National Productivity Board

Annual Report 2021

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Executive summary

The National Productivity Board is an independent institution responsible for monitoring productivity and competitiveness. It has been operational since May 2019 and brings together federal and regional experts. It was established at the invitation of the Council of the European Union in order to understand the reasons for the decline in productivity growth in recent decades and to identify possible solutions.

The increase in productivity is an essential factor of economic growth and, consequently, constitutes an essential condition for improved living standards, even if it is not sufficient on its own. Increasing productivity and economic growth also allow for necessary political flexibility needed to achieve a more sustainable, inclusive and resilient economy, particularly amidst the backdrop of a crisis.

The impact of the COVID-19 crisis on productivity growth, estimated on the basis of preliminary data, has been positive. However, the slowdown caused by the economic and financial downturn in 2008 has yet to be turned around. Consequently, the National Productivity Board (NPB) stresses the importance of entrepreneurial dynamism and innovation to stimulate productivity growth. The challenge consists in aligning policies with these two levers to support economic growth post-COVID-19 and to ensure greater economic resilience. In 2021, the NPB also conducted an assessment of the Recovery and Resilience Plan and its impact on productivity growth.

Slowdown in productivity growth since the economic and financial crisis

National diagnostic

The preliminary results point to a positive impact of the COVID-19 crisis on productivity growth, since worked hours are contracting more than value added in volume. The pandemic has reduced the divergences in European countries productivity performances, with a convergence towards an average annual rate of growth very close to 0.7% over 2012-2020 period.

The slowdown in productivity growth in recent years compared to the 2000-2007 period has been observed in Belgium as well as in its three main neighbouring countries. The more pronounced slowdown in Belgian manufacturing is mainly due to the slowdown of productivity growth in industries which were the most productive prior to the 2008 economic and financial downturn. This observation contrasts with Belgian market services, where productivity has accelerated over the recent period.

The weakening of productivity growth following the 2008 economic and financial crisis can be explained by the sharp drop in the contribution of the total factor productivity and the contribution of non-ICT/tangible capital deepening.

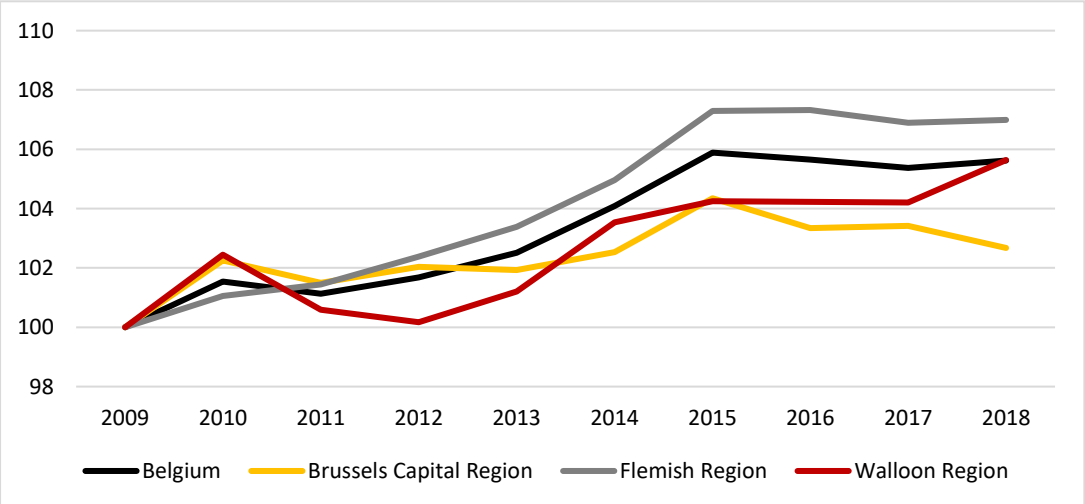
Graph I. Average annual growth rate of hourly labour productivity, sectors of activities

For Belgium: growth rate in non-market services over 2000-2007 period = 0.0%. Source: Eurostat, National Accounts, October 2021.

Regional situation

Just as at national level, a general downward trend in productivity growth was observed across the three Belgian regions, over a lengthy period (since 1980), even though its profile and timing differ from one region to the next. Across the various regions, the decline in productivity growth appears to be mainly due to a more significant slowdown in the manufacturing industry than in market services. These latter sectors provided a more significant contribution to overall productivity growth across all three regions.

Graph II. Evolution of labour productivity per hour
Index, 2009 = 100



Source: Regional accounts.

Moreover, just as at national level, the change in the composition of the economy would also appear to have contributed to slower productivity growth across the three regions, although these structural changes cannot alone explain the entire decline.

Importance of productivity growth and its levers

Members of the NPB highlighted two particular strategic areas for public policy aimed at reversing the decline witnessed in productivity growth.

Entrepreneurial dynamism

Recent studies have shown that a drop in entrepreneurial dynamism may explain the decline in productivity growth in OECD countries. Following the findings of the Austrian-US economist Joseph Schumpeter, some researchers consider "creative destruction"(the replacement of old companies and technologies with new ones) as a key factor of productivity and economic growth. A fall in the entry and exit of firms, or the growth (or decline) of the most (or least) productive companies, could also explain the decline in productivity growth. However, the fact that entrepreneurial dynamism and productivity growth are both showing a clear downward trend does not necessarily indicate a causal link between such dynamism and productivity. Both trends may indeed also be explained by other underlying factors such as demographics (e.g. the ageing population) or a decreasing number of growing industries and an increasing number of industries having reached maturity. This latter phase is characterised both by a drop in entrepreneurial dynamism (increasing market concentration and obstacles to business creation) and in productivity growth.

Eurostat figures show that Belgium ranks 6th in the classification of countries with the lowest birth rate of firms. The exit rate of firms is even lower in Belgium than in any other European Union countries. According to data published by Statbel, the Belgian statistics office, during the 1970-2020 period, the start-up rate in Belgium increased substantially in the 1980s, dropped dramatically in the first half of the 1990s and has been stagnating at a low level ever since. Since this period, the birth rate of firms seems to have stabilised at a relatively low level. Figures published by Statbel on the rate of bankruptcies, for the 2000-2020 period, show a clear downward trend and is at a very low level. Compared with other countries, Belgium also has a low share of high-growth firms.

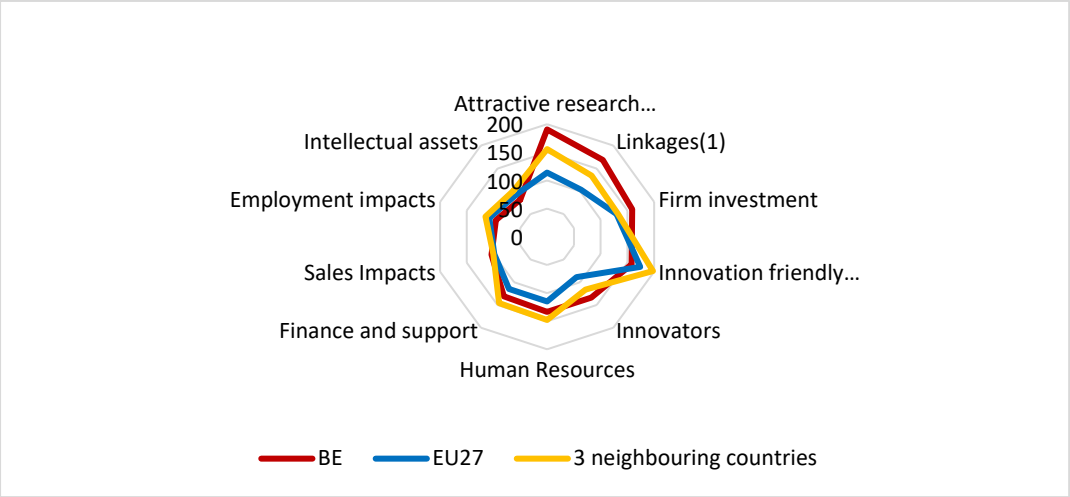
An analysis of productivity growth at industry level, based on data on Belgian companies for the 2002-2017 period, suggests that start-ups are increasingly struggling to reach the average level of productivity of mature companies. Entry and exit, as well as the reallocation of market shares between existing companies, appear to be less significant for the productivity growth of an industry than for that of the firms within the same industry. The low exit rate of companies observed in Belgium suggests the existence of barriers to the exit of less productive firms. This may slow down company creation, which in turn can have a negative impact, as productivity growth of start-ups still contributes considerably to productivity growth of industries.

So far, there is little evidence proving that the COVID-19 pandemic has led to an increased exit of less productive firms, the so-called "cleansing", or a sharp decrease in the creation of new companies and negative long-term effects ("scarring"), which are usually observed during periods of recession.

Innovation

The NPB has already stressed the importance of further developing the innovative capacity of all economic stakeholders. The impact of innovation and R&D on productivity is widely recognised in economic literature. Innovation can take many forms; it is reflected, inter alia, in R&D investments and patents.

Graph III. Main dimensions of performance from the European Innovation Scoreboard
Results in 2019 compared to those of the EU in 2012



[1] The category "linkages" includes three sub-indicators measuring innovative capacities: 1) the collaborative efforts between innovative companies, 2) co-publications between the private and public sector, and 3) the extent to which the private sector co-funds public R&D activities.
Source: European Innovation Scoreboard (2020).

In Belgium, R&D expenditure as a share in GDP has increased since 2005, reaching 2.9 % in 2019 above the 2.2 % observed across the EU. However, this is primarily limited to certain companies (some large Belgian and foreign entities) and to certain industries (pharmaceuticals, IT goods and services). The increase in R&D investment was boosted by tax incentives. Partial tax exemptions of tax withholding on wages for R&D staff have effectively stimulated R&D, which appears less clear for the R&D tax credit or the income tax deduction on patents.

Concerning this latter point, Belgium is one of the top 15 countries worldwide with the largest number of registered patents in the European market. Over 40 % of Belgian patent applications that are submitted to the European Patent Office come from 10 major economic players. These applications mainly concern the healthcare and specific industrial machinery sectors, whilst applications in the digitalisation sector remain limited. Furthermore, Belgium also excels in the green innovation sector, primarily in the chemical and petrochemical industry, and more specifically in the special machinery sector (mechanical engineering) and in preparation of chemical, mineral and glass products.

Patent figures confirm the importance of cooperation in the field of innovation. Over one third of Belgian patents are the fruit of collaboration conducted with foreign researchers. Moreover, universities play a significant role in patent applications. Various public-led initiatives (e.g. in funding mechanisms, intellectual property, interfacing, etc.) have also contributed to this as well as public financial aid (European and regional joint funding programmes).

The NPB underlines that innovation should be based on an ecosystem formed of a well-established network of companies, universities and research institutes, and supported by favourable and complementary conditions, such as quality infrastructure, appropriate regulations, an entrepreneurial culture open to innovation, as well as human capital with necessary qualifications.

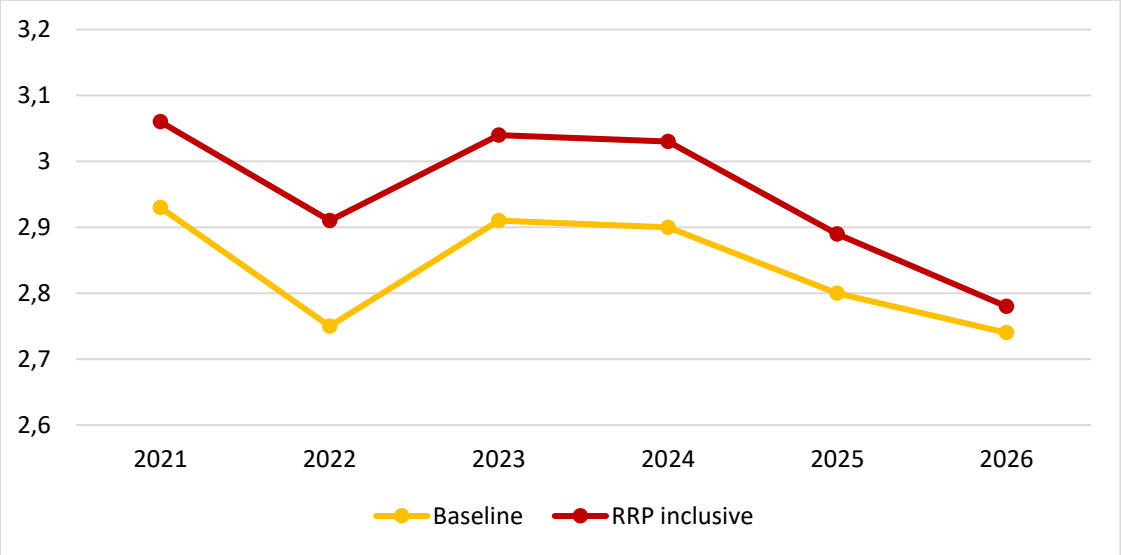
The recovery Plan may also boost productivity growth

The final chapter of this report will examine to what extent the National Recovery and Resilience Plan (RRP), as approved by European Council in early July 2021, contributes to productivity growth.

Simulations by the Federal Planning Bureau show that RRP investments have a positive effect on productivity and its impact lasts much longer than the period during which measures are implemented. However, the magnitude of the effect is low. This is not surprising given the relatively limited European funds available to Belgium (5.925 billion EUR for 2021-2026). However, a certain number of comments should be made on these simulations. Only Belgian RRP projects have been taken into account. The impact of additional initiatives which have been / will be taken at various levels of government within the country and the recovery plans of other countries were not taken into consideration. Moreover, simulations only take into account investment projects and not the impact of structural reforms. These constitute a significant part of the RRP and may re-inforce the effects of investments announced in the Plan.

Graph IV. Gross fixed capital formation in the public sector: baseline scenario and scenario with the additional investments planned in the RRP

In % of GDP



Source: FPB.

The NPB 2020 report sets forth four priority areas in order to achieve a sustainable increase in productivity growth. These priorities are clearly reflected in the Plan, although a certain number of areas are marked for attention.

Investing in skills: importance of STEM and continuing training

The RRP clearly focuses on training and education. A large part of these resources is devoted to strengthening digital skills. The needs in this sector are significant: Belgium is facing a shortage of staff digitally trained and a significant part of the population does not have basic digital skills. However, other skills should not be disregarded. It is also important for the proposed initiatives to be integrated into wider strategies that address major educational and training challenges.

Increasing private and public investments

The RRP is a genuine investment Plan and over half of the plan concerns direct public investment. Such investment is essential because, since the 1990s, there has been a clear downward trend in the net stock of Public capital expressed as a percentage of GDP, which corresponds to a harmful effect on the quality of public infrastructure. However, the amount of public investment announced in the RRP will be insufficient to achieve the ambition of increasing public investment to 3.5 % of GDP by 2024. The wider Recovery, Investment and Reform

Plans that have been announced by the Regions and the Federal government will be necessary to achieve this target.

However, public finances should also be given close attention. A systematic integration of spending reviews in budget planning at regional, local and federal government levels, as foreseen in the Plan, is certainly useful with a view to healthy public finances. In addition, a credible medium-term budget path is also necessary to enable the creation of budgetary buffers during the economic recovery phase.

Investing in green and digital transition

Belgian RRP spending contributes to the digital transition, the transition to a low-carbon, sustainable and climate-resilient economy as well as the achievement of European objectives in this area. However, as substantial investment is necessary for these transitions, it is important for the Plan to also sufficiently encourage private investment. This requires, among other things, a clear and stable regulatory framework that is part of a coherent vision in the digitalisation, mobility, energy and circular economy sectors. Sufficient effort must also be made in this area.

Promoting entrepreneurial dynamism

The RRP plans for several projects that may facilitate business creation. On example is the significant investments made in the digitalisation and modernisation of public services. However, sufficient entrepreneurial dynamism also implies that structurally unviable companies may withdraw. In this context, it is important that the number of zombie firms, already at a high level in Belgium, does not increase any further. In the future, temporary support measures should be eliminated with caution and the timing for this is crucial. A fair balance needs to be found between an overly lengthy extension of support measures with a risk of further increasing the number of zombie firms and wasting public funds, and a premature elimination that could lead to an excessive number of payment defaults.

Finally, the overall impact of the Plan will depend to a large extent on its concrete implementation. A certain number of (reform) projects are described in the Plan in relatively general terms. Furthermore, coherence between recovery and resilience measures and interventions of various entities is key.

This report takes due account of National Accounts data until October 2021 and data from the Recovery and Resilience Plan of June 2021.

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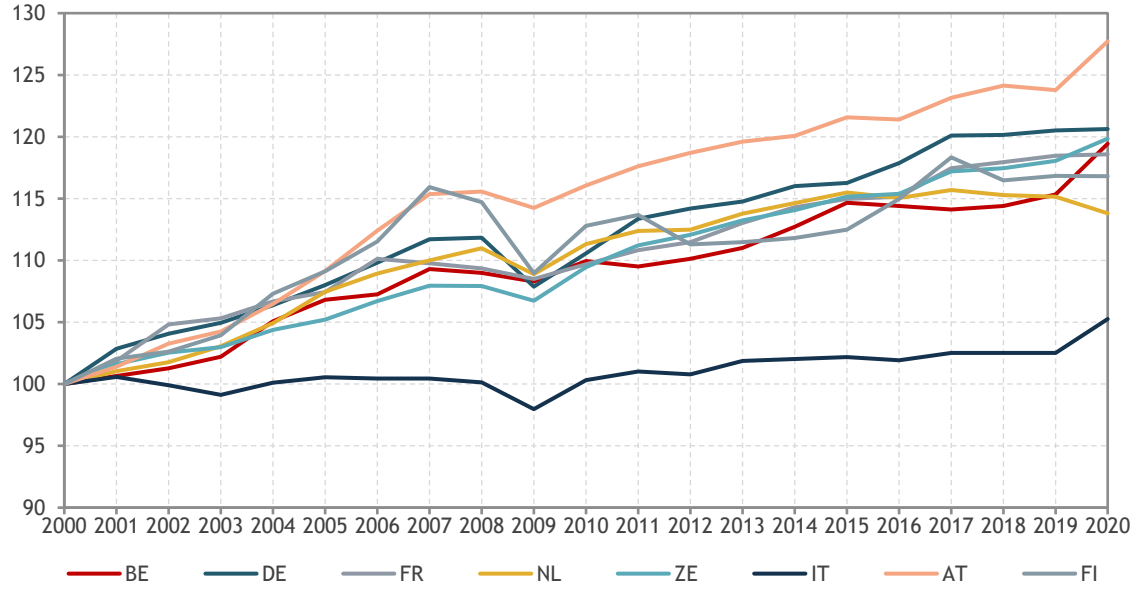
1. Observations

1.1. National situation

Convergence between European countries towards low rates of growth in hourly labour productivity

According to preliminary data for 2020, the impact of the COVID-19 pandemic on the development of labour productivity in Belgium was positive, with hours worked contracting more than gross value added in volume. Labour productivity increased (3.6%) between 2019 and 2020 in Belgium and in Austria (3.2%). However, productivity fell in the Netherlands (-1.2%) and, remained quasi-stable in Germany and in France (0.1%).

Graph 1. Evolution of labour productivity
Index, 2000 = 100



Source: Eurostat, National Accounts, October 2021.

Despite this stability in productivity growth in Belgium, the diagnostic outlined in 2020 of a slowdown in productivity growth after the 2008 economic and financial downturn continues to be valid as shown by the data in Table 1.

Table 1. Average annual growth rate of hourly labour productivity, total economy
In %

	2000-2020	2000-2007	2012-2020
Euro zone	0.9	1.1	0.8
Belgium	0.9	1.3	1.0
Germany	0.9	1.6	0.7
France	0.9	1.3	0.8
Italy	0.3	0.1	0.5
Netherlands	0.6	1.4	0.1
Finland	0.8	2.1	0.6
Austria	1.2	2.1	0.9

Source: Eurostat, National Accounts, October 2021.

However, the current crisis has reduced the dispersal of performances over 2012-2020 period, with average annual growth rates of countries very close to 0.7%. The Netherlands stands out due to its particularly low rate

of growth (0.1%), whilst Belgium (1.0%) and Austria (0.9%) have recorded performances slightly higher than the Euro zone.

Table 2. Average annual growth rate of hourly labour productivity, sectors of activities
In %

	Belgium	Germany	France	Netherlands
		2000-2020		
Total economy	0.9	0.9	0.9	0.6
Manufacturing	2.3	1.6	2.1	2.3
Market services	1.1	1.0	0.7	0.8
Non-market services	-0.2	-0.1	0.6	-0.3
		2000-2007		
Total economy	1.3	1.6	1.3	1.4
Manufacturing	3.4	3.6	3.6	4.1
Market services	1.3	1.5	1.0	1.4
Non-market services	0.0	-0.2	0.8	-0.2
		2012-2020		
Total economy	1.0	0.7	0.8	0.1
Manufacturing	2.4	0.7	1.1	1.5
Market services	1.6	1.2	0.9	0.3
Non-market services	-0.3	-0.5	0.5	-0.7

Note: Manufacturing corresponds to section C, market services cover sections G through N, and non-market services cover sections O though U of NACE-rev2.

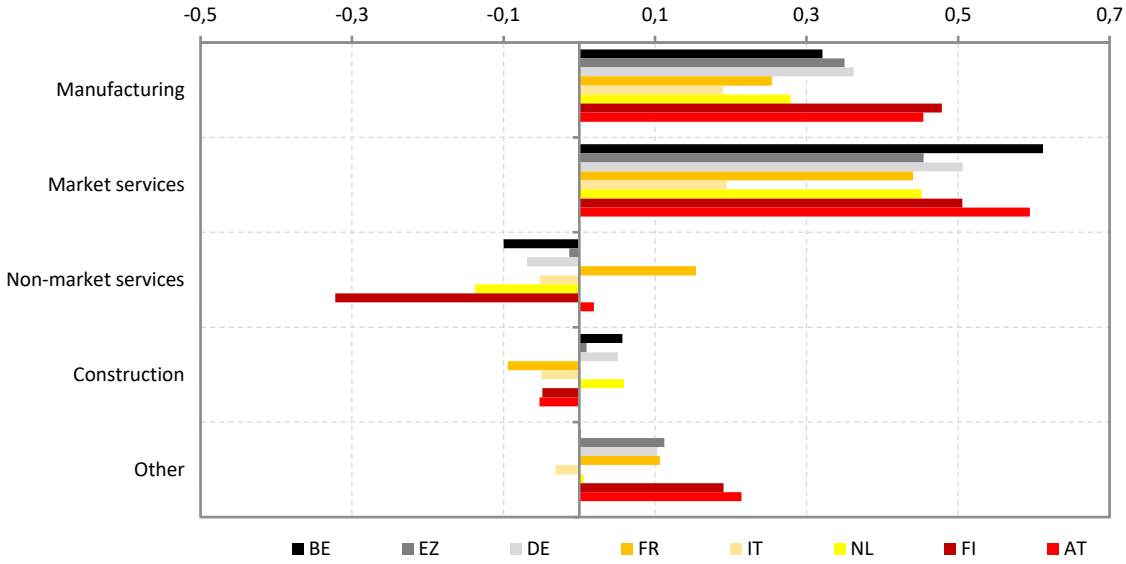
Source: Eurostat, National Accounts, October 2021.

The slowdown of productivity growth during the recent period, 2012-2020, compared to2000-2007, is a characteristic common to Belgium and its three largest neighbouring countries. This slowdown industries is particularly clear in manufacturing (Table 2). However, in light of the slowdown in productivity growth in manufacturing in Germany, the Netherlands and France, the slowdown observed in Belgian manufacturing is more limited and manufacturing is still recording stronger productivity growth than other industries in Belgium. In Belgium, market services productivity accelerated over the most recent period while in Germany and in France, productivity growth of market services decreased but less strongly than in manufacturing. Market services in the Netherlands recorded a clear slowdown with a four-fold reduction of their average annual growth rate. The decline in productivity in non-market services accelerated in Belgium as well as Germany and the Netherlands. However, as underlined in the 2020 annual report, the measurement of value added and production factors in these activities is subject to a degree of caution and it is very difficult to provide an economic interpretation of the change in productivity of these activities as it results from the national accounts.

Importance of the market services contribution to the hourly labour productivity growth

The contribution of the main sectors of activity to total economy productivity growth over the 2000-2020 period, which depends on the relative importance of these sectors and their own productivity dynamic, allows to highlight important changes in relation to the analysis undertaken in 2020 (Graph 2). Firstly, in the Euro zone as well as in all countries analysed, it is the market services that now make the greatest contribution to total economy productivity growth. Secondly, the contribution of non-market services is small or even negative in all countries except for France, where the contribution is close to 0.2%. This French exception in the productivity performance of these services is likely to merely be a statistical phenomenon linked to the method of recording the actual activities of these services. It is, consequently, important that a better measurement methodology of the activity of non-market services will be developed by the European statistical institute, Eurostat.

Graph 2. Contribution of the main sectors to hourly labour productivity growth, 2000-2020
Annual average in percentage points



Note: Manufacturing corresponds to Section C, market services cover sections G through N, and non-market services cover sections O though U, construction covers section F and Others cover sections A, B, D and E of NACE-rev2.
Source: Eurostat, National Accounts, October 2021.

In dynamic terms, for all countries, except for Italy, manufacturing presents a contribution to total productivity growth which declined over 2012-2020 in comparison to the pre-crisis period, 2000-2007 (Table 3). This decline is more pronounced for German, Finnish and Austrian manufacturing. A reduction in the contribution of market services is also visible in most countries but not in Italy and Belgium.

Table 3. Contribution to the average annual growth rate of total economy hourly labour productivity
In percentage points

	Manufacturing		Market services		Non market services		Construction		Others	
	2000-2007	2012-2020	2000-2007	2012-2020	2000-2007	2012-2020	2000-2007	2012-2020	2000-2007	2012-2020
Euro zone	0.6	0.3	0.5	0.5	0.0	0.0	-0.1	0.0	0.2	0.1
BE	0.6	0.3	0.7	0.8	-0.1	-0.1	0.1	0.1	0.0	0.0
DE	0.8	0.2	0.8	0.6	-0.1	-0.2	0.1	0.1	0.1	0.1
FR	0.5	0.1	0.6	0.5	0.2	0.2	-0.1	0.0	0.2	0.1
IT	0.2	0.2	0.1	0.4	0.0	0.0	-0.2	0.1	-0.1	-0.1
NL	0.5	0.2	0.8	0.2	-0.1	-0.2	0.1	0.1	0.1	-0.1
FI	1.6	0.4	0.7	0.4	-0.3	-0.3	-0.1	-0.1	0.2	0.2
AT	0.8	0.3	0.8	0.5	0.1	0.0	0.1	0.0	0.3	0.1

Note: Manufacturing corresponds to section C, market services cover sections G through N, and non-market services cover sections O though U, construction covers section F and Others cover sections A, B, D and E of NACE-rev2.
Source: Eurostat, National Accounts, October 2021.

The two major groups of activities, manufacturing and market services, are analysed in more details as in 2020. This analysis is undertaken at the A38 industry level of the national accounts, the most detailed level for which official data on worked hours is available in Belgium. This is primarily undertaken in comparison with the three largest neighbouring countries.

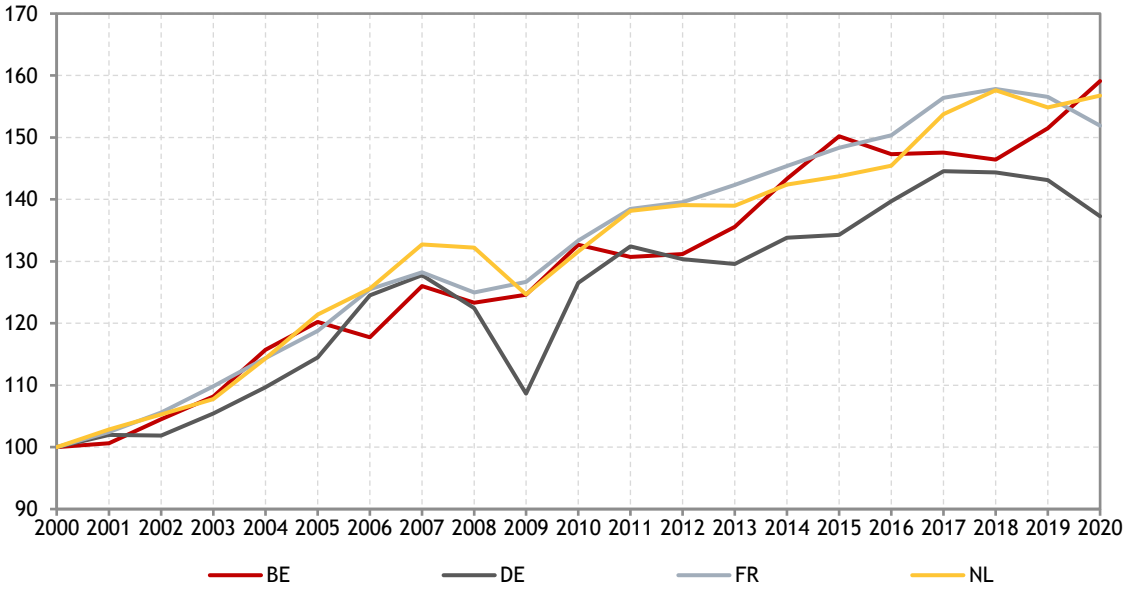
Manufacturing

As highlighted in the 2020 annual report, the dynamism of productivity in manufacturing was particularly weak in Belgium from 2015 (Graph 3). However, 2019 saw a return to positive productivity growth, which was further

consolidated in 2020, erasing the losses recorded in previous years. Germany also appears to be witnessing a decline in productivity in manufacturing, albeit over a different time frame to that in Belgium, since this only began in 2018. France has also seen a fall which began in 2019. The Netherlands only recorded a negative growth rate in 2019, with productivity in manufacturing accelerating in 2020.

Graph 3. Evolution of hourly labour productivity in manufacturing

Index, 2000 = 100



Source: Eurostat, National Accounts, October 2021.

Analysis of the 13 manufacturing industries confirms the diagnostic set out in 2020: the clear slowdown in productivity growth in the Belgian manufacturing can mainly be explained by the slowdown in productivity in the best performing industries in this area before the 2008 economic and financial downturn (Table 4).

Table 4. Average annual growth rate of value added in volume, hours worked and hourly productivity in the Belgian manufacturing

In %

	Value added			Hours worked			Productivity		
	00-20	00-07	12-20	00-20	00-07	12-20	00-20	00-07	12-20
Manufacturing	0.5	1.8	0.8	-1.8	-1.5	-1.6	2.3	3.4	2.4
Food industry	1.2	2.3	0.4	-0.3	-0.4	-0.1	1.5	2.8	0.5
Textile industry	-5.1	-0.9	-5.2	-5.7	-4.9	-4.7	0.7	4.3	-0.5
Wood and paper industry	-0.9	2.8	-3.3	-2.2	-1.7	-2.7	1.3	4.5	-0.6
Petroleum refineries	1.2	10.2	-0.9	0.3	-0.1	1.5	0.9	10.3	-2.4
Chemicals industry	0.4	-1.9	2.1	-1.5	-2.1	-0.9	1.9	0.2	3.1
Pharmaceuticals industry	7.0	9.5	7.7	2.0	2.7	2.7	4.9	6.6	4.9
Rubber and plastics industry	0.8	3.0	-0.3	-1.1	-0.9	-1.1	1.9	4.0	0.8
Metallurgy	-0.7	1.4	-0.4	-2.4	-0.5	-3.1	1.8	2.0	2.9
Manufacturing of electronic products	0.6	5.5	1.0	-4.0	-4.9	-0.9	4.9	11.0	1.9
Manufacturing of electrical appliances	-3.8	-2.4	-5.0	-3.4	-4.1	-3.9	-0.4	1.8	-1.2
Manufacturing of machinery and equipment	-1.0	2.9	-2.3	-1.8	-0.1	-2.9	0.9	3.0	0.6
Manufacturing of motor vehicles	-3.0	-2.1	-1.9	-4.3	-3.1	-4.4	1.3	1.0	2.6
Others manufacturing industries	1.4	-2.4	1.9	0.4	-1.4	0.2	1.0	-1.0	1.7

Source: Eurostat, National Accounts, October 2021.

Over the recent period (2012-2020), 4 industries recorded a decline in productivity growth (textile, wood and paper, petroleum refinery and electrical appliances) and 5 sectors including manufacturing of electronic products, pharmaceuticals and the rubber and plastics industry, recorded a deceleration of productivity growth in comparison to 2000-2007. Chemicals, other manufacturing industries, manufacturing of motor vehicles and metallurgy recorded an increase in the growth of their productivity. The first two sectors reported a greater

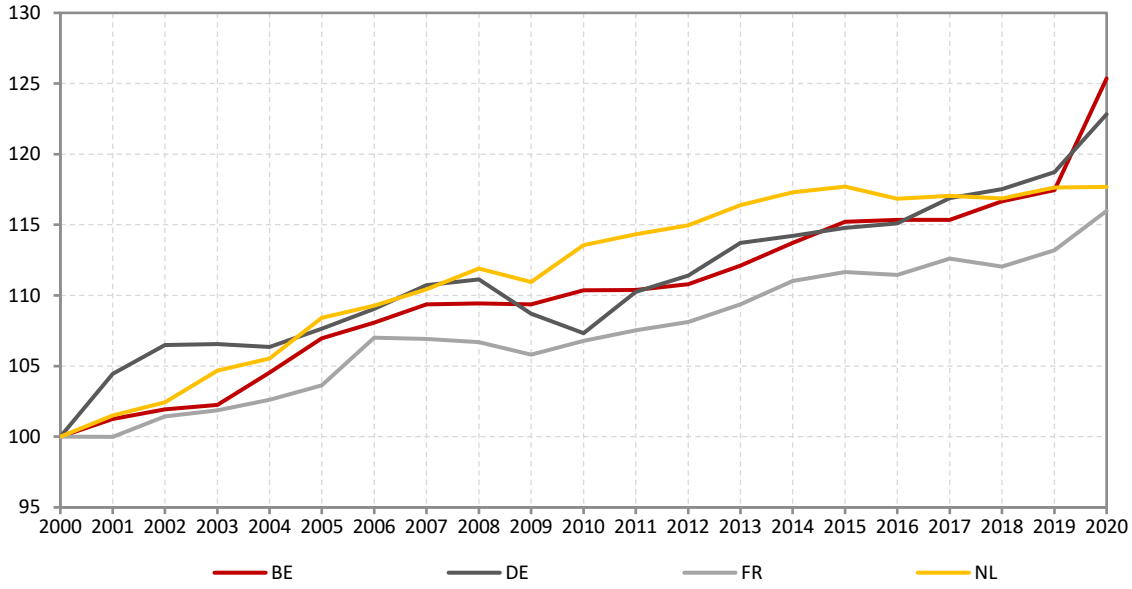
dynamic in their value added in volume, whilst the last two sectors reported an acceleration of labour volume contraction.

These evolutions of productivity growth in the manufacturing industries led to a less visible dispersion of performances during the recent period than during 2000-2007, due to a convergence towards lower growth rates.

Market services

The difference in the productivity dynamics between manufacturing and market services across countries clearly appears when comparing the y-axis scale of Graphs 3 and 4. Market services overall have a lower productivity growth than manufacturing

Graph 4. Evolution of labour productivity in market services
Index, 2000 = 100



Source: Eurostat, National Accounts, October 2021.

In contrast to manufacturing, the acceleration of productivity growth in market services occurs first began in Germany from 2017, then in Belgium in 2018 and in France in 2019. Productivity growth in Dutch market services is particularly sluggish from 2015 to 2020.

Analysis of productivity growth in the 12 industries comprising Belgian market services shows a slight increase in the dispersal of performances over the recent period compared to 2000-2007 (Table 5). 4 industries recorded negative average annual growth rate over the 2012-2020 period including publishing, cinema, video which already recorded a fall in productivity before the 2008 economic and financial downturn (2000-2007 period). Telecommunications, legal and accounting activities and administrative and support services are the only industries where productivity growth accelerated over the recent period.

Table 5. Average annual growth rate of value added in volume, hours worked and hourly productivity in the Belgian market services

In %

	Value added			Hours worked			Productivity		
	00-20	00-07	12-20	00-20	00-07	12-20	00-20	00-07	12-20
Market services	1.7	2.9	1.0	0.6	1.6	-0.6	1.1	1.3	1.6
Trade	0.8	3.5	-0.8	-0.5	0.5	-1.6	1.4	2.9	0.8
Transport and storage	0.2	0.7	-0.7	-0.4	-0.7	-0.1	0.6	1.4	-0.6
Accomodation and food service activities	-2.4	2.0	-6.5	-1.7	0.3	-4.9	-0.7	1.7	-1.7
Publishing, film and video	-0.3	0.5	-2.3	-0.6	0.7	-1.2	0.3	-0.2	-1.1
Telecommunications	6.0	5.9	5.7	-1.6	-0.9	-3.1	7.7	6.9	9.1
IT services	5.2	5.3	4.9	4.3	3.8	4.4	0.9	1.5	0.6
Financial and insurance activities	-0.2	1.0	-0.8	-1.4	-1.4	-1.7	1.2	2.5	0.8
Real estate activities	2.6	2.1	1.9	1.9	2.6	1.2	0.6	-0.5	0.7
Legal and accounting services	3.4	4.8	3.1	2.1	4.1	-0.4	1.3	0.7	3.5
Scientific R&D	3.2	5.8	2.3	3.0	3.5	4.5	0.1	2.3	-2.1
Advertising and technical services	1.7	4.4	1.8	1.6	1.5	1.4	0.1	2.8	0.4
Administrative and support services	2.5	3.2	3.4	2.4	4.5	1.0	0.1	-1.2	2.3

Source: Eurostat, National Accounts, October 2021.

The acceleration in productivity growth in market services is therefore based on a few industries which often already recorded productivity gains before the 2008 economic and financial crisis and which compensate for the continued slowdown in productivity in services that were already under-performing before the 2008 economic and financial downturn.

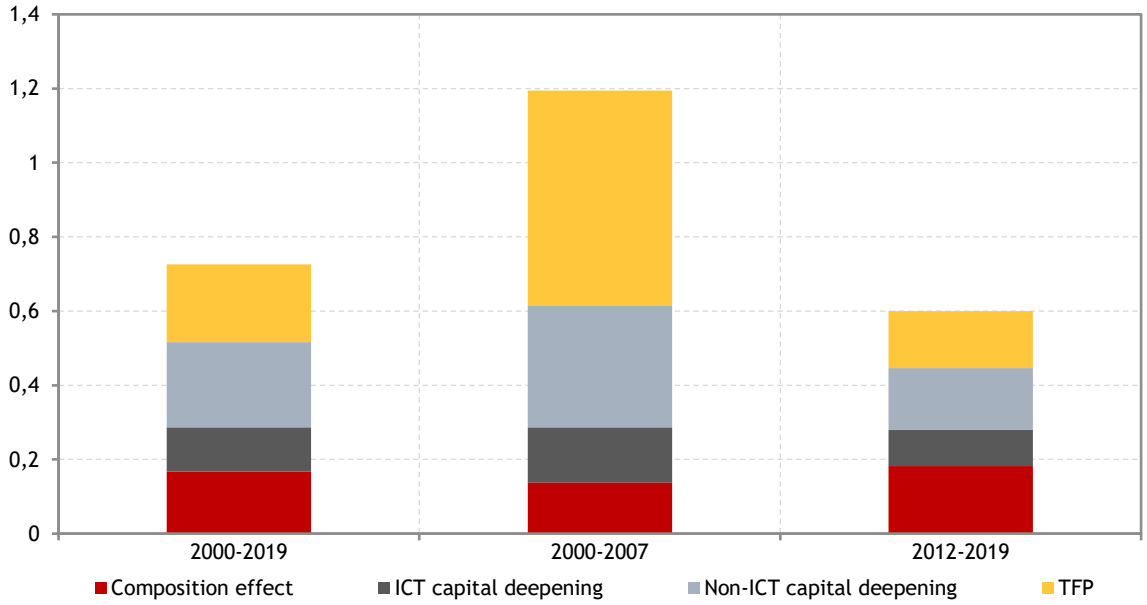
Decomposition of productivity growth: non-ICT/tangible capital deepening and TFP heavily reduce their contribution

Growth accounting enables a breakdown of productivity growth rate into four contributions: labour composition effect, information and communication technologies (ICT) capital deepening, non-ICT capital deepening, and total factor productivity (TFP).

As the 2020 annual report already highlighted, Graph 5 confirms that the significant reduction in labour productivity growth can be explained by the sharp decline in the contribution of TFP (threefold reduction) and non-ICT capital deepening (twofold reduction). ICT capital deepening also reduced its contribution to productivity growth, albeit in a more moderate way.

Graph 5. Contribution to total hourly labour productivity growth (ICT/non-ICT)

In percentage points



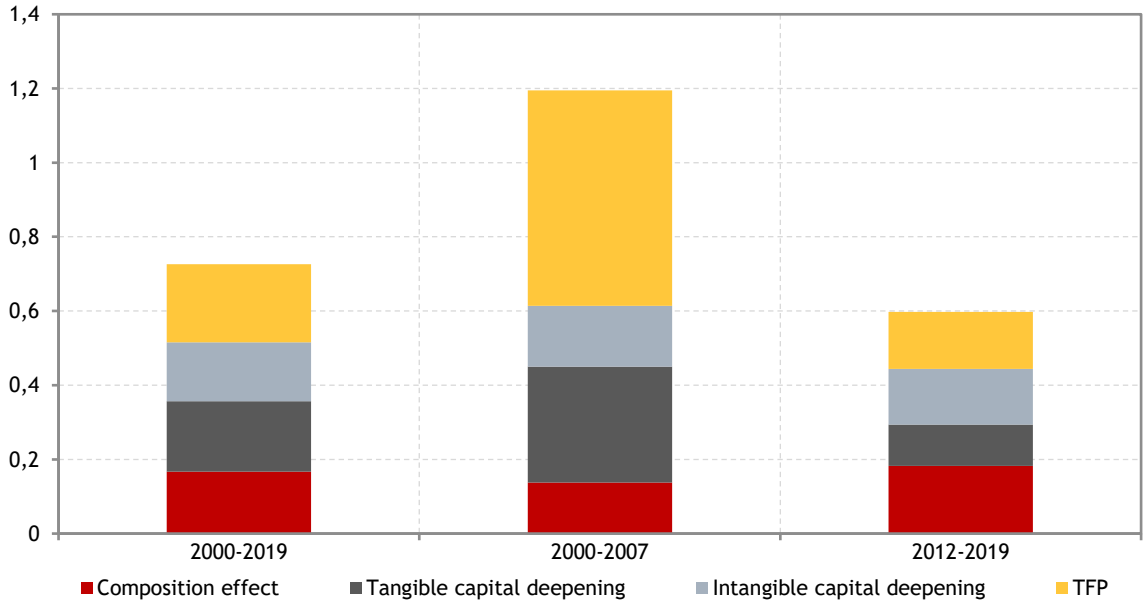
Source: EUKLEMS database, June 2021 release, FPB.

The contribution of capital deepening can also be broken down by making a distinction between tangible and intangible capital. Assets included in the definition of intangible capital are research and development, software and databases and other intellectual property rights.

Over the 2000-2019 period, the contribution of tangible capital deepening remains sligthly above the contribution of intangible capital deepening. However, this is no longer the case over the most recent period, 2012-2019 given the sharp contraction of the contribution of tangible capital deepening recorded since the 2008 financial downturn. The contribution of intangible capital deepening was, on the other hand, virtually unaffected by this crisis as Graph 6 shows.

Graph 6. Contribution to total hourly labour productivity growth (tangible/intangible)

In percentage points



Source: EUKLEMS database, June 2021 release, FPB.

1.2. Regional situation

The 2020 annual report published by the NPB underlined the importance of conducting an analysis of labour productivity figures at regional level so as to provide clarification from this perspective of the dynamics examined at national level in recent years (NPB 2020, p. 53). The productivity differences observed between regions may, in part, be due to differences in the breakdown of industries across the three regions. The aims of regional analysis are (1) to identify differences observed in productivity and productivity growth between all three regions and (2) to explain the differences observed by examining the industry decomposition industries and their own growth dynamic.

This regional overview complements the national overview and also covers the recent period. However, it appears useful to firstly show how this exercise falls into the change in regional productivity figures (per capita) over a longer-term perspective. The analysis in this section was written by IBSA, IWEPS and Statistiek Vlaanderen.

Methodology

Data

The regional analysis is based on figures from the regional accounts as published by the National Accounts Institute (NAI) as at late January 2021.

These regional accounts have, to a large extent, been adapted to the benchmark revision of national accounts introduced in 2019 as well as a benchmark revision used by the regional accounts and introduced in 2020 (primarily concerning the distribution of aggregates within companies with several establishments, as well as industries within the financial institutions).

However, in this version of the publication, the revisions undertaken were post-2009. Moreover, labour volumes have not yet been modified.

Furthermore, as is customary, value added is already provisionally estimated for the last year (namely 2019), but not labour volumes, which are only available for the previous year (2018).

These restrictions somewhat limit the analysis of hourly productivity over the 2009-2018 period. The results could, moreover, be affected by expected revisions to labour volume. This perspective led to a restriction to the level of detail in the results and calls for a degree of caution in their interpretation.

Additional hypotheses

Whilst results are presented in line with major industries (Manufacturing industry, Construction, market services, Non-market services and Other), hourly labour estimates are primarily undertaken for 38 industries (A38).

The series of hours worked by self-employed people are, however, only available for 10 industries (A10) in the regional accounts. For each region it is, therefore, necessary to estimate the hours worked by self-employed people per the A38 business sector, which is the level of sector-specific breakdown published for employees. The utilised method is as follows. The average number of working hours of self-employed people per A38 sector is obtained by weighting the average number of working hours of employees in the same region, per A38 sector, in relation to the ratio between the average number or working hours of self-employed workers and employees, both evaluated per A10 sector. The product resulting from this average estimated number of working hours of self-employed workers per A38 sector then provides an estimate of the number of hours worked by self-employed workers per A38 sector[1]. In each region, the distribution per A38 sector resulting from this estimate is

[1] An alternative estimation method, which consists of breaking down national series by region and as per A38 business sector, provides similar results. These results have not, therefore, been reported in the analysis.

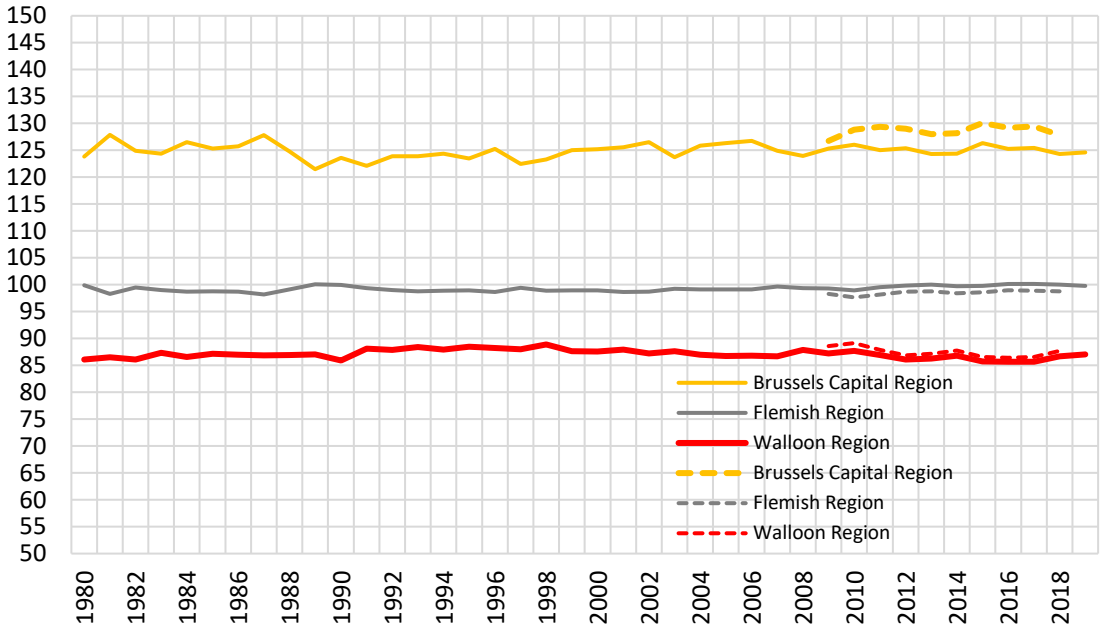
then used to breakdown the volume of hours published for each A10 sector between the different A38 sectors that compose this.

It is, moreover, necessary to measure value added as a volume per business sector. Failing any regional price information, regional value added as a volume is obtained, in both this analysis as well as in regional accounts[2], by using national deflation factors in detail across 64 industries (A64) and additional hypotheses pertaining to the volume of public activities in these sectors. This approach takes account of regional price discrepancies related to the business structure of regional economies.

Large-scale stability over the long-term in the difference in labour productivity *per capita* between regions

Analysis of the regional component of the change in productivity in Belgium questions the existence of inter-regional disparities, which would go some way towards explaining the slowdown observed in growth in national productivity in recent decades. However, since the early 1980s, the three regions of Belgium have recorded different[3] levels of nominal value added per capita, with this remaining remarkably stable, as shown by Graph 7. This shows that the levels of regional nominal value added per capita, compared to the national value, have only recorded marginal change over the entire period. Between 1980 and 2018, the index remained very close to the national average for the Flanders region, whilst Brussels retained an increase of around 25 %, and Wallonia a deficit of around 15 %.

Graph 7. Nominal value added per capita (solid curve) and per hour (dashed curve)
Index, Belgium = 100



Sources: NAI, HERMREG.

2 Regional accounts published by the ICN, however, only currently present an aggregated volume for the economy as a whole.

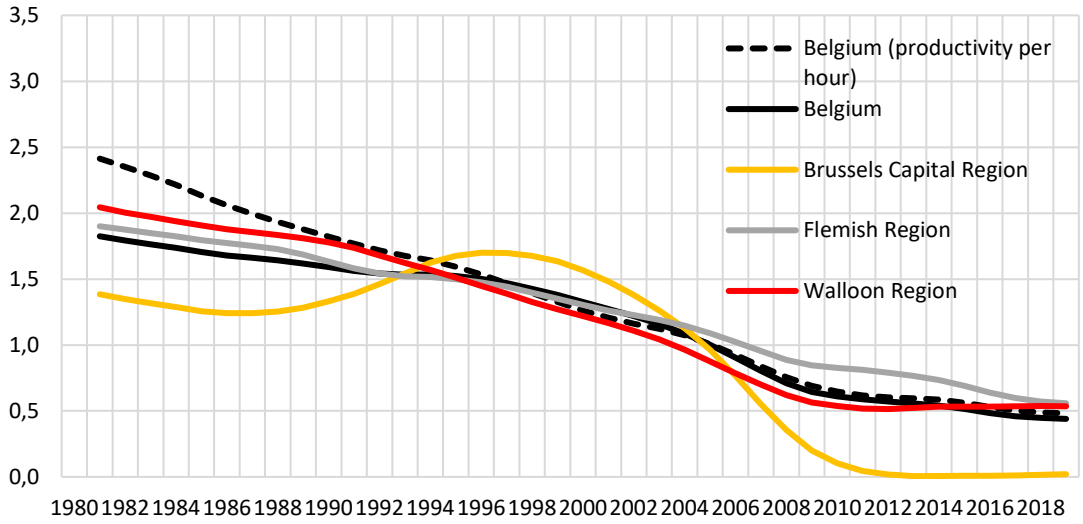
3 In order to conduct this analysis of the change in labour productivity over a long period at regional level, only *per capita* data is available. The series of data used in this framework comes from the HERMREG model developed by the Federal Plan Office in collaboration with the Brussels Statistical and Analysis Institute (IBSA), the Walloon Evaluation, Prospection and Statistical Institute (IWEPS) and Statistical Vlaanderen.

Graph 7 also shows that consideration of hours worked (available from 2009 onwards, see dashed curves) does not call into question the observed stability in terms of the levels of nominal value added per capita across all three regions in relation to the Belgian reference.

Just like Belgium, which has shown a widespread slowdown in productivity growth, all regions have recorded a steady decline in increased labour productivity per capita since the early 1980s, notably due to the transition of regional economies towards services. Tertiarisation is consequently often referred to as one of the primary channels of slowdowns in productivity trends, with productivity gains being structurally faster in the manufacturing industry[4]. Graph 8 shows the change in trend in the rate of productivity growth per capita in Belgium and in the regions, as well as hourly productivity in Belgium[5].

Graph 8. Labour productivity growth per capita – trends

In %



Sources: NAI, HERMREG, our calculations.

The long-term change in labour productivity is on the whole similar in Wallonia and Flanders. The slowdown in productivity growth in Flanders appears to be stable, whilst it accentuated in Wallonia from the 2000s up until the 2008 economic and financial downturn. The more recent slowdown in productivity increases in Flanders tends to be converging towards productivity growth between the two regions (at 0.5 %) over recent years.

The rates of productivity increases in Brussels are on quite a unique track, with the slowdown in productivity increases being both more recent, since the 2000s, and more significant. Since the 2008 downturn, the Brussels economy has struggled to record any productivity increases, showing practically zero productivity growth per capita in recent years.

[4] Despite an economic structure already more focused on the tertiary sector than in the two other regions, the Brussels-Capital region records productivity levels that are significantly higher, with this excess, inter alia, being put into perspective with certain specificities of the Brussels economic fabric. Consequently, the region has a large concentration of finance and insurance activities with strong value added in the country. Moreover, in the vast majority of business sectors, the Brussels-Capital region is home to many more large-scale and international companies whose productivity level is generally much higher (cf. for instance CBS 2017 and KUL 2012). Furthermore, companies and offices in Brussels would appear to be home to more directors and highly-qualified posts, notably shown in the levels of wages (component of value added), which are higher than in the two other regions. If these structural specificities continue, they will not prevent increasing tertiarisation from following suit, in all three regions, with a slowdown in productivity increases.

[5] The addition of hourly productivity for Belgium shows that the change in the average number of working hours weighed heavy over productivity growth per capita up until the early 2000s. This was not the case thereafter. Consequently, productivity growth per capita, the only long-term measurement available per region, can be considered as a reasonable approximation of hourly productivity, at least to highlight any regional differences.

Slowdown *hourly* labour productivity growth between regions

As per the national situation, regional analysis of hourly productivity is focused on recent changes. There is, however, a specific difficulty to regional analysis, which is due to calculation of the reference year, due to the delayed impact of the crisis on the regional economies and the sensitivity of results to the sub-periods in question, as shown in Table 6. The 2015-2018 period is of particular importance, as underlined by the 2020 NPB report. Indeed, whilst slowdown in productivity growth in Belgium was somewhat exacerbated by the 2008-2009 economic and financial downturn, since 2015 Belgian productivity levels have witnessed particularly low levels of growth. From this perspective, an analysis at regional scale of the most recent years should be favoured. Consequently, the regional analysis is aimed at shedding more light on changes in productivity during the 2009-2018 period, but will also particularly focus on the 2015-2018 period.

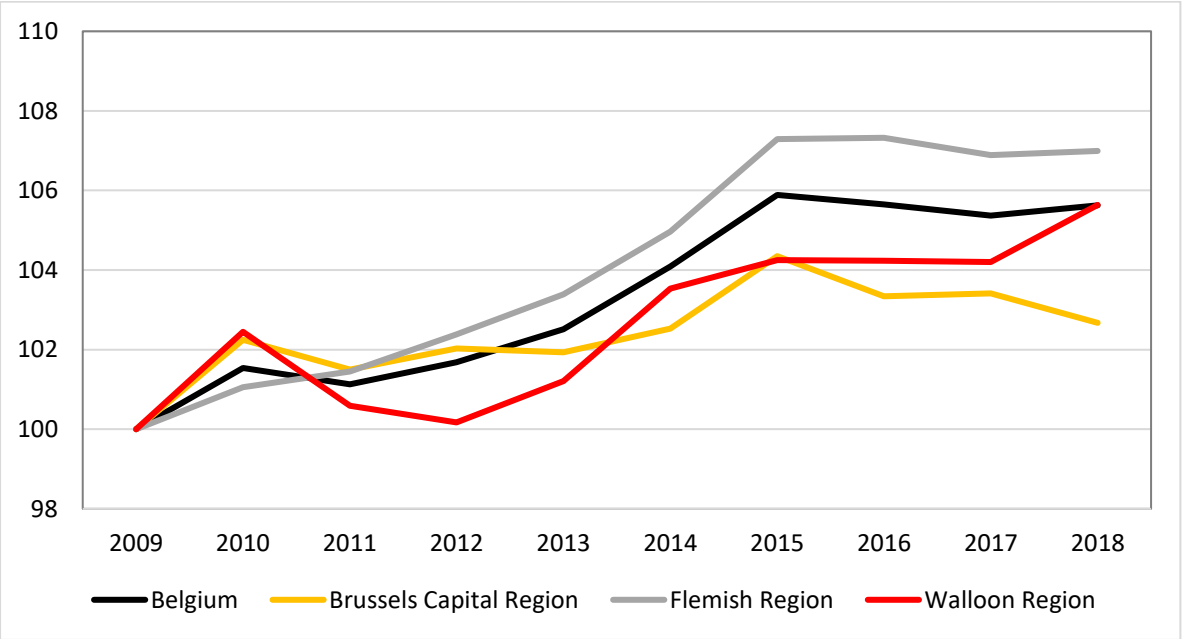
Table 6. Average annual hourly labour productivity growth, total economy
In %

	2015-2018	2009-2018
Belgium	-0,1	0,6
Brussels-Capital Region	-0,5	0,3
Flanders	-0,1	0,8
Wallonia	0,4	0,6

Source: Regional accounts.

On average, over the entire 2009-2018 period, the rate of growth in hourly labour productivity is quite different from one region to the next. With an increase of 0.8 % per year, Flanders comes out ahead of Wallonia, which has an identical rate of growth to the national average (0.6 %). The Brussels region is clearly below this since the increase in productivity is limited to 0.3 % per year on average. Graph 9 shows just how these average changes conceal very different trajectories in the growth of labour productivity between regions.

Graph 9. Evolution in hourly productivity growth
Index, 2009 = 100



Source: Regional accounts.

Over the recent period, namely between 2015 and 2018, the particularly low level of productivity growth in Belgium is the result of a contrasted change in regional increases in productivity. In Flanders, these are almost

zero (-0.1 % per year on average). The increase in activity (+1.7 %) was combined with slightly higher growth in hours worked (+1.7 %). In Wallonia, economic growth, similar to that observed in Flanders (+1.8 %) was less intensive in terms of hours worked (+1.4 %), meaning that the region recorded some of the highest increases in labour productivity (+0.4 %). In Brussels, a lower increase in hours worked (+0.8 %) than in the other regions was recorded, the sluggishness of activities (+0.2 %) led to significant losses in productivity (-0.54 %).

All three regions recorded a significant slowdown in productivity growth in manufacturing, and only Wallonia benefited from increased productivity in the market services sector

After conducting analysis of the change in regional productivity levels at an aggregated level, it is interesting to then analyse the results from a sector-specific perspective. Table 7 shows the change in hourly labour productivity per major business sector: manufacturing, construction, market services, non-market services.

Over the entire 2009-2018 period, manufacturing recorded relatively high increases in productivity across all three regions, at around 2 % per year on average. These increases in productivity are clearly higher than those in other activity groups. Consequently, within market services, productivity growth was between 0.8 % and 0.9 % depending on the region. The relative slowdown in productivity growth at an aggregated level across all three regions in recent years can, to a large extent, be explained by changes in these two main sectors of activity.

Over the 2015-2018 period, Brussels notably suffered from a severe drop in productivity in manufacturing[6] (-11.9 % per year on average), whilst increases in productivity remained positive in market services (+0.7 %). In the Flanders region, the decline in productivity growth concerned both industries, seriously affecting productivity increases in market services (+0.3 % per year on average) and leading to productivity losses in manufacturing (-0.6 %). Wallonia recorded a clearly less favourable change in relation to the other two regions between 2015 and 2018. The Walloon industry indeed continued to witness increases in productivity (+0.5 % per year on average) and, above all, market services recorded an acceleration in productivity growth (+1.3 %) compared to the previous period.

Overall, from a sector-specific perspective, the following points can be noted:

- In Flanders and Brussels, the slowdown in productivity growth was more significant in manufacturing (which same records negative values) than in market services.
- Wallonia stood out from the other two regions by (i) a less significant slowdown in productivity growth in industry (with this remaining positive), as well as by (ii) an increase in productivity in market services.

Table 7. Average annual hourly labour productivity growth
In %

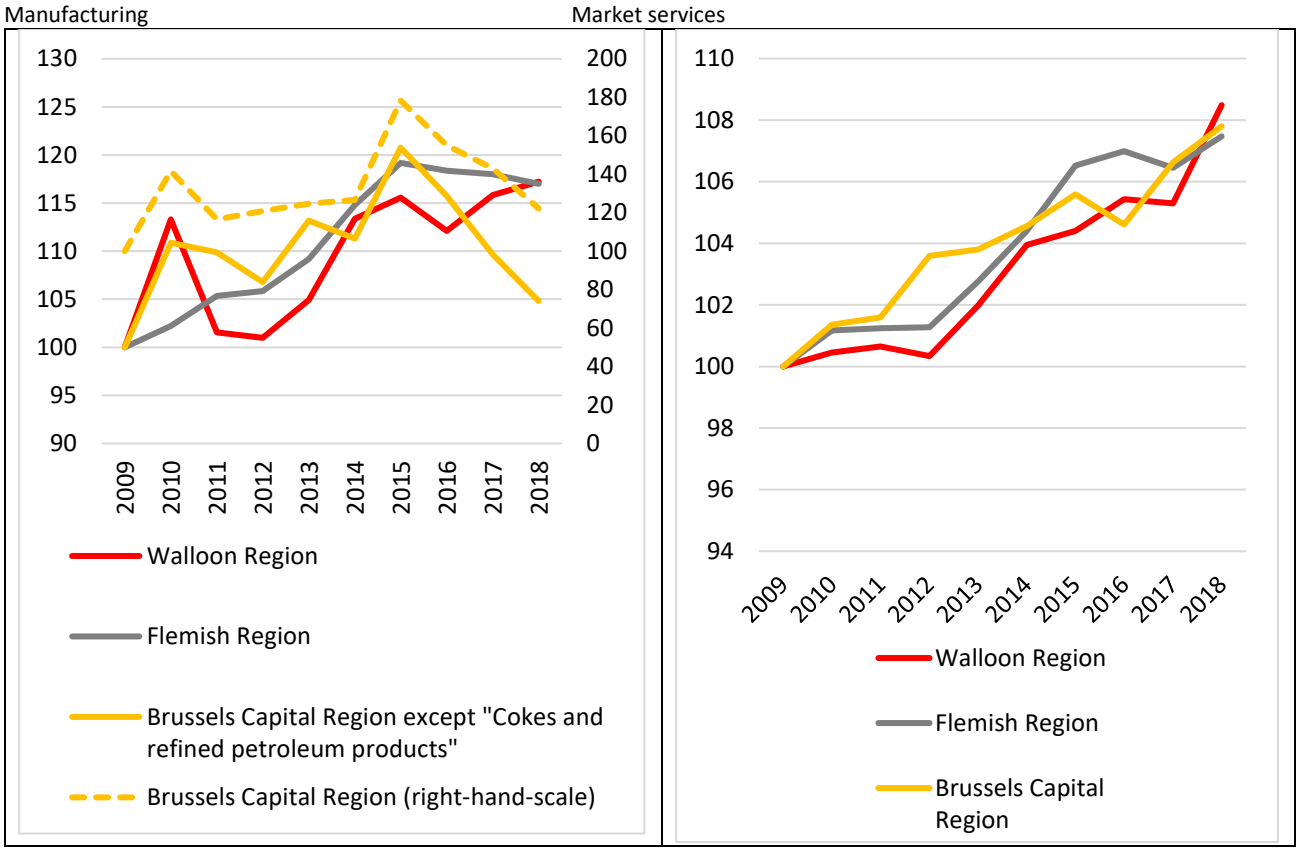
	Brussels region	Flanders	Wallonia
	2015-2018		
Total economy	-0,5	-0,1	0,4
Manufacturing	-11,9	-0,6	0,5
Construction	-1,6	0,5	0,1
Market services	0,7	0,3	1,3
Non -market services	-0,5	-0,2	-0,2
	2009-2018		
Total economy	0,3	0,8	0,6
Manufacturing	2,2	1,8	1,8
Construction	-0,7	1,0	0,4
Market services	0,8	0,8	0,9
Non- market services	0,1	0,0	0,0

[6] Compared to the other two regions, the share of value added and employment in this sector is very low in Brussels. If a specific company changes its activities or stops trading, this can have a significant impact on the total productivity of this sector.

Comment: manufacturing corresponds to Section C, market services cover Sections G through N, and non-market services cover Sections O though U, construction covers Section F and Others cover Sections A, B, D and E of NACE-rev2.
Source: Regional accounts.

The change in hourly productivity in manufacturing and in market services is presented in double Graph 10. Concerning the methodology, it is important to indicate that the change in value added in Brussels manufacturing is heavily influenced by the results of refinery activities in Antwerp on behalf of a company located in Brussels and listed in the "Coking and refinery" sector (CD division of NACE-rev2). The high variability of this aggregate has a considerable effect on the calculations of hourly productivity, not only in the industrial sector concerned, but also for the entire Brussels economy, whilst the link with the economic reality of the Capital is weak. It is, consequently, useful to measure labour productivity in Brussels by omitting the "Coking and refinery" branch. The ordinate scale shows a large scale of change in increased productivity in industry in relation to market services. The graph additionally shows the specific situation in Wallonia of an increase in productivity of manufacturing and the market services from 2016.

Graph 10. Evolution in hourly labour productivity growth in manufacturing and market services
Index, 2009 = 100



Dashed curve refers to the right-hand axis.
Source: Regional accounts.

Importance of the contribution by market services to productivity growth

The impact of the change in productivity in primary activities over the change in productivity of the entire economy depends on the structure of each economy and its change over time. Table 8 illustrates the sector breakdown of regional economies in terms of value added and employment between 2009 and 2018. The economic weight of manufacturing, measured both in terms of value added and hours worked, contracted in all three regions, whilst the share of market services increased, except for the share of hours worked in market services, which were reduced in the Brussels-Capital region. On the other hand, the contribution of non-market

services to value added and hours worked increased in Brussels, while it remained stable or slightly declined in Flanders[7] and Wallonia.

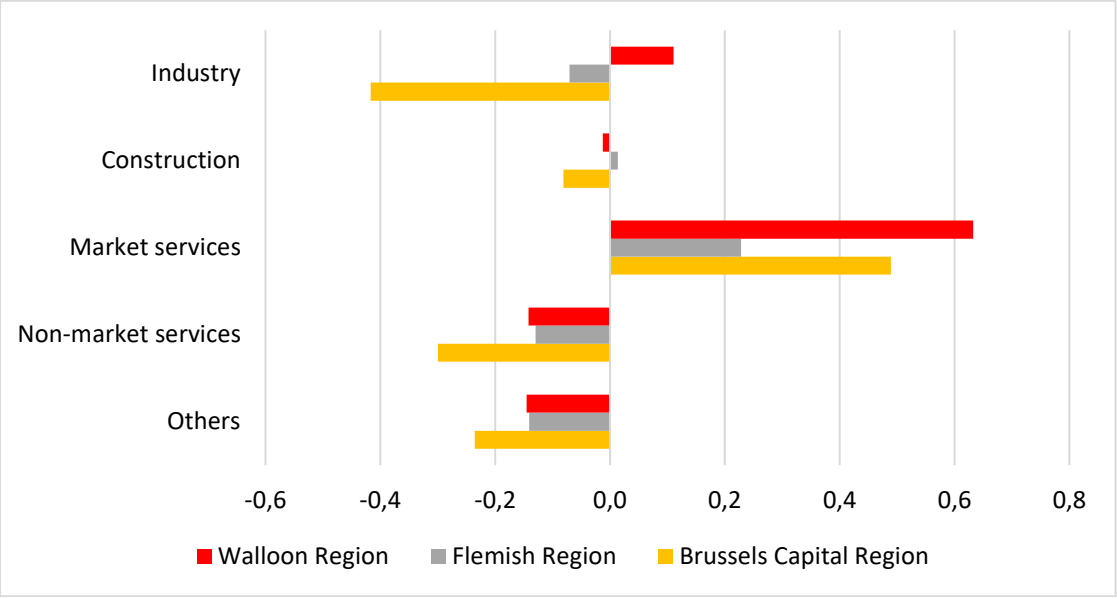
Table 8. Share of major activities in nominal value added and hours worked for the whole economy
As a %

	Manufacturing				Market services				Non-market services			
	Value added		Hours worked		Value added		Hours worked		Value added		Hours worked	
	2009	2018	2009	2018	2009	2018	2009	2018	2009	2018	2009	2018
Belgium	14,5	13,6	12,2	10,6	52,4	54,7	47,9	49,3	23,9	23,5	30,4	30,5
Brussels Capital Region	3,1	2,5	4,1	2,8	64,9	66,2	54,6	53,0	25,4	27,0	37,0	39,2
Flanders	18,0	16,8	14,5	12,6	51,6	54,2	48,7	50,9	20,6	20,0	26,5	26,5
Wallonia	15,1	14,5	11,6	10,3	44,2	46,9	42,4	43,8	30,4	29,6	35,2	34,8

Comment: manufacturing corresponds to section C, market services cover sections G through N, and non-market services cover sections O though U of NACE-rev2.
Source: Regional accounts.

Associating the economic significance and the change in labour productivity of the primary activity categories enables us to determine the contribution of these sectors to productivity growth of the regional economies taken as a whole. The sector-specifics contributions to productivity growth between 2015 and 2018 are shown under Graph 11.

Graph 11. Sector-specific contributions to hourly labour productivity: regional comparison, 2015-2018
Annual average as a percentage



Source: Regional accounts, our calculations.

Due to their significant structural weight in advanced economies, market services provide the primary contribution towards productivity growth across all three regions. In Wallonia, the large contribution of market services (+0.6 %) results from sustained growth of value added without an equivalent increase in the volume of labour. In Flanders, the increase in activities, similar to growth in Wallonia, instead led to a rise in employment, limiting the contribution by the sector towards productivity growth (+0.2 %). In Brussels, market services provided the only positive contribution towards growth of regional productivity (+0.5 %). Whilst growth in value

added of the sector remains relatively moderate compared to in Flanders and Wallonia, the number of new jobs created was particularly low in the Capital.

The contribution by manufacturing to the increase in labour productivity is negative in Flanders and Brussels, while positive in Wallonia. In Flanders, productivity is penalised by the low level of growth of industrial activities (+0.2 %), of which the impact is further accentuated by the relative significance of the sector in the Flemish business sector. In Brussels, where the weight of industry is significantly lower, the clearly negative contribution of manufacturing results from the sharp contraction of value added from the industrial sector. In Wallonia, the relatively sustained growth of value added (+1.6 %) and a more limited increase in labour volume (+1.1 %) led to a positive contribution to regional productivity (+0.1 %) by manufacturing.

The contribution to productivity of non-market services is negative across all three regional economies.

Unfavourable impact of sector-based structure on growth in hourly productivity in the regions

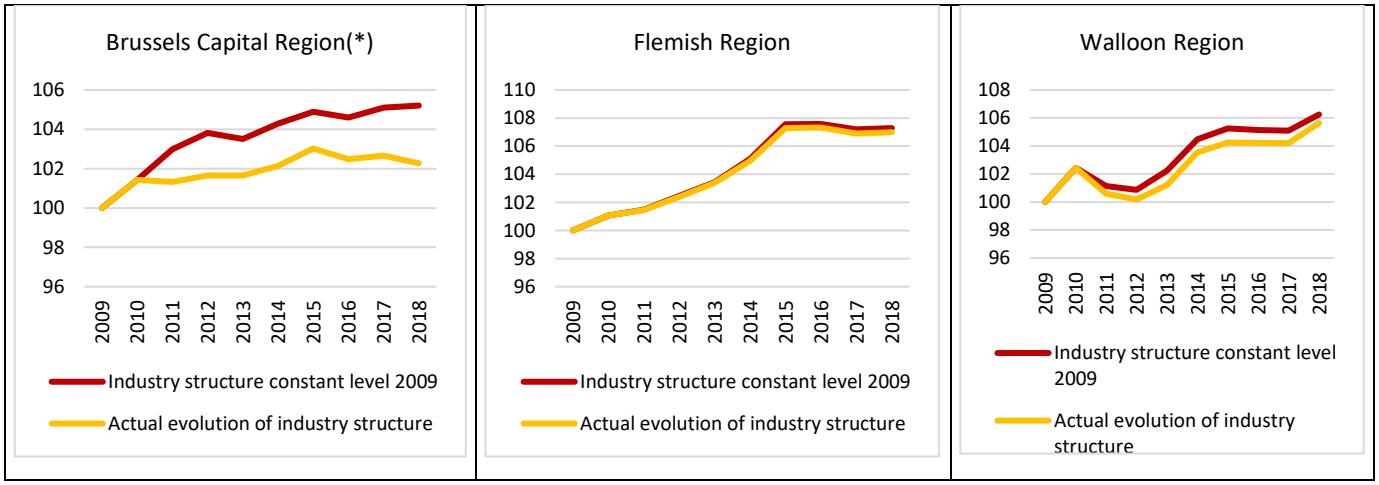
Modification of the productive structure of regional economics, due to the decline in the economic weight of manufacturing and the increasing significance of personal and commercial services, can in part explain the slowdown in productivity growth of the regional economies. It is therefore useful to consider the manner in which this restructuring affects regional growth in labour productivity.

The method is as follows: actual growth in gross value added between 2009 and 2018 is applied year on year to the structure of industries in 2009 at A38 level. In a similar manner, growth in the number of hours worked is applied to the structure of industries in 2009, also at A38 level.

Hypothetical productivity growth per hour worked is then obtained in supposing that the structure of industries remains constant at 2009 levels. This figure is then compared to actual growth. This comparison provides us with information as to the influence of change in the breakdown of industries over productivity growth per hour worked.

In 2018, productivity per hour in Brussels was above 2.3 % in real terms compared to 2009[8]. If the structure of industries in the Brussels-Capital region remained unchanged, and similar to that of 2009, actual productivity per hour would have increased by 5.2 %. The differential in productivity growth per hour worked was already perceptible in 2011 and 2012, and further accentuated in 2017 and 2018.

Graph 12. Evolution in productivity per hour depending on the structure of industries in all 3 regions, 2009-2018



(*) without the 'CD: Coking and refinery' sector.
Source: NAI, our calculations.

[8] Calculations for the Brussels-Capital region are undertaken without taking into account the "CD: Coking and refinery" sector.

In the Flemish region, productivity per hour saw actual growth of 7.0 % over the 2009-2018 period. This was scarcely less than if the structure of industries had stayed the same in 2018 as in 2009 (+7.3 %). Consequently, the change in the breakdown of industries in the Flemish region has had practically no influence at all over productivity growth per hour worked.

The Walloon region recorded actual productivity growth per hour worked of 5.6 % over the 2009-2018 period. This was less than if the structure of industries had stayed the same as in 2009 (+6.3 %). The difference was greater (difference of around 1 percentage point) between 2013 and 2015. Since then, the Walloon region has been able to make up a portion of this difference (difference of -0.6 percentage points in 2018).

In conclusion, it appears that the change to the breakdown of industries over the 2009-2018 period contributed towards slower productivity growth in the Brussels-Capital region and, to a lesser extent, in the Walloon region. This influence was, however, barely perceptible in the Flemish region.

Shift & share analysis

What is it that determines change in productivity per hour in a particular region? Or, more precisely: what is the influence of the change in productivity per hour over gross value added? Are the results in one region higher or lower than those of Belgium as a whole? Can this be attributed to the presence of many "strong" industries (with a greater productivity growth per hour worked)? Are industries in this region simply better performers than their Belgian counterparts?

The shift & share analysis aims to provide answers to these questions.

Methodology

The shift & share analysis, as applied here, is a tool used to compare growth of gross value added in one region over a given period to growth which could have been achieved if this region had seen Belgian total productivity growth per hour worked (applied to all industries in this same region). This difference corresponds to the standard component.

The region may, therefore, have recorded better or worse results. This over- or under-performance is broken down in two manners:

- The structural component reflects the share of the actual increase of gross value added of a region, which is due to a combination of "strong" and "weak" sectors (in terms of productivity growth per hour worked in relation to the sector average).

In concrete terms, this is the difference between growth in Belgian productivity per hour in a business sector in relation to total Belgian productivity per hour applied to the volume of labour of this specific business sector (in hours). The difference between gross value added is positive if the increase in productivity per hour in the sector is greater than that of the whole economy and negative in the contrary instance. The total differences between gross value added for all industries is positive if there is a predominance in "strong" growth businesses, and negative in the contrary instance.

Analysis of the influence of the breakdown of industries in the previous section concerned the change in productivity per hour in a region with or without a constant structure of industries (measuring the effect of the change in business sector structure). The structural component of shift & share analysis consists of applying the change to total productivity or to the business sector per hour worked (thereby measuring the effect of the share of industries with strong/weak growth concerning productivity).

- The dynamic component examines whether the regional growth dynamic for each business sector is stronger or weaker than the Belgian growth dynamic for this sector (in terms of productivity growth per hour worked).

In concrete, the difference is calculated per business sector between the gross actual value added and that which would have been recorded if the increase in Belgian productivity per hour had been applied to the volume of labour (in hours) in this regional business sector. The total product of these calculations for each business sector gives a total figure that is either positive or negative.

The following formula will allow this result to be obtained:

Standard effect: $AV^{T}_{R,2018} - \sum_i(Prod^{T}_{B,2018} / Prod^{T}_{B,2009}). Prod^{i}_{R,2009} . H^{i}_{R,2018}$

Structural component: $\sum_i((Prod^{i}_{B,2018} / Prod^{i}_{B,2009}). Prod^{i}_{R,2009} . H^{i}_{R,2018} - (Prod^{T}_{B,2018} / Prod^{T}_{B,2009}). Prod^{i}_{R,2009} . H^{i}_{R,2018})$

Dynamic component: $\sum_i(VA^{i}_{R,2018} - (Prod^{i}_{B,2018} / Prod^{i}_{B,2009}). Prod^{i}_{R,2009} . H^{i}_{R,2018})$

AV: gross value added by volume, Prod: productivity per hour, H: number of hours worked, B: Belgium, R: region in question, i: 5 distinct industries.

Application of shift & share analysis requires the choice of the following parameters:

- The period (start and end year of the change): in this case, this is the 2009-2018
- The reference area: in this case, Belgium and the regions: all 3 regions in this case.
- The industries: in this case, it concerns 5 industries concerned in the entire regional analysis: manufacturing (NACE CA-CM sectors), construction (FF), market services (GG-NN), non-market services (OO-TT) and the remaining industries (AA, BB, DD, EE).

As a reminder, the choice of regions, start and end years, and the distribution of industries all have a significant influence on the results of shift & share analysis.

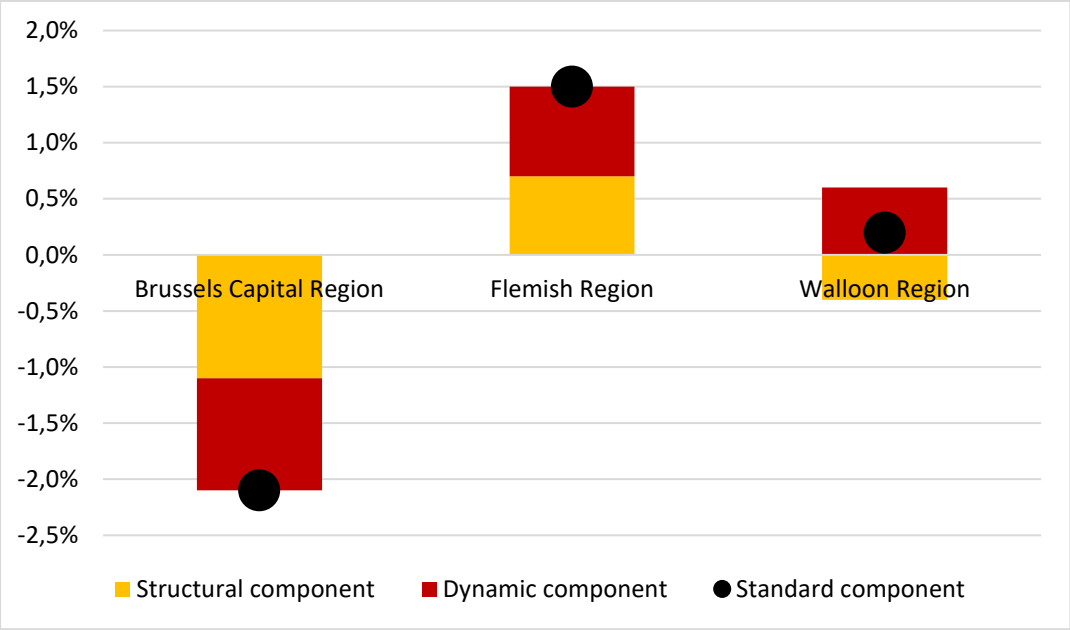
2009-2018 period

Over the entire 2009-2018 period, the gross value added in the Brussels-Capital region increased 2.1 % more slowly in real terms than if the total increase of productivity per hour in Belgium for the various industries had been taken into account. The structural component is negative (-1.1 %): non-market services have a relatively significant influence on the Brussels economy, but growth in their productivity is relatively slow. The dynamic component is also negative (-1.0 %). This can be explained by the fact that productivity growth in Brussels in the "other" business sector, and to a lesser extent in construction, is lower than that of their Belgian counterparts.

In the Flemish region, gross value added increased by 1.5 % more in real terms than would have been the case if the increase in Belgian productivity per hour had been applied. This can be explained both by a positive structural component (+0.7 %) and a positive dynamic component (+0.8 %). The relative importance of manufacturing in the Flemish region plays a fundamental role for the first of these components. Productivity growth is greater than the average of the economy as a whole. The positive dynamic component is primarily due to market services and the "other" business sector, which recorded more solid productivity growth in the Flemish region than the Belgian average.

In the Walloon region, growth in gross value added over the 2009-2018 period is 0.2 % higher in real terms than it would have been if we applied total productivity per hour in Belgium. The structural component is negative (-0.4 %), primarily due to non-market services. The dynamic component is positive by 0.6 % (primarily market services).

Graph 13. Shift & share analysis of productivity per hour, regions in Belgium, 2009-2018
In % of gross value added (chain-linked euros with 2015 as reference year)



Source: Statistiek Vlaanderen calculations.

In short, for the entire 2009-2018 period, regional productivity growth per hour worked in the Flemish region, and to a lesser extent, in the Walloon region, appears to have a more favourable effect over the change in actual gross value added than if productivity growth in Belgium was taken into account. It is the opposite in the Brussels region. In the Flemish region, performances between the same industries as well as their composition play a positive role. It is the opposite in the Brussels region. In the Walloon region, the table is more mixed: we can observe an overall positive dynamism of industries, but the structural composition plays a relatively unfavourable role.

Conclusions

- Results in terms of labour productivity present a very **high degree of variability** depending on the region, periods and industries in question; it is, therefore, necessary to remain cautious in the observations and recommendations that may be made on this basis.
- Just as at national level, the 3 regions recorded a **widespread slowdown** in the growth of labour productivity (per capita) over a long period.
- This trend is shared across all 3 regions, albeit with **different profiles and timings**:
    - an earlier slowdown (since the start of the 1980s), but more progressive in Flanders and Wallonia;
    - a much later slowdown (since the end of the 1990s), but more significant in Brussels.
- The **differences in the nominal level of value added per capita/hour between the regions are remarkably stable** over the long term: overall, Flanders is close to the national average, whilst Brussels has a higher figure, and Wallonia a lower figure.
- From a sector-specific perspective, **the slowdown in productivity growth was more significant in manufacturing** (even recording negative values in Brussels and Flanders) than in market services, and for all three regions.
- **Over the 2015-2018 period, only Wallonia recorded increases in productivity** and stood out from the other two regions due to:
    - a less significant slowdown in productivity growth in manufacturing (with this remaining positive);
    - an increase in productivity in market services;
    - In all three regions, it is market **services that make the primary contribution towards growth in labour productivity** for the whole economy.

- **The change in structure of the economic fabric made a negative contribution to productivity growth per hour in all three regions.** This phenomenon was more significant in the Brussels-Capital region, and less so in the Flemish region. Isolating the effect of structural change, however, does not call into question the observed slowdown in productivity in any of the three regions.
- For the entire 2009-2018 period, regional productivity growth per hour would appear to have a more favourable effect on gross value added in the Flemish region than if productivity in Belgium had been taken into account (scarcely more in the Walloon region). It is the opposite in the Brussels region. Performances in regional industries even have an influence almost equal to their composition for the Brussels and Flemish regions. In the Walloon region, performances of industries marginally dominate the negative effect of the composition of industries.

2. Competitiveness levers

2.1. Entrepreneurial dynamism

Limited entrepreneurial dynamism could explain the slowdown in productivity growth.

Recent studies have argued that a drop in entrepreneurial dynamism could be an explanation behind the decline in productivity growth in OECD countries (Decker et al. 2017; Calvino, Criscuolo and Verlhac 2020). Start-ups may challenge established companies by launching new products, services, technologies and forms of organisation. Well-established companies may react to competition from new start-ups in a variety of manners, but the less productive companies, which fail to respond to such challenges, may be forced to stop trading. New start-ups contribute towards productivity growth of the business sector in which they operate by a sharp increase in their technical efficiency during the first few years following creation. Reallocation within the same industry may increase productivity if resources are transferred from companies with low productivity to those with high productivity. Researchers, in the footsteps of Schumpeter (1942), consider that the creative destruction resulting from replacement of old companies and technologies with new companies and technologies is crucial for economic productivity and growth (Davis et al. 2007; Dejardin 2011; Dent et al. 2016; Gourio, Messer and Siemer 2016) [9]. According to this line of thought, a drop in the number of start-ups or reallocation within a business sector can, in part, explain the slowdown in productivity growth of industries. However, the empirical assessment of this correlation is far from easy. Moreover, there are also recent theoretical models that show a less direct link between entrepreneurial dynamism and productivity growth (Dhingra and Morrow 2019 and Baqaee and Farhi 2020). The fact that entrepreneurial dynamism and productivity growth are both showing a clear downward trend does not necessarily prove a link of cause and effect between the dynamism of companies on productivity levels. It is possible that both of these trends are due to other underlying factors such as demographics or technological opportunities (Hopenhayn, Neira and Singhania 2018; St-Amant and Tessier 2018; Karahan, Pugsley and Şahin 2019; Vollrath 2020).

Various definitions and data sources for companies are available[10]. For official figures concerning business demography, Statbel, the Belgian statistical office, considers legal units for which economic activity of at least one day per year was established, on the basis of an administrative register such as the ONSS (National Social Security Office), VAT or annual accounts. These figures respect the Eurostat definition, which enables comparison between EU member states. An important distinction to be made is that between companies with no employees (for instance, self-employed workers who do not have any employees) and companies with at least one employee. Although self-employed workers play a substantial role in certain industries in Belgium, they generally have little growth ambitions. From the perspective of contribution towards business sector dynamism, a distinction is made between entrepreneurs motivated by need and those motivated by growth (Schoar 2010). In relation to other countries, the share of entrepreneurs motivated by growth in Belgium is low and also declined between 2004 and 2015 (De Mulder and Godefroid 2016).

The high level of under-representation of companies with strong growth in employment in Belgium is not only explained by the low number of companies with high growth, but also by their relatively small scale and less by the sector-specific specialisation of Belgium (Sleuwaegen 2016).

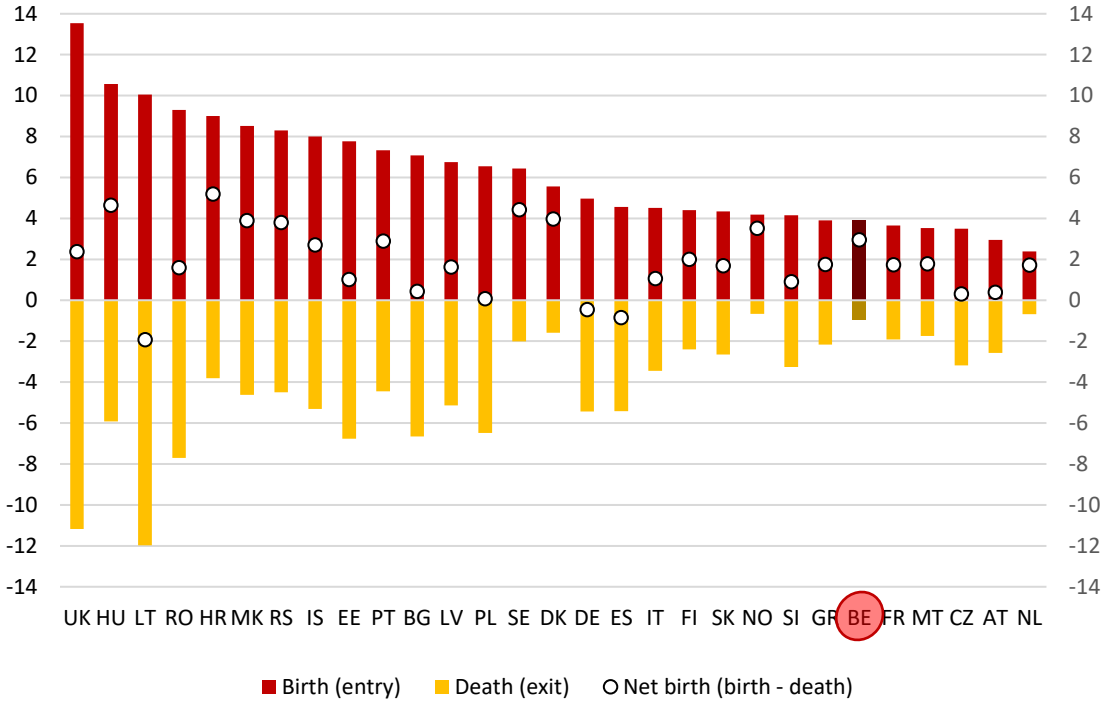
Graph 14 compares entry and exit (birth and deaths) of companies with at least one employee from the Eurostat database of 29 countries. Countries are ranked by decreasing enterprise birth rate (new births as a % of active companies), in 2018. Only five countries recorded an enterprise birth rate lower than Belgium. It is striking to observe that the birth rate is even lower in France and the Netherlands. Eurostat figures show that these countries have a relatively high number of births without employees, which can be explained by the status of "Entreprise Individuelle" in France and "Zelfstandigen zonder personeel (zzp)" in the Netherlands. The conclusions drawn regarding entrepreneurial dynamism often depend on whether all companies (including

[9] According to Schumpeter (1942), the dynamic of creative destruction would also lead to destruction of the capitalist system itself by leading to bureaucratisation of prosperous large companies, which would become increasingly cautious and less inclined to take risks, thereby supplanting real entrepreneurs.

[10] For further information concerning the various definitions and data sources, see Dumont (2021).

those without employees) are considered or only those with employees, and there is some disagreement as to the most pertinent company concept (Dumont 2021) [11].

Graph 14. Birth and death rate of enterprises in the 29 European countries, 2018.
% of active companies



The graph shows birth and death of enterprises with at least 1 employee.
Source: Eurostat, Business demography by size class, Structural Business Statistics.

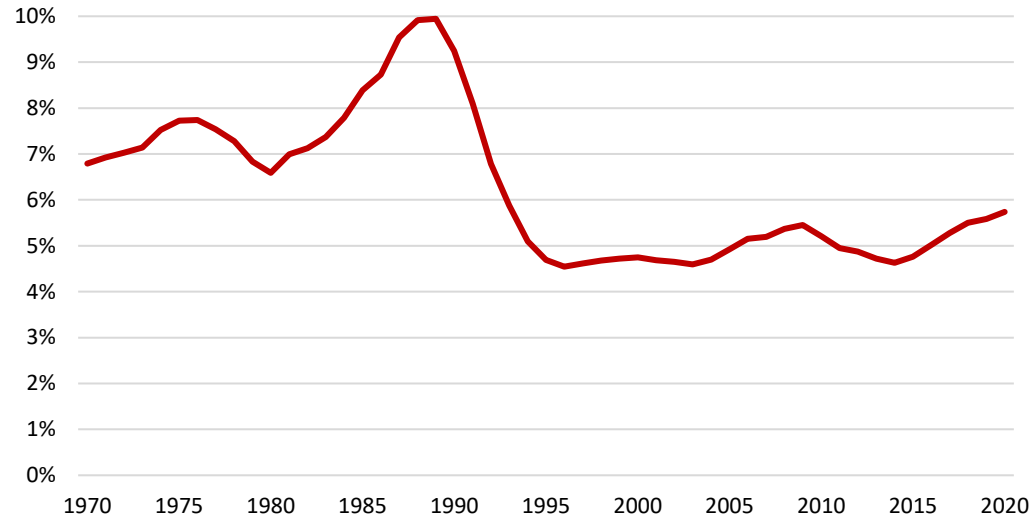
Graph 14 also shows the death rate, namely the number of companies that cease trading as a percentage of the number of active companies. The graph clearly shows that high entry generally goes hand in hand with high exit of companies. The sum of the entry and exits rates, called "churning", is often used as a measurement for entrepreneurial dynamism. Amongst the 29 countries in Graph 14, Belgium recorded the third lowest "churning" rate in 2018. The net birth rate, which is the difference between entry and exit, reflects the net increase in the number of active compagnies. The net birth rate is relatively high in Belgium (8th position), but this is primarily the result of the very low exit rate.

The official Statbel figures concerning the demographics of companies in Belgium, which follow the Eurostat guidelines, are only available for 2008-2018[12]. Data published by the Crossroads Bank for Enterprises, although not following Eurostat directives, allow us to follow changes over a longer period of time. Graph 15 shows the start-up rate of non-financial compagnies in Belgium for the 1970-2020 period.

[11] With regard to the rate of creation of companies without employees, Belgium is ranked 19th (out of 29 countries in Graph 14).

[12] Over this short period, figures show a marginal increase in the rate of creation of companies in Belgium (see Dumont 2021).

Graph 15. Company birth rate in Belgium, 1970-2020
% of active companies



The figure shows the number of non-financial companies (excluding associations) that were founded as a % of the number of active companies. The time series is adjusted by taking the five-year moving average.
Source: Crossroads Bank for Enterprises (CBE Open data download 5/01/2021).

The enterprise birth rate rose sharply in Belgium in the 1980s but fell even more rapidly in the first half of the 1990s. Since then, the birth rate seems to have stabilised at a low level. Changes in company legislation sometimes have a significant impact on company births, without necessarily indicating the creation of new economic activity. During the 1970-1995 period, several directives of the EEC (European Economic Community) were transposed into Belgian national legislation. In 1985, the personal limited liability company, was transformed into a private limited liability company, which also allowed legal entities to establish a one person private limited company. The highest birth rate was recorded in 1988 and 1989, the first two years after the introduction of the single person private limited company, which offered self-employed entrepreneurs the possibility of legally separating their private and professional assets. The temporary increase in the birth rate from 2007 can be explained by the possibility, from that year, of different taxpayers being considered as one entity for VAT purposes. For this purpose, a new form of company was created, the VAT unit. The corporate tax reform in 2017 seems to have led practitioners of a liberal profession and other self-employed individuals to create a company in order to legally reduce the levies on their activities (Coppens et al. 2018).

Statbel's figures on the bankruptcy rate (number of bankruptcies in relation to the number of active companies) in Belgium over the 2000-2020 period show a clear downward trend and a very low level (as can also be seen for 2018 in Graph 14).

The entry and exit of companies are subject to cyclical effects. Recession years are often characterised by "cleansing" and "scarring" phenomena (Foster, Grim and Haltiwanger 2014; Riley, Rosazza Bondibene and Young 2014). Cleansing means an increase in company exits. If these companies have low productivity, then their exit will have a positive impact on the productivity of the industry in which they operated. Scarring testifies to the long-term negative effects of years of crisis. For example, a recession can slow the entry of companies, which, given the importance of start-ups, can leave lasting scars on the dynamics within industries (Kacher and Weiler 2017). The average productivity of young companies tends to be higher during recessions, suggesting a higher barrier to form companies (Foster, Grim and Haltiwanger 2014; Dumont et al. 2016). Recent data available on the entry and exit of companies in Belgium does not yet provide any evidence of "cleansing" or "scarring" following the COVID-19 crisis. Company creation fell sharply in April and May 2020, compared to the corresponding months of 2019. However, as of June, company creation for the rest of 2020 was higher than the level of 2019 and also higher than the average level for the 2015-2018 period[13]. In the March-December 2020 period, more companies were formed than in the same period of 2019. Recent figures on the entry of companies do not distinguish between companies without employees and those with at least one employee. A recent study

[13] In November 2020, when the new measures came into force following the second wave of COVID-19, the number of company formations was slightly below the level of 2019.

in the United States suggests that many new companies in 2020 tented to be driven by necessity (Dinlersoz et al. 2021). During the recession year of 2009, the birth rate of companies without employees in Belgium also increased, in contrast to the birth rate of companies with employees, which decreased slightly. In 2020, about 30 % fewer bankruptcies were recorded than in 2019. The first months of 2021 also saw a noticeable reduction in bankruptcies compared to 2019 or previous years. To a large extent, the low number of bankruptcies reflects the implementation of a moratorium on bankruptcies imposed twice in 2020 (April-June 2020 and November 2020 – January 2021)[14].

The measures taken by governments and central banks to cushion the economic shock of the COVID-19 crisis have led to a debate on whether state aid would artificially keep non-viable companies, and in particular so-called "zombie" companies, alive and thus slow down the process of creative destruction (Laeven, Schepens and Schnabel 2020). Becker and Oehmke (2021) consider the trade-off between the inefficient destruction of viable companies and the inefficient maintenance of non-viable companies to be the main focus of economic policy in response to the COVID-19 crisis. They advocate a legislative framework for bankruptcy that takes into account the future potential and size of insolvent companies as a criterion for assessing the viability and economic importance of a company.

In addition to the creation of companies, the extent to which young start-ups can develop also gives an idea of the dynamism within a sector. The proportion of high-growth companies (so-called gazelles) is an increasingly used indicator. Within the EU, Belgium is one of the countries with the lowest proportion of growing companies. In Belgium, only 3 % of young companies turn out to be gazelles (De Mulder, Godefroid and Swartenbroekx 2017)[15]. Bijnens and Konings (2020) show that the probability of a company in Belgium experiencing high growth has decreased since 2000, and that the share of young companies experiencing high growth has also decreased. They find that the decline in entrepreneurial dynamism in Belgium is linked to the ICT intensity of industries.

The Dynemp project[16] of the OECD shows that job reallocation decreased in most countries, with reallocation being the sum of jobs created and jobs lost relative to the total number of jobs in an industry (OECD 2020). Graph 16 compares the reallocation of jobs in Belgium over the 2000-2014 period with a group of reference countries[17].

The reallocation of jobs decreased in Belgium and for the reference group in manufacturing, and even more so in non-financial market services. The decline in reallocation was slightly less pronounced in Belgium than in the reference group. However, the level of reallocation in Belgium was lower than in other countries due to lower job creation by young companies and less job loss by older small companies, both in manufacturing and in non-financial market services. In non-financial market services, large existing companies in Belgium achieve net job creation, in contrast to the reference group, for which large existing companies witness a net job loss (OECD 2020).

Without establishing causal links, a decomposition analysis aims to assess the relative contribution of the following components to industry-level productivity growth: the entry and exit of companies, the reallocation of market shares in the total output of an industry and productivity growth of the companies that make up the branch. Dumont (2021) reports the results of a decomposition of industry-level productivity growth, based on firm-level data, in 67 industries in Belgium for the2002-2017 period.

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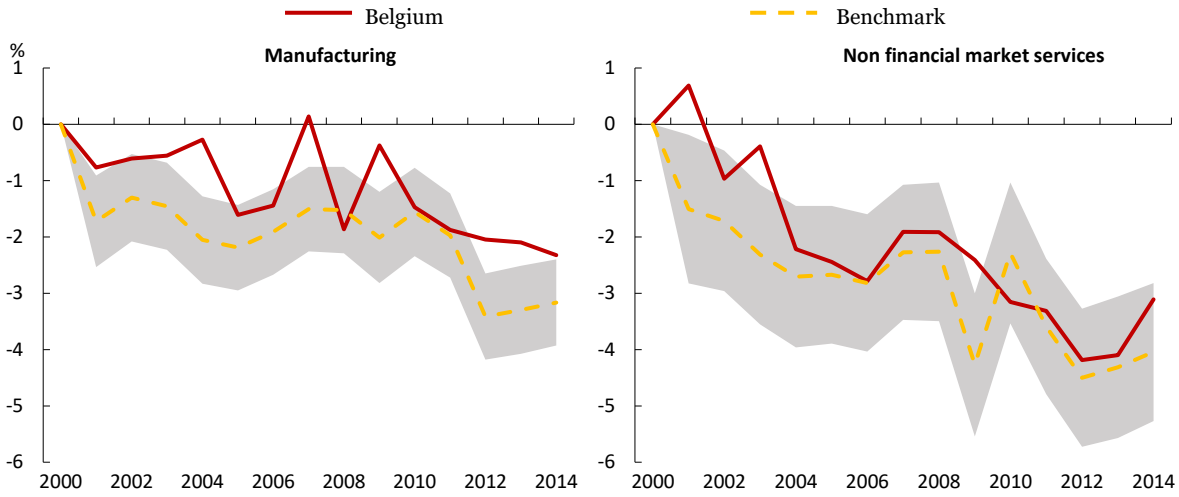
14 As we have already noted, the bankruptcy rate is on a downward trend between 2000 and 2020. For more details on the impact of Covid-19 on company creation and bankruptcies, see Dumont (2021).

15 For an in-depth analysis of high-growth companies in Belgium, see Sleuwaegen (2016).

16 See https://www.oecd.org/sti/dynemp.htm

17 Finland, France, Austria, Hungary, Italy, the Netherlands, Norway, Portugal, Spain and Sweden.

Graph 16. Reallocation of jobs in Belgium in relation to a benchmark group, 2000-2014



Note: Job reallocation is defined as the sum of job creation and destruction over total employment. The grey line indicates the 95 % confidence interval.
Source: OECD (2020), "Belgium: Business Dynamics", OECD Insights on Productivity and Business Dynamics, December 2020.

In the analysis, incumbents are divided into three age groups: start-ups (1-4 years after entry), young companies (5-9 years after entry) and mature companies (10 or more years after entry). The results appear to depend heavily on the chosen productivity estimate. The sign of the contribution of market share reallocation to the productivity growth of an industry, i.e. the impact of a change in the share of a firm in the total industry output, depends on the age of the company. The negative contribution for start-ups indicates a phase where start-ups develop by building a customer base, where the initial level of productivity is lower. As companies age, market selection appears to be more productivity-based, with the most productive companies increasing their market share in the industry, while the least productive companies lose market share. A previous analysis of the productivity growth of Belgian manufacturing companies, over the 1998-2012 period, not only highlighted the importance of international trade for productivity, but also that misallocation[18] increased since 2008 (Fuss and Theodorakopoulos 2018).

The most robust result of the analysis, which is consistent with the conclusions of previous studies, is that the productivity growth of start-ups makes the predominant (positive) contribution to the productivity growth of an industry in the first years after entry. However, it is noted that the relative productivity of start-ups decreased during the period under review. In addition, the low enterprise birth rate in Belgium also limits the positive contribution of start-ups.

The analysis of productivity growth suggests that young companies are having more difficulty to catch up with the average level of productivity of incumbents. The role of entrepreneurial dynamism, such as that of entry and exit but also of reallocation, seems less important, although the very low exit rate in Belgium seems to reflect the existence of barriers to exit for low productivity companies. This can inhibit company entry which, in turn, can have a negative impact on the productivity growth of an industry given the significant positive contribution of start-ups to productivity growth. The reformed bankruptcy legislation, which entered into force in Belgium on 1 May 2018, aims to improve the handling of bankruptcies. In 2021, the federal government implemented a reform aimed at making access to the judicial reorganisation procedure more flexible in Belgium.

[18] A reduction in the link between a company's productivity and its market share in the exit of the industry to which it belongs may indicate a less productivity-efficient allocation of productive resources.

2.2. Innovation

Productivity and innovation

Innovation driving TFP growth

Based on the findings in previous NPB reports and in Section 1 of this report, the persistent weakness in productivity growth in Belgium is largely due to the lack of Total Factor Productivity, or TFP. Reinvigorating productivity growth is therefore an essential remedy for the persistent weakness in productivity growth. It is generally accepted[19] that TFP reflects, among other things[20] the effect of innovation and technical progress leading to greater efficiency of production processes while using the same inputs. TFP growth would make it possible to achieve a robust path of growth and ensure that future resources are available over a sufficiently long period of time (Van Ark, 2014). Moreover, in view of experiences in other countries in which TFP growth may have been a significant source of growth[21], the low growth of TFP in Belgium is by no means inevitable, provided that adequate strategies are active. Among these, innovation thus plays a central role.
When we talk about innovation, both the introduction of new technologies, products or intermediate inputs, and the dissemination of new ideas, techniques, organisations and innovative processes, can be considered. In fact, any observed variation in TFP may reflect a large number of changes that have been adopted within companies and in the economy more generally[22]. In addition to "technical" innovation, the effects of organisational changes or good management practices, knowledge development, but also changes in product brands, network and spillover effects, changes in adjustment costs and economies of scale, effects due to the state of competition, or the quality of institutions and the regulatory environment, which the company has to deal with, are considered.

New technologies and productivity

The link between innovation and productivity has been extensively studied and is the subject of a recurring debate pitting the positions of techno-pessimists against those of techno-optimists.

For techno-pessimists like Gordon (2012), the inventions of the 2000s related to new information and communication technologies (ICT) primarily concerned communication and entertainment equipment. While they certainly offer more possibilities, they would not, in his view, be disruptive innovations, also known as radical innovations, as was the case during previous waves of technological revolution. In other words, the incremental benefits from the iPhone would be meagre compared to that of the telephone[23]. According to Bloom et al., (2017), ideas would be increasingly difficult to come by: despite ever-increasing investment in R&D, productivity growth has steadily waned over time, and the authors estimate that research efforts would need to double every 13 years to keep GDP per capita in the United States rising steadily.

For techno-optimists, new technologies are still the guarantee of future productivity growth. In addition to the question of the measurement of certain dematerialised activities or the proper consideration of investments in intangible assets in the accounting of GDP, some techno-optimists argue that the observed slowdown in productivity is only temporary and that lagging effects have probably contributed to the perception of what the literature refers to as the Solow paradox[24]. The ICT revolution will further transform economies (Brynjolfsson, Rock and Syverson, 2017). Artificial intelligence, robotics, 3D printing and biotechnology in particular, are

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19 According to OECD, 2019.

20 Since TFP is obtained as a residual of an estimate of the production function, it reflects multiple effects in addition to the effect of technological progress with which it is traditionally associated, such as errors and omissions and the business cycle effect.

21 Such as Finland, Germany, Japan or Korea (see OECD, 2019).

22 As already mentioned above, here we mean TFP in a broad sense and also incorporating the effects of workforce composition changes. With regard to the latter, its contribution to work productivity growth is quite small, but has remained positive over time, especially since the economic and financial crisis of 2008 (see NPB, 2020 and Section 1 of this report).

23 Also see Cordemans, 2018.

24 Solow's paradox refers to the fact that productivity slowdown is observed during a period of rapid innovation, especially digital, and refers to Solow's quote, "You see computers everywhere, except in productivity statistics".

expected to make significant advances in the coming years and spread more widely across industries, accompanied by waves of complementary innovations. The integration of ICT into more "physical" sectors is indeed blurring the boundaries between cross-fertilisation technologies. This is evidenced by the decisive advances made in the epidemiological fight against COVID-19 (development and production of vaccines on a large scale via new digital techniques).

Beyond such a debate, this report assumes that innovation stimulates TFP and is therefore a source of productivity growth.

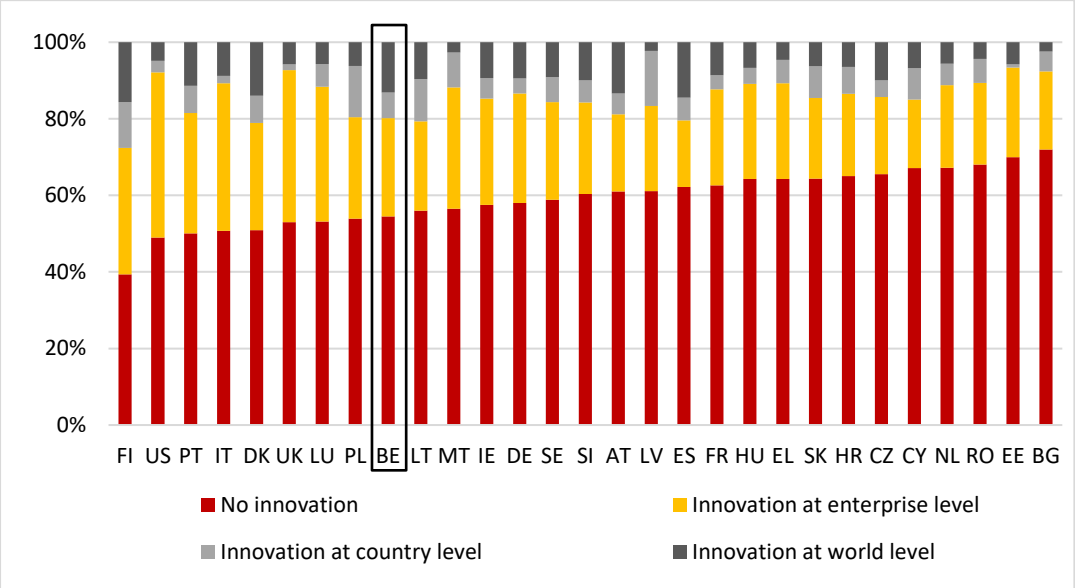
The COVID-19 crisis cannot be forgotten in this debate

The current context is obviously not without consequences for future innovation capacities. The COVID-19 crisis has been the deepest crisis since World War II and one can wonder what would likely be its impact on innovation efforts in the short to medium term.

In 2020, high uncertainties as well as the succession of more or less long and widespread lockdowns have continuously clouded the prospects for a recovery in demand for Belgian companies. In such a climate, private investment has been particularly impacted, being either suspended or abandoned. According to the April 2021 survey by the Economic Risk Management Group (ERMG), the surveyed companies expected the coronavirus crisis to decrease their investments by an average of 19 and 13 %, respectively, in 2021 and 2022, compared to a situation they consider normal. The riskiest projects would be the first jeopardized and among them, those in R&D.

However, the EIB survey (EIB, 2020), which specifically looked at the impact of the COVID-19 crisis on investment in European countries, seems to put the scale of such negative effects into perspective. It indicates that Belgium would have continued to perform relatively better in this area than most other European countries. In 2020, almost half of the Belgian companies surveyed (45 %) seem to have developed or introduced new products, processes or services in their investment activities (20 % of companies have even deployed them on a national and/or international market scale). Only one third of SMEs have invested in it, compared with three out of five (60 %) for large companies.

Graph 17. Innovation activity by country, survey May-August 2020
% of surveyed companies



Source: EIB (2020).

A promising ecosystem: a prerequisite

The COVID-19 crisis has very much demonstrated the importance of controlling emerging epidemiological and public health risks, in order to not only limit human casualties, but also to minimise the resulting economic costs and social damage. In fact, it has become crucial for countries facing this crisis to have innovative strength in the health sector, not only to develop and produce new vaccines and treatments quickly and on a large scale, but also to have appropriate support and diagnostic equipment. This may have been precisely possible with the many-year development of an innovative ecosystem in this field of health, especially in Belgium, where the pharmaceutical industry and companies active in biotechnology have benefited from an environment conducive to their development.

This tends to reveal that investment in innovation is not enough. Such investments must be able to build on an already well-established fabric of companies, universities and research centres, supported by a set of favourable and complementary conditions, thus forming an innovative ecosystem. Indeed, the mere fact of developing or adopting an innovation will not in itself be a sufficient condition to enable the company to strive towards the best practices of its industry. It is the combination of this innovation with other investments as well as an enabling environment that will be decisive in initiating a virtuous circle leading to an innovative, dynamic and attractive fabric[25].

State of the innovative capacity in Belgium and economic impact

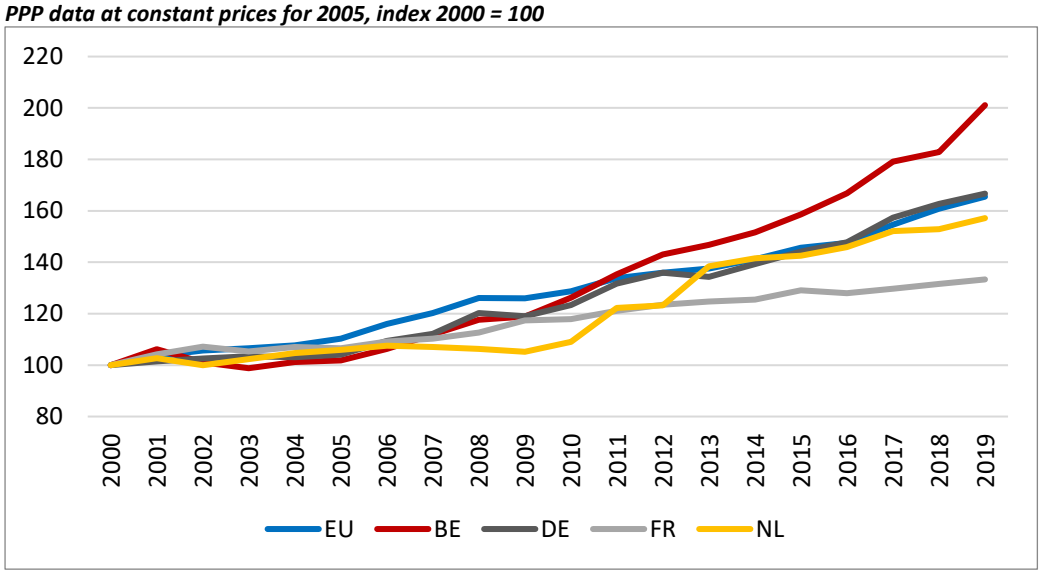
Belgium among the notable European innovators

After several years of stagnation and even decline between 2001 and 2005, the ratio of R&D expenditure to GDP, also called R&D intensity, has accelerated since 2005 in Belgium, and more frankly after 2008. Belgium has thus clearly broken away from the European average and has moved closer to the leading countries in the field, namely the Scandinavian countries of the EU and Germany. In 2019, Belgium was at the top of the European "notable innovators" group: R&D intensity was 2.9 % of GDP, well above the EU average of 2.2 %. In Belgium, 70 % of this expenditure is carried out by the private sector, which is slightly higher than in neighbouring and Scandinavian EU countries.

[25] It refers to quality infrastructure (transport, communication, energy), a favourable business climate, as well as education systems adapted to constant changes from new knowledge. The latter plays a particularly important role. Adaptation to and integration of new knowledge by students and employed people ensures the creation of a human capital ready to translate new ideas and techniques into production processes in a practical way. Taken together, these conditions are also attractive elements for foreign companies at the frontier of their sector and wishing to develop their innovative activities in other markets or collaborate with research centres for their innovative projects.

Graph 18. Evolution of R&D expenditure

PPP data at constant prices for 2005, index 2000 = 100

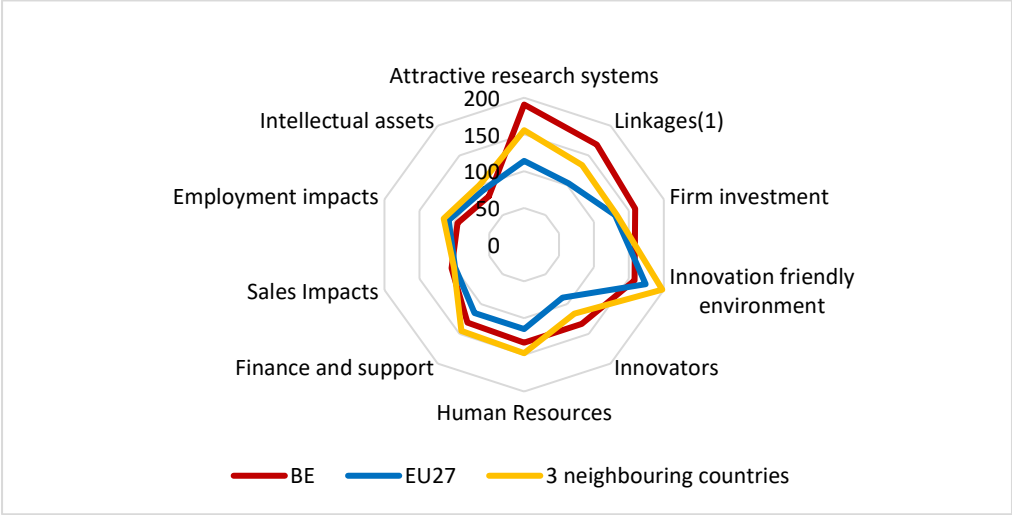


Source: Eurostat.

The European Innovation Scoreboard 2020 presents a picture of the overall performance of innovation in Belgium in 2019. In addition to the above-mentioned increase in R&D intensity, the main identified strengths are the attractiveness of our research systems (number of foreign PhD students and international scientific co-publications), the highly developed collaboration links between innovative SMEs and other entities, as well as the proportion of SMEs that have introduced product, process, marketing or organisational innovations. Nevertheless, it appears that barriers exist with regard to certain intellectual assets (design applications), the smaller share of employment in fast-growing companies active in innovative sectors and the weakness of entrepreneurship. There are, however, encouraging signs for the latter over the past two years as illustrated in the previous Section 2.1 of this report.

Graph 19. Main performance dimensions of the European innovation scoreboard

Results in 2019 compared to those of the EU in 2012



[1] The category "linkages" includes three sub-indicators measuring innovation capacity: 1) collaborative efforts between innovative companies, 2) co-publications between the private and public sectors, and 3) the extent to which the private sector finances public R&D activities.

Source: European Innovation Scoreboard (2020).

The innovative Belgian landscape thus seems to have both strengthened and changed. The next sections aim to further characterise the Belgian innovation ecosystem and to better identify the factors that have been promising or, on the contrary, that may have hindered it. Several recent articles have analysed the evolution of R&D expenditure and innovation activity in Belgium. Although the primary objective was not to demonstrate

the link between these variables and productivity, this research nevertheless offers insights that allow an in-depth examination of the innovative capacity in Belgium and to extract the main characteristics of its ecosystem. Through the main results and highlights of these analyses, lessons can also be learned to better guide policies to support innovation.

Relatively concentrated research activity

However substantial, Belgian R&D expenditure appears to be relatively concentrated, not only in terms of companies but also in terms of industries. Two recent studies (Vennix, 2019; Biatour et al., 2020) highlight several stylised facts of research activity in Belgium.

The study of Vennix (2019) offers a complete mapping of companies active in R&D by highlighting their main characteristics such as their sector, their geographical location, their size, age or a group membership[26].

The study by Biatour et al. (2020) presents an analysis of the industries that carried out the most R&D in Belgium during the 2009-2019 period. This analysis seeks to determine whether, as a result of increased R&D spending, new products have been brought to market, or whether companies have changed the way they position themselves in value chains for the same offered products.

The two analyses reach the same conclusions for several important elements:

- *R&D expenditure is rather the work of a few large entities, foreign and Belgian*.

It appears that a relatively limited number of stakeholders tends to generate a large part of research. According to Vennix (2019), the ten companies investing the most in R&D alone accounted for more than half of the expenditures incurred in 2015.

The amount invested per company naturally depends on its size, with larger entities spending more on R&D than smaller firms, but also on the group membership. Vennix (2019) thus shows that R&D expenditure is mainly carried out by foreign multinationals (58 % of private R&D expenditure in 2015), followed by large Belgian groups (31 %); in contrast, only 11 % are carried out by other domestic firms. Biatour et al. also observe that, within the four studied industries, the majority of the large companies in each industry belong to a foreign multinational group, which means that the decision-making centres are largely located abroad.

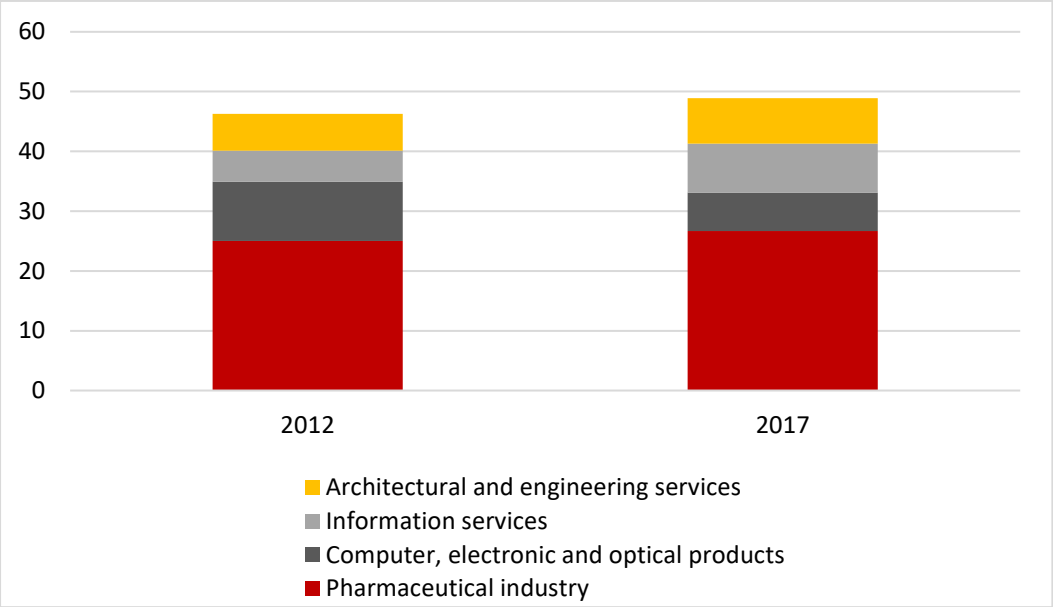
- *Some sectors account for the majority of R&D expenditure*

The studies of Vennix (2019) and Biatour et al. (2020) identify the pharmaceutical industry and computer, electronic and optical products as two of the most R&D intensive industries in Belgium. Biatour et al. (2020) also retain IT services as well as architecture and engineering services in their analyses. Together, these four industries accounted for almost half of Belgian companies' total R&D spending in 2017. Vennix (2019) also includes the scientific R&D sector in its analysis framework, which naturally concentrates a large volume of R&D expenditure carried out for the benefit of other industries.

[26] This study is based on a sample of 1,964 Belgian companies that accounted for nearly EUR 7.4 billion in R&D expenditure in 2015, or nearly 73 % of Belgium's gross R&D expenditure. In 2016, these companies employed 279,000 people (or 6 % of total employment) and generated an value added of EUR 45 billion (or 10.6 % of GDP).

Graph 20. R&D of the four selected industries

As a % of companies' total R&D



Source: Biatour et al. (2020).

- The pharmaceutical sector differs from these sectors

According to Vennix (2019), the Belgian chemical and pharmaceutical industry accounts for almost 48.3 % of total R&D expenditure. However, this industry represents only a limited number of units accounted for (7.6 % of companies). In addition, this sector contrasts with some characteristics that are exacerbated in it: Biatour et al. indicate that the concentration in the pharmaceutical industry is significantly higher than elsewhere in terms of R&D and value added. According to the study, nine of the ten largest companies active in this industry are owned by a foreign multinational, while in the other comparison industries 'only' six of the ten largest companies are in foreign hands. Thus, much more than elsewhere, developments in the pharmaceutical sector seem to be more broadly influenced by the activities of a small number of large companies whose decision-making centres are located abroad. In addition, the results of Biatour et al. (2020) suggest that in this sector production and R&D activities partially tend to dissociate[27]. In other industries, this is less noticeable.

- Country size affects the findings of the concentration of Belgian R&D

By widening the scope to other European countries of similar size, it appears that this trait of relative concentration is also found there just as much, if not more. Indeed, Biatour et al. (2020) shows that, while the four most important industries in terms of R&D expenditure[28] concentrate more than half of this total expenditure in Belgium (53.0 %), other R&D intensive countries show an even higher degree of R&D concentration than Belgium, namely the three Scandinavian EU countries (59.7 % on average), the Netherlands (63.0 %) and, even more, Switzerland (72.2 %). The concentrated nature of R&D therefore does not seem to be a Belgian specificity; it could be more related to the size of the country, but also to the way in which certain innovative sectors are structured (presence of large international groups).

[27] Indeed, in this sector specifically, companies tend to specialise in knowledge-intensive activities (such as R&D), and this is accompanied by a relative shift in the composition of the capital stock towards more intangible investments relative to those in technological equipment. Such changes could thus suggest that the production activity and that of R&D in the pharmaceutical industry tend to partially dissociate on Belgian soil.

[28] These industries (level A38) are pharmacy (C21), R&D services (M72), IT activities (J62-63) and architecture and engineering services (M71).

R&D activity supported by significant tax incentives

The increased intensity of Belgian R&D observed since 2005 has not been unrelated to the introduction and extension of various tax incentives for this type of expenditure. In line with the European objective of increasing R&D spending to 3 % of GDP by 2020, the Belgian government has introduced a series of incentives. Some have been reinforced several times over time.

A first incentive was implemented between 2005 and 2007. It consists of a partial exemption from payment of the professional withholding tax on the salaries of R&D staff up to 80 %. It was amended several times in order to extend the scope of the various schemes provided for[29]. As of 2007, companies can choose between a tax deduction and a tax credit for R&D investments. Finally, in 2008 a tax deduction of 80 % of income from patents and investments in environmentally-friendly R&D was introduced. It should be noted that, in response to the COVID-19 crisis, while several countries have increased the generosity of tax breaks for R&D, or introduced changes in the administration of tax incentives for R&D in order to facilitate and accelerate its financing, Belgium for its part has not changed its provisions on tax relief for R&D in 2020[30].

Belgium's good position vis-à-vis its European peers in terms of R&D intensity can more broadly be considered in a framework of strong support for innovation, justified by certain structural disadvantages repeatedly highlighted in the Innovation Scoreboard (see Graph 19). According to the OECD (2021a), Belgium is now one of the OECD countries offering the most generous tax incentives in terms of R&D relative to GDP, just after in particular France, the United Kingdom and Austria. Indeed, in 2017 (last year available) the total public support for the R&D of companies (i.e. a *policy mix* of direct government funding and tax incentives) amounted to 0.24 % of GDP, well above the EU average (0.17 % of GDP).

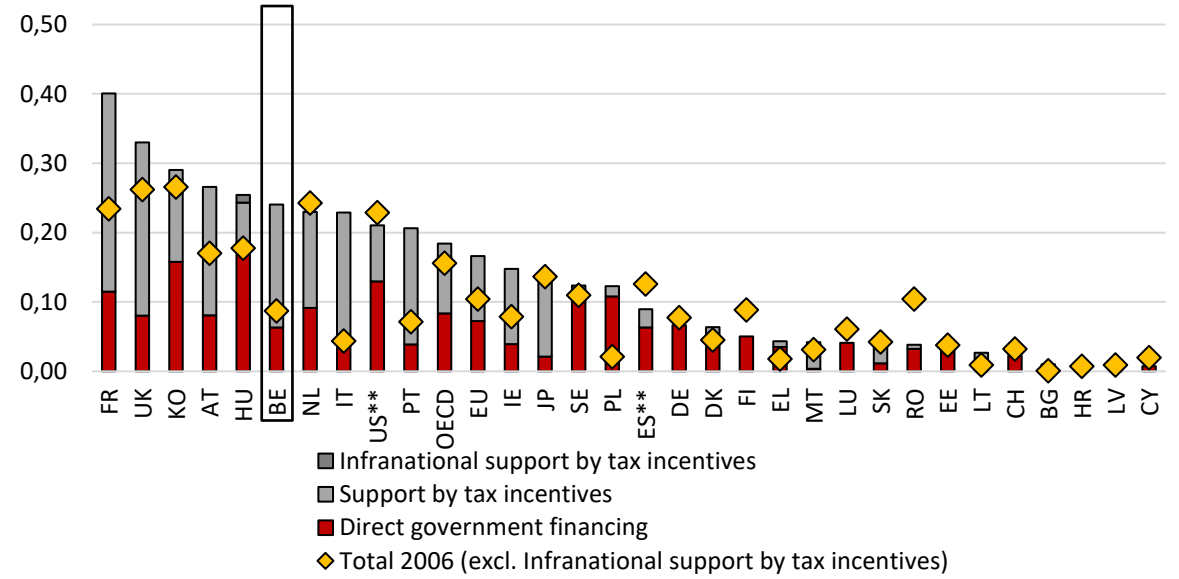
Since 2005, the generosity of such public support has tended to increase, mainly as a result of the increase in tax incentives. Indeed, while direct financing of company expenditure on R&D decreased from 0.07 % in 2007 to 0.06 % in 2017, the share of tax incentives for R&D in total public aid increased over this period, from 29 % in 2007 to 74 % in 2017.

[29] Dumont (2019) identifies four partial exemption schemes: i) for companies engaged in research cooperation with a university, higher education institution or scientific institution; ii) for young innovative companies; and iii) two other schemes based on the education level of R&D staff. Regarding the latter, since January 2018, the degree level required for eligible R&D staff has been lowered: companies can benefit from a partial exemption from the remuneration of R&D employees with at least a bachelor's degree in qualifying fields of study. Their exemption rate, initially set at 40 %, was increased to 80 % in January 2020. Finally, a fifth scheme, introduced before 2005, concerns universities and higher education, as well as recognised scientific institutions.

[30] See OECD, 2020. This section refers to new tax breaks in response to the COVID-19 crisis. This obviously does not consider national, regional or European public funds in support of R&D projects and intended to counter COVID-19.

Graph 21. Importance of public support for company expenditure on R&D, 2017

As a % of GDP



* Data on tax aid not available ** Data on subnational tax aid not available.
Source: OECD, R&D tax incentives Database, March 2021.

However, the concentration of R&D spending may suggest that these incentives mainly benefit large stakeholders. According to OECD estimates (2021a), the distribution of tax incentives[31] according to the size of the companies shows that in Belgium there is a clear difference between the companies that are eligible for these measures and those that benefit from them. SMEs accounted for 46 % of the number of beneficiaries of tax relief for R&D expenditure in 2017. But, by contrast, they only represent about 8 % of the total amounts allocated in the same year[32]. Most of the amounts allocated (77 %) were indeed captured by large companies, while the latter represented 36 % of the population of beneficiaries of tax relief schemes for R&D in 2017. Margins therefore exist to develop more targeted R&D support measures at non-internationalised companies, medium or small.

In view of the increasing popularity of the various R&D support schemes and measures, the associated budgetary cost has increased significantly. Therefore, it seems legitimate to be able to assess their effectiveness and to check whether certain adjustments would make it possible to optimise the results achieved at the same budget. The Dumont study (2019) presents the latest assessments of the Belgian R&D tax incentive system. It shows that partial exemption schemes from the payment of withholding tax on the salaries of R&D personnel contribute to yielding additional research activities. In particular, young companies that often do not generate sufficient profits can immediately benefit from this exemption. On the other hand, the R&D tax credit, or the 80 % tax deduction of patent revenues do not show strong indications of efficiency[33]. Moreover, the evaluation confirms that the additionality of R&D decreases as companies combine different tax aid schemes.

From R&D expenditure to filing a patent

The process leading to innovation involves several sequences; upstream basic research involves, for example, laboratory experiments or testing new processes and materials. But this in itself is not enough for such inventions to be introduced to the markets and adopted by companies. Indeed, in addition to upstream R&D, entrepreneurial efforts in particular are still necessary to develop, manufacture and market the new invented

[31] Partial exemptions from the payment of withholding tax on the salaries of R&D personnel and the refundable tax credit for R&D are considered here.

[32] For Belgium, the OECD defines SMEs as companies which, in the last two years, have not exceeded an average annual number of 50 employees, or a turnover of less than EUR 9 million, or a balance sheet of less than EUR 4.5 million. Given the different definitions of SMEs used in different countries, comparative exercises are not discussed here.

[33] In 2016, the tax deduction for patent income (80 % of this income) was replaced by a tax deduction for innovation income (with a deduction rate increased to 85 %).

product or process. As such, patent data is widely used in empirical work to provide a measure of innovative performance. The latter are the concrete results of the R&D expenditure incurred by companies, and therefore reflect the downstream outcome of the innovation process. Although the relationship is not direct, a positive correlation between the number of patents and other indicators related to innovative and economic performance could be observed.

Patents can be defined as a legal means of protecting inventions. However, patenting is not compulsory; not all inventions are patented. There are many other intellectual property instruments commonly used by companies to protect their ideas or inventions. For example, they may prefer secrecy agreements, or use other types of mechanisms to acquire a dominant position in their market. Other companies may choose to go through contractual agreements to buy the right to use a specific technology, without necessarily contributing to its production: licensing or protected media, such as microchips and integrated circuits, offer an alternative for cross-fertilisation of technologies between entities.

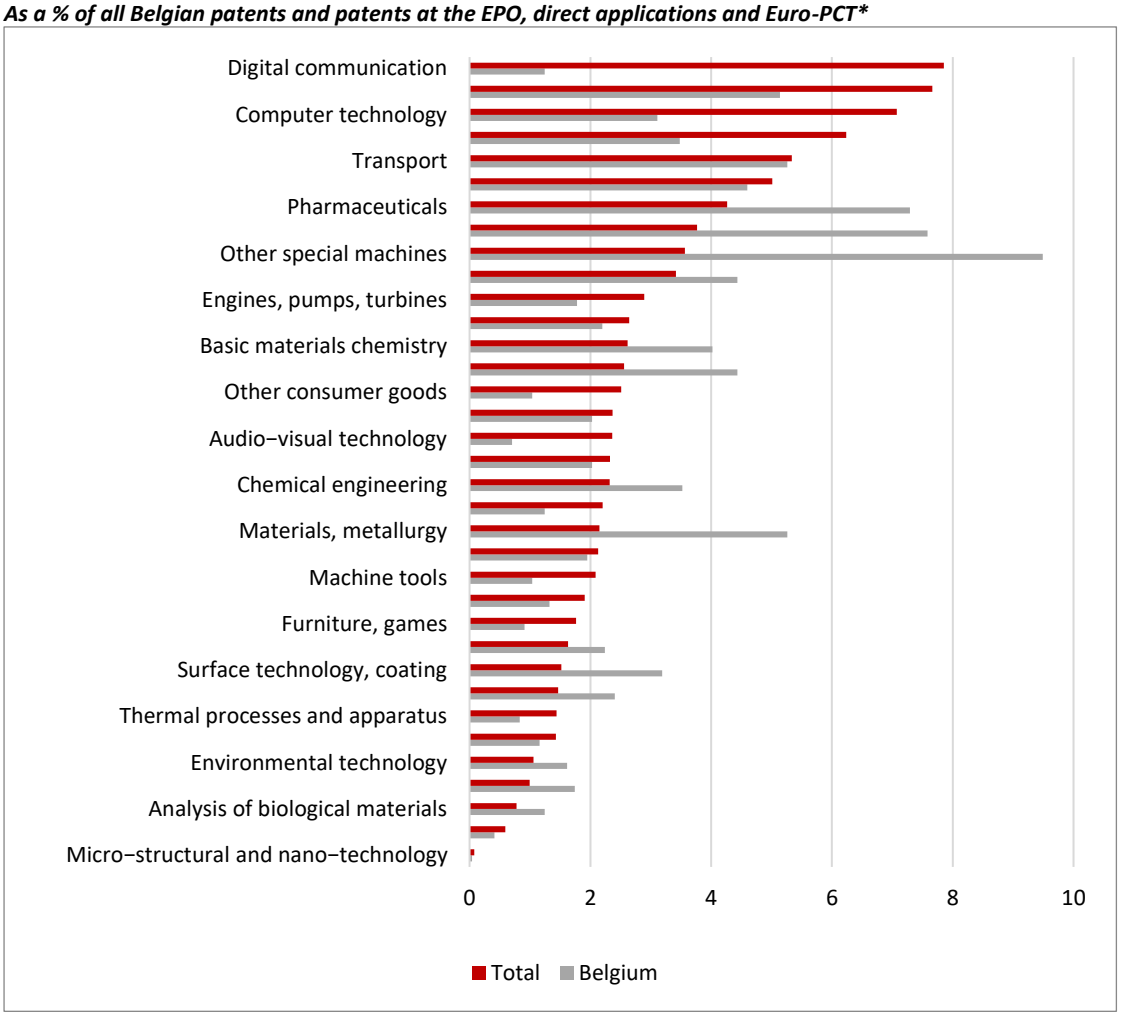
While nuances should be borne in mind about the use of such patent data as an indication of innovation, it can be generally accepted that patents reflect a greater inventiveness. However, the tendency to patent can also be largely influenced by sector effects, with manufacturing typically being much more active in filing patents than the service sector. The structure of the corporate fabric can also interfere, with larger companies having a greater propensity to file patents. The size of the country will also translate into a greater or lesser number of patent applications. The tax environment also influences the location of the headquarter offices and research centres of innovative companies; as a result, patents will tend to be filed more in countries that offer a favourable tax regime in this area. Finally, some firms can multiply deposits as pure offensive strategies in order to partitioning their market vis-à-vis their innovative competitors (Cheliout, 2020).

Cheliout (2020) shows that Belgian patents also echo a relative concentration. The top ten applicants file almost 40 % of Belgian patents with the European Patent Office (EPO). In terms of specialisation, it also appears that Belgium is very active in the innovative sectors of health technologies (which are growing strongly following the COVID-19 pandemic) and machines linked to specific industrial applications[34]; but the country appears relatively disengaged from those related to digitalisation. However, as mentioned above, it is possible that the size of the country naturally favours such effects of concentration and specialisation in certain areas.

[34] "Other special machines" are part of the aggregate field of mechanical engineering. These include, for example, tools and machinery in agriculture, horticulture, forestry, machines for harvested food, shaping clays and other ceramic composition, working cement or stone, working of plastics and other plastic substances, manufacture of glass or minerals, preparation of chemicals.

Graph 22. Distribution of patents filed at the EPO by technological fields

As a % of all Belgian patents and patents at the EPO, direct applications and Euro-PCT*



*In addition to direct patent applications to the European Patent Office (EPO), any international application for which the EPO is a designated office and which has been granted an international filing date, shall produce from that date the effects of a regular European application ("euro-direct application"). This international application, which corresponds to a regular European patent application, is called “Euro-PCT”.

Source: Cheliout (2020).

In recent years, innovative activities have become increasingly internationalised. Researchers with specialised knowledge can collaborate in a scientific consortium project in complementary fields and leverage their respective comparative advantages, thus creating synergies. Such projects usually have a higher value and bear higher costs.

Relying solely on domestic resources can be a constraint and push countries to open up to other research centres abroad. As such, Belgium tends to show one of the highest levels of openness and international collaboration. Concerning the ownership of patents, the holding of Belgian titles by foreigners, and that of foreign patents by Belgian companies, are both at high levels compared to other European countries. But on average over the last available period (2015-2016), the foreign dimension (39.7 %) tended to slightly surpass the domestic dimension (34.0 %). This orientation of openness is in contrast with other very R&D intensive countries (such as the Scandinavian countries) which seem to have more control over their own patents. They also perform better in other parameters that affect innovation outcomes more broadly, such as the education system. The latter is likely to play a significant role because it is able to provide the absorptive capacities to new knowledge.

However, such extensive globalisation of research in Belgium is certainly not without positive aspects. More than a third of Belgian inventions are the result of international work with other inventors established abroad. Such intense cooperation on a global level can result from a continuum of different collaborative forms, ranging from inter-company or inter-entity strategies (laboratories, universities) to intra-group global strategies. This is

not surprising, since small open economies tend to benefit more from large-scale economies by joining a network of researchers rather than solely relying on a pool of national resources. Belgium's close association with the development of world-leading technologies also reflects the recognition of skills, human capital and hence value of Belgian inventors and researchers, as well as the attractiveness they exert to foreign multinationals wishing to work with them.

Box: Green innovation in Belgium

Climate change mitigation technologies (CCMT) are designed to improve energy efficiency, recover heat or reduce greenhouse gas emissions from the processes, equipment and products. They are likely to ensure, or even accelerate, the transition to a low-carbon economy and to help Belgium have the appropriate technologies to enable it to achieve the ambitious goals it has set for itself in this area.

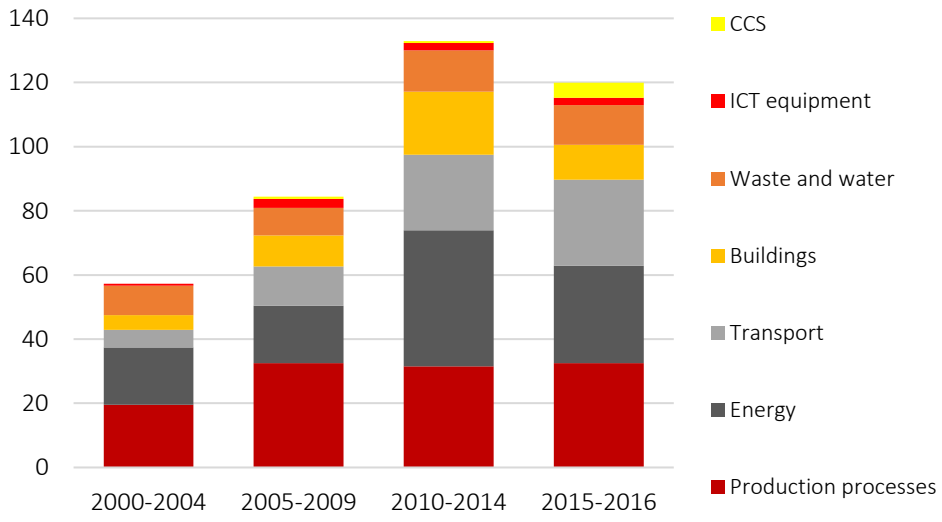
The article by Swartenbroekx (2021) provides an overview of the contribution of European and Belgian innovation ecosystems to the deployment of technologies beneficial to environmental transition. The analysis is based on data from patents filed with the EPO in these technological fields.

It appears that innovative activity in these sectors was very strong until 2012, after which requests for protection of green innovations on the European market somewhat declined. This also echoes the slowdown observed in the rest of the world around these technologies. With regard to the main European stakeholders, 75 % of applications are filed by applicants from five member states, in which Germany is largely dominant.

What about green innovation in Belgium? Considering the number of green patents corrected for the size of the country, it appears that Belgium managed to maintain its position in the ranking of countries filing patents with the EPO over the 2000-2016 period. Several stylised facts also emerge from the article:

- *Regarding the main green sectors, Belgian patenting activity is supported in technologies related to industrial production processes, in particular those in the chemical and petrochemical sectors*. This reflects the specialisation of Belgian innovation in general in the sector of special machines (mechanical engineering) for the preparation of chemicals, minerals, glass, etc. *The sharp increase in Belgian patent filings since 2005 in energy is mainly observed in the field of solar and wind technologies*. However, the movement has slowed since 2011-2012, except for electricity storage technologies such as batteries, hydrogen and fuel cells. *In the field of transport, patent applications of Belgian origin concern air and road transport equipment* (especially for combustion engine vehicles).

Graph 23. CCMT patents filed by applicants residing in Belgium
Annual number of CCMT patents filed with the EPO



CCMT = Climate Change Mitigation Technology; CCS = Carbon capture and storage
Source: Swartenbroekx (2021).

- *The concentration of innovation efforts is reflected in Belgian green patents*: over the 2000-2016 period, 47 % of applications were owned by the top ten applicants. This concentration is very high in the technological sectors related to the chemical and petrochemical industries, road transport and air transport. In all green sectors under review, there are also internationally active companies, most of which have a research centre in Belgium. When considering the main CCMT areas to which their patents relate, companies are especially intensifying their inventions in technologies related to their activities or main products.

- *Several Belgian university research centres are very active*: the patent portfolio of the top five such stakeholders is as large as that of Belgian company with the largest number of CCMT patents filed with the EPO. Universities and research organisations hold nearly 40 % of patents in ICT equipment-related CCMTs. The most important patenting activity of universities in the field of energy relates to solar photovoltaics and energy storage solutions. Patented inventions in production processes are more widely distributed among universities and multidisciplinary research organisations.

Table 9. Top Belgian CCMT patent applicants to the EPO during the 2000-2016 period[1]

	Enterprise or institution[2]	% of total Belgian OCMT patents at EPO	Main technological field[3]
1	Solvay	10,9	Production
2	Total Petrochemicals Research/Atofina Research	7,1	Production
3	Plastic Omnium Advanced Innovation & Research-Energy automotive systems	7	Transport
4	IMEC	4,5	Energy
5	Safran Aero Boosters SA/Techspace Aero	4,5	Transport
6	Electrolux Home Products Corp	3,5	Building
7	AGC Glass Europe	2,7	Production-Energy
8	VITO	2,5	Energy
9	Umicore	2,4	Production-Energy
10	ZF Wind Power Antwerpen	2,3	Energy
	First 10 applicants	**47,4**	
11	Agfa Gevaert NV	2,2	Energy
12	Katholieke Universiteit Leuven	1,8	Energy
13	Universiteit Gent	1,5	Production-Energy

[1] Classification of consolidated principal applicants to the EPO (first applicant principle), direct applications and euro-PCT.
[2] Entities with the same company name, unless otherwise specified. The institution refers to universities and research organisations and is indicated in bold. IMEC: Interuniversity Microelectronics Centre, VITO: Vlaamse Instelling voor Technologisch Onderzoek.
[3] Share of patents in the main CCMT areas in a company's or institution's green patent applications above 30 % (to 75 % for energy).
Source: Swartenbroekx (2021).

Universities are a driver of innovation

The success of a country's innovative capacity depends on an ecosystem that has a set of favourable conditions. It can be, broadly speaking, quality infrastructure (in energy, telecommunications or mobility), simplified regulations, an entrepreneurial culture open to innovative ideas, successful integration into the networks of the global economy, or human capital with the required qualifications (Science, Technology, Engineering and Mathematics or STEM). This dynamic innovative fabric is intertwined with interactions between various stakeholders, whether public authorities, companies, universities or research centres. The creation of dense clusters whose members are highly interconnected is undeniably an asset: this not only strengthens the dynamics of Belgium's intrinsic innovative capabilities, but also increases its attractiveness to foreign innovative entities.

Universities and research laboratories in particular contribute to such an ecosystem. Among the potential sources of productivity gains, increasing investment in human capital is an essential complement to new capital investment, for example, in digital infrastructure, in order to reap its full potential. A recent study by Bijnens and Dhyne (2021) shows that during the 1995-2018 period it was those companies that performed best in terms of productivity that were able to increase the qualification of their workforce (particularly the share of their workforce specialised in science, technology and mathematics). Beyond their essential role in training the workforce, it appears that over time, universities and research centres have also become key stakeholders on which Belgian innovation potential can count.

Better valuation of the results from university research

When considering the development of R&D efforts that lay downstream of the innovation process, the general trend observed in the European patent market during the 2000-2016 period is that of a doubling of applications involving universities. In Belgium a similar trend is observed. According to Cheliout (2020), among the top ten Belgian patent applicants to the EPO, there is a clear presence of universities, their spin-offs and consortia with private entities. The significant and welcome increase in patent filings by Belgian universities, quite consistently over time, has primarily been done by a few institutions mainly located in Flanders.

On the other hand, the main technological fields in which Belgian universities are active and have (co-)filed patents are electrical systems (e.g. semiconductor devices), medicinal and pharmaceutical preparations (e.g. specific therapeutic treatments), organic chemistry and biochemistry (e.g. genetics) and physics (e.g. instruments, measurement or test processes, optical devices). These technological sectors refer to the sectors in which Belgium specialises (biotechnology, pharmaceuticals, certain areas of chemistry and measurement instruments).

The solid role of Belgian universities in the filing of our patents shows that we can no longer strictly consider their contribution as the only pursuit of pure fundamental research, but also as the development and marketing of the product of their research, which corresponds to a more entrepreneurial attitude on their part. Universities therefore go beyond their traditional role and thus ensure a transfer of their knowledge to the rest of Belgian society, which relies on market mechanisms and on a partial privatisation of their research results.

Table 10. Contribution of universities to patent production
EPO filings, direct applications and Euro-PCT, average over the 2006-2016 period

Countries	In % of total patents filed	Number of patents per million inhabitants	Countries	In % of total patents filed	Number of patents per million inhabitants
CH	2,6	18,3	AT	2,9	5,8
BE	11,6	17,2	UK	7,5	5,6
IE	11,4	13,2	FI[1]	0,8	2,7
DK	4,8	12,0	LU	0,3	2,7
FR	4,6	7,1	ES	7,9	2,4
NL	2,6	7,0	IT	2,3	1,6
DE	2,1	6,3	SE[1]	0,1	0,4

[1] Finland was one of the last European countries to abolish the "professor's privilege" in 2007. This privilege is now only still applicable in Sweden. The "professor's privilege" allows university researchers to retain individual ownership of their inventions and annuities, not the institution to which they were attached.
Source: Cheliout (2020).

A strong academic openness to collaboration for research projects

Belgian universities also tend to join partnerships rather than being a single entity that produces patents on its own. National interuniversity research is widespread (e.g. IMEC or VIB, themselves involved in further collaboration with other Belgian universities) therefore these institutions represent a large overall volume of patents. They also collaborate with foreign entities. In addition, universities tend to have a strong link with private companies through partnerships. This characteristic marked by Belgian academic research is a great asset that may prove crucial in the future. The COVID-19 crisis has proven the essential role of collaboration across national borders to find quick solutions to fight the virus. This governance model has proven to be the most effective in quickly initiating joint projects and initiatives between several international R&D stakeholders during the pandemic (e.g. around the World Health Organisation). It is these innovative ecosystems characterised by close collaborative networks that have been at the forefront of containing epidemiological risks as quickly as possible[35].

[35] See OECD, 2021b.

Several government initiatives have helped to activate the role of universities

This trend towards more academic entrepreneurship, as well as strong collaboration, is not unrelated to several public initiatives and instruments. Together, they stimulated the contribution of universities in the Belgian innovative ecosystem, while redefining their role. There is large literature linking the success of an innovative approach to the fact that the inventor comes from an academic background (see, for example, Meyer, 2003). This observation has fed into many of the OECD's work under the Higher Education Innovate label. On the basis of this work, it is clear that governments can and should interact widely in the diffusion of technologies through this means.

According to the study LiEU[36] (2020), this is in line with the "new mission" assigned by the public authorities to universities. Overall, the study presents the Belgian authorities' multiple initiatives that have had a major impact on the way in which the transfer of knowledge from academia to the rest of Belgian society has taken place since the 1990s. First of all, it is undeniable that financial state aid constitutes a first-line instrument, in particular with the deployment of European and regional co-financing programmes that have made it possible to free up new budgets. These financial tools have also been accompanied by the establishment of interfacing structures that have networked and pooled resources around partnership research activities between universities and other external organisations. These include competitiveness clusters, science parks and incubators.

Major regulatory reforms have also pushed the economic and governance model of universities towards further professionalisation and institutionalisation of their research. It is particularly the possibility of access to several intellectual property instruments that has given them the opportunity to be able to protect, market and thus control the income return from their own research. In the United States, in the wake of the Bayh-Dole Act of 1980 granting U.S. universities the right to own patents on federally funded inventions and to become the exclusive providers of licenses to third parties, a wave of patent filings and commercialisation of academic research resulted. Combined with institutional differences between European countries, this would explain the "European paradox": despite a solid scientific base, European scientific advances did not materialise as much in new commercially viable technologies as in the United States. This delay led European countries to support the reproduction of the American system during the 1990s[37]. Several of them, including Belgium, have thus repealed "professor's privilege" that allowed university researchers to retain individual ownership of their inventions and annuities, and not the institution to which they were attached[38].

Innovation and R&D, productivity boosters?

After positioning Belgium in the European innovation landscape, in this section we return to the question of the link between innovation capacity and productivity growth. This link is particularly complex because multiple channels affect the dynamics and causality that underlie their interactions. R&D expenditure primarily leads to greater economic growth (in the manner of endogenous growth theory). Patents are only a part of R&D efforts since they constitute one of the legal steps in the overall process associated with innovation. Nevertheless, they can also be an indication of some research productivity. According to literature, patents and stronger protection have a significant impact on the productivity and market value of companies (Bloom and van Reenen, 2002; Park, 1999). Yet Bloom et al. (2017) also show that while research effort has increased significantly, research productivity has fallen sharply. This testifies that the relationship is far from simple.

Cheliout (2020) presents the results of a descriptive exercise examining the evolution of patents and productivity growth at sectoral level in Belgium as well as in other EU countries. Patent figures are classified by technological fields (expressed according to the associated NACE sector) and standardised by the number of people employed. Productivity growth is defined as the growth in the ratio of real value added to the number of people employed in each NACE sector. The average number of patents produced in Belgium during an initial five-year period (2000-2005) is considered, compared with the subsequent average productivity growth over the 2006-2016 period in the sectors associated with the technological fields for which patents have been filed.

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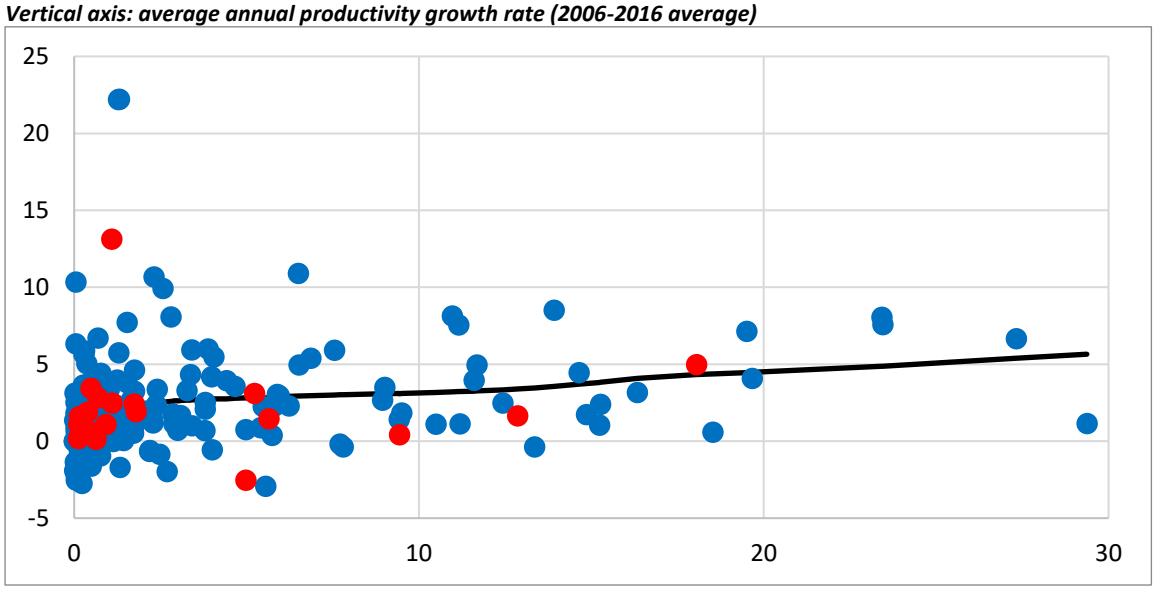
36 More particularly of the Wallonia-Brussels Federation.

37 See Lissoni et al., 2008 and Martinez and Sterzi, 2020.

38 However, some countries only repealed it during the 2000s (such as Finland), or even maintained it (Sweden). See Cheliout, 2020.

As a downstream indicator of innovation, rather capturing the dimension of successful and commercially viable R&D efforts, patents could fuel productivity growth through several channels: a direct channel where the stock of innovations available to an economy is increased through the production of new technologies. There is also an indirect channel where, through disclosure of invention information, other non-patent companies operating in the same sector end up adopting and benefiting from the new invented product or process, resulting in gains for the sector as a whole. The latter channel could be linked to some form of dissemination of technology. The adoption (direct and indirect) of new technologies can take time, which justifies the approach used of observing whether any innovation through patents manifests itself in future productivity gains.

Graph 24. Patent filings and productivity growth by industry[1]
Horizontal axis: number of patents per worker (average 2000-2005)
Vertical axis: average annual productivity growth rate (2006-2016 average)



[1] The data covers Belgium (in red), Germany, France, the Netherlands, Denmark, Finland, Sweden, Spain, Italy, Austria and the United Kingdom (in blue).
Source: Cheliout (2020).

The graph above provides several upshots. Although there is a very strong heterogeneity of sectoral situations, a positive correlation between patent filings and future productivity growth is plausible. While definitive conclusions cannot be drawn from this exploratory analysis, it suggests a positive link between inventive step and productivity growth at the macroeconomic level.

Opting for the microeconomic analysis angle, the analysis by Vennix (2019) also seems to suggest the presence of such a link, although some results are inconclusive and also call for future more in-depth investigations into the link between innovation and productivity growth at Belgian company level. The study by Vennix (2019) focuses on the direct impact exerted by innovative companies, investigating whether they experience a higher average annual growth in their value added, employment and labour productivity than their non-R&D counterparts. The results show that investment in R&D has generally had a positive impact on the average annual growth in value added and employment of these companies for periods of four years or more. On the other hand, over a shorter period (less than four years), such a positive impact of R&D on the average annual growth of these two variables cannot be demonstrated. While R&D efforts do not appear to result in net job creation or value-added growth in the short term, the results show that R&D activities stimulate growth in the medium- to long-term without resulting in net job losses. From an economic point of view, this justifies a policy that supports and facilitates R&D.

3. Assessment of the National Recovery and Resilience Plan

Following the example of national governments, European authorities took measures in 2020 in response to the health crisis and to lessen the economic effects of the COVID-19 crisis. In addition to the measures taken in the second quarter of 2020[39], a historic recovery Plan was adopted in July 2020. Entitled NextGenerationEU, the key element of the Plan is the Recovery and Resilience Facility – RRF. Member states could use part of these funds by submitting a Recovery and Resilience Plan (RRP) made up of investment projects and structural reforms that had to comply with certain conditions[40]. The Belgian RRP received a positive assessment from the EC, and 9 out of the 11 criteria were given an A rating[41].

In the section below, the National Productivity Board (NPB) analyses the Plan's contribution to productivity growth. In its 2020 report, the NPB identified a certain number of axes on which, according to its members, the National Recovery and Resilience Plan (RRP) should focus in priority to increase productivity growth in a sustainable way, taking into account the country-specific recommendations made to Belgium in the framework of the European Semester and the challenges to productivity growth resulting from the COVID-19 crisis.

Following a quantitative analysis in the first section, the current report examines the extent to which the RRP meets the priority recommendations formulated by the NPB in its 2020 report. The last section gives an overview of the recovery policy in the broad sense carried out by the authorities of different entities.

3.1. Anticipated impact on productivity and growth: some figures

The **National Recovery and Resilience Plan** is composed of 105 investment projects and 35 reform projects put forward by the Belgian federal and regional governments. The projects are **built around six axes**: 1) Climate, sustainability and innovation; 2) Digital transformation; 3) Mobility; 4) Social inclusion and community; 5) Economy of the future and productivity; and 6) Public finances – spending review. Within these axes, the projects are grouped together under different components (see Table 11).

Table 11. Distribution of projects by axis and component

	Share in investment spending
Axis 1 Climate, sustainability and innovation	**34,1 %**
Renovation of buildings	17,1 %
Emerging energy technologies	10,3 %
Climate & Environment	6,8 %
Axis 2 Digital transformation	**12,9 %**
Cybersecurity	1,3 %
Public administration	9,9 %
Fiber optics, 5G and new technologies	1,7 %
Axis 3 Mobility	**21,8 %**

[39] For example, the Corona Response Investment Initiative (CRII), the Pandemic Crisis Support credit line made available to member states by way of the European Stability Mechanism (ESM), the Pan-European Guarantee Fund implemented by the BEI and Support for Mitigation of Unemployment Risks in an Emergency (SURE).

[40] Amongst other things, the measures had to meet the country-specific recommendations made by the European Council in the framework of the European Semester (in particular those adopted in 2019 and 2020) as well as effectively contributing to the green and digital transition: a minimum of 37 % was required to support the green transition, and a minimum of 20 % to hasten the digital transition. The plans also had to contribute to the four dimensions set out in the 2021 Annual Sustainable Growth Strategy: environmental sustainability, productivity, fairness and macroeconomic stability. The European Commission also strongly encourages member states to focus on a certain number of key programmes: power up, renovate, recharge and refuel, connect, modernise, scale-up and reskill and upskill.

[41] Belgium was given an A rating in the following areas: balanced agreement; response to country-specific recommendations; contribution to growth and employment; respect for the "do no significant harm" principle; green objectives; digital objectives; sustainable results; milestones and targets; and monitoring systems. Belgium was given a B rating for the coherence of its Plan and cost calculation.

Cycling and pedestrian facilities	6,9 %
Modal shift in transport	11,3 %
Greening road transport	3,5 %
Axis 4 Social and living together	**14,1 %**
Education 2.0	7,5 %
Training and employment for vulnerable groups	2,8 %
Social infrastructure	3,8 %
End of career and pensions	0 %
Axis 5 Economy of the future and productivity	**17,0 %**
Training and labor market	6,3 %
Supporting economic activity	7,4 %
Circular economy	3,3 %
Axis 6 Public finance and expenditure review	**0,1 %**
Expenditure review	0,1 %
TOTAL	**100 %**

Source: EC (2021a).

The impact of Belgian investment projects resulting from the RRP on productivity is positive but modest

The Federal Planning Bureau has calculated **the impact of the National Recovery and Resilience Plan's investment projects**, particularly on productivity and economic growth. This analysis shows that 88 % of the RRP's total expenditure is used to increase the economy's gross fixed capital formation. The RRP is therefore a **real investment plan**. Simulations also indicate that increasing the total amount of capital has a **positive effect on productivity**. **However, this effect remains modest**: in 2026, investment projects increase productivity by 0.19 % compared to the baseline scenario, and GDP by 0.23 % compared to the baseline scenario[42].

The modest impact is not surprising in view of **the relatively limited European funds to which Belgium can call upon**. This represents a total of EUR 5.925 billion for the 2021-2026 period, this equates to an annual investment of 0.2 % of GDP over the period 2021-2026, or a total of 1.2 % of GDP in 2019. This percentage is lower than the average within the EU27, which is 2.3 %[43]. This amount is also limited compared to the comprehensive support measures taken by the different governmental levels in order to support the purchasing power of households affected by the crisis and to safeguard, as far as possible, the companies whose financial situation has been affected by the decrease, or even the cessation of their activity. The income support provided to households in 2020 and the support to companies and independent workers[44] amounted to 3.6 % of GDP (NBB, 2021, p. 136).

However, it is also necessary to make some observations on the relatively small impact of the RRP on productivity and economic growth.

Some observations

First of all, it should be noted that the **duration of the investments' impact on productivity growth** is much **longer than the implementation period of the measures**. According to the Federal Planning Bureau simulations, productivity in 2030 will still be 0.18 % higher than the baseline scenario, and even in 2040 the impact will still

[42] Simulations based on the QUEST III R&D model – a dynamic general equilibrium model. Further information on the characteristics of this model and measure simulation is available in the "Macroeconomic and fiscal effects of the draft National Recovery and Resilience Plan" report published by the Federal Planning Bureau in April 2021 at the request of the Secretary of State for Recovery and Strategic Investments.

[43] Southern and Eastern European countries, in particular, will receive a relatively larger share of the funds, in line with the European recovery plan, which highlights solidarity with the EU countries who have been worst affected by the COVID-19 crisis and with the poorest or least developed member states.

[44] Household income support concerns temporary unemployment benefits, temporary rights for independent workers and other benefits and social premiums. Support for companies and independent workers concerns benefits in the event of forced closure or a sharp drop in sales, fiscal measures to increase solvability and support for specific branches of activity.

be 0.12 %. An important reason is that public investment (in particular investment in infrastructures and in R&D) increases the return on investments in the private sector, thus attracting further private investment. In addition, GDP growth also generates feedback effects through the increase of national components in overall demand, including investment. Capital stock only depreciates progressively before returning to its equilibrium level so that, even long after the measures have been implemented, the investment exceeds its equilibrium level.

It should further be noted that the Federal Planning Bureau's simulations only take into account the **projects of the National Recovery and Resilience Plan**. The impact of further recovery measures, which have been or are being taken at different political levels (see Section 3.3), has not yet been assessed. The same applies to the impact that the recovery plans of other European countries may have on the Belgian economy. For a small open economy such as Belgium, these effects may be considerable, especially on a short term basis. This is what emerges from the simulations carried out by the EC concerning the economic impact of the NextGenerationEU plan (NGEU). **Cross-border spill over effects have a big impact on economic growth** (see Table 12)**, particularly at the beginning of the period.** On the other hand, if some countries are more successful than Belgium in preparing their economies for future transitions, this could weaken Belgium's relative position in the long term.

Table 12. Difference in the real GDP level (as a %) compared to the scenario without the NextGenerationEU for Belgium

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2040
Baseline scenario	0,5	0,8	0,8	0,8	0,9	0,9	0,7	0,6	0,5	0,4	0,2
Spillover	0,4	0,5	0,5	0,5	0,5	0,5	0,4	0,3	0,2	0,1	0

Note: the EC's results cannot be directly compared to the Federal Planning Bureau's figures due to differences in assumptions and methodology.
Source: EC (2021), p. 56.

Thirdly, the **simulations** of the Federal Planning Bureau and the EC only **take into account the investment projects** and not the impact of structural reforms, which also make up an important part of the RRP[45]. The impact of structural reforms can, however, be important. Using a model-based benchmarking exercise, Varga and in 't Veld (2014) calculated that if Belgium implemented structural reforms to reduce by half the difference with the best performing countries in regards to a number of work market and product market indicators, Belgium's GDP could increase by about 16 % over a 20 year period. This figure is higher than the 11 % average established by the European Union.

The RRP suggests several structural reforms that could impact productivity growth, in particular reforms to reduce administrative costs and facilitate the creation of businesses, encourage reconversion and increase the level of education in the active population, contribute to improving mobility, modify costs relating to input and production factors[46], reduce the private investment risk premium or boost investment in research and development. Thus, **the reforms announced in the Plan** have **certainly got the potential** to **strengthen the impact of the investments set out in the Plan**. Of course, it can also be argued that further investments would have little effect if they are not followed up by the necessary reforms.

The EC's assessment concludes that the investments and reforms within the different components reinforce each other on the whole, but that the Plan **could have better exploited the full potential of certain investments by introducing additional and more far-reaching reforms.** For example, it points to investments in education (IT infrastructure, personal tutoring in compulsory education), which could have been completed by reforms aimed at increasing the educational advantages of these investments for students, such as reforms to basic training and ongoing teacher training. It also notes that within certain axes, in particular the "Economy of the

[45] On the one hand, these are structural reforms that are necessary to make the proposed investments work and, on the other hand, structural reforms in response to the EC's 2019-2020 country-specific recommendations for Belgium in the framework of the European Semester.

[46] This is with reference to the reforms announced for green taxation and to reduce labour costs.

future and productivity" axis, the measures could have been more coherent and reinforce each other mutually. For the coherence of its Plan, Belgium was only given a B rating.

Lastly, it should be noted that **the Plan's final impact** will depend largely **on how it is implemented.** A certain number of (reform) plans are described in the Plan in relatively general terms. The agreed milestones and targets to be reached in order to receive further financing should ensure that the projects bear results by a certain date, but the practicalities of how some of the plan's measures will be implemented are not explained in detail. A certain number of reforms (such as the comprehensive tax reform) were not expressed in milestones and targets because the government was unable to provide adequate commitment to their implementation within the RRP's time frame.

3.2. Specific points for attention from the NPB's 2020 report

Investing in skills: the importance of STEM and continuing education

In its 2020 report, the NPB highlighted the importance of **investments in teaching and training** with a special focus on STEM profiles (Science, Technology, Engineering and Mathematics). The structural problems already existing on the labour market could be heightened by the crisis. Without investment in education and training, increased temporary unemployment may lead to a hysteresis effect on the labour supply. The crisis also increases the necessity for employees to be reassigned to new activities. In addition, the crisis may accelerate the digital and green transition, both of which could greatly increase the need for training and reconversion.

The **RRP** puts **a strong emphasis** on education and training, principally in the components "Education 2.0" (component 4.1), "Inclusion, training and employment for vulnerable groups" (component 4.2) and "Training and labour market" (component 5.1). Ranking according to the functional classification of public expenditure is not easy, not least because different expenditures within a given project can relate to different functional categories, but according to the Federal Planning Bureau's analysis, about **16 % of total RRP funds go towards education and training**[47]. Furthermore, several structural reforms are also put forward, which should reinforce the proposed investments or result in the reconversion or an increase in the active population's qualification level[48].

In the framework of the RRP, the different governments put **a strong focus** on **reinforcing digital skills**[49]. Darvas et al. (2021) have analysed the recovery and resilience plans submitted to the EC. According to their calculations, Belgium devotes 14.9 % of its total RRP resources to education and training to boost digital skills. This is higher than the 11.4 % spent on average in the 22 countries for which figures are available[50].

It is positive because **the needs in this field are** indeed **considerable**. Belgium is faced with a shortage of workers with digital training and a large proportion of the population does not have basic digital skills. However, the relatively high importance given to digital skills **should not result in other skills being overlooked** (such as those needed for green transition).

The skills needed in the construction sector should also be given special attention. A relatively high proportion of the RRP's projects concern construction or renovation of buildings, which can result in **bottlenecks in specific parts of the building sector** (FPB, 2021, p. 12; CEC, 2021). Given the construction projects calendar, this challenge is already becoming apparent in the short term, especially if one considers that the construction sector in Belgium already experiences more difficulty than average in finding skilled personnel (ERMG survey published 1/06/2021).

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47 The FPB has allocated all the expenditure for a project to the dominant function.

48 For example: Digisprong (VL), Voorsprongfonds Hoger Onderwijs (VL), Plan d'action global contre le décrochage scolaire (FWB), Stratégie de (re)qualification (RBC), le compte à la formation (FED), Levenslang leren (VLA), la réforme de l'accompagnement des chômeurs (WAL).

49 This concerns initiatives focused on digital skills and talents, but also projects aimed at optimising the digital facilitation of education and training in the context of continuing education.

50 Data dating from 7 July 2021. Data is updated on the basis of the new plans which we receive.

Lastly, the Plan does not have an overall strategy for reinforcing participation in continuing training. The measures included in the Plan are strongly focused on increasing the training offer and less on measures aimed at encouraging participation in training and developing an apprenticeship culture, both of which have been identified as the main obstacles to participation in continuing training (see CE, 2021a, p. 46). It is important that the **initiatives put forward** in the framework of the RRP **be integrated in the broader education and training strategies** that respond to the key challenges in this area (on both the demand side and the supply side), and which also support the industrial policy. In its 2020 report, the NPB identified a certain number of challenges regarding teaching and training, and these are currently studied by the High Council of Employment in the framework of its thematic report for 2021.

Increasing private and public investments

In its 2020 report, the NPB highlighted the importance of investment for productivity growth in the public as well as the private sector. It is a positive sign, therefore, that **88 % of the RRP is intended to increase the economy's capital stock**. **More than half** of these resources are **direct public investments**. In fact, since the 1990s, there has been a decline in the state's net capital stock as a percentage of GDP (for example see Biatour and Kegels, 2021), which has a negative effect on the quality of public infrastructures.

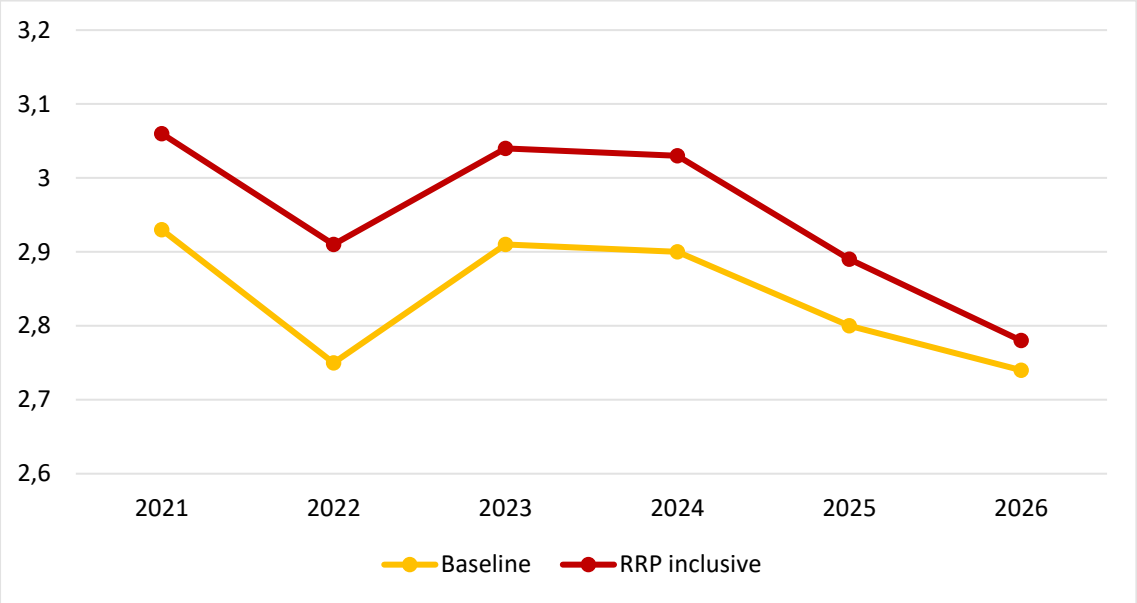
The share of the RRP directly intended for companies is smaller, but the Plan should also have an important ripple effect on private investment, since several investments included in the Plan will require co-financing with private sector participation (see EC, 2021a, p. 53). Furthermore, the RRP aims to provide a framework for private investments through a certain number of structural reforms, thereby also encouraging these investments. Public investment can reduce production costs for private enterprises (congestion costs, for example) and/or increase available knowledge accumulation in the economy, which also encourages private investments (see NPB, 2020, p. 31).

Focusing attention on public investments and the health of public finances

With regard to public investment, the federal government's objective is to raise public investment to 4 % of GDP in the entire kingdom by 2030 (see the governmental agreement of 30 September 2020, PNR, 2021, p.598). In parallel, **the aim** is to raise **public investment to 3.5 % of GDP by 2024** – in line with the European average. Implementing the RRP should result in an average annual increase in public investment of 0.2 % of GDP over the 2021-2026 period. As shown in the graph below, the **public investments** announced in the RRP **will not be sufficient** to **reach the target fixed** for 2024, and the broader recovery, investment and reform plans announced by the regions and the federal government (see Section 3.3) will be necessary to reach the target.

Graph 25. Gross fixed capital formation in the public sector: baseline scenario and scenario with the additional investments envisaged in the RRP

As a %



Source: FPB.

Even if public investments are especially necessary, it **is important to continue monitoring public finances**. Even before the COVID-19 crisis, a certain number of structural changes (particularly the dynamics of an ageing population and health care) threatened the medium term viability of public finances. These problems have not gone away with the crisis. Furthermore, Belgium suffers from high public debt, which has risen sharply during the crisis (the debt ratio has gone from 98.1 % of GDP in 2019 to 114.1 % of GDP in 2020).

In view of these fiscal challenges, it is important that the budget remains viable in the medium term. Furthermore, stricter European fiscal requirements will be brought in again at some point when the general derogation clause[51] in the European Stability and Growth Pact is deactivated. On the basis of preliminary indications, the EC has suggested that this could happen in 2023 (see EC, 2021b).

The systematic integration of **spending reviews** in budgetary planning at the regional, communities and federal government level, as specified in the Plan, is **undoubtedly useful** to consolidate public finances. These exercises can improve the efficiency of public expenditure and thereby free up resources for necessary and urgent investments or, if resources remain constant, improve governmental production (see NPB, 2020). However, this **also necessitates a credible medium term budgetary path**, which plans to constitute budgetary reserves in line with economic recovery. Without a credible medium term framework for financial markets, the Belgian state risks seeing a rise in the interest rates on borrowings.

Encouraging investments in knowledge

The nature of the investment is as important as its scale. For this reason, the NPB highlighted in its 2020 report **the growing importance of investing in intangible fixed assets** for productivity growth, including investments in research and development.

The Federal Planning Bureau has calculated that about **one quarter of the gross fixed capital formation** announced in the Plan **is intangible**. Almost **14 %** of **investments** are investments in **research and development**. Investments in R&D are spread between the different components of the plan and are largely focused on green and digital transition.

[51] This clause allows member states to deviate from the budgetary target on a temporary basis and on condition that this does not compromise budget viability in the medium term.

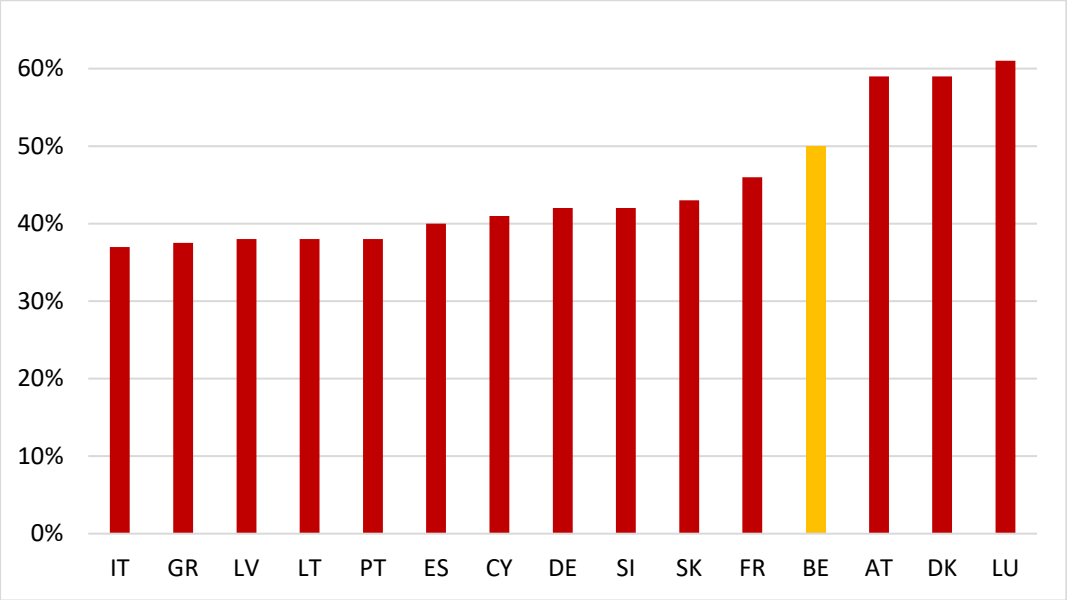
Given the importance of R&D investment (and more broadly in intangible investment), more support should be given to this type of investment, even if, as mentioned in Section 2.2, it is also important to reflect on how to increase the efficiency of existing measures and public resources for R&D in the broad sense. **Margins exist to direct certain fiscal measures in support of R&D towards small or medium-sized non-internationalised beneficiaries.** The Flemish government's initiative of broadening the scope of application of R&D instruments to small companies and following up on them is of interest in this context. But action is also needed at other levels.

Investing in green and digital transition

In its 2020 report, the NPB also highlighted the importance of investments focused on the future and in line with green and digital transition. One of the European requirements is that at least 20 % of total RRP expenditure must go towards digital transition, and at least 37 % to green transition.

The Belgian RRP **focuses** on the **green component**: 49.6 % of Belgium's RRP expenditure will support the transition towards a low-carbon economy, sustainable and resistant to climate change. This figure is not only much **higher** than that **required by Europe** (37 %), but also relatively **high compared to other countries** for which figures are available.

Graph 26. Support for climate targets
As a % of total expenditure envisaged by the RRP



Source: CE, Recovery and Resilience Plans' assessments | European Commission (europa.eu).

The Belgian RRP's largest contributions to climate targets come from the following components: "emerging energy technologies"[52] (21 %), "renovation of buildings" (19 %), "modal shift" (18 %), "cycling and walking infrastructures" (14 %) and "climate and environment"[53] (12 %).

These green investments are not only important from an environmental point of view, but also bring **great potential for productivity growth**. Investments in the modal shift and cycling infrastructures can, for example, contribute to reducing congestion costs for businesses. Investments in emerging energy technologies can have a multiplying effect due to future investments in similar innovative technologies and can also contribute to the development of new growth areas. Certain measures (such as better water management) also contribute to

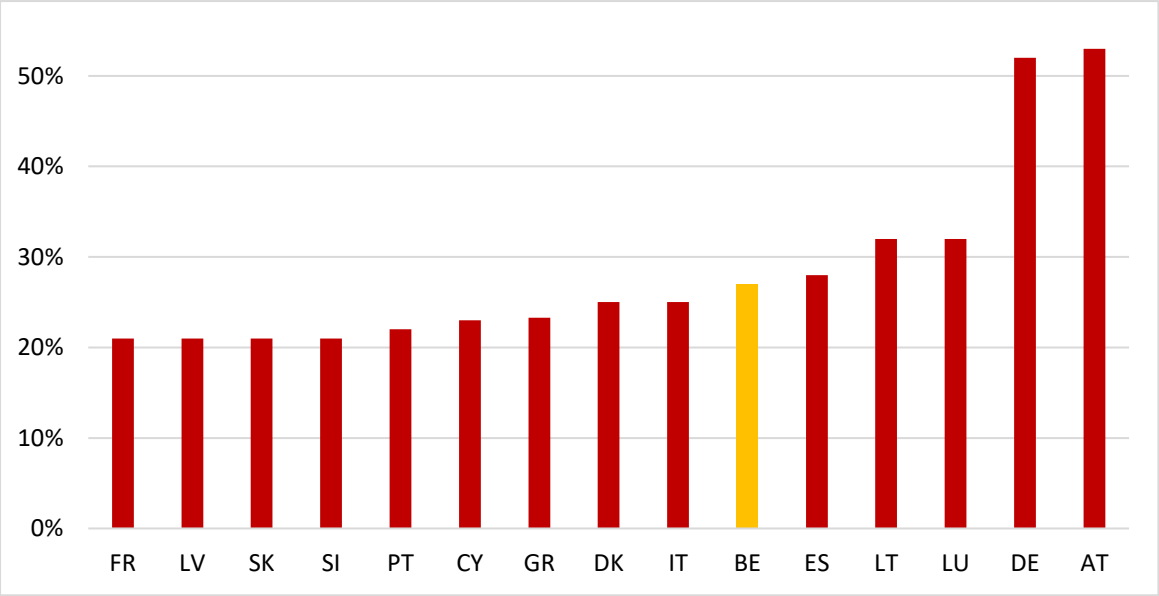
[52] These projects particularly include the electrification of industrial processes, green hydrogen as a raw material and energy carrier, the capture, use and storage of CO_2, H2 and CO_2 transport infrastructures and renewable and waste heat networks.

[53] This component includes measures aimed at restoring biodiversity and increasing climate change resilience.

economic resilience. However, it is important that these measures be integrated in a broader vision. To this end, **it is positive that the RRP's reforms and investments are based on the aims of the National Energy and Climate Plan (NECP)** dated December 2019[54], but the new version of the NECP, which must respond to the reinforcement of European climate targets, should also be coherent with the RRP. Furthermore, the **measures** announced in the RRP must **be in line with a real vision concerning mobility, energy and circular economy...**

The RRP also contributes to digital transition. **Digital investments** represent 26.6 % of the Plan's total investments, which again **exceeds the 20 % required by Europe**. This proportion is **comparable to that of most other countries** for which figures are available, but is substantially less than that allocated by Germany and Austria.

Graph 27. Support for digital targets
As a % of total expenditure



Source: CE, Recovery and Resilience Plans' assessments | European Commission (europa.eu)

A large part of these projects are in line with the **Digital Transformation axis**, particularly with the projects aimed at reinforcing connectivity (including 5G and optic fibre, component 2.3) and cybersecurity (component 2.1). These projects are important to enable growing levels the increase in data traffic (in complete safety) and to boost the development of new technologies and applications (IoT, for example). It is pleasing therefore that the Plan contains a **certain number of crucial reforms enabling the deployment of a high-capacity connectivity infrastructure**. With regard to 5G, the Plan aims to organise and implement the 5G spectrum auction under investment-friendly conditions by mid-2022. However, the Plan is **less clear concerning the revision of radiation standards[55] (regional)** enabling deployment without, of course, imposing restrictions that go beyond what is required for the necessary protection of health and the environment.

The projects aimed at digitalisation of the public administration (component 2.2) represent another important component in the Digital Transformation axis. In this component, a big boost is not only given to digitalising public administration (see below), but also to reinforcing capacities for the use of large open databases collecting the data available across different public administrations[56]. The NPB already highlighted the growing importance

54 However, renewable energy investments are limited and Belgium should encourage further investments in renewable energies outside the plan in order to reach the NECP's target of 17.5 % renewable energy by 2030.

55 The Plan includes regional reforms concerning the revision of radiation standards to enable effective 5G deployment for both private and industrial use, "if deemed necessary and recommended by the relevant committees".

56 For example, the public interest data enterprise that the Flemish government wants to implement in accordance with the regulations on data governance (Data Governance Act) in preparation; the development of an (inter)federal strategy concerning data and the intention at federal level to guide public administration to make data increasingly available as open

of data for a wide range of high technology applications and Belgium's relatively poor performance in this field in its previous report. For this reason, **the focus on open public data is highly encouraging**. The recovery plans should provide an opportunity to encourage the production and exchange of high quality statistical data between the administrations and users (businesses, voluntary sector, the world of research, etc.), while remaining linked to European evolutions in this area (for example, the European regulations on data protection).

In addition to the projects in the Digital Transformation axis, the digital component also appears transversally in the Plan's other axes. The Sustainability axis, for example, includes investments in advanced technologies supporting the energy transition; the Mobility axis includes measures for the development of intelligent mobility; several measures exist aimed at increasing digital skills and digital inclusion (see above); etc. **The challenges presented by the digital transition are thus approached in a structural way in the Plan** (CE, 2021a, p. 77). The fact that these measures are aligned with various European initiatives concerning digital policy is also positive[57].

Promoting entrepreneurial dynamism

The NPB's 2020 report also highlighted the importance of sufficient entrepreneurial dynamism for productivity growth. It is encouraging to observe that the current crisis, at first sight, does not appear to have a negative effect on the creation of new businesses. However, given the relatively low creation rate in Belgium, it is important to make the creation of new businesses easier (also see Section 2.1).

This requires investments and reforms to improve the business environment. In this context, the Plan (mainly component 2.2) includes considerable investments to digitalise and modernise public administration at all levels. The projects concern both the use of digital technologies to make public administrations more efficient in their internal processes and the use of digital technologies to make public administrations more efficient in their interactions with businesses and citizens. In parallel with the reforms planned at the federal and regional levels (aimed in particular at simplifying administrative procedures and improving electronic public procurement markets), **investing in digitalising public administrations should contribute to reducing the costs of the administrative burden** (CE, 2021a, p. 57). The **digital transformation of the justice system** is also an important element in creating a favourable environment for investments and businesses. It is to be expected that it contributes to the **efficiency of our justice system** – a sensitive subject pointed at by several international institutions for many years.

However, the **reduction of the administrative burden must go beyond digitalising paper processes**. The regulations themselves must also be assessed. The Plan partly addresses this issue[58], but in its assessment the EC points out that the Plan does not deal with the complex labour laws and the recommendation to remove obstacles to competition in the services, in particular the regulated professions. In general, an assessment should be made of the extent to which the regulatory frameworks hinder entrepreneurial dynamism and are still sufficiently in line with new evolutions (for example digital transition).

In addition to reducing the administrative burden, the government must **also provide adequate incentives for the creation and continued growth of innovative businesses**. The support measures (for example support for R&D) must be assessed in this sense (see above). But public procurement can also be an important instrument – while of course remaining within the limits imposed by the relevant European regulations. The implementation of the RRP gives rise to numerous public tenders and as a consequence presents opportunities in this area. It is important that the public tender procedures give young innovative businesses sufficient possibilities.

data; the regional data exchange platform which the Brussels region wants to develop; the data governance that the Walloon region wants to develop to improve data quality and its intention to develop data exchange via its integrator, etc.

57 For example, the European digital strategy, the European Skills Agenda, the European Pillar of Social Rights, the Single Digital Gateway, the European Education Area and the Digital Education Action Plan, the European Health Data Space and the EU's cybersecurity strategy for the digital decade.

58 For example, support the introduction of a Single Digital Gateway by revising and simplifying the procedure of creating and running a business; Flanders, Wallonia and Brussels are carrying out reforms to rationalise licensing and environmental procedures; the spending reviews in Flanders will also focus on reducing the regulatory burden.

In parallel to the launch and continued growth of businesses, sufficient entrepreneurial dynamism also **implies** that **structurally non-viable businesses can close down**. In this context, it is important to ensure that the already high number of zombie businesses in Belgium (see the NPB's previous reports NPB) does not increase further. For the moment there is little indication that the COVID-19 crisis has resulted in an increase of closures of low-productivity businesses (see Section 2.1). The moratorium on bankruptcies in effect until the start of 2021 and the wide range of support measures rightly taken by the government, to lessen the economic shock of the crisis for businesses, could have contributed to this[59], even if it should be noted that the progressive withdrawal of the moratorium on credit has not led to an increase in payment defaults.

In the future, **temporary support measures** should be **phased out** gradually and carefully, but the **calendar** is **of crucial importance** in this regard. If the measures are phased out too soon, recovery could be compromised. However, phasing out too late could lead to market distortions and barriers to shutting down declining businesses (EC, 2021, spring forecast). It will therefore be necessary to find the right moment between prolonging the support measures too long, with the risk of creating zombie businesses, detecting losses in the banking sector too late and wasting public funds, and phasing out these measures prematurely, which could lead to an excess of payment defaults (EC, 2021a).

3.3. Coherence with other Plans and policies

As indicated above, although the Belgian Recovery and Resilience Plan (RRP) has a limited reach, it only represents part of the recovery policy carried out in Belgium. In parallel to the projects submitted in the framework of the RRP, the federal and regional authorities envisage other recovery and resilience initiatives. Not all the Plans are as specific at the current time. Here is an overview of the situation at 30 June 2021:

- **AT THE FEDERAL LEVEL**: The RRP's federal reforms and investment projects will be integrated in a broader investment recovery Plan, as envisaged in the government agreement. The federal government would like public investments to reach 4 % of GDP by 2030 in the kingdom as a whole. The recovery and investment Plan will formulate all the investment projects in accordance with monitoring methodology and the RRP's principles of application. The adoption of the federal recovery and investment Plan is earmarked for autumn 2021. The federal government has already implemented a transformation fund of EUR 750 million within the IFPS, which will invest in the first five axes of the RRP.

- **AT THE FLEMISH REGIONAL LEVEL**: Projects amounting to EUR 2.25 billion submitted by the Flemish government in the framework of the National Recovery and Resilience Plan have their place in the broader "Vlaamse Veerkracht" (Flemish resilience) plan announced by the Flemish government on 28 September 2020. This Plan includes investment projects and reforms and represents a total of EUR 4.3 billion. The Plan lays out seven key elements: making economy and society sustainable; investing in infrastructures; carrying out the digital transformation of Flanders; investing in people and talent; reinforcing the Flemish health and welfare system; managing the COVID-19 crisis and Brexit and improving the efficiency of the government. Apart from the unique recovery sum of EUR 4.3 billion, the Flemish government also finances the recovery via regular existing and additional funding. Thus, the instruments of the PMV (EUR 4.215 billion) are used to support the economy and businesses, and the Flemish government also invests in the building of schools and in health and welfare, amongst other things. All the projects are in line with the Flemish government's agreement and other more specific Plans of the Flemish government. On 2 April 2021, 93 % of the projects had already been launched (see Monitoring the Flemish Recovery and Resilience Plan, April 2021).

- **AT THE WALLOON REGIONAL LEVEL**: As like at the Flemish regional level, the projects presented by the Walloon government in the framework of the Recovery and Resilience Plan are also in line with a broader recovery Plan, the "Wallonia Recovery Plan" (21/5/2021), which will mobilise EUR 7.6 billion.

[59] Whereas the measures were still fairly general during the first wave, the accent was put much more on preventing the effects of bankruptcy after the second wave. In addition to support measures, a moratorium on bankruptcies was put in place until the start of 2021.

In addition to the measures financed in the framework of the RRP, the *Get up Wallonia* Plan and the Walloon transition plan (already envisaged in the regional Policy Declaration) are also part of it. The Government has chosen to pool three complementary action programmes to ensure maximum coherence with the measures taken and thus maximise the beneficial impact. The Plan is built around 5 axes: Investing in the youth and talents of Wallonia; ensuring environmental sustainability; boosting economic growth[60]; supporting well-being, solidarity and social inclusion; ensuring innovative and participatory governance. In addition to investment projects, this Plan envisages a series of reforms in different areas (employment, training, economic growth, mobility, social inclusion and the environment). Most of the practical details are still to be worked out by the end of the summer.

- **AT THE BRUSSELS-CAPITAL REGIONAL LEVEL**: After managing the health crisis, the Brussels-Capital region adopted the first part of its recovery and growth plan in July 2020. It was then completed with incentives and additional measures aimed at rethinking models of urban development, production, consumption and solidarity to make them more resilient. These projects were included as a priority in the National Recovery and Resilience Plan. In view of the strong impact of the COVID-19 crisis, it was decided to finance these projects entirely through multi-annual budgets from Brussels, but also to use their own resources to finance projects which Europe did not approve. The projects are fully consistent with the strategic priorities of the 2019-2024 common policy statement and also form an integral part of the Go4Brussels 2030 strategy[61], updated in February 2021, taking recovery projects into account.

- **AT THE GERMAN-SPEAKING COMMUNITY LEVEL:** The projects of the German-speaking community are in line with the regional strategic economic development Plan, in particular in the "Ostbelgien leben 2025" strategic vision, in the Ministry for the German-speaking community's permanent work programme (LAP) and in the government's declaration. The latter is based on a guidance note that summarises the future challenges facing the German-speaking community as a result of the health crisis and establishes a link with the regional strategic development Plan. The development plan revolves around five thematic axes: border region, economic region, training region, solidarity-based region and living region.

Even if the designations do not always correspond, the priorities of broader recovery Plans already announced are in line with the axes defined in the Recovery and Resilience Plan. Broader recovery plans, such as the RRP, place emphasis on hastening the transition towards a more sustainable, low-carbon and climate change resilient economy, optimising the benefits of the digital transformation and reinforcing well-being and social cohesion. Public investments in infrastructures, education, training and innovation are also dealt with in the different Plans.

The Plans of the various governments also seem to fit in with other initiatives within these same governments. However, the coherence of the different governments' Plans between themselves has been a focus of little or no attention. In its assessment of the Belgian RRP, the EC also pointed to the fact that numerous reforms and investments are not applied in a uniform and coherent manner in all the country's entities, which would however be justified. (EC, 2021a, p. 97). It also noted that inefficient coordination between governmental levels creates a complex regulatory environment and weighs on the implementation of a certain number of strategic measures (EC, 2021a, p. 12). Consequently, it is important, wherever possible, to look for synergies between the different authorities when implementing Plans.

Lastly, it should also be noted that, in addition to the structural reform measures and investments envisaged in the recovery Plans, **monetary policy** also **represents** a **powerful lever for the recovery**. Monetary policy reinforces the budgetary recovery measures by offering favourable financing conditions to governments, businesses and households.

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60 This axis aims to meet the objective of increasing digitalisation, amongst other things.

61 This strategy is based on two pillars. On one hand it aims to develop a transition strategy for the Brussels economy by 2030, to decarbonise all sectors and increase support for circular and regenerative sectors, social and democratic entrepreneurship and digitisation of the economy, and on the other hand aims to focus the cross-policies on employment and training on the specific question of qualifications and promoting alliances between work and the environment.

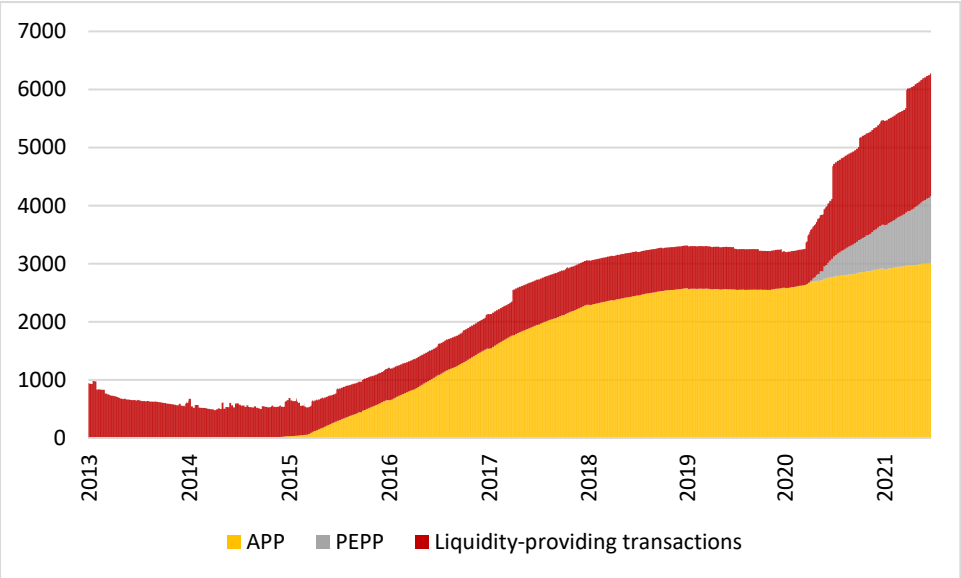
Box: Measures taken by the ECB in response to the COVID-19 crisis

The primary objective of the monetary policy in the euro zone is to maintain price stability[62]. In crisis conditions, this essential task is achieved by pursuing three principal objectives: stabilising financial markets to preserve monetary transmission, ensuring a harmonious general policy stance and supporting credit in the private sector. **Thus, if boosting economic productivity is not one of the direct aims of monetary policy (it is clearly up to governments to take initiatives in this area) it can create conditions which make higher productivity easier to achieve by supporting more flexible business and government financing.**

In response to the COVID-19 crisis, the Governing Council of the European Central Bank (ECB) has adopted a vast range of measures:

(1) **The purchase of private and public sector securities** is the main instrument for stabilising financial markets and ensuring generally flexible financing conditions. Following the COVID-19 crisis, purchases made in the framework of the already existing **Asset Purchase Programme (APP)** were increased by EUR 120 billion in 2020. Private sector financing has been supported thanks to the strong support of purchases of private sector securities and the addition of purchase options to *non-financial* commercial paper. In addition, a new temporary crisis programme, the ***Pandemic Emergency Purchase Programme (PEPP)***, has been launched with a total of EUR 1.850 billion for securities purchases until at least the end of March 2022 (Graph 28).

Graph 28. Eurosystem purchase and liquidity-providing operations programmes
EUR billions



Source: ECB.

If the two programmes are usually subject to the same conditions, purchases in the framework of the PEPP can be made with more flexibility. This flexibility covers several aspects, particularly the timing, between the categories of assets and between euro zone countries. For example, the PEPP's purchases of *commercial paper* were mostly made during the first months of the crisis. The Eurosystem has acted as a sort of security net for a market that represents an important source of finance for businesses, but which practically closed down because of the crisis. From March to May 2020, commercial paper worth more than EUR 35 billion was bought in the framework of this programme, or about half the total market. As this market gradually picked up again, the purchases of PEPP also decreased. In the same way as the APP, government bonds nevertheless represent the

[62] According to the Treaty on the Functioning of the EU, the principal aim of monetary policy in the euro zone is to maintain price stability. Without prejudice to this primary objective, the Treaty also sets out that monetary policy must support the EU's general economic policies, namely balanced economic growth, a highly competitive social market economy which targets full employment and social progress, and a high level of protection and improvement of the quality of the environment.

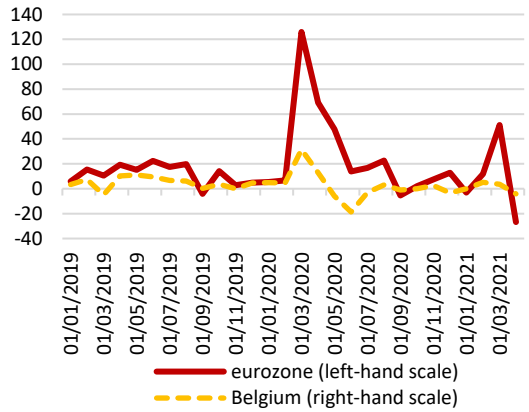
largest share of PEPP purchases. Since the start of the COVID-19 crisis, the Eurosystem has bought EUR 145 billion and 1,375 billion public and private securities respectively in the framework of the APP and the PEPP (net purchases between March 2020 and May 2021).

(2) Supporting bank loans to households and businesses has been a key objective of actions taken by the ECB's Governing Council since the start of the crisis, because banks provide a large part of private sector financing in the euro zone. In this context, **rules for the implementation of the third series of** (***targeted longer-term refinancing operations*** – TLTRO-III) **launched in September 2019 have been eased**. TLTRO operations are targeted in the sense that they encourage banks to lend more to the private sector, as they can then borrow liquidities cheaply themselves through Eurosystem. The lending conditions under TLTRO-III were made more attractive in three ways: euro area banks could borrow more liquidity from the Eurosystem; it has become easier for banks to borrow at the lowest possible interest rate; finally, TLTRO-III rates were lowered. Banks in the euro zone borrowed record amounts from the ECB last year following these rule relaxations (Graph 28).

This has enabled banks to maintain their loans to the private sector during the crisis. The unfolding of the crisis showed how important that was. Faced with a huge drop in their revenue as a result of the lockdown, businesses began to massively borrow from banks to finance their operating costs. During the first three months of the crisis (March-May 2020), the credit flow from banks to businesses in the euro zone reached an unprecedented amount of EUR 243 billion. During the same period, Belgian businesses borrowed EUR 4 billion from Belgian banks. In the following months, credit flows gradually decreased to reach the levels recorded before the beginning of the crisis (Graph 29). Because of the uncertainty resulting from the crisis, investment credits weighed on the demand for loans to businesses during 2020, although certain signs indicate that demand for this type of credit has recently picked up again. Finally, the banks did not confine themselves to lending massively to businesses, they also did it with flexible conditions. Thus, bank lending rates to businesses remained at the historically low rates recorded over recent years even during the crisis (Graph 30).

Graph 29. Bank lending to non-financial corporations in Belgium and the euro zone

Monthly credit flows in EUR billions



Sources: ECB, BNB.

Graph 30. Interest rates on loans granted by banks to non-financial corporations in the euro zone

As a %

Source: ECB.

(3) The easing and enlargement of the Eurosystem refinancing operations has been completed with a third package of measures regarding **guarantee requirements**. Banks wishing to borrow liquidities with Eurosystem must provide sufficient guarantees. In crisis periods, the amount of guarantees available can be put under pressure, in view of the deteriorating conditions on financial markets. The measures approved by the ECB's Governing Council, which remain in force until June 2022, have in particular increased the eligibility of securities and enabled the Eurosystem to accept more risks in its balance sheet. The Council has also completed the measures taken by national authorities, for example, by accepting loans as collateral from SMEs and independent workers who benefit from a public guarantee in several countries, including Belgium.

(4) Lastly, **the system of swap lines and repos between the ECB and the central banks of countries outside the euro zone** has ensured the availability of sufficient liquidity all over the world, either by exchanging euros for the currency of another central bank, or by providing guarantees in euros.

If the crisis measures taken by the ECB, as well as by governments and prudential authorities, have succeeded to lessen the economic impact of the crisis, their scale also raises some questions. **They can have undesirable secondary effects, such as keeping businesses that would be unviable in other circumstances, also known as zombie businesses, afloat.** The crisis measures were designed to avoid these secondary effects as much as possible. Nevertheless, the scale of the measures is such that there is a risk of these zombie businesses surviving. On the other hand, owing to the nature of the crisis, businesses that are in fact viable have been affected; they are subject to liquidity shocks without necessarily being insolvent. Furthermore, public support on a grand scale ensures that businesses suffering from a lack of liquidity will not immediately go bankrupt[63]. In addition, these evolutions are closely monitored by the ECB's Governing Council. However, the most important role is played here by prudential policy, which has targeted instruments to monitor and, if necessary, deal with these financial weaknesses.

63 Also see: VoxEU.org, "*Zombification in Europe in times of pandemic*", L. Laeven, G. Schepens and I. Schnabel, 11 October 2020.

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Activity report

The Board

Creation of the Board

Following the report on "Completing Europe's economic and monetary Union" report compiled by the "five Presidents" (22 June 2015), the Council of the European Union approved on 20 September 2016 a recommendation encouraging the member states to create a National Productivity Board. The creation of such a board responds to a desire to strengthen competitiveness in a sustainable way so that economies are more resilient and can recover more quickly from economic shock from now on. The role of the Productivity Boards is to analyse competitiveness in the broad sense, to enrich basic knowledge and to inform the national debate, in order to reinforce the ownership of policies and reforms.
The National Productivity Board was officially established in Belgium on 14 May 2019, in accordance with the law of 25 November 2018 creating the National Productivity Council (published in the Moniteur Belge on 7 December 2018) which transposes the European recommendation.

Mission of the Board

The National Productivity Board is tasked with:

- diagnosis and analysis of productivity and competitiveness developments;
- analysis of policy challenges in the field of productivity and competitiveness;
- assessment of the effects of policy options in the above-mentioned fields.

To carry out its tasks, the National Productivity Board may contact the Productivity Boards of other member states, communicate publicly on a timely basis, obtain appropriate access to information available from public administrations and consult stakeholders.
The National Productivity Board performs these tasks within the framework of the European Semester, in particular by assisting the European Commission in data collection and by assisting governments in preparing the drafting of the National Reform Programme.
The National Productivity Board publishes an annual report.

Composition of the Board

The National Productivity Board is headed by a Bureau that comprises:

- a chairman, nominated by the secretariat of the Central Economic Council (CEC), and
- two vice-chairmen, one nominated by the National Bank of Belgium (NBB) and the other by the Federal Planning Bureau (FPB).

The Bureau determines the agenda of meetings as well as the choice of themes to be studied by the Board.
The National Productivity Board is composed of 12 members, six of which come from the federal level and six from the regional level:

- Siska Vandecandelaere (CEC)
- Luc Denayer (CEC)
- Catherine Fuss (NBB)
- Tim Hermans (NBB)
- Chantal Kegels (FPB)
- Joost Verlinden (FPB)
- Astrid Romain (Brussels-Capital region)
- Koen Declercq (Brussels-Capital region)
- Caroline Ven (Flemish region)
- Joep Konings (Flemish region)
- Marcus Dejardin (Walloon region)
- *the second member of the Walloon region is currently being replaced*.

The FPS Economy provides the secretariat of the Board.
The members of the Board and of its secretariat are appointed by the King of Belgium.

2021 activities

Board meetings

The National Productivity Board has met on the six occasions below:

- 7 December 2020 (videoconference): Discussion about the themes to be featured in the next report;
- 11 January 2021 (videoconference): Discussion about the themes to be featured in the next report;
- 14 April 2021 (videoconference): Discussion about the structure of the 2021 Annual Report;
- 31 May 2021 (videoconference): Discussion about the contents of the 2021 Annual Report;
- 8 July 2021 (videoconference): Discussion about the texts in the 2021 Annual Report;
- 23 August 2021 (videoconference): Completion of the 2021 Annual Report.

External activities

In addition to the the National Productivity Board meetings, several activities have been organised by external organisations and attended by Board members, in particular on:

- 11 March 2021: Presentation of the 2020 Annual Report to the KUL (Chantal Kegels);
- 10 May 2021: High Council of Employment;
- 3 June 2021: The vice-chairman Chantal Kegels' participation in an OECD expert group in the framework of the "Slovakia: evaluation of the position and performance of the National Productivity Board" project;
- 7 September 2021: Virtual visit of the OECD expert group in the framework of the "Slovakia: evaluation of the position and performance of the National Productivity Board" project.
- 6 October 2021: Meeting with OECD in the framework of the Economic Survey of Belgium.

Appendix

Appendix1. Advice of the Central Economic Council (CEC)

Saisine

L'article 4 de la loi du 25 novembre 2018 portant sur la création du Conseil national de la productivité (CNP) prévoit dans son paraphe 2 que les études et les rapports de cette institution puissent faire l'objet d'un débat au sein du Conseil central de l'économie (CCE), préalablement à leur publication. Si ce dernier souhaite formuler un avis, cet avis sera joint en annexe lors de la publication de l'étude ou du rapport. Le rapport annuel 2021 sur la productivité a été transmis au Conseil central de l'économie le 1er septembre 2021.

Le projet d'avis, qui est le résultat des discussions menées au sein de la sous-commission « Conseil de la productivité » les 13, 21 et 22 septembre 2021, a été approuvé en séance plénière le 28 septembre 2021.

Le rapport du Conseil national de la productivité

Le rapport annuel du CNP a pour objectif de définir l'état de la connaissance sur la productivité et la compétitivité pour permettre d'en apprendre davantage sur les sources de la croissance de la productivité et d'identifier les causes éventuelles de son ralentissement.

En vue d'affiner le diagnostic de départ de l'évolution de la productivité et de la compétitivité en Belgique et de formuler, le cas échéant, des recommandations utiles de politique économique, le CNP doit pouvoir mener des analyses approfondies, notamment sur la base des demandes formulées par le CCE. Pour cela, il doit pouvoir faire appel à des experts externes. Le CCE demande que des ressources soient mises à la disposition du CNP à cette fin.

Les concepts de compétitivité et de productivité

Les gains de productivité représentent une condition nécessaire, mais non pas suffisante, de la prospérité de la population, du renforcement de la cohésion sociale et du financement des investissements nécessaires à l'atteinte des objectifs environnementaux européens, soit la neutralité carbone à l'horizon 2050. Les gains de productivité sont le fondement d'une amélioration des revenus réels et de baisses des prix relatifs. Grâce à ces derniers, les entreprises peuvent aussi accroître leur rentabilité, laquelle est déterminante pour les investissements futurs. Ces différents éléments sont nécessaires pour qu'une augmentation de la productivité puisse donner lieu à une amélioration de la compétitivité.

Le rapport de l'OCDE « Vers une croissance verte ? Suivi des progrès » (2015) a fait le bilan de l'expérience acquise par les différents pays sur la voie d'une croissance verte. Il évalue notamment les problèmes rencontrés pour aligner les priorités économiques et environnementales et identifie les conditions propices à l'application de politiques de croissance verte plus ambitieuses et plus efficaces, aptes à générer et à saisir les opportunités économiques. Pour le CCE, la productivité, le progrès social et des politiques environnementales ambitieuses peuvent aller de pair, mais cela ne se fait pas spontanément. Il faut pour cela un cadre propice de politiques publiques qui doivent être bien conçues et cohérentes et garantir un level playing field. Pour que les gains de productivité aient une influence positive sur l'environnement, il est entre autres nécessaire de se diriger vers une économie circulaire[64] et une utilisation des ressources de plus en plus sobre. A cet effet, le CCE insiste sur la dimension « investissement », notamment l'innovation, et sur les obstacles à lever à cet égard (cf. 5.2).

La Belgique est aujourd'hui confrontée à des défis concernant la soutenabilité à moyen et à long termes de ses **finances publiques**, situation qui a été essentiellement aggravée cette dernière décennie par les crises financière, économique et sanitaire. Cela pourrait limiter les possibilités de recours à des instruments budgétaires dans le futur. Dès lors, la croissance de la productivité est aussi nécessaire pour dégager les marges budgétaires permettant d'élargir la palette des choix politiques possibles et ainsi relever les défis tels que le vieillissement de la population, la cohésion sociale (en particulier garantir la viabilité de notre système de protection sociale à

[64] Le CCE et le CFDD se sont prononcés dans un avis à ce sujet (CCE et CFDD 2021c).

long terme) et la transition écologique et numérique. Dans ses derniers rapports, le Comité d'étude sur le vieillissement a ainsi mis à chaque fois en évidence l'importance du contexte macroéconomique et plus particulièrement des gains de productivité lors de l'estimation du coût budgétaire du vieillissement. Une dette publique élevée et croissante est aussi susceptible d'accroître la vulnérabilité des politiques publiques, particulièrement en cas de hausse des taux d'intérêt et des primes de risque.

Il est important de remarquer que les liens entre la productivité d'une part, et la prospérité, la cohésion sociale et l'environnement d'autre part fonctionnent dans les deux sens. En matière de cohésion sociale, même si le sujet reste controversé dans la littérature économique, de plus en plus d'études[65] tendent à indiquer que les inégalités auraient un impact négatif sur la croissance, du moins au-delà d'un certain seuil. Les multiples dimensions de l'inégalité sont étroitement liées et tendent à s'alimenter mutuellement. En particulier, les inégalités en matière d'opportunités, ont non seulement des conséquences défavorables et potentiellement durables pour les générations actuelles, mais pèsent également sur les perspectives économiques futures. L'accessibilité et la qualité de l'enseignement sont essentielles à cet égard. Il est toutefois à noter que la Belgique figure parmi les pays où le niveau des inégalités, de même que l'écart salarial entre hommes et femmes, sont les plus contenus. Le risque de pauvreté pour les travailleurs est également bas, bien que les taux d'emploi soient comparativement faibles. (Cordemans 2019). En matière environnementale, selon une étude commandée par la Commission nationale Climat sur les principaux impacts socio-économiques directs du changement climatique (De Ridder et al. 2020), le changement climatique devrait affecter un grand nombre de secteurs économiques en Belgique. Les coûts totaux attendus – principalement causés par les chaleurs extrêmes, les sécheresses et les inondations – sont largement supérieurs aux gains éventuels dus à des hivers plus doux. La chaleur risque par ailleurs de générer des pertes de productivité du travail. Atteindre les objectifs définis par le CCE est donc également crucial pour accroître la productivité.

Constats

a. Diagnostic national

Selon le CNP, on observe un ralentissement marqué de la productivité belge après la crise économique et financière de 2008. Ce faible taux de croissance de la productivité est dû à une forte baisse de la contribution de la productivité totale des facteurs et du capital deepening (intensification capitalistique) non lié aux technologies de l'information et de la communication[66]. À ce jour**, l'impact de la crise de la COVID-19 sur l'évolution de la productivité du travail belge a toutefois été assez limité**. Le CCE invite les responsables de la conduite de la politique économique à rester attentif à l'impact de la crise sur la productivité des entreprises, un impact qui pourrait encore se matérialiser dans les prochains mois.

A l'heure actuelle, les **politiques budgétaires** des différentes entités du pays sont cruciales pour stabiliser l'économie. Il est important d'utiliser les fonds publics à bon escient afin de stimuler la croissance potentielle et augmenter ainsi les marges de manœuvre futures. Cela permettra aussi au pays de stabiliser le ratio dette / PIB. En vue de faire face à la pandémie, la Commission européenne a activé la « clause dérogatoire générale », qui permet de déroger temporairement aux limites de dettes et de déficits fixées par le Pacte de stabilité. Cette clause sera prolongée en 2022, en vue de la désactiver en 2023. Le CCE rappelle sa demande adressée au gouvernement belge et à la Commission européenne, d'un traitement favorable des investissements publics productifs dans le cadre des règles budgétaires européennes (CCE et CNT 2020). Une hausse des investissements, et en particulier des investissements publics, doit viser à stimuler tant la croissance économique à court terme que la croissance économique potentielle à long terme.

Les dynamiques de productivité au sein de **l'industrie manufacturière** (marquée par un ralentissement de la croissance des branches d'activité qui étaient les plus performantes dans ce domaine avant 2008) diffèrent de

[65] Cingano (2014), Dabla-Norris et al. (2015).

[66] La comptabilité de la croissance permet de décomposer le taux de croissance de la productivité en quatre contributions : (1) l'effet de composition de la main-d'œuvre, (2) l'intensification capitalistique en technologies de l'information et de la communication (TIC), (3) les actifs non liés à ces technologies (non-TIC) et (4) la productivité totale des facteurs (PTF). Le capital lié aux TIC comprend le matériel informatique, les équipements de télécommunications et les logiciels et bases de données. La PTF rend compte de l'efficience globale avec laquelle les facteurs travail et capital sont conjointement utilisés dans le processus de production. La hausse de la PTF correspond à un résidu, c'est-à-dire à la part de la croissance du PIB qui n'est pas expliquée par l'évolution des facteurs travail et capital.

celles observées dans **les services marchands** (où la décélération de la croissance de la productivité a surtout eu lieu dans les branches déjà peu performantes dans le passé). Le CCE s'interroge sur les dynamiques à l'origine de ces évolutions contrastées.

Le CCE rappelle qu'une **approche « micro »** de la productivité est souhaitable en vue de comprendre les dynamiques à l'œuvre derrière l'évolution générale de la productivité. Il réitère également son souhait de réaliser une analyse en profondeur des **niveaux de productivité**. Les écarts de croissance de productivité observés entre la Belgique et ses principaux pays voisins pourraient en effet s'expliquer par la proximité de la frontière technologique[67].

b. Diagnostic régional

Le CCE invite le CNP à présenter ses résultats aux différents Conseils économiques et sociaux régionaux du pays. Des domaines importants analysés par le CNP relèvent en effet de la responsabilité partielle ou exclusive des Régions ou des Communautés.

Le CNP observe un ralentissement de la productivité dans les trois régions, avec des variations. Les membres du CCE constatent qu'il existe des écarts de productivité entre les régions, mais que la dispersion observée entre les régions n'est pas particulièrement forte d'un point de vue international.

Le CCE invite le CNP à reproduire cette analyse de manière régulière. Un horizon de temps plus éloigné serait en effet utile pour réaliser une analyse robuste des dynamiques à l'œuvre.

Leviers de la compétitivité

Selon le CNP, le faible taux de croissance de la productivité en Belgique trouve en grande partie son origine dans l'atonie de la productivité totale des facteurs, qui est plus étroitement liée au dynamisme entrepreneurial et à l'innovation.

c. Dynamisme entrepreneurial

Selon le rapport du CNP, la crise de la COVID-19 ne semble pas avoir impacté de manière significative la dynamique des entreprises. Il n'a pas observé de phénomène de « cleansing » ou de « scarring ». Le CCE invite le CNP à suivre cet indicateur de près, car il est possible que la situation évolue dans les prochains mois. En effet, le faible nombre de faillites d'entreprises au cours des 18 derniers mois est dû en partie à l'instauration d'un moratoire sur les faillites (d'avril à juin 2020, et de novembre 2020 à janvier 2021). Les entreprises à l'arrêt ou en difficulté ont également bénéficié de mesures de soutien et d'aides publiques durant cette période.

Le CCE souligne l'importance de disposer d'un **cadre réglementaire**[68] qui facilite l'entrée de nouvelles firmes à haut potentiel et la sortie ou la réorientation des firmes les moins efficaces, et qui permet aux entreprises de se développer et de mettre en place des conditions favorables à l'accroissement de l'efficacité.

D'après une analyse sectorielle citée dans le rapport pour la période 2002-2017, il apparait que les **entreprises débutantes** (de 1 à 4 ans) ont de plus en plus de difficultés à atteindre le niveau de productivité moyen des entreprises établies. Il est crucial d'investiguer les facteurs à même d'expliquer cette évolution, car la croissance de la productivité des entreprises débutantes au cours des premières années suivant leur entrée apporte une contribution significative (positive) à la croissance de la productivité au sein d'une branche d'activité.

La congestion du marché engendrée par les entreprises les moins productives (en particulier les « entreprises zombies ») peut créer des barrières à l'entrée et limiter les possibilités de croissance d'autres entreprises plus

[67] La "frontière technologique" renvoie à l'utilisation de la meilleure technologie disponible (dans un certain domaine de production) à travers le monde. Un pays qui se situe en deçà de la frontière peut, par imitation des technologies existantes, accroître rapidement sa productivité. Un pays qui, en revanche, se situe sur la frontière technologique, doit s'employer à la déplacer par le développement d'innovations.

[68] Notons dans ce cadre qu'une réforme de la réglementation sur les faillites est entrée en vigueur en Belgique le 1er mai 2018. En 2021, le gouvernement fédéral a également procédé à une réforme visant à assouplir l'accès à la procédure de réorganisation judiciaire en Belgique.

productives. Pour le CCE, la réhabilitation des entreprises en difficulté implique moins de coûts sociaux liés à la perte d'emplois que si seule une sortie était envisagée. Il est dès lors important de **faciliter la réorganisation des entreprises zombies qui disposent d'un potentiel de croissance** clairement démontré, en particulier par une reprise, et de réaliser les investissements nécessaires pour améliorer leur productivité. Dans la mesure du possible, la relance d'entreprises en difficulté, en particulier quand elles occupent une place importante dans la chaîne de valeur, est donc préférable à leur suppression. Lorsque cela n'est pas possible, l'État a un rôle à jouer dans la protection sociale et la réintégration des travailleurs concernés, en dialogue avec les représentants du monde de l'entreprise et du travail. A cet égard, il convient d'éliminer autant que possible les barrières à la cessation ordonnée des entreprises affaiblies pour lesquelles une réhabilitation n'est pas possible, tout en agissant avec la précaution requise. Une sortie du marché des entreprises « zombies » permet aux facteurs de production de se libérer, ce qui, dans le long terme, favorise la création de nouvelles entreprises ou l'expansion d'entreprises existantes plus productives.

d. Innovation

La crise de la COVID-19 a eu un impact incertain sur les efforts d'innovation à court et moyen terme. En temps de crise, les projets d'investissements privés peuvent être suspendus ou abandonnés, en particulier les projets les plus risqués, tels que ceux en R&D. Le CCE s'interroge sur les effets de la diminution de l'investissement (notamment en R&D) sur la croissance de la productivité.

La R&D et l'innovation (ainsi que la diffusion de celle-ci) sont des déterminants importants de la croissance économique et peuvent également apporter (une partie de) la réponse à certains des grands défis sociétaux auxquels nous sommes confrontés (par exemple, les défis environnementaux, les défis sanitaires, le vieillissement...). Il est donc important de maintenir le niveau de soutien à la R&D en Belgique, mais il faut en même temps contrôler l'efficacité des mesures d'aide. Les choix réalisés aujourd'hui en matière de R&D ayant un impact à long terme, il est d'autant plus nécessaire de s'assurer le plus vite possible que les moyens publics soient alloués de manière optimale pour stimuler la R&D. À ce titre – et comme indiqué dans le rapport du CNP –, si les régimes de dispense partielle de versement du précompte professionnel sur les salaires du personnel de R&D contribuent à générer des activités de recherche additionnelles, il n'y a pas d'indications solides d'efficience concernant le crédit d'impôt à la R&D, ou la déduction fiscale à 80 % des revenus des brevets[69]. De plus, l'additionnalité de la R&D – soit la mesure dans laquelle l'aide publique crée de nouvelles activités de R&D – diminue si les entreprises combinent différents dispositifs d'aides fiscales (Dumont 2019, p.5).

La Belgique doit faire face à des constats ou des appels répétés d'organisations nationales (comme le Bureau fédéral du plan) et internationales (comme la Commission européenne et l'OCDE), quant à plusieurs problèmes : une meilleure efficacité des mesures de soutien à la R&D, une meilleure valorisation des résultats de la R&D financée par les pouvoirs publics au niveau de l'activité économique et de l'emploi, et une meilleure diffusion de l'innovation. Les membres du CCE établissent en ce moment un diagnostic commun de ces problèmes. Ces travaux devraient permettre de formuler des propositions afin de mieux calibrer les politiques économiques de soutien aux dépenses en R&D et de mettre en place des politiques économiques adéquates dans le but de valoriser au maximum les dépenses en R&D, c'est-à-dire de faire en sorte que ces dernières se traduisent le plus possible par de la valeur ajoutée et des emplois supplémentaires.

[69] En 2016, la déduction fiscale pour les revenus des brevets a été remplacée par une déduction fiscale pour revenus d'innovation.

En Belgique, l'activité de R&D est relativement concentrée dans un petit nombre de secteurs et de grandes entreprises. De plus, une petite part des dépenses totales en R&D provient des **jeunes entreprises**[70]. Or, ce sont certaines de ces jeunes entreprises qui ont le meilleur potentiel de croissance (Schoonackers 2020). Dans ses recommandations spécifiques à la Belgique, la Commission européenne appelle à une répartition plus large des investissements en R&D, y compris parmi les **petites entreprises**.

Le CCE considère qu'une attention particulière doit être accordée à la manière dont la **diffusion** peut être stimulée. En effet, il n'est pas seulement important de développer de nouvelles technologies/connaissances, il convient également de les diffuser au sein de l'économie. Il est donc important de surmonter les obstacles à cette diffusion technologique, notamment en augmentant la capacité d'absorption des entreprises (y compris les PME), soit la capacité à apprécier, assimiler et intégrer les nouvelles technologies/connaissances dans des applications commerciales. Dans le souci d'augmenter la capacité d'absorption des entreprises, on peut miser sur l'élargissement de la base R&D, le relèvement de l'offre de profils STEM et TIC sur le marché du travail, l'encouragement de l'innovation organisationnelle dans les entreprises… Par ailleurs, il importe aussi de stimuler les liens entre les acteurs de l'innovation.

Comme il l'a exprimé dans un avis récent, le CCE (2020) estime par ailleurs qu'il est important de ne pas perdre de vue l'innovation lors de l'élaboration des **réglementations**, et de tenir compte de cet élément lorsqu'il s'agit de mettre en balance d'autres « intérêts » en jeu tels que la sécurité, la qualité, la protection... De nombreuses réglementations, sans être (dé)favorables à l'innovation en termes de contenu, ont, de par leur mise en œuvre, un impact significatif sur l'innovation. Par exemple, une réglementation qui favorise les entreprises établies par rapport aux nouvelles entreprises et entrave ainsi l'entrée sur le marché de nouveaux arrivants peut avoir un impact négatif sur le fonctionnement du marché et donc sur l'innovation. Les lourdes charges administratives ont également un coût d'opportunité : les ressources et le temps utilisés pour se conformer à la réglementation ne peuvent être consacrés à d'autres activités, comme l'innovation. Il est également important, sur le plan du contenu, que les réglementations soient adaptées suffisamment rapidement aux nouveaux développements et qu'elles laissent de la place à l'innovation. La rapidité avec laquelle cela se produira sera déterminante pour le développement des « first mover advantages » dans une perspective internationale. Il faut toutefois aussi tenir compte de l'impact sociétal des innovations, des risques potentiels et des éventuels effets secondaires indésirables.

e. Thématiques complémentaires

Parallèlement aux deux axes stratégiques épinglés par le CNP dans son rapport (le dynamisme entrepreneurial et l'innovation), le CCE souhaiterait mettre à nouveau en avant l'importance de l'éducation et de la formation d'une part, et de la concurrence d'autre part, comme leviers de la compétitivité.

Education et formation

L'éducation et la formation sont des éléments essentiels dans le processus d'accumulation de capital humain. Or ce facteur est fondamental pour stimuler la productivité et la capacité d'innovation. L'enseignement et la formation œuvrent à une diminution des inadéquations sur le marché du travail, garantissent les opportunités sur le marché du travail, développent et élargissent les possibilités de carrière dans ce contexte de transition, facilitent l'activation et la mobilité professionnelle dans un secteur et entre les secteurs, contribuent à diminuer les pénuries sur le marché du travail et ont un rôle émancipateur pour chaque citoyen qui dépasse le cadre du marché du travail (développement personnel, démocratie, bien-être, participation citoyenne, arts et culture, etc.).

La **formation tout au long de la vie** est un élément clé afin de répondre aux besoins des entreprises et aux inquiétudes des travailleurs dans ce contexte de transition environnementale et de changements technologiques qui devraient entrainer une transformation qualitative et quantitative du marché du travail. Ce facteur

[70] Vennix (2019) montre que moins de 3 % des dépenses belges en R&D du secteur privé sont le fait des entreprises de moins de 5 ans.

est fondamental pour stimuler la productivité et la capacité d'innovation. La participation à la formation continue constitue une responsabilité partagée entre les employeurs, les travailleurs, les autres individus et les pouvoirs publics.

L'économie est confrontée à un problème structurel d'**inadéquation sur le marché du travail**. D'un côté, de nombreux postes restent difficiles à pourvoir. De l'autre, des groupes spécifiques de la population continuent d'éprouver des difficultés à être intégrés au marché du travail. Ce phénomène se révèle être un frein sérieux à l'activité économique et une menace pour la cohésion sociale. Les transitions climatique et numérique qui s'annoncent sont porteuses de nombreuses opportunités en termes d'emploi et de compétitivité mais il faut veiller à ce qu'elles n'aggravent pas les problèmes structurels de l'économie belge. L'intégration des groupes à risque sur le marché du travail constitue une thématique prioritaire. Ainsi, il convient de soutenir l'insertion dans le marché de l'emploi des personnes les plus éloignées du marché du travail (en particulier les personnes faiblement scolarisées, les travailleurs âgés, les personnes issues de l'immigration, ainsi que les personnes absentes pour raison de maladie qui peuvent reprendre une activité professionnelle, éventuellement à un poste de travail adapté ou dans un autre métier, en fonction de leurs problèmes de santé). Vu l'importance des orientations en sciences et techniques (STEM) – y compris les cycles courts portés sur la pratique – pour le marché du travail, il est également requis de chercher à rendre plus attrayant le choix de ces formations.

Concurrence

Les questions de concurrence et de concentration constituent une problématique importante eu égard notamment à l'impact négatif sur la concurrence de la **concentration du pouvoir de marché** ces dernières années aux mains de quelques acteurs, dont certaines plateformes en ligne mais aussi certains secteurs de services. Il subsiste des obstacles à la concurrence dans plusieurs secteurs de services, comme le rappellent régulièrement la Commission européenne (2020) et l'OCDE (2020). Ces problèmes de concurrence peuvent constituer un des facteurs explicatifs de la dispersion croissante des performances de productivité entre les entreprises les plus et les moins productives. Vu l'effet néfaste d'une concurrence entravée sur la productivité, le CCE demande que le CNP donne priorité à ce problème dans ses analyses futures.

Pour éviter une concurrence déloyale avec des entreprises étrangères soumises à des législations moins contraignantes en matière (entre autres) de droits fondamentaux des travailleurs et des citoyens, ou encore de protection de la santé et de l'environnement, il est aussi souhaitable de promouvoir une gouvernance et des relations commerciales qui garantissent un **level playing field** pour les entreprises. Un « level playing field » pour les entreprises est essentiel en vue d'assurer la transition vers une société neutre en carbone et sobre en ressources.

Le CCE plaide enfin pour un renforcement des moyens de **l'Autorité belge de la concurrence**, au vu de son rôle important dans la poursuite des pratiques anticoncurrentielles, dans le contrôle des principales opérations de concentration et de fusion et de la nouvelle compétence que celle-ci s'est vu octroyer en juin 2020 concernant les abus de position de dépendance économique (B2B) (loi du 4 avril 2019). La CCS Concurrence (2020) s'est également exprimée dans ce sens dans le cadre de son avis sur le renforcement de l'efficacité des autorités nationales de concurrence.

Autres thématiques importantes

E-commerce

Les conséquences de la crise de la COVID-19 sur le secteur de la distribution sont énormes dans le domaine de l'e-commerce et du commerce physique. La CCS Distribution (2020) souligne dans un avis récent le défi majeur à relever par les autorités publiques en Belgique, à savoir le développement de l'e-commerce et l'amélioration de sa durabilité en symbiose avec le commerce physique. Des conditions de concurrence équitables pour les entreprises d'e-commerce belges et étrangères et une politique cohérente assortie d'objectifs et mesures concrets en vue d'une plus grande durabilité de la logistique de l'e-commerce et du last mile en Belgique sont indispensables au succès de la prise en charge de ce défi (CCS Consommation et al. 2021).

Chaines de valeur

La pandémie et la transition vers la neutralité carbone mettent en évidence nos **dépendances aux chaines de valeur**. Il serait intéressant d'effectuer des analyses en profondeur des secteurs les plus touchés et de l'impact que cela a sur la productivité. Mieux comprendre les chaines de valeur des entreprises belges pourrait déboucher sur des recommandations plus précises pour améliorer la position internationale de ces dernières, en diversifiant par exemple les chaines de valeurs ou, dans des cas particuliers, en relocalisant certaines parties des chaines de valeurs vers le marché intérieur européen.

Par ailleurs, la crise a montré que certaines opérations visant à accroitre les gains de productivité pouvaient donner lieu à une perte en termes de **résilience** (comme la délocalisation des activités essentielles). À l'inverse, certains investissements visant à accroître la résilience peuvent se faire au détriment de la croissance de la productivité à court terme. Il convient de mener une réflexion sociétale sur notre indépendance stratégique par rapport à certains biens et services essentiels qui dépasse le cadre d'analyse de l'entreprise individuelle. Dans ce cadre, le CCE regrette que le Plan pour la reprise et la résilience contienne peu d'éléments visant à améliorer la résilience de notre pays (CCE et CFDD 2021a).

Plan de relance

f. Cadre institutionnel et importance du dialogue social

La Facilité pour la reprise et la résilience, cadrée par le Pacte vert pour l'Europe, poursuit quatre objectifs généraux : la promotion de la cohésion économique, sociale et territoriale de l'Union européenne, le renforcement de la résilience économique et sociale, l'atténuation de l'impact social et économique de la crise et le soutien à la transition écologique et à la transformation numérique.

Chaque État membre de l'Union européenne a été invité à remettre à la Commission européenne un Plan pour la reprise et la résilience (PRR) pour pouvoir bénéficier de la Facilité pour la reprise et la résilience. Le 23 juin 2021, la Commission européenne a adopté une évaluation positive du plan pour la reprise et la résilience de la Belgique. La Commission a évalué le plan de la Belgique au regard des critères énoncés au niveau européen. Dans son analyse, elle a examiné en particulier si les investissements et les réformes prévus dans le plan de la Belgique soutenaient les transitions écologique et numérique, contribuaient à relever efficacement les défis recensés et renforçaient son potentiel de croissance, la création d'emplois et sa résilience économique et sociale.

La Commission relève également que la Belgique a consulté un large éventail de parties prenantes dans le cadre du processus d'élaboration et d'adoption du plan afin de renforcer l'appropriation nationale du plan. Au niveau fédéral, un grand nombre de parties prenantes ont été consultées, notamment les interlocuteurs sociaux et la société civile. Le gouvernement fédéral a mis en place un comité consultatif, composé du Conseil central de l'économie et du Conseil fédéral du développement durable, réunissant les interlocuteurs sociaux et la société civile (organisations environnementales, organisations de coopération au développement, organisations de consommateurs, organisations de jeunesse et universitaires), qui a fourni des avis à différents stades du processus d'élaboration du plan. Le Conseil national du travail s'est joint aux travaux conjoints du Conseil central de l'économie et du Conseil fédéral du développement durable. Il est à noter enfin que le gouvernement s'est engagé à poursuivre le dialogue avec les partenaires sociaux et la société civile au cours de la mise en œuvre du plan.

g. Contenu

Pour le CCE et le CFDD (2021a), le PRR doit s'inscrire dans une **vision à long terme** (incluant une stratégie de long terme pour les investissements publics) et servir à mener des politiques viables sur les plans financiers et budgétaires tout en accordant une attention suffisante à la gestion des risques (tant sanitaires qu'économiques et environnementaux).

Cette vision large doit fixer l'orientation globale et assurer la **cohérence entre les différents niveaux de pouvoir** (fédéral, régional, européen). Elle nécessite une **politique/stratégie industrielle** intégrant les investissements en R&D, les investissements en matière de rénovation, d'énergie durable et de mobilité, la transition vers une économie circulaire et la transition numérique.

La pandémie de COVID-19 a mis en évidence l'**interdépendance mondiale**. La reprise et la résilience d'une petite économie ouverte comme celle de la Belgique dépendront donc aussi d'une approche européenne et mondiale coordonnée, de la performance de son tissu industriel et de services ainsi que des conditions dans lesquelles il opère. Dans le cadre de cette coordination mondiale, et considérant l'interdépendance entre pays, il est important que les États européens, dont la Belgique, remplissent leurs différents engagements de solidarité internationale, en particulier dans le cadre de l'Agenda 2030 et ses 17 ODD, et assurent la cohérence de toutes leurs politiques avec cet agenda.

Le PRR doit s'inscrire dans un processus structurel de **développement durable** (dans un cadre européen et mondial) s'appuyant sur l'évolution des connaissances scientifiques. Dans ce cadre, le CCE, le CNT et la CCS Consommation (2021) plaident pour une coordination interfédérale renforcée et une gouvernance efficace dans le domaine du développement durable, sans oublier la prise en compte du contexte supranational (ONU, OIT, Commission européenne). Ils demandent d'élaborer une vision intrafédérale et interfédérale (un plan interfédéral) en matière de développement durable et de relancer à cet effet la conférence interministérielle pour le développement durable.

En matière de **productivité**, le CCE et le CFDD s'interrogent dans un avis commun (CCE et CFDD (2021b) quant à l'absence de réforme en vue de promouvoir la concurrence (loyale) entre entreprises et une politique proactive de protection du consommateur, des mesures pourtant annoncées dans l'accord de gouvernement. Le PRR ne mentionne pas non plus de réforme structurelle au niveau fédéral portant sur le système de R&D et d'innovation. En ce qui concerne la transition vers une économie circulaire, des recommandations concrètes ont été formulées voici peu par le CCE et le CFDD (2020). Enfin, en matière de formation, les Conseils ont appelé le gouvernement à poursuivre activement dans le cadre de la relance un certain nombre d'efforts et de réformes reprises dans l'accord de gouvernement : l'insertion sur le marché de l'emploi, la mobilité des travailleurs vers les secteurs où il y a des pénuries, les aspects liés au temps de travail et à la flexibilité, le travail intermédiaire, l'évaluation des différentes formes de contrats sur le marché du travail et le régime de fin de carrière. Il importe de mener ces réformes en étroite concertation avec les partenaires sociaux et les autres parties prenantes, conformément aux engagements pris dans l'accord de gouvernement.

Le PRR ne comble que partiellement un retard en matière d'investissement en Belgique. Le Conseil appelle à une augmentation structurelle des **investissements publics** à 4 % du PIB par an d'ici 2030. Le Conseil regrette par ailleurs l'absence de réforme destinée à permettre une meilleure coordination budgétaire entre les entités fédérées. Cette réforme permettrait à la Belgique d'atteindre plus facilement ses objectifs d'investissement public.

Les **investissements privés** doivent eux aussi être encouragés. En effet, la combinaison des investissements publics et privés a un effet multiplicateur plus grand sur l'économie. Les pouvoirs publics ont pour tâche importante d'indiquer la direction à suivre. Pour ce faire, il faut un cadre réglementaire clair, cohérent et stable, garantissant aux investisseurs la sécurité juridique nécessaire. Celui-ci doit simultanément garantir les droits fondamentaux des travailleurs et des citoyens, la protection de la santé et de l'environnement et éviter un impact négatif sur la vitalité des entreprises.

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