0.16	0.07	0.06	0.15
	Renting and leasing	0.09	0.1	0.05	0.03	0.09
	Personal services	0.1	0.09	0.09	0.04	0.12
	Network services	0.07	0.09	0.04	0.01	0.09
TNF8	**Services (Total)**	13.24	2.64	13	11	15
	Other services	13.28	2.8	13	11	15
	Trade	12.73	2.15	12	11	14
	Construction	14.88	3.63	14	12	17
	Renting and leasing	13.35	2.69	13	12	15
	Personal services	13.81	2.43	14	12	16
	Network services	12.46	2.15	13	11	14.5
Survival rate	**Services (Total)**	0.65	0.15	0.67	0.57	0.76
	Other services	0.6	0.17	0.62	0.52	0.72
	Trade	0.7	0.13	0.72	0.62	0.79
	Construction	0.59	0.14	0.62	0.48	0.71
	Renting and leasing	0.63	0.11	0.65	0.6	0.71
	Personal services	0.68	0.15	0.68	0.58	0.8
	Network services	0.65	0.12	0.66	0.6	0.73

Sources: DG Statistique - Statistics Belgium, own calculations

Annex 4: Alternative PCM: methodology

This annex describes the method used in the calculation of the cost of capital and of the alternative PCM.

As a reminder (cf. Annex 1), the following formula is used to calculate the PCM without the costs of capital:

$$PCM_S = \sum_{i \in S}^{N} m_i PCM_i = \sum_{i \in S}^{N} m_i \frac{Sales_i - Input\ costs_i - Labour\ cost_i}{Sales_i}$$

Two possible sources can be used to calculate this PCM:

- the annual accounts of companies. In this case, *Sales* is based on sections 70 to 74 of the Minimum Standard Chart of Accounts, *Inputs costs* is based on sections 60+61 and *Labour costs* is based on section 62.
- the Structural Business Survey. In these cases, the specific variables of this survey are used, in particular the variable V_12170 (*Weighted Gross Profit*) for the numerator and the variable V_12110 (*Weighted Sales*) for the denominator. The PCM used in the screening exercise is based on the data obtained from this source.

The Alternative PCM integrates the costs of capital and is calculated in the following way:

$$PCM - Alt_S = \sum_{i \in S}^{N} m_i PCM - Alt_i$$
$$= \sum_{i \in S}^{N} m_i \frac{Sales_i - Input\ costs_i - Labour\ costs_i - Capital\ costs_i}{Sales_i}$$

Where $Capital\ costs_i$ represents the costs associated with the capital used in the company.

The costs of capital of a given sector in the economy are calculated in accordance with the approach which is generally used in the related literature, that of Hall and Jorgenson[46] (1967). The costs of capital are calculated as the result of the productive capital stock and the price of capital:

$$CapCost_{s,t}^{i} = Prc_{s,t}^{i} * P_{s,t-1}^{i} (i_t - \pi_{e,t} + \partial_{s,t}^{i})$$

Where

- $CapCost_{s,t}^{i}$ are the costs of capital of sector s in year t of type of capital i
- $Prc_{s,t}^{i}$ is the productive capital stock of sector s at 1/1 of the year t for type of capital i
- $P_{s,t-1}^{i}$ is the deflator for sector s for type of capital i, namely the ratio between the average price in the year t-1 and the average price in the year t.
- $i_t - \pi_{e,t}$ is the real interest rate expected in year t for the whole economy
- $\partial_{s,t}^{i}$ is the depreciation rate of sector x in the year t for type of capital i.

The total costs of capital for sector *s* in the year *t* are calculated by totalling the sum, for the various types of capital, of the costs of capital for each type of capital.

[46] Hall, R. and Jorgenson D. , Tax policy and investment behavior, *American Economic Review*, 1967, vol. 57, pp. 391-444.

As explained in the FPB document,[47] the origin of this formula lies in the assumption that the purchase price of a capital good in a correctly functioning market must correspond with the present value of services which this item is expected to generate in the future. This last value is calculated per year as the result of the amount of capital services rendered, equal to the productive stock, and its usage cost.

The costs of capital are calculated for 3 years, namely 2012, 2013 and 2014. The basic data come from the annual accounts of companies, in particular the detailed accounts concerning the flows and inventories of capital goods, which are only available for a limited number of companies who incorporate the full format.

The data distinguish between 8 types of capital goods:

* On the one hand, 2 intangible goods:
  210 Research and development
  211 Concessions, patents, etc.

* On the other hand, 6 tangible goods:
  22 Land and buildings
  23 Plant, machinery and equipment
  24 Furniture and rolling stock
  25 Financial leasing
  26 Others
  27 Assets under construction

This approach is inspired by the "permanent inventory" method. Unlike aggregated statistical data, it is not possible for individual companies, and not even relevant, to collect and use the data relating to investments which stretch extremely far into the past. 2000 was chosen as the starting year.

Concerning investments (from 2000 to 2014), they are calculated, like in the national accounts[48], as the net total of accounts associated with "acquisitions and disposals". For the intangible assets, the acquisitions are recorded in accounts 802*, and for tangible assets, in accounts 816*. As for disposals, they can be calculated for intangible assets on the basis of accounts 803* - accounts 810*, whereas for tangible assets, the following formula is used: (817* - 830* + 823*). The accounts 804* and 818* ("Transfer from one heading to another") are also integrated into the formula because they incorporate correction imputations between different types of capital. A series of corrections and processing is then made to these data.

As for the value of the initial capital, it is calculated as follows: "Acquisition prices" + "Capital gains" – "Accounting depreciation" = "Net book value". For most of the companies, this situation relates to 2000, in other cases it is subsequent years.

To calculate the costs of capital of a given year, the investment amounts and the initial capital, expressed in current prices, are converted into amounts expressed in year prices using the deflators of the NBB (unpublished) for the A38 sectors.

[47] See Bernadette Biatour, Geert Bryon, Chantal Kegels, Capital services and total factor productivity measurements: impact of various methodologies for Belgium, FPB, March 2007, pages 11 and 12.

[48] See National Accounts Institute, Gross National Income, Methodological inventory Belgium, ESA 2010, NBB, June 30 2016, pages 436-437

To calculate the productive capital consumption and the productive capital stock of a sector, the age-efficacy profile/disposal on a straight line basis was used[49], following the approach presented in the FPB article[50].

The real depreciation rate is calculated using the formula presented in the work of the FPB[51]. The cost of the capital is firstly calculated per type of capital, per sector. Next, the costs of different types of capital are aggregated to obtain the cost of capital per sector.

Table 1 for industries and table 2 for services below show the effect of incorporating the costs of capital in the PCM for the sectors with the highest initial values for the PCM.

Table1. Impact of integrating the costs of capital on the sectors with the highest PCM, industrial sectors with domestic turnover > 200 million EUR, 2014

NACE	Sector	PCM 2014 – Structural Business Survey (%)	PCM 2014 – Annual accounts (%)	Alternative PCM 2014 (Capital costs) (%)
21201	Manufacture of pharmaceuticals	29.5	26.2	3.3
2611	Manufacture of electronic components	25.9	26.1	21.9
1105	Manufacture of beer	24.2	28.5	20.0
2733	Manufacture of wiring devices	23.0	14.8	7.9
3030	Manufacture of air and spacecraft and related machinery	20.1	19.0	12.8
10712	Artisanal manufacture of bread; artisanal manufacture of fresh pastry goods and cakes	19.2	13.9	9.2
2790	Manufacture of other electrical equipment	19.0	14.5	10.3
1200	Manufacture of tobacco products	18.4	20.2	14.0
23321	Manufacture of bricks	18.3	19.2	8.2
1813	Pre-press and pre-media services	17.2	7.6	3.7
	Total industrial sectors (mean)	9.4	9.2	2.3
	Total industrial sector (median)	8.6	8.8	3.7

Sources: DG Statistique - Statistics Belgium, NBB, own calculations

[49] In fact, there is no consensus in the literature on the most appropriate profiles to use for the capital goods used in more than 600 different sectors of an entire economy like that of Belgium.

[50] See Bernadette Biatour, Geert Bryon, Chantal Kegels, Capital services and total factor productivity measurements: impact of various methodologies for Belgium, FPB, March 2007, pages 11 and 12.

[51] See Bernadette Biatour, et. al., op. cit. footnote 8 page 12.

Table 2. Impact of integrating the costs of capital on the sectors with the highest PCM, services sectors with domestic turnover > 600 million EUR, 2014

NACE	Sector	PCM 2014 – Structural Business Survey (%)	PCM 2014 – Annual accounts (%)	Alternative PCM 2014 (Capital costs) (%)
68203	Renting and operating of non-residential own or leased real estate, except land	49.4	72.5	52.6
68201	Renting and operating of residential own or leased real estate, except social housing	45.1	72.8	40.5
68202	Renting and operating of social housing	43.7	45.5	11.9
7711	Renting and leasing of cars and light motor vehicles	41.6	44.8	9.9
7211	Research and experimental development on biotechnology	36.8	2.7	-1.6
6110	Wired telecommunications activities	36.7	35.9	9.4
69101	Activities of lawyers	36.2	20.2	18.8
7500	Veterinary activities	35.4	18.4	12.9
77399	Renting and leasing of other machinery, equipment and tangible goods n.e.c.	35.0	46.4	8.7
69102	Activities of notaries	34.9	21.1	20.2
	Total services (mean)	12.7	11.4	5.5
	Total services (median)	9.7	7.2	4.0

Sources: DG Statistique - Statistics Belgium, NBB, own calculations

Annex 5: NACE divisions(2-digits)

Divisions NACE	Description
10	Manufacture of food products
11	Manufacture of beverages
12	Manufacture of tobacco products
13	Manufacture of textiles
14	Manufacture of wearing apparel
15	Manufacture of leather and related products
16	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
17	Manufacture of paper and paper products
18	Printing and reproduction of recorded media
19	Manufacture of coke and refined petroleum products
20	Manufacture of chemicals and chemical products
21	Manufacture of basic pharmaceutical products and pharmaceutical preparations
22	Manufacture of rubber and plastic products
23	Manufacture of other non-metallic mineral products
24	Manufacture of basic metals
25	Manufacture of fabricated metal products, except machinery and equipment
26	Manufacture of computer, electronic and optical products
27	Manufacture of electrical equipment
28	Manufacture of machinery and equipment n.e.c.
29	Manufacture of motor vehicles, trailers and semi-trailers
30	Manufacture of other transport equipment
31	Manufacture of furniture
32	Other manufacturing
33	Repair and installation of machinery and equipment
35	Electricity, gas, steam and air conditioning supply
38	Water collection, treatment and supply
39	Sewerage
41	Construction of buildings
42	Civil engineering
43	Specialised construction activities
45	Wholesale and retail trade and repair of motor vehicles and motorcycles
46	Wholesale trade, except of motor vehicles and motorcycles
47	Retail trade, except of motor vehicles and motorcycles
49	Land transport and transport via pipelines
50	Water transport
51	Air transport
52	Warehousing and support activities for transportation
53	Postal and courier activities
55	Accommodation
56	Food and beverage service activities
58	Publishing activities

Divisions NACE	Description
59	Motion picture, video and television programme production, sound recording and music publishing activities
60	Programming and broadcasting activities
61	Telecommunications
62	Computer programming, consultancy and related activities
63	Information service activities
68	Real estate activities
69	Legal and accounting activities
70	Activities of head offices; management consultancy activities
71	Architectural and engineering activities; technical testing and analysis
72	Scientific research and development
73	Advertising and market research
74	Other professional, scientific and technical activities
75	Veterinary activities
77	Rental and leasing activities
78	Employment activities
79	Travel agency, tour operator reservation service and related activities
80	Security and investigation activities
81	Services to buildings and landscape activities
82	Office administrative, office support and other business support activities
87	Residential care activities
88	Social work activities without accommodation
90	Creative, arts and entertainment activities
91	Libraries, archives, museums and other cultural activities
93	Gambling and betting activities
94	Activities of membership organisations
95	Repair of computers and personal and household goods
96	Other personal service activities

Annex 6: Glossary and abbreviations

Abbreviation	Definition
BIPT	Belgian Institute for Postal services and Telecommunications
BoD	Benefit of the Doubt
DG Statistique	General Direction Statistique – Statistics Belgium of FPS Economy
FPB	Federal Planning Bureau
HHI	Herfindahl-Hirshman Index
IC	Composite Indicator
MSCA	Minimum Standard Chart of Accounts
NAI	National Accounts Institute
NACE	Nomenclature statistique des Activités économiques de la Communauté Européenne
NBB	National Bank of Belgium
PCM	Price Cost Margin
SME	Small and Medium Enterprises
SBS	Structural Business Survey
TNF	Total Number of Different Firms Index
VAT	Value Added Tax