ECONOMIC REVIEW
December 2021

National Bank OF BELGIUM
Eurosystem

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Contents

Economic projections for Belgium – December 2021

- Global growth is easing as supply struggles to keep up with demand, which results in delivery and production delays, shortages of (input) materials and rising prices. At the same time energy prices have skyrocketed.
- The current NBB projections are based on a set of common Eurosystem assumptions. The latter include significant declines in energy price as of the spring of next year (in line with the prices on futures markets), as well as the dissipation of the supply bottlenecks by late-2022.
- The recent resurgence of the COVID-19 pandemic (despite successful vaccination campaigns), that has led to the reintroduction of certain containment measures in many euro area countries, is another element that weighs on the near-term outlook.
- The Belgian economy has recovered much faster than expected from the initial COVID-19 shock and has already reached its pre-pandemic level. However, the aforementioned headwinds (supply bottlenecks, high energy prices, resurgence of the pandemic) should lead to a clear slowdown : the economy will barely grow until the spring of 2022.
- However, the outlook for the medium term is brighter and growth should pick up after the first quarter of 2022. It will be mainly driven by private consumption owing to solid income growth and a normalisation of the savings ratio.
- The labour market continued to surprise on the upside in recent quarters ; job creation should decelerate but stay positive also thanks to an increase in the participation rate.
- Surging prices lead to unprecedented labour cost growth as of 2022 via the indexation mechanisms, which worsens cost competitiveness in the short term.
- In turn, higher wage costs are passed on to core inflation, although no longer-lasting wage-price spiral is included in the projections. Declining firm profit margins should partially absorb labour cost increases, while external price pressures should ease in the course of 2022.
- Against this backdrop, headline inflation peaks in the first months of 2022 (at close to 8 %) and core inflation peaks by mid-2022 but both fall back to levels that are clearly below 2 % by the end of the projection period.
- The budget deficit is expected to stay above 4 % of GDP by the end of the projection horizon and government debt remains on an upward path, also after the end of the projection period.
- The risks surrounding the outlook remain high and pertain to the expected price developments on international markets, as well as the health situation.
- As usual, the projections only take into account government measures that have been decided and are likely to pass the legislative process and had been announced in sufficient detail by the cut-off date (1 December 2021). Additional government measures could affect the growth outlook as well as the public finance projections.

Introduction

The macroeconomic projections for Belgium described in this article are part of the joint Eurosystem projections for the euro area. That projection exercise is based on a set of technical assumptions and forecasts for the international environment drawn up jointly by the participating institutions, namely the ECB and the national central banks of the euro area. The cut-off date for the Belgian projections was 1 December 2021. The baseline projections for Belgium are discussed in detail and individual risks are discussed in the final section of this article.

1. Global growth is easing while price pressures are mounting

The global economy had already reached its pre-crisis level again by the end of 2020, mainly thanks to the exceptionally strong recovery in China. Elsewhere, and for the advanced countries in particular, the recovery phase took a bit longer and the pre-crisis level was only reached in the course of 2021. Meanwhile, survey data suggest that the momentum for growth in the second half of the year is already easing again, as several headwinds (re-)emerged or intensified.

Supply continues to struggle to keep up with the surge in demand, not least in the euro area, which results in shortages of specific materials, lengthening delivery (and production) times and upward pressure on prices. Based on current survey indications these supply issues are assumed to dissipate only by the end of 2022. In addition, the spectacular surge in energy prices substantially raises production costs for energy-intensive manufacturing industries and pushes up headline inflation numbers. Finally, the recent resurgence of COVID-cases has already triggered the reintroduction of restrictive measures in many countries. All in all, the short-term economic outlook has been slightly revised down compared to the spring, but the balance of risks continues to be tilted to the downside. According to the current Eurosystem assumptions, global activity (excluding the euro area) growth is projected to reach 6 % in 2021 but would gradually decline over the projection horizon, to 3.7 % in 2024.

The supply shortages and rising input prices are mainly hampering production in the manufacturing industry and therefore also international goods trade. According to the Eurosystem assumptions, global trade (excluding the euro area) growth is still estimated to increase by 11 % in 2021 but the growth rate would fall to an annual average of just over 4 % over the remainder of the projection horizon.

As usual, the profile of world trade determines the growth path of euro area foreign demand and Belgian export markets, with the latter being an important element for the macroeconomic projections for Belgium

Table 1

The international environment

(annual percentage changes)

	2020	2021 e	2022 e	2023 e	2024 e
World (excluding euro area) real GDP	–2.3	6.0	4.5	3.9	3.7
World (excluding euro area) trade	–8.0	11.1	3.9	4.4	4.0
Euro area foreign demand [1]	–9.3	8.9	4.0	4.3	3.9
Belgium's relevant export markets [1]	–9.7	7.9	5.5	5.8	3.4

Source : Eurosystem.

1 Calculated as a weighted average of imports of trading partners.

in the medium term. Compared to the NBB's June 2021 projections, Belgian export market figures have been revised slightly down in 2021 and 2022, reflecting the headwinds in the near term. Belgian export market growth in 2023, on the other hand, has been revised up and is expected to amount to 5.8 %, before dropping to 3.4 % in 2024.

Turning to the technical and financial assumptions underlying these new Eurosystem projections, the exchange rate is considered to remain constant throughout the projection period. In the case of the US dollar, this implies an exchange rate of $ 1.13 to the euro, i.e. a mild depreciation of the euro compared to the average level in the first half of 2021.

As usual, oil price and interest rate assumptions are based on market expectations. At the cut-off date (25 November), a barrel of Brent crude oil was priced at just over €70 and the price was expected to gradually trend down to close to €60 by the end of 2024. However, the resurgence of COVID-19 fears and the threat of a new virus variant in particular wreaked havoc on the financial markets and the oil price suddenly plummeted by close to 10 USD on Friday 26 November, just after the cut-off date of the assumptions. At the time of writing, it was still clearly below the assumptions used for the near term. At the same time, gas prices have risen significantly and are now clearly higher than the assumptions used for this exercise.

The three-month interbank deposit rate is expected to rise somewhat, from an average of –0.5 % in 2021 to 0 in 2024. The Belgian sovereign long-term interest rate is currently close to zero, but should rise to 0.5 % on average in 2024. This should lead to an increase in the average mortgage interest rate by about 70 basis points over the projection horizon. The average interest rate on business loans should rise to a similar degree. Even so, financing conditions remain very favourable compared to long-run averages.

The mechanical impact of the revised assumptions on economic activity compared to the June forecasting exercise is negative in 2021 and 2022, but positive in 2023.

Table 2

The Eurosystem technical assumptions

(annual averages; in %, unless otherwise stated)

	2020	2021 e	2022 e	2023 e	2024 e
EUR/USD exchange rate	1.14	1.18	1.13	1.13	1.13
Oil price (US dollars per barrel)	41.5	71.8	77.5	72.3	69.4
Interest rate on three-month interbank deposits in euro	–0.4	–0.5	–0.5	–0.2	0.0
Yield on ten-year Belgian government bonds	–0.1	0.0	0.2	0.4	0.5
Business loan interest rate	1.6	1.6	1.7	2.0	2.2
Household mortgage interest rate	1.6	1.5	1.8	2.0	2.2

Source: Eurosystem.

2. The euro area growth outlook remains solid while inflation should come down soon

The euro area economy has posted strong growth in the previous two quarters, at over 2 % in quarterly terms, mainly supported by a strong performance from the services industry and dynamic consumer spending in response to the gradual reopening of the economy. This reopening effect on growth is now fading and the euro area economy is assessed to be slowing down in the final quarter of this year in particular, due to the aforementioned headwinds. While supply bottlenecks are mainly weighing on industrial production, a worsening of the health situation is likely to dampen private consumption growth (in particular for the services industry).

However, energy price pressures are expected to weaken further as of the spring of 2022 and supply chain disruptions should dissipate in the course of next year. In addition, the Eurosystem projections are anchored to the assumption that the health situation should improve again in the spring. Hence, beyond the near term, the euro area growth outlook remains solid. The expansion of private consumption and total investment should continue to be the main growth engines. Government investment in particular is boosted by the NGEU funds. Despite the short-lived deceleration at the end of this year, euro area growth should still come in at above 4 % in 2022. It is then projected to gradually decline to a level that is close to the trend growth rate.

Headline inflation has surged in recent months to a peak of close to 5 % in November, mostly reflecting the strong increases in energy prices. However, it should gradually fall and already be back below 2 % by the end of next year. Second-round effects via higher wage claims remain quite limited and core inflation stays below 2 % throughout the projection period, even though it comes close to that level at the end of 2024.

Eurosystem staff assesses risks to growth as being tilted to the downside, for the near-term in particular. It is currently still unclear how the pandemic will evolve over the coming weeks. Beyond the near-term, the pick-up of activity is conditional, for instance, on the dissipation of supply disruptions. At the same time, Eurosystem staff mostly sees upside risks to inflation. The latter include the possibility of a stronger wage-price spiral, as well as an upward shift in inflation expectations.

The labour market has been resilient so far, inter alia thanks to government support measures such as the short-term working schemes. Employment growth should remain very strong until the spring and only gradually lose traction in the projection period. The unemployment rate continues to decline and should be 1 percentage point below the pre-crisis level in 2024.

The euro area budget deficit still remains high in 2021 but declines throughout the projection period as the government support measures are gradually phased out. It reaches a level that is comfortably below 2 % of GDP in 2024 and also below the pre-crisis deficit. This does not only reflect the more favourable cyclical conditions but also a strong improvement in the structural budget balance. The government debt is on a declining path, also when economic growth normalises. It falls to below 90 % of GDP in 2024.

Table 3

Eurosystem projections for the euro area

(percentage changes compared to the previous year, unless otherwise stated)

	2020	2021 e	2022 e	2023 e	2024 e
Real GDP (contributions in percentage points)	–6.5	5.1	4.2	2.9	1.6
of which:					
Domestic demand (exclude changes in inventories)	–5.7	3.4	3.9	2.5	1.3
Net exports	–0.4	1.3	0.4	0.2	0.2
Inflation (HICP)	0.3	2.6	3.2	1.8	1.8
Core inflation [1]	0.7	1.4	1.9	1.7	1.8
Domestic employment	–1.5	1.1	1.3	1.0	0.6
Unemployment rate [2]	7.9	7.7	7.3	6.9	6.6
General government financing requirement (–) or capacity [3]	–7.2	–5.9	–3.2	–2.1	–1.8
Public debt [3]	97.3	96.6	93.2	90.7	89.7

Source: ECB.

1 Measured by the HICP excluding food and energy.

2 In % of the labour force.

3 In % of GDP.

3. The Belgian economy decelerates sharply in the near term but growth should pick up again in the spring of next year

The recovery of the Belgian economy has accelerated in the course of 2021. Third-quarter growth came in at 2.0 % in quarter-on-quarter terms, 0.2 pp higher than was expected in both our June 2021 projection exercise and in the September 2021 Business Cycle Monitor, as well as the NAI's flash estimate. However, this growth rate was mechanically boosted by a level effect related to the gradual normalisation of health-related measures in the course of the second quarter: the restrictions on activities and associated spending opportunities that negatively affected (part of) the second quarter, did not affect the third to the same degree. GDP growth in the fourth quarter will not benefit from a similar boost. As indicated in the Business Cycle Monitor published on 9 December 2021, activity should decelerate sharply to a quarterly growth of just 0.2 % in the fourth quarter due to increasing headwinds.

First, pervasive supply bottlenecks are negatively affecting growth by limiting the production capacity of firms. The manufacturing and logistical industries were unprepared for the much faster than expected recovery in the second half of 2020. The demand glut caused freight tariffs to skyrocket. Major ports became jammed with ships and containers and delivery times increased across the board and are hampering production. The difficulties to anticipate volatile demand caused bullwhip effects exacerbating the supply-chain problems. A recent NBB ad-hoc business survey (published on 8 November) found that firms in (retail) trade, manufacturing and construction in particular have been hit. Moreover, an increasingly tight labour market presents a significant hurdle for firms seeking to maintain or even expand their production.

Second, the strong hike in energy prices, which was particularly marked in Europe, is weighing on economic growth. On the one hand, energy-intensive manufacturing industries are faced with higher costs and sometimes

reduce output levels, in particular when they can not fully pass on these cost increases to output prices. On the other hand, higher energy bills negatively affect demand through their impact on purchasing power (as it takes time for the indexation mechanisms to kick in and the indexation does not fully offset the price hikes, for the low-income households in particular) or consumer confidence and, hence, precautionary saving.

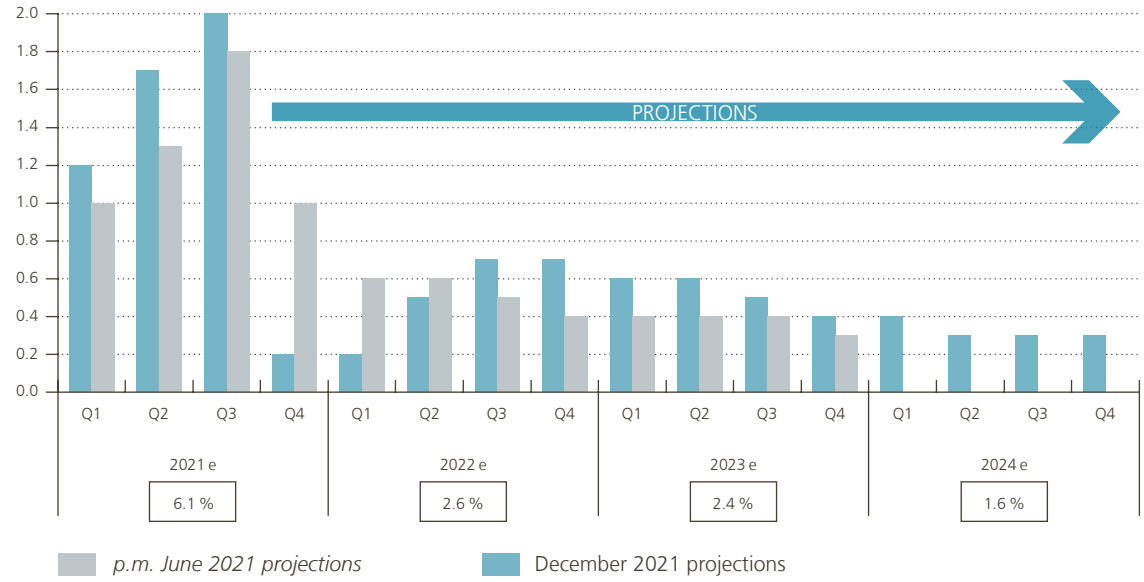
Finally, the resurgence of the ongoing pandemic has put further strains on the economy. In the end, it turned out that even a very high vaccination rate could not prevent the spread of the virus. Infection and hospitalisation numbers started to rise again and important containment measures were reintroduced in several euro area countries, including full lockdowns in a number of cases. In Belgium, working-from-home policies and face mask mandates have been tightened again, while consumption in restaurants and bars is regulated through the COVID Safe Ticket (CST), which effectively bans the unvaccinated. In addition, nightlife venues were closed again and large-scale indoor and certain outdoor events were cancelled. The increasing infection rate also leads to a higher number of workers on sick leave or in quarantine, which puts strains on production in many firms. Even though hospitalisation numbers started dropping at the time of writing, it was assumed, also given the uncertainty surrounding the emergence of the new omicron variant, that the current restrictive measures will remain in place to some degree in a large part of the following quarter as well.

All in all and based on the current information set, these headwinds are likely to still depress growth at the start of 2022. However, they should gradually dissipate in the course of next year. The futures on the energy markets, on which the assumptions for these projections are based, point to declining prices, in particular for gas from the spring onwards. The health situation is assumed to improve again after the winter months and should allow for a relaxation of the containment measures, once the booster vaccination campaign picks up speed. Finally, the aforementioned NBB survey shows that firms on average expect that supply bottlenecks will last well into 2022 but improve thereafter and certain indicators suggest that some supply chain problems may even ease in the near term.

Chart 1

Quarterly growth is depressed in the near term but should pick up again in the course of 2022

(quarter-on-quarter growth in real GDP, percentages, seasonally and working-day adjusted; the numbers in the boxes show the annual growth in percentages)



Sources: NAI, NBB.

Against this backdrop, growth should remain flat in the first quarter of 2022 but then gradually pick up again to above-potential levels, partly reflecting a normalisation after the headwinds dissipate. In the longer term, growth is projected to gradually decline to its potential level.

In annual terms, growth is now estimated to come in at just above 6 % in 2021. This is even higher than the estimate of 5.5 % in the NBB's June 2021 projections despite the slower growth at the end of the year but also reflects upward revisions of the NAI statistics for the first three quarters of the year. Yearly growth then declines to around 2.5 % in the two following years and is projected to drop to just above potential in 2024. Beyond the near term, the slowdown in annual growth is also due to the decline in public consumption as the boost from COVID19-related health care spending disappears.

All in all, the post-crisis recovery of the Belgian economy has been remarkably strong. The return to quarterly growth numbers that are lower on average than in 2021 should also be seen as a normalisation after turbulent times. While the economy has already returned to its pre-pandemic level, there is still some damage compared to a hypothetical 'no-COVID-19'-scenario in which the December 2019 projections are taken as a benchmark. However, this damage is much smaller than feared initially (which is in line, for instance, with the limited increase seen for the unemployment rate).

4. Domestic demand and private consumption in particular will drive growth

Private consumption had lagged the recovery seen in the other demand components and was still about 10 % below pre-crisis levels in the first quarter of 2021 whereas other demand components had already regained their losses. However, consumption growth accelerated significantly in the course of 2021. Although a peak over the summer was expected, the November NAI data release indicated that the expansion in the third quarter (+6.3 %) was even more spectacular than projected, pushing household consumption above pre-crisis levels several quarters sooner than expected in the June exercise.

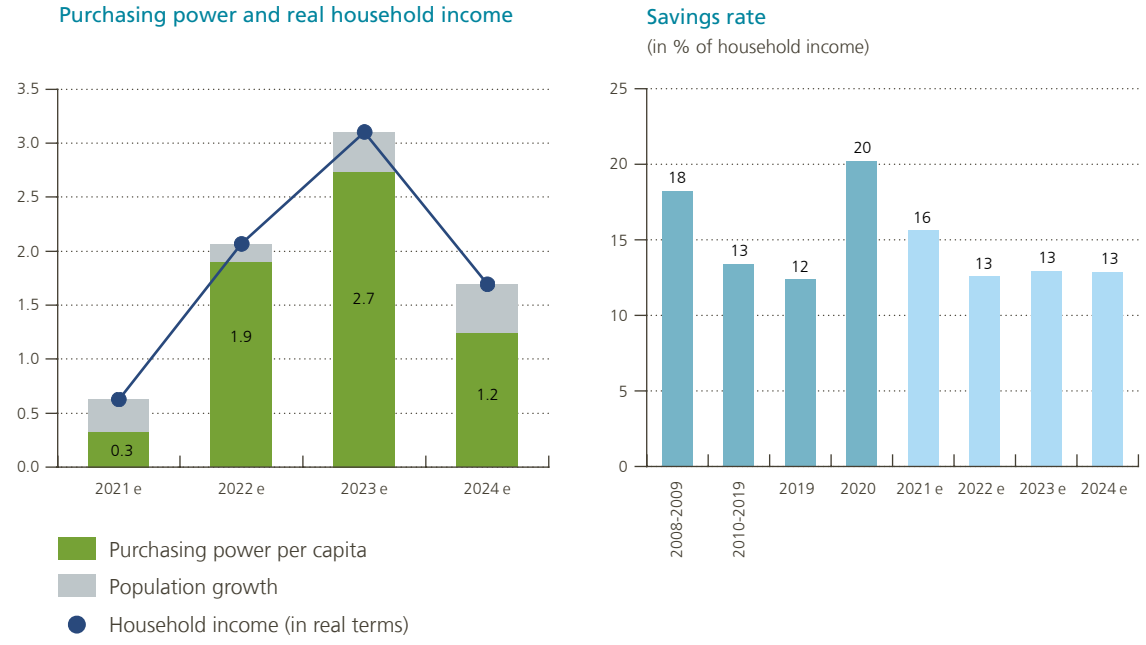
Going forward, we project a strong deceleration in quarter-on-quarter growth from the fourth quarter of 2021 onwards. This will be caused in large part by the disappearance of the base effect from the easing of restrictions in the second quarter. In addition, the aforementioned headwinds should in particular weigh on private consumption. Supply bottlenecks imply longer waiting times for durable consumption goods, while higher energy prices erode consumers' purchasing power and confidence. In addition, the resurgence of the pandemic should dampen household consumption, mostly for leisure and certain services industries. Households have already adapted their behaviour in response to the news about rising infection rates: even prior to the official restrictive measures, mobility indicators regarding retail and recreation clearly fell back below their pre-pandemic levels.

In the longer term fundamentals for household consumption remain sound. All in all, growth rates for private consumption remain above-average until the end of 2023, before normalising in 2024. Private consumption is supported by the continued net job creation and robust real disposable income growth. Even though certain groups in the population have certainly recorded big income losses in 2020, average household income was shielded by the automatic stabilisers and massive government support measures. The latter have been gradually wound down in 2021, but disposable incomes have been boosted by strong employment growth. However, part of the gains has been eroded by higher inflation. Purchasing power is projected to only increase by 0.6 % in 2021 or 0.3 % per capita. This will be (partially) compensated in 2022 and beyond as the wage indexation mechanisms kick in with the usual lag and drive up nominal wages, while inflationary pressures are expected to come down. Overall, real disposable income should grow by around 7 % in the 2022-2024 period, which amounts to a total gain in purchasing power of nearly 6 % per capita.

Chart 2

Household purchasing power and savings ratio

(percentage changes compared to the previous year, unless otherwise mentioned)



Sources: NAI, NBB.

In addition, the savings ratio should decline from the exceptional peak in the crisis year 2020 to around the pre-pandemic level. Compared to pre-crisis levels, 2020 saw Belgian households accumulate an additional €23 billion in 'surplus savings'. The various containment measures disrupted spending patterns, 'forcing' households to save and the savings ratio reached an annual average of 20.2 %. Savings should fall to 15.6 % of gross disposable income in 2021, following the rebound in household consumption as restrictions were scaled back. This is still higher than usual as containment measures (e.g. the closure of bars and restaurants, as well as contact professions) were still in place for several months in 2021. The savings ratio will then fall back further as of 2022, to levels that are close to the pre-crisis ones. The minor uptick of the savings ratio in the outer years is due to some consumption smoothing in the presence of volatile income developments brought about by the indexation mechanisms. In 2023, wages and social transfers are indexed on the basis of past high inflation, while actual inflation is already declining rapidly (see below); this leads to a spike in real income growth in that year, a larger part of which is saved. The 2024 level is slightly higher than the pre-crisis level, which should be seen against the backdrop of the structural worsening in public finances and the greater need for fiscal consolidation. The latter may have an upward impact on precautionary saving.

Table 4

GDP and main expenditure categories

(seasonally adjusted volume data; percentage changes compared to the previous year, unless otherwise stated)

	2020	2021 e	2022 e	2023 e	2024 e
Household and NPI final consumption expenditure	–8.2	6.4	5.7	2.6	1.8
General government final consumption expenditure	0.2	4.5	–0.7	0.9	1.4
Gross fixed capital formation	–6.2	9.4	1.8	4.4	2.3
General government	0.6	8.7	3.6	9.3	3.6
Housing	–6.8	10.4	2.4	1.6	1.2
Businesses	–7.0	9.2	1.3	4.5	2.4
p.m. Domestic expenditure excluding the change in inventories[1]	*–5.7*	*6.5*	*3.1*	*2.6*	*1.8*
Change in inventories[1]	–0.3	–0.9	–0.5	0.1	0.0
Net exports of goods and services[1]	0.4	0.4	0.1	–0.2	–0.2
Exports of goods and services	–5.5	9.0	4.2	4.1	2.4
Imports of goods and services	–5.9	8.7	4.1	4.4	2.6
Gross domestic product	–5.7	6.1	2.6	2.4	1.6

Sources: NAI, NBB.

1 Contribution to the change in GDP compared to the previous year, percentage points.

The savings ratio does not dip below the pre-crisis level: our baseline assumption remains that the additional savings that households have accumulated last year will not be tapped into much for pent-up demand or 'revenge spending'. This is confirmed in a recent analysis by Basselier and Minne (2021)[1]. Savings were mostly accumulated by relatively well-off households with a lower marginal propensity to consume. In addition, they may have been already used partially for renovation works and are invested predominantly in less liquid assets, as suggested by the financial statistics.

The rebound of business investment after the immediate crisis impact has been remarkable. Firms kept investing, in line with the solid recovery in business confidence. In volume terms, by the second quarter of 2021 business investment already exceeded pre-crisis levels by 1.5 %. However, contrary to expectations, third-quarter growth came in negative at –2.4 % according to the current statistics. The extent and speed of the recovery of this demand component may imply that much of the 'recovery dynamics' is already behind us. Furthermore, rising input costs are weighing on margins, supply chain difficulties and labour market tightness are hampering production and flare-ups of the COVID-19 virus indicate that the health crisis is not over yet. These conditions will weigh on business investment growth in the short run, bringing annual growth to 9.2 % in 2021, slightly below what we expected in the June exercise. However, continued strong demand should, in principle, encourage firms to invest in capacity expansion. Other fundamentals for business investment growth such as financing conditions and confidence levels in general also remain sound. Business investment should pick up from the first quarter of next year on, although the decline in the second half of 2021 will also affect annual growth in 2022, which should remain limited to 1.3 %.

Public consumption growth in 2020 was revised down by 0.4 pp since the June exercise, in large part due to healthcare spending that was (partially) shifted to 2021 as hospital capacity had to be reserved for COVID-19-patients. Partly because of this shift, our projection for 2021 has been revised up by 0.8 pp to 4.5 %.

1 Household savings during and after the COVID-19 crisis: Lessons from surveys | nbb.be, November 2021

A further boost to public consumption in 2021 comes from the costs related to the 2021 vaccination drive, that came in higher than previously expected. In addition, public employment in the first half of 2021 was up due to the replacement of a much larger than usual cohort of teachers on sick leave. Although the booster vaccination drive will affect 2022, we expect a gradual return to normal for health care spending from 2022 onwards. The disappearance of most COVID-spending will temporarily push public consumption growth into negative territory and will weigh somewhat on activity growth in 2022.

Public investment growth is expected to come in at 8.7 % this year. It is boosted by the investment projects included in the recovery plans, even if account is taken of the existing capacity constraints in the construction sector. The latter are likely to cause a postponement of some of these projects to 2022 or later. Nevertheless, government investment for 2021 is substantial, also in part because of the delivery of several military transportation aircraft in the course of 2021. The disappearance of this one-off element reduces investment growth somewhat next year but it remains robust throughout the projection period, in line with the announced government plans to increase the government investment ratio.

Housing investment posted very strong growth since the second half of 2020. The pre-crisis level has now been exceeded by about 3.5 % in real terms, more or less in line with our earlier expectations. Anecdotal evidence suggests that part of the accumulated savings 'surplus' was routed to investment in housing, which is one of the main savings motives among households. Even though the underlying fundamentals for housing investment remain healthy, growth is projected to moderate in the projection period, also in view of the limited increase in mortgage interest rates that is expected on the basis of the common Eurosystem assumptions.

Driven by buoyant world demand, Belgian export growth was strong in the first half of 2021, but came in negative in the third quarter, as export market growth slowed and supply chain problems escalated, weighing on world trade. After having recovered somewhat more slowly from the COVID-shock and suffering a potentially Brexit-related dip at the beginning of the year, imports held up slightly better than exports in the third quarter, also on account of the delivery of the aforementioned military transportation aircraft. Leaving aside the short-run volatility, as in previous exercises onwards, net exports are expected to contribute negatively to GDP throughout the projection period: continued strong domestic demand will drive up imports and losses in export market shares are projected to continue, in line with longer-term competitiveness trends. These losses are slightly exacerbated by the relatively strong increase in wage costs discussed in section 6.

5. Job creation should decelerate but continue throughout the projection period

On the labour market the post-crisis recovery is mostly seen in the gradual decline in the use of temporary employment, as well as the bridging rights for the self-employed. At the height of the crisis in 2020, a substantial part of the working population made use of those systems, which minimised job losses. The gradual normalisation from the summer of 2020 onwards has not led to an increase in the number of unemployed, which suggests that most of these workers have returned to regular employment, either in their old job or in a new job. This is due to very high labour demand, as also witnessed by historically high vacancy rates.

Technically, movements in and out of the system of temporary unemployment and bridging rights are seen as changes in average working time (as the workers concerned are still considered to be employed). Hence, the return to normal increases average working time, that took a big hit at the height of the crisis, also beyond the effect caused by the increased use of temporary unemployment and bridging rights. Average working time is still below its pre-crisis level and should continue to recover gradually throughout the projection period.

Chart 3

Domestic employment, working time and productivity

(contribution to year-on-year GDP growth, percentage points, data adjusted for seasonal and calendar effects)

Sources: NAI, NBB.

At the same time, the recovery has fueled job creation. Employment growth has continued to surprise on the upside, with an average net increase of 25 000 in the last five quarters; thereby amply making up for the losses incurred in the first half of 2020. Job creation should slow down in the projection period and in the near term in particular. In addition to the labour market impact of the estimated slowdown in activity, this reflects two elements. First, according to survey data, hiring difficulties have become pervasive in the economy: they affect most industries and do not only concern high-skilled workers. Hence, the creation of new jobs is likely to decelerate. Second, the flexible use of the temporary unemployment system was scheduled to come to an end on 31 December 2021[1]. Among the workers that are still in the system some may not succeed in returning to regular employment. Hence, employment growth should fall in the course of 2022. It will pick up again at the end of next year, albeit at a lower rate than the one observed in 2021. In annual terms, some 40 000 extra jobs should be created every year in the 2022-2024 period (with 2022 benefiting from a significant carry-over effect from the strong employment growth in the course of 2021). All in all, the harmonized employment rate of the 20 to 64 years old is expected to reach 72 % in 2024.

Turning to the different sub-segments of employment, the branches sensitive to the business cycle show a decreasing job creation in the projection period, that is roughly in line with GDP dynamics, while employment growth in education and administration falls back strongly in 2022 after the aforementioned significant increase in 2021. Remarkably and unlike what has been observed in other euro area countries, the number of self-employed continued to grow in 2020 and 2021. The structure of self-employment in Belgium, with a larger share of highly-educated people in professional and managerial occupations, and its long-term upward trend (against a declining trend in the euro area) may partially account for that. However, outflows out of self-employment have been unusually low during the crisis, also due to the protective measures. Against this backdrop, we expect a slowdown in the number of self-employed in the first half of the projection period before growth picks up again in the second half.

1 On December 10 (i.e. beyond the cut-off date for these projections), the government decided to prolong the support measures until the end of the first quarter of 2022.

Table 5

Labour supply and demand

(seasonally adjusted data; change in thousands of persons, unless otherwise stated)

	2019	2020	2021 e	2022 e	2023 e	2024 e
Working age population [1]	17	15	7	10	15	11
Labour force	59	16	52	29	30	31
Domestic employment	77	–1	81	44	41	39
Employees	63	–15	62	36	31	26
Branches sensitive to the business cycle [2]	37	–29	39	22	19	13
Administration and education	11	6	11	3	3	2
Other services [3]	14	8	12	11	9	11
Self-employed	14	14	19	8	10	13
Unemployed job-seekers	–19	17	–29	–15	–10	–8
p.m. Harmonised unemployment rate [4, 5]	*5.4*	*5.6*	*6.3*	*6.1*	*5.9*	*5.7*
Harmonised employment rate [4, 6]	*70.5*	*70.0*	*70.4*	*71.2*	*71.6*	*72.0*

Sources: FPB, NAI, NEO, Statbel, NBB.

1 Population aged 15-64 years.

2 Agriculture, industry, energy and water, construction, trade, hotels and restaurants, transport and communication, financial activities, property services and business services.

3 Health, welfare, community, public social services, personal services and domestic services.

4 On the basis of data from the labour force survey.

5 Job-seekers in % of the labour force aged 15-64 years.

6 Persons in work in % of the total population of working age (20-64 years).

Job creation is supported by a continued increase in labour market participation. The latter fell in the crisis year 2020 and the return to the job market of discouraged workers may partly explain the strong hike in 2021. Participation is projected to continue to increase in the projection period. This does not only reflect the slow upward trend related to cohort effects but also results from a number of measures that make work more attractive (including the increase in the minimum wage and the gradual abolition of the special social security contribution, that is only paid on income from work). All in all, the labour force should increase by around 90 000 persons in the 2022-2024 period.

As employment growth exceeds the increase in the labour force, unemployment will fall. The harmonised unemployment rate should come down to about 5.7 % at the end of the projection period, which is still somewhat higher than before the crisis.

6. Core inflation and labour cost growth reach a peak in 2022

Inflation has been rising substantially in recent months with the HICP indicator even peaking at above 7 % in November. This is primarily due to the stratospheric increase in energy prices. Taking into account the benchmark

Eurosystem assumptions on price developments on the international energy markets, inflation should remain very high over the course of winter and even peak at close to 8 %. However, the current projections point to a gradual decline as of March 2022.

The high energy inflation in 2021 comes from two factors. First, there is a base effect. Mostly due to the COVID-19 crisis, oil prices dropped significantly in the first half of 2020, which resulted in negative energy inflation rates and weighed on total inflation. The subsequent recovery brought back oil prices to the pre-crisis level in the spring of 2021, which already boosted energy inflation in the first half of this year. Second, after the spring, oil prices increased further and electricity and gas prices started to skyrocket. The most spectacular increase was in gas prices and resulted from the interplay of several factors : booming demand from Asia and an inelastic energy supply, the heating season in the previous winter that lasted longer than usual in Europe,

Table 6

Price and cost indicators

(percentage changes compared to the previous year, unless otherwise stated)

	2019	2020	2021 e	2022 e	2023 e	2024 e
Total inflation (HICP)	1.2	0.4	3.2	4.9	1.2	1.2
Core inflation [1]	1.5	1.4	1.2	2.4	1.9	1.5
of which :						
Services	1.8	1.8	1.6	2.5	2.4	2.0
Non-energy industrial goods (NEIG)	1.0	0.7	0.8	2.1	1.1	0.9
Energy	–0.8	–11.0	22.9	23.6	–7.0	–4.0
Food	1.3	2.6	1.0	2.7	2.6	2.4
p.m. Inflation according to the national index	*1.4*	*0.7*	*2.4*	*4.5*	*1.3*	*1.2*
Health index [2]	1.5	1.0	2.0	4.4	1.3	1.3
Private sector labour costs [3] :						
Labour costs per hour worked	2.1	4.3	–0.3	4.5	2.8	1.8
of which :						
Real conventional wages	0.7	0.6	0.4	0.6	0.2	0.6
Wage drift and other factors	–0.2	3.1	–1.5	–0.4	0.3	0.1
Indexation	1.8	1.0	1.1	4.2	2.3	1.3
Social contributions	–0.1	0.4	–0.3	–0.1	0.1	–0.1
Wage subsidies	–0.1	–1.0	0.0	0.3	0.0	–0.1
p.m. Labour costs per hour worked according to the national accounts [4]	*2.2*	*5.3*	*–0.3*	*4.2*	*2.9*	*1.9*
Labour productivity [5]	1.0	4.3	0.1	–0.9	0.2	0.4
Unit labour costs [3]	1.1	–0.1	–0.4	5.5	2.6	1.4

Sources : EC, FPS Employment, Labour and Social Dialogue, Statbel, NAI, NBB.

1 Measured by the HICP excluding food and energy.

2 Measured by the national consumer price index excluding tobacco, alcoholic beverages and motor fuel.

3 Labour costs are not shown here according to the national accounts concept but according to a broader concept that also includes reductions in contributions for target groups and wage subsidies. That concept gives a better idea of the true labour cost for firms.

4 Excluding wage subsidies and reductions in contributions for target groups.

5 Value added in volume per hour worked by employees and the self-employed.

the resulting lower-than-usual stocks for gas and increasing European carbon prices (ETS – Emission Trading System) that pushed up the cost for producing electricity, etc. Based on the current futures, electricity and gas prices should drop as of April 2022. After that, prices should continue to decline gradually up to the end of the projection horizon. Along with the declining path of the Eurosystem assumption of the Brent oil price, energy inflation should fall into negative territory again in 2023 and 2024 and push down total inflation.

The sharp acceleration of inflation in recent months pushes up wage costs through the indexation mechanisms, as the rising energy costs mostly feed into the health index. In the private sector, nominal hourly labour costs should increase by 4.5 % in 2022. This is the highest increase since the start of this time series – so at least since 1996 – and primarily due to the indexation effect (4.2 %).

The labour cost projections also take into account the wage norm for the 2021-2022 period capping the nationwide increase in conventional wages at 0.4 % (most of which would be granted in 2022), as well as the structural wage increases for the care sector of 0.6 % in the 2021-2022 period. Given that the latter wage increases are financed by the governments through wage subsidies, they do not increase overall wage costs. As surveys indicate that hiring difficulties lead to stronger wage pressures (in Flanders in particular), the estimates for the final quarter of this year and 2022 include a slightly higher wage drift. Finally, wage costs are also affected by other factors, mostly related to more technical composition effects. The latter reflect the fact that, on average, mostly lower-income workers were affected by temporary unemployment. When they return to regular employment in 2021 and 2022 this mechanically reduces the average wage cost per hour.

As the negotiation of the wage norm for 2023-2024 will only take place at the end of 2022, the real conventional wage growth for those years had to be based as usual upon a technical assumption (0.8 %). Considering the time needed to reach agreements at the industry level, this increase should mostly affect 2024. Wage drift should decline but remain positive for those years. This mainly reflects durable changes in the structure of employment such as a larger share of employees that is higher educated and the fact that employees tend to retire later (which increases the share of older and higher-paid employees).

While the projected decline in energy inflation reduces the indexation effect in the last years of the projection period, hourly labour costs should still strongly expand by more than 9 % over three years. The nominal wage growth in the neighbouring countries will also reflect higher inflation to some extent, but the substantial increase in Belgian wage costs is likely to erode relative cost competitiveness, in particular in 2022.

As costs are at least partly passed on to final selling prices, the high energy inflation, the large increases in the prices of intermediate inputs and materials, and the increase in labour costs feed into core inflation. The latter has started to increase since the late spring. Services inflation, in particular, has been up due to "reopening effects", as many businesses increased prices when they were allowed to reopen, while goods inflation already reflected the rise in input costs. The second-round effects coming from the aforementioned strong increase in wage costs should keep core inflation on an upward path in the first half of next year as well. However, according to the current projections, underlying price pressures should gradually ease as of the second half of 2022. This is conditional on the expected decline in energy prices and the assumption that supply chain bottlenecks will have mostly dissipated by then, which would lower pipeline price pressures for input costs. More generally, the projection that the hike in underlying inflation is transitory reflects the fact that increased wage costs should be partly absorbed by firm profit margins, in line with historical regularities. Profit margins typically decelerate or decline when wage costs increase rapidly, as companies do or can not pass on the full extent of the cost increases to final selling prices. In this connection, the current projections point to declining profit margins throughout the 2022-2024 period (even if they would remain above a long-run average in level terms).

All in all, core inflation is projected to peak at 2.4 % in 2022, the highest level this century. In the absence of a genuine wage-price spiral and as the exogenous cost drivers are assumed to lose traction next year, core inflation would gradually fall back to its long-term average of around 1.5 % by 2024.

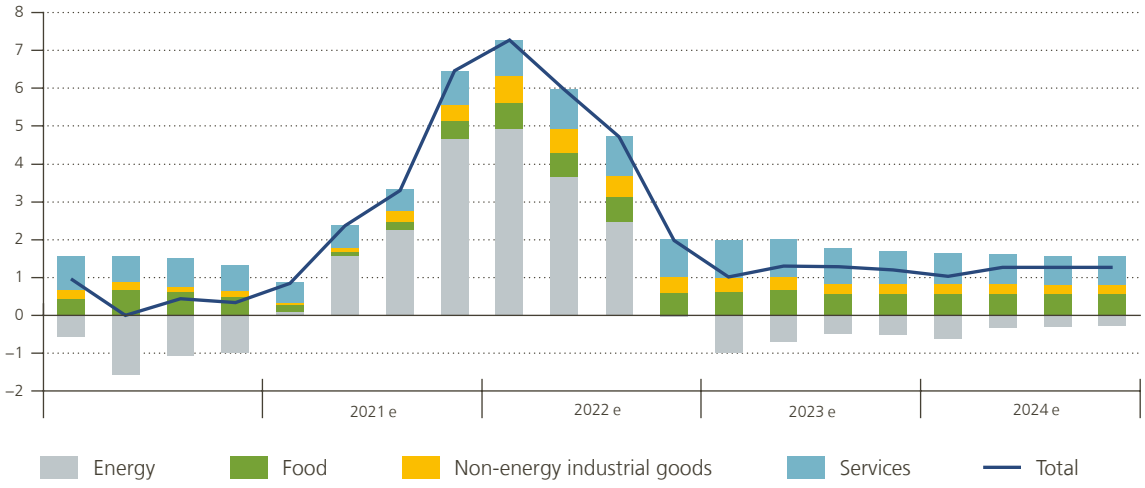
Food inflation, finally, should also go up, from 1.0 % in 2021 to 2.7 % in 2022 and fall back slightly to 2.4 % in 2024. These figures take into account the assumption that excise duties on tobacco products will increase each year for the rest of the projection horizon. All in all, in yearly averages total inflation comes in at just below 5 % next year but drops substantially in the final years of the projection period, mostly due to the decline in energy prices.

The national consumer price index is used to calculate the health index, which excludes tobacco, alcoholic beverages and motor fuels, and serves as a reference for indexation of wages and replacement incomes. As electricity, heating oil and gas are taken into account in the health index, its growth rate also strongly increases to 4.4 % in 2022, before dropping back in 2023 and 2024. The pivotal index for public wages and social benefits has been passed in August 2021. It is set to be exceeded again in December 2021, February 2022, and April 2023.

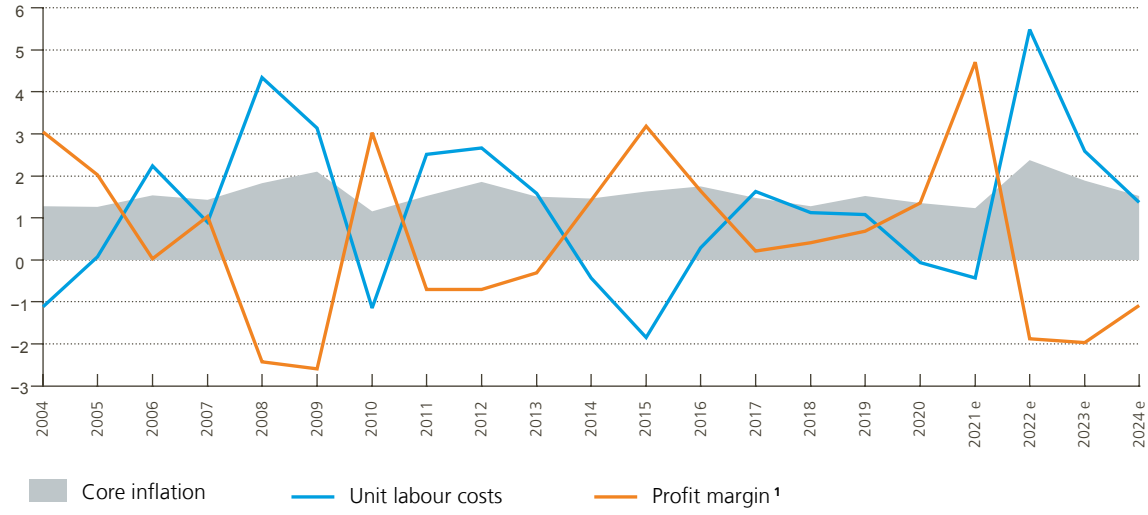
Chart 4

Inflationary pressures peak in 2022

Total HICP inflation (in %) and contribution of the different components (in p.p.)



Core inflation (in %) : unit labour costs versus profit margins



Sources: ECB, Eurostat, NAI and NBB calculations.

1 The profit margin is proxied here as the difference between the GDP deflator growth and unit labour cost growth in the private sector.

7. The general government deficit is expected to remain high after the pandemic

Following a deficit of 9.1 % of GDP in 2020, the 2021 deficit is expected to shrink to 6.3 % of GDP due to the strong economic recovery and the partial unwinding of temporary COVID-19 related support measures. The recovery pushed up fiscal and parafiscal revenues while temporary discretionary measures that provided additional support to households and enterprises fell from some 4.2 % of GDP to 2.5 % of GDP. Particularly in the first half of the year, temporary unemployment benefits and replacement income for self-employed, in addition to regional transfers to enterprises remained important. While temporary COVID-19 measures have declined further throughout the year, it was decided to still prolong certain measures, including the flexible use of the temporary unemployment system, on 10 December, i.e. after the cut-off date of these projections.

The budgetary improvement in 2021 was to some extent offset by the implementation of recovery plans at various government levels, and particularly at the regional level. It should be noted here that only resilience measures outside Belgium's National Recovery and Resilience Plan, that was submitted in the context of the Next Generation EU programme, are weighing on the budget balance. Those within the Plan are financed by additional grants received from the EU. In addition, the summer floods, that caused severe damage, particularly in Wallonia, urged governments to provide support for more than € 1 bn. Finally, a series of structural spending measures that are steadily increasing current spending, kicked in. This mostly pertains to the federal and regional budget increases and wage subsidies in the health care and social sector, and the rise in minimum social benefits decided by the federal government.

In 2022, the general government budget balance is expected to further improve to a deficit of 4.2 % of GDP. At unchanged policy, and in line with the assumption that the health situation will improve again as of next spring, the temporary COVID-19 measures would almost disappear. At the same time, fiscal and parafiscal revenues would further normalize as the economic recovery continues. On the expenditure side, the increasing impact of the structural measures taken in 2021 reduces the drop in primary expenditure relative to GDP. All in all, no noticeable consolidation efforts were decided in the initial 2022 budgets. This should be seen against the background of the European Commission's decision to extend the general escape clause, that allows member states to temporarily deviate from their medium-term budgetary objectives, to 2022.

Table 7

General government accounts

(in % of GDP)

	2019	2020	2021 e	2022 e	2023 e	2024 e
General government						
Revenue	49.9	50.1	49.1	49.3	49.6	49.9
of which : fiscal and parafiscal revenue	42.9	43.1	42.3	42.3	42.6	43.0
Primary expenditure	49.9	57.2	53.8	52.1	52.2	52.9
Current expenditure	46.5	53.6	49.8	48.3	48.5	49.0
Capital expenditure	3.4	3.6	3.9	3.8	3.8	3.9
Primary balance	0.1	–7.1	–4.6	–2.8	–2.7	–3.0
Interest charges	2.0	1.9	1.6	1.4	1.3	1.3
Financing requirement (–) or capacity	–1.9	–9.1	–6.3	–4.2	–4.0	–4.2

Sources : NAI, NBB.

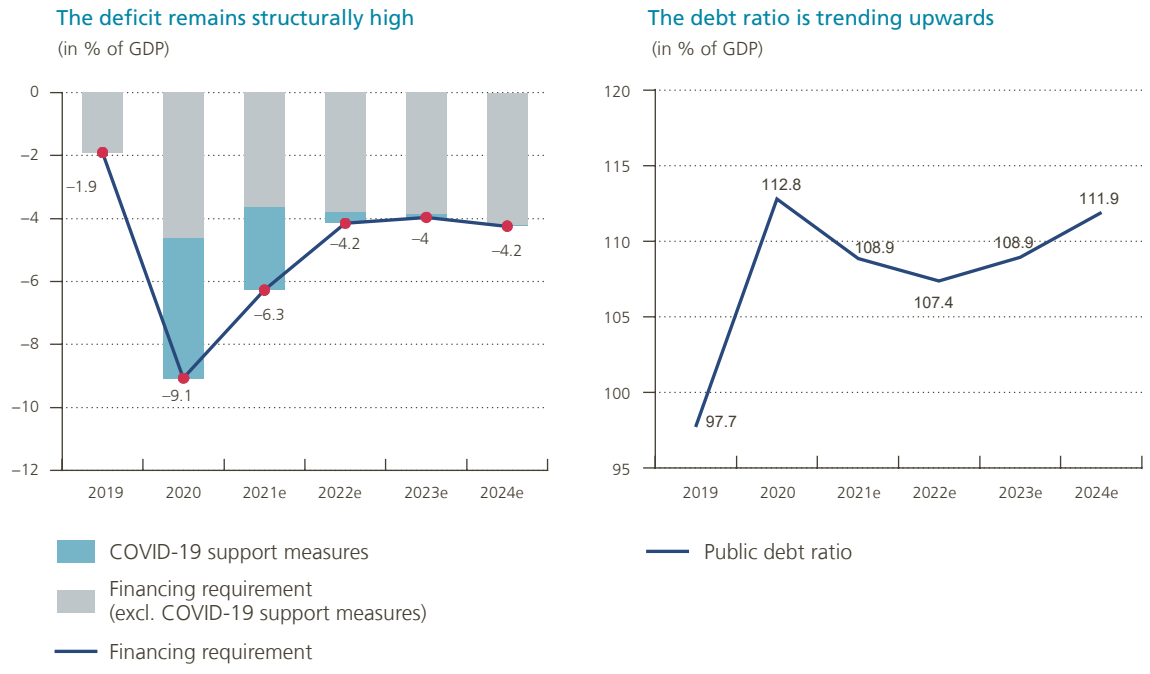
In 2023, the deficit is projected to slightly decrease, albeit to a still high level of 4.0 % of GDP. This is mainly due to the above-potential increase in activity and a favorable growth composition (as labour income outpaces GDP). However, despite the disappearance of the emergency support following the 2021 floods and of the temporary compensation for high energy prices decided in 2021, the primary expenditure to GDP ratio is rising marginally in 2023, mostly reflecting pension expenditures. In 2024 the budget balance widens again to 4.2 % of GDP. This worsening is entirely driven by the increase in primary expenditure, mostly attributable to a structural increase in social benefits.

All in all, the persistent deterioration of the budget balance since 2019, can be traced back to an increase in the primary expenditure to GDP ratio. Within primary expenditures, the rise is primarily attributable to current spending. Capital spending only contributes to a minor extent.

Interest payments are expected to steadily decline over the projection horizon, from 1.9 % of GDP in 2020 to 1.3 % in 2024, as newly issued and refinanced debt are financed at much lower rates than in the past. Indeed, 10-year bond yields are expected to remain close to zero in 2021 and 2022, and only slightly increase the years after. While the debt to GDP ratio is declining in 2021 and 2022, taking advantage of buoyant nominal GDP growth, there is an underlying upward trend that becomes visible from 2023 onwards. This should induce federal and regional governments to start planning measures to curb this trend without delay.

Chart 5

The deficit shrinks, but remains structurally high after the pandemic



Sources: NAI, NBB.

8. The baseline projections are still surrounded by considerable (downside and upside) risks

The uncertainty surrounding the baseline economic projections that are described in this article is still much larger than usual. One important source of this uncertainty is the developments regarding the pandemic. While the concerns about the COVID-health situation had initially declined over the summer, the recent uptick in the number of infections and hospitalisations has showed that the initial vaccination campaign was not sufficient to put an end to the pandemic and, hence, that health developments can continue to affect economic outcomes. These projections take into account the health situation and the containment measures as they were or could reasonably be anticipated at the cut-off date (1 December 2021). In line with the common Eurosystem approach we have also assumed that the current restrictive measures should be maintained well into the first quarter of 2022. Thereafter, an improvement in the health situation should allow for a relaxation of the current measures. Obviously, a different development of the pandemic will in principle change the macroeconomic outlook. Clearly, a stronger and more protracted deterioration of the health situation constitutes an important negative risk for the current GDP projections, in particular if it comes with more stringent containment measures. On the other hand, if it is confirmed that the infection and hospitalisation numbers seem to have reached a peak and people's mobility increases again, the economic impact could be more short-lived and the outlook for the first quarter of 2022 in these projections might be too pessimistic.

At the same time, no account could be taken of any government support measures that are announced after the cut-off date. This was the case, for instance, for the extension, to the first quarter of 2022, of the crisis-related easier access to temporary unemployment and bridging rights that was announced on 10 December. A preliminary assessment suggests that the macroeconomic and budgetary impact of this measure should be relatively limited.

The second main source of uncertainty pertains to the international markets for energy, as well as intermediate goods and raw materials. As regards energy prices the projections are – in line with the usual Eurosystem practices – anchored to the futures prices. The latter currently indicate declining prices in the course of next year, with strong decreases in the case of gas. It should be noted that the price expectations derived from these futures are not always accurate (as was illustrated in the Spring projections, when futures prices did not anticipate the spectacular increase witnessed in reality since the summer). After the cut-off date for these projections, oil prices have declined while gas prices have increased significantly. The current supply bottlenecks are assumed to dissipate as of late 2022. This is fully in line with the average expectations of Belgian firms, as suggested by the ad-hoc NBB firm survey carried out at the end of October. The assumptions regarding international energy prices and supply bottlenecks strongly determine the inflation outlook in these projections. It is an important element in the assessment that there will be no longer-lasting wage-price spiral. The latter assessment is also based upon the feature that large wage cost increases are typically partly absorbed by firm profit margins and the fact that the current legal framework will not allow very high increases in conventional wages. Inflation may be higher for longer if the external price pressures remain higher than currently assumed or if profit margins do not decline.

Finally, in the longer term, the unsustainable budget position will have to be addressed, which may require consolidation measures in the outer year(s) of the projection period. Depending on the specific measures that will be taken, the growth and budget outlook may be quite different for those years.

Annex

Projections for the Belgian economy: summary of the main results

(percentage changes compared to the previous year, unless otherwise stated)

	2020	2021 e	2022 e	2023 e	2024 e
Growth (calendar adjusted data)	–5.7	6.1	2.6	2.4	1.6
Real GDP					
Contributions to growth:					
Domestic expenditure, excluding change in inventories	–5.7	6.5	3.1	2.6	1.8
Net exports of goods and services	0.4	0.4	0.1	–0.2	–0.2
Change in inventories	–0.3	–0.9	–0.5	0.1	0.0
Prices and costs					
Harmonised index of consumer prices	0.4	3.2	4.9	1.2	1.2
Health index	1.0	2.0	4.4	1.3	1.3
GDP deflator	1.3	4.3	3.6	0.6	0.3
Terms of trade	0.5	–0.8	–0.5	0.3	0.2
Unit labour costs in the private sector [1]	–0.1	–0.4	5.5	2.6	1.4
Hourly labour costs in the private sector [1]	4.3	–0.3	4.5	2.8	1.8
Hourly productivity in the private sector	4.3	0.1	–0.9	0.2	0.4
Labour market					
Domestic employment (annual average change in thousands of persons)	–0.8	81.0	44.0	40.7	38.7
Total volume of labour [2]	–8.5	5.9	3.4	2.1	1.0
Harmonised unemployment rate (in % of the labour force aged 15 years and over)	5.6	6.3	6.1	5.9	5.7
Incomes					
Real disposable income of individuals	0.9	0.6	2.1	3.1	1.7
Savings ratio of individuals (in % of disposable income)	20.2	15.6	12.6	13.0	12.9
Public finances (in % of GDP)					
Primary balance	–7.1	–4.6	–2.8	–2.7	–3.0
Budget balance	–9.1	–6.3	–4.2	–4.0	–4.2
Public debt	112.8	108.9	107.4	108.9	111.9
Current account (according to the balance of payments, in % of GDP)	0.8	1.0	1.0	1.2	1.3

Sources: EC, NAI, Statbel, NBB.

1 Including wage subsidies (mainly reductions in payroll tax) and targeted reductions in social contributions.

2 Total number of hours worked in the economy.

Summary Report on the NBB Listens Portal

J. Wauters*

Introduction

The European Central Bank (ECB) launched a strategy review in January 2020. As part of this review, the ECB and the national central banks of the euro area have hosted listening events with the general public, civil society organisations, and academia. The aim is to let ideas and perspectives that were shared at these events feed into the strategy review, the outcome being presented on 8 July 2021 by ECB President Christine Lagarde and Vice-President Luis de Guindos[1].

The National Bank of Belgium (NBB) organised its online listening event on 22 January 2021, with participants from 28 civil society organisations representing the various layers of society[2]. To complement this event with views from Belgian citizens, an online "NBB Listens portal" was set up, similar to the ECB's initiative. Through the portal, citizens could answer thirteen open-ended questions and thereby share their views on four topics: "price stability", "economic issues", "other issues", and "communication". In the end, 751 citizens submitted 8459 valid text responses. These responses were classified into several categories for each question by combining human reading with text analysis tools.

This article discusses the responses to the four topics covered by the NBB Listens portal. Its main findings are the following:

1) Price stability:
   - Three-quarters of respondents find predictable inflation to be important. When asked whether they worry about too low or too high inflation, the largest share (35 %) mentioned high inflation only.
   - Changes in the price level are mainly felt through changes in the purchasing power of wages and salaries, changes in investment behaviour, and a lower real (i.e., inflation-adjusted) return of savings.
   - More than half of the respondents (57 %) signalled housing as a type of good for which they feel the effects of price changes the most.

2) Economic expectations and concerns:
   - When asked about their economic concerns, respondents saw the economic outlook as their primary concern, followed by their savings and pensions.

* I am very grateful to all respondents for their participation, Vincent Palau for excellent assistance, and Siria Angino (ECB) for a very useful discussion on text analysis at the start of the project. I also thank NBB colleagues Luc Aucremanne, Saif Ben Hadj, Jef Boeckx, Marjolein Deroose, Dennis Essers, Thomas Stragier, and Mario Vackier for helpful suggestions and comments.
As the author, I am responsible for the analysis of the survey data. Colleagues from the Communications Department and the Economics and Research Department set up the online portal and designed the survey. Contact: joris.wauters@nbb.be.

1 See https://www.ecb.europa.eu/home/search/review/html/index.en.html.

2 See https://www.nbb.be/nl/evenementen/nbb-luistert-event for an overview and summary reports in Dutch and French.

- About half of respondents had not experienced any negative (economic) impact from economic changes over the past ten years. However, when asked how low interest rates and monetary policy affect them generally, a large majority (62 %) claimed to be negatively affected or concerned about the recent monetary policy measures.

3) Themes other than price stability:
   - When asked about which other themes the NBB and ECB should pay attention to, close to half of the respondents opted for 'climate change'.
   - Climate change would mainly affect respondents by altering their daily lives, e.g., through changes in consumption habits or the more frequent occurrence of natural disasters. The second most prominent concern was higher costs, such as a higher tax burden.

4) Communicating with the public:
   - Fifty-six per cent of respondents feel informed by or about the NBB (or ECB), and 60 % report being familiar with NBB and ECB monetary policy speeches, press conferences and publications.
   - When asked how the central banks could better explain economic issues and monetary policy decisions, a large percentage urged central banks to better explain themselves by addressing the public in simple language and using illustrative examples in their communication. Respondents suggested both traditional media (e.g., newspapers, radio, and TV) and digital media (e.g., social media, webinars, the website) as the main communication channels for reaching the public.

An important caveat is that the sample over-represents certain groups, such as senior Dutch-speaking male citizens. Therefore, it remains uncertain to what extent the findings in this report – both quantitative and qualitative – extend to the Belgian population.

This report is arranged as follows. Section 1 describes the design of the questionnaire and the method for analysing the results. In Section 2, the main characteristics of the respondents are described. Sections 3 to 6 each describe the results for the separate themes. Finally, Section 7 concludes.

1. Questionnaire design and method of analysis

To gauge public opinion regarding specific themes, the NBB opened an online listens portal. Through this website, citizens could respond in Dutch or French to thirteen open-ended questions. The portal was open between 22 October 2020 and 1 February 2021. It was advertised through an online campaign via the NBB website and NBB social media (LinkedIn and Twitter), and an extensive mailing campaign.

The portal was structured into four main domains: i) Price stability, ii) Economic expectations and concerns, iii) Themes other than price stability, and iv) Communication with the public. The first three topics each had three questions, while the fourth had four. Each topic was introduced with a short explanatory text, included below in the sections describing the results. The respondents could reply to the questions by entering text in designated boxes. (Multiple-choice options were not used.)

To facilitate interpretation, the responses were classified into several categories by combining human reading with text analysis tools. These tools entailed either a dictionary-based approach or supervised learning. Further methodological details are provided in the Annex. The questions from the NBB Listens portal, listed below, were very similar to those from the "ECB Listens Portal". The analysis therefore mainly followed the ECB's response categories, and similarly, the structure of the ECB report was used as a template for this article[1].

1 See https://www.ecb.europa.eu/home/search/review/html/ecb.strategyreview002.en.html for the summary report on the ECB listens portal.

The responses were analysed question by question, the empty cells being removed at the start in each case. Hence, the reported percentages per question in each category are expressed relative to the total number of valid responses received for the question at hand. Only when a question has mutually exclusive response categories do these shares add up to 100 %.

2. Respondent characteristics

The thirteen open-ended questions of the online NBB Listens portal received 8459 text responses from 751 respondents. *It is important to stress that these respondents do not represent a random sample of the Belgian population*. Indeed, some groups are over-represented, as 87 % of the respondents are male, 61 % are aged 55 and older (Table 1), and 76 % are Dutch-speaking (vs. 24 % French-speaking)[1].

Table 1

Age composition of the respondents

	13-18	19-24	25-34	35-44	45-54	55-64	65+	Total
Count	1	10	63	85	135	248	209	751
Share (in %, rounded)	0	1	8	11	18	33	28	

Source: NBB.

Correcting the skewed structure of the sample is not possible with re-sampling for two reasons. First, some age categories are too severely under-represented. For instance, the 13-18 years category contains only one individual, and this person would receive an unacceptably large weight under a re-weighting correction. Second, as the respondents were aware of the listens portal and voluntarily chose to participate, they might have distinct characteristics compared to other citizens. They could, for instance, have a stronger affinity for economic issues than the general population. If so, re-sampling would not solve such a "self-selection bias". Therefore, while the results from the portal provide valuable insights into the public's concerns, one cannot ascertain to what extent the findings in this report – both quantitative and qualitative – extend to the Belgian population.

The non-response rate for the questions was, on average, 13 % and varied between 4 % and 31 % (see Annex).

3. First topic: price stability

Introductory text

As monetary policymakers, we are responsible for price stability. Indeed, the Treaty on the Functioning of the European Union states that price stability is our primary objective.

1 By contrast, the Belgian population is about 49% male, around 32% are aged 55 and older, and close to 60% have Dutch as their mother tongue. See https://statbel.fgov.be/en/themes/population/structure-population and https://en.wikipedia.org/wiki/Languages_of_Belgium.

Price stability refers to the general level of prices; it means that the price of an imaginary basket of goods and services that a typical household buys does not fluctuate excessively. The Governing Council has defined price stability more concretely as an annual increase in consumer prices in the euro area of below, but close to, 2 % over the medium term. Therefore, it wishes to avoid excessive price increases (inflation) as well as price falls (deflation), as these are detrimental to economic activity. On the other hand, low and stable inflation has many advantages; in a nutshell, it enables the economy to function smoothly.

Price stability: Question 1

- *How do changes in the general price level affect you/your organisation/your members? How important is predictable inflation?*

Here, many respondents replied to only one of the two embedded sub-questions. Therefore, each sub-question was considered separately, and the shares are reported after discarding the non-responses each time. Chart 1 shows the channels through which price level changes are believed to affect the respondents. Slightly less than half of the valid responses (47 %) report that the main impact would be felt through changes in the purchasing power of wages and salaries, while changes in investment behaviour and a lower real (i.e., inflation-adjusted) return on savings form the second category (37 %).

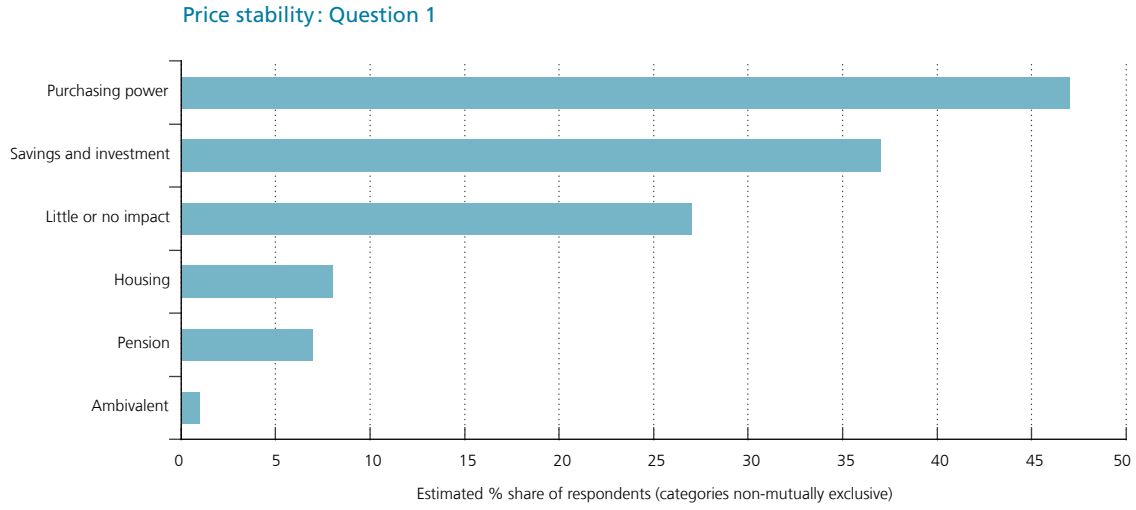
Around a quarter of respondents (27 %) feel that changes in the price level have little to no impact on their life. Within this sub-group, several referred to the system of wage indexation in Belgium. According to one respondent, "*Controlled inflation is acceptable as long as incomes (wages, pensions, alternative income, family allowances, etc.) are indexed as is the case in Belgium.*" Also, many respondents wrote that if inflation is low and stable, it has no significant influence on them.

Next, less than 10 % mentioned housing, for instance, regarding how inflation impacts long-term decisions like purchasing a family home. In the words of one respondent: "*Predictable inflation is important to allow families to properly plan their capital building from the point of view of buying a house and other capital goods and pensions.*"

The final and less frequently selected categories concern the lower purchasing power of pension income or an ambivalent stance.

Chart 1

How do changes in the general price level affect you?



Source: NBB.

Turning to the second sub-question, three-quarters of valid responses say that predictable inflation is important. As stated by one respondent, "[predictable inflation] *gives businesses a stable monetary framework that benefits investment and indirectly also employment*". By contrast, 17 % stated that predictable inflation is of little or no importance. (A residual 8 % of responses were classified in an "Other" category.)

Price stability: Question 2

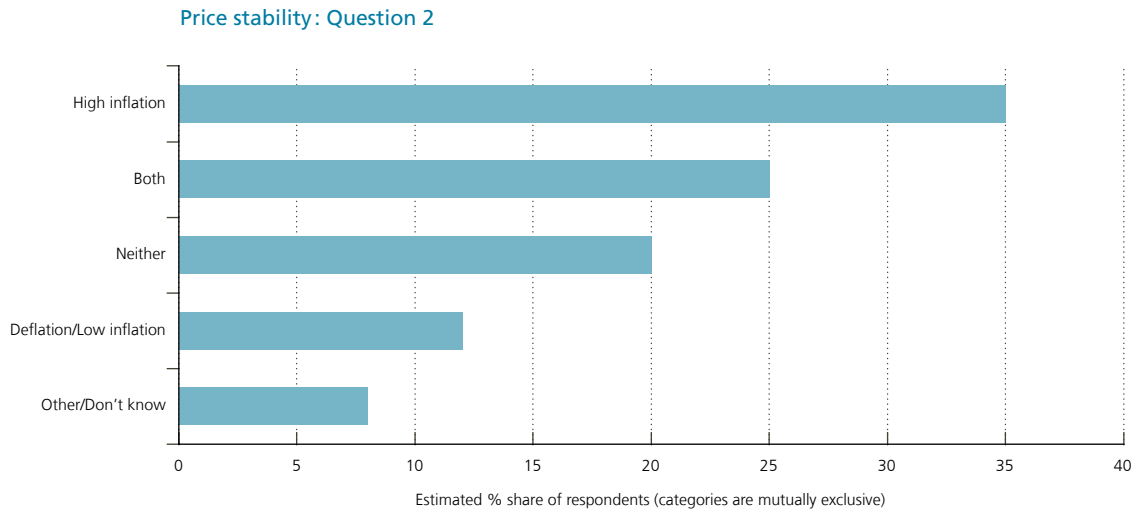
- *Are you worried about too low or too high inflation?*

The largest share of respondents (35 %) reports feeling worried about high inflation only (Chart 2). Several respondents connect their concern with recent years' expansionary monetary policy measures and the generally high government debt levels. For example, one respondent mentions, "*I am very concerned about a very high rate of inflation in the future, as a result of the unbridled support measures and money creation in the last ten years.*"

One-quarter of respondents are concerned about both high and low inflation. Some respondents highlight that deflation is also undesirable, e.g., because it makes it more difficult for governments to repay their debt. With a share of about 20 %, a third category reports not being worried about high or low inflation at all. Only 12 % worry solely about low inflation, and the remaining 8 % had no opinion or responded off-topic.

Chart 2

Are you worried about too low or too high inflation?



Source: NBB.

Price stability: Question 3

- *For which types of goods and services do you feel the effects of price changes the most? Which goods and services should be included in the consumption basket that determines the inflation rate? For example, how important do you think the rising cost of housing is?*

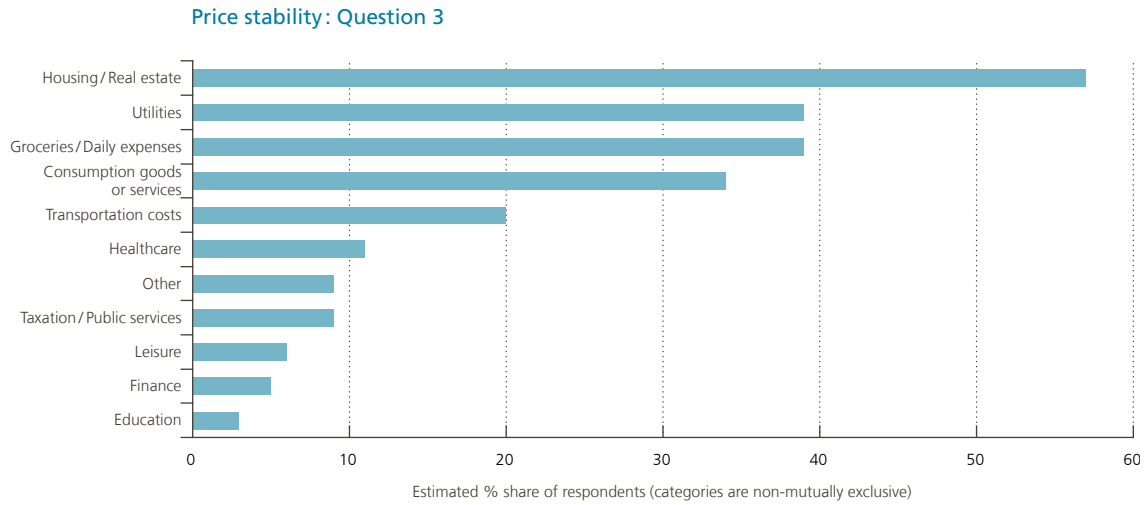
With a share of 57 %, most respondents signalled housing (i.e., purchase prices and rent) as a vital category for which they feel the effects of price changes (Chart 3). Some respondents referred to the large share that housing costs represent in household budgets. Others saw high house prices as a problem for non-owners, such as young or poor households: "*Housing is very important and is becoming more and more expensive. For the younger generation, the purchase of a home is no longer self-evident.*" By contrast, of the respondents

that did not fall into this category, several claim that they don't feel the effect of rising house prices because they are homeowners: "*Since we own our own home, the rising housing costs are not our main concern.*"

Some way behind, the next-ranked categories are "Utilities" (e.g., costs of heating, water, and electricity) and "Daily expenses" (or groceries) for items such as food (39 %). They are followed by expenses for (non-) durable consumption goods or services (34 %) and "Transportation costs" such as petrol (about 20 %). Other categories such as "Healthcare" and expenses related to "Taxation/Public services" were mentioned by about 10 % of respondents, while categories such as "Leisure", "Finance", and "Education" even less frequently.

Chart 3

For which types of goods and services do you feel the effects of price changes the most?



Source: NBB.

4. Second topic: economic expectations and concerns

Introductory text

Monetary policymakers have no direct influence on rising and falling prices. To achieve price stability, we use instruments that indirectly affect inflation. The main instrument is policy interest rates. They act as the accelerator and brake pedal of economic activity and inflation. For example, an increase in interest rates will curb a heated economy with too high inflation. A higher interest rate makes it more expensive to borrow money, so consumers and businesses spend less. As a result, economic activity slows down, and prices rise less rapidly. On the other hand, a decrease in interest rates will stimulate an economy in which growth has cooled and inflation is too low. A lower interest rate makes it cheaper to borrow money, so more is bought and invested. As a result, economic activity picks up, and prices and wages rise. In a context of persistently low inflation and negative policy rates, the ECB has in recent years also used other exceptional instruments to support economic activity and consequently inflation. One example is asset purchases. These exceptional instruments also operate according to the principle of braking and acceleration.

By pursuing price stability, we also support economic growth and prosperity in the euro area. More than that, it is probably the best way for monetary policy to contribute to people's welfare.

The reasoning outlined here reflects our frame of mind: you may see it differently. To make our monetary policy as effective as possible, we therefore want to get a better idea of your economic concerns and the impact of our policy on your life.

Economic expectations: Question 1

- *What economic concerns are you/your organisation and your members facing?*

With a share of just over 40 %, the "Economic outlook" is the respondents' main concern (Chart 4). This category includes worries about a slow recovery from the Covid crisis, weak growth and structural problems, and the emergence of future crises. For example, one respondent writes: "*Partly because of covid 19, our economy is ruined and cannot be restored.*"

The second most common concern of respondents relates to "Savings and pensions" (30 %). Respondents in this category often criticise the central bank's low (or negative) interest rate policies. For one thing, they see the loss of income from their savings as detrimental. As one respondent puts it, "*How can you guarantee your income during retirement?*" For another, a few respondents even see low interest rates leading people to save more rather than less. According to one respondent, "*a (too) low interest rate, or negative interest rate, creates uncertainty for the future, causing consumers, fearing future deficits, to save even more rather than spend the money. Thus, too low interest rates, in fact, have the opposite effect of what the policy wants.*"

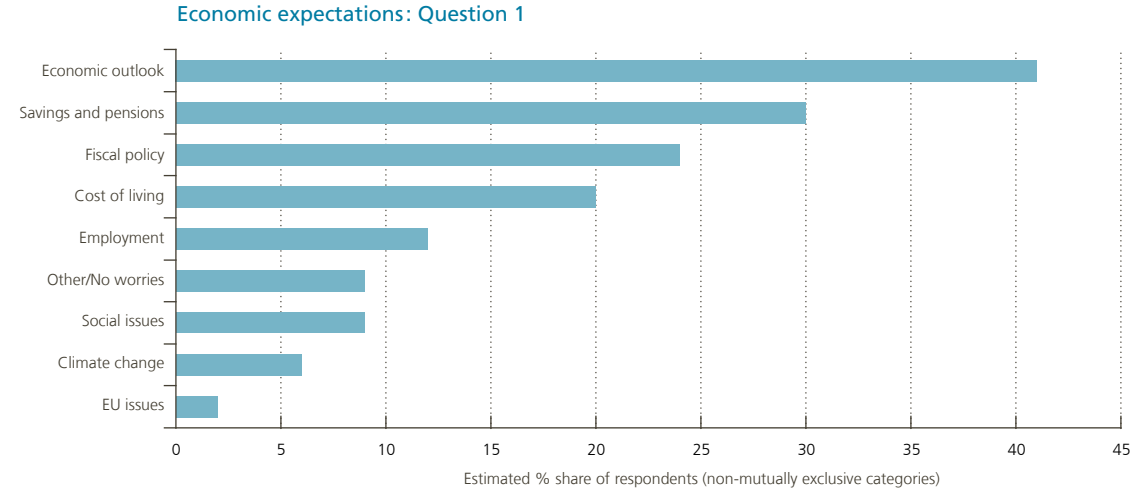
Close to a quarter of respondents are concerned about "Fiscal policy". Several respondents believe that higher taxes will be necessary for the future due to public spending during the Covid pandemic, and some ask themselves if public debt levels are sustainable ("*How are we ever going to reduce the debt mountain?*").

"Cost of living" is the fourth most frequent concern, at a rate of one in five. This group refers to the risk of losing purchasing power in the future due to a rising cost of living. Some see their purchasing power at risk due to ample money creation by central banks that could drive up future inflation.

The following five categories were less prominent for respondents. Around 12 % reported concerns about "Employment", in part due to higher unemployment because of the pandemic. A more detailed breakdown showed that this category's share was highest for those in the 25-34 age bracket (18 %) and showed a downward trend for older age groups.

Chart 4

What economic concerns are you facing?



Source: NBB.

Next, 9 % of respondents claim to have either no worries or refer to other concerns. The same percentage of respondents cite "Social issues" such as inequality and poverty. Finally, 6 % refer to climate change and sustainability, and 2 % to EU-related concerns.

Economic expectations: Question 2

- *How have changes in the economy over the past ten years affected your life/that of your members? For example, in finding work. And more recently, how has the current economic crisis due to the corona pandemic affected your life/the life of your members?*

This question's responses were analysed with a focus on the *economic* impact on the respondents' lives. Many respondents find that the Covid pandemic did not affect them materially but worsened their mental state due to a lack of social interaction. For example, one respondent writes, "*The Covid-19 health crisis did not affect me too badly because my wife and I were able to continue working (telework) and kept our income. On the other hand, the social and psychological impact has been seriously underestimated.*" With this distinction in mind, 51 % of respondents fall into the "Positive or unchanged" impact category. One person reports: "*No impact, I'm lucky to still have my job.*", while another writes, "*There's no influence. I can live with the Corona measures for another two years.*"

By contrast, the share of respondents in the "Negative" category is 27 %. Several from this group report on the negative impact of the pandemic on relatives. According to one respondent, "*Lack of prospects in the cultural sector affects my loved ones*", while another writes "*Family members find it harder to find work than before the crisis.*"

Finally, 22 % of respondents are in an "other" category who either don't know ("*as a pensioner, I find it difficult to answer*") or made general statements about economic policy and the pandemic.

Economic expectations: Question 3

- *How do low interest rates and monetary policy, in general, affect you/your organisation/your members and the economy as a whole? For example, how do they affect your decisions regarding consumption, saving, borrowing, investing? Are you/your organisation/your members concerned about the exceptional monetary measures we have taken in recent years to support economic activity and inflation?*

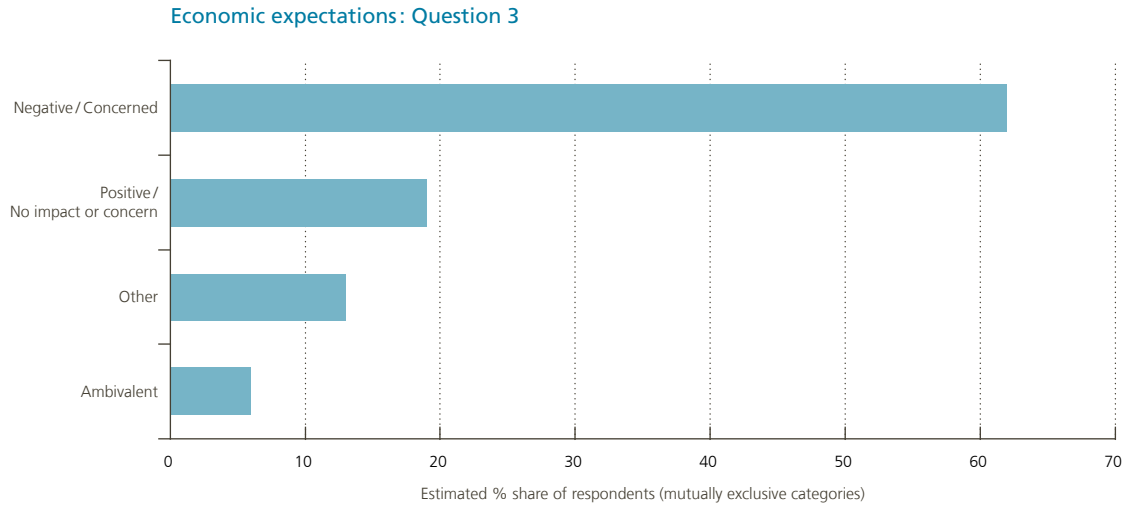
With a share of 62 %, a large majority of respondents claimed to be negatively affected or concerned by the recent monetary policy measures (Chart 5). Low interest rates were frequently mentioned, for instance, regarding a lower return on savings. For example, a respondent states, "*Yes, for me, this is a major concern. Low interest rates impoverish people – especially for larger purchases that require longer saving periods. Dreams become more difficult to realise.*" Respondents also stated that the low interest rates incite risk-taking: "*Due to low inflation, I have to make more risky investments to get a reasonable return.*" Again, a few respondents mentioned that low interest rates prompted them to save more instead of less. As one respondent puts it, "*The lower the interest rate, the less I will consume because the more I have to save for my old age.*"

Next, about one in five respondents felt that the measures had a positive or negligible impact on their lives or were unconcerned (19 %). Several respondents saw the advantages of low interest rates for borrowing to finance investments or acquire real estate. For example, one respondent from age group 25-34 writes, "*The low interest rate makes it easier for many people in my age group to acquire property*." Some respondents also view changes in their investment portfolio from a positive angle compared to the previous group: "*I am not worried. I rather see it as an opportunity. For example, I no longer save on savings accounts and invest entirely in investment funds.*"

About 13 % of respondents fall into the "Other" category who either didn't know or made general statements. Finally, 6 % of respondents had ambivalent views.

Chart 5

How do low interest rates and monetary policy, in general, affect you and the economy as a whole?



Source: NBB.

5. Third topic: themes other than price stability

Introductory text

As monetary policymakers, our main task is to maintain price stability in the euro area. When that task is accomplished, we also have the task of supporting the general economic policies of the European Union. Sustainable economic growth, free competition, full employment, social progress and the protection and improvement of the quality of the environment are important objectives in the general economic policies of the European Union.

Other themes: Questions 1 and 2

- *Question 1: Do you think the NBB and ECB should pay more or less attention to these other issues? Which ones deserve more attention and why? For instance, do you think monetary policy has a role to play in combating climate change?*
- *Question 2: Are there any issues not mentioned above that you think the NBB and ECB should take into account in their joint monetary policy?*

The two questions are related, yet the second question had a high non-response rate of 30 %. Of its valid responses, 16 % were simply "no", and the categories from question one were often selected. Therefore, the discussion focuses on the first question only.

The first ranked category is "Climate change", for which a substantial 48 % of respondents affirmed that the NBB or ECB should pay (more) attention (Chart 6). Several respondents seemed very concerned about this issue. For example, one reply was, "*Everything must be done in the fight against climate change!*"

A caveat is that the estimated share for this category could be biased up or downward. On the one hand, about 6 % of respondents wrote a simple affirmation (e.g., "Yes") and were classified in the "Yes, unspecified" category since it's unclear to which part of the question they responded. If they replied to the last part on climate change – even though it was included as an example – then the share is under-estimated. On the other

hand, the last part of the question may have nudged respondents towards "Climate change", thereby creating an upward bias[1].

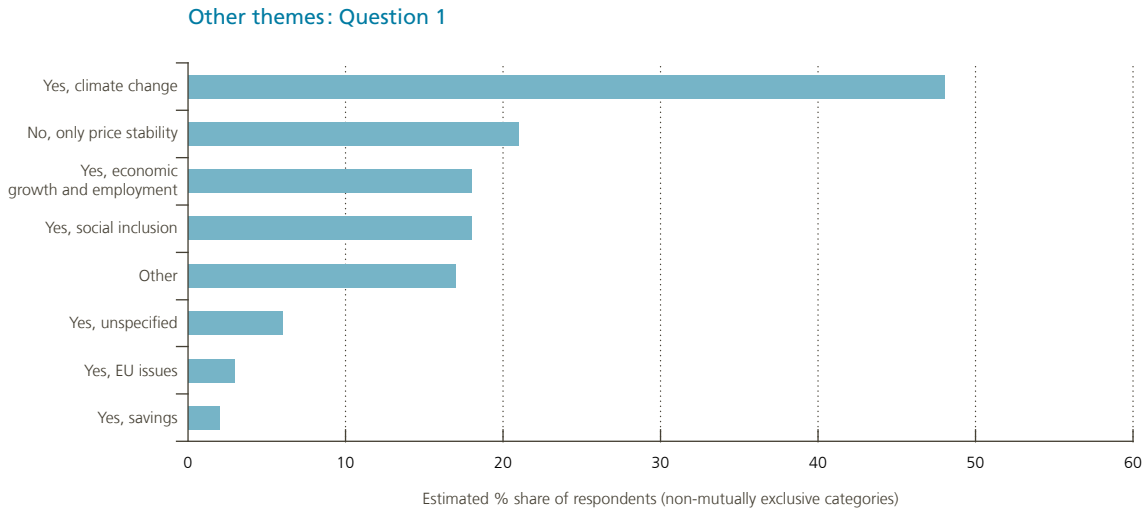
In contrast with respondents from the first ranked category, 21 % of respondents feel that the central bank should focus on its core task of maintaining price stability. For example, one respondent writes, "*The ECB should not support economic policies. They are not democratically elected for this.*"

The following three categories all have shares close to 18 %, namely "Economic growth and employment", "Social inclusion" (referring to inequality, redistribution, etc.), and an "Other" category that captures respondents who don't have an opinion or who express general remarks or scepticism. A respondent from the last category wrote: "*Climate change affects the whole globe. The monetary policy of the NBB and ECB will always fall short here.*"

Finally, issues related to the EU and Savings (e.g., low interest rates) were infrequently mentioned.

Chart 6

Do you think the NBB and ECB should pay more or less attention to these other issues?



Source: NBB.

Other themes: Question 3

- *How will climate change affect you/your organisation/your members, and the economy?*

With a share of 35 %, respondents mainly envisaged climate change impacting their daily lives or those of future generations (Chart 7). They noted several ways in which an impact could be felt, one being necessary changes in consumption habits. For example, a respondent writes: "*The corona crisis has made some of us realise it. We can live a comfortable life with a lot less luxury. Consuming less will only benefit our planet.*" Others mentioned the more frequent occurrence of natural disasters or general changes in the climate: "*Climate change is causing warmer weather in our regions. In the longer term, this may also have effects on storms/heatwaves and flooding.*"

1 Two arguments support the notion of an upward bias. First, there's a similarity with the third question from topic one on price stability. The final part of the question referred to housing as an example, and the first ranked response category (i.e., housing) also had a remarkably larger share. Second, when asked about their economic concerns, a relatively small share was found for the category "Climate change" in the first question of topic two on "Economic expectations".

Next, close to one out of four respondents mentioned higher costs, e.g. "*More expensive energy, more expensive transport.*" This group also mentioned higher taxes as a necessity to finance climate-related policies.

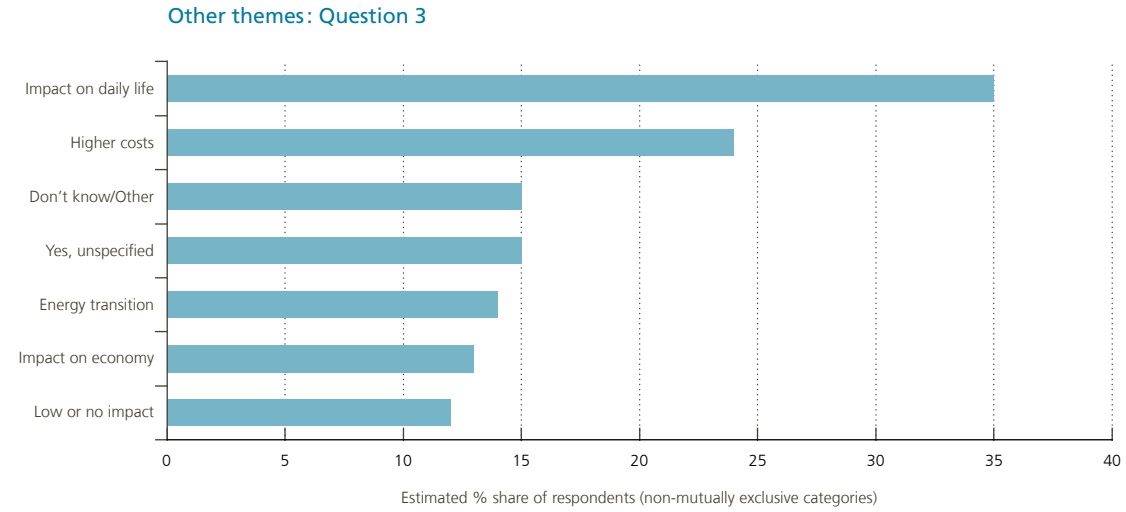
Fifteen per cent reported either not having an answer or gave more general statements (e.g., "*This theme does not fall within the competence of the ECB and therefore this question is superfluous.*"). Around 15 % acknowledged that climate change would have an impact, but without specifying how (e.g., "*that's clear... doesn't need an extra explanation*").

The following two categories concern the impact of the "Energy transition" (14 %) and the impact on the economy in general (13 %). The former entails additional investment and other policies regarding climate change. According to one respondent, "*Climate change will require a lot of additional investment. As a private individual, I will have to invest in insulation, energy transition...*". Concerning the latter, some respondents mentioned that climate change brings both positive and negative economic effects. For example, one respondent writes: *"In itself, "change" or, in this case, "preventing change" is good for an economy as it brings new businesses and products. If we are too late and the doom scenarios of flooding due to too high water levels happen, this will, of course, be detrimental to the economy."*

A smaller group of 12 % of respondents mentioned that climate change would have little or no impact on them. Within this group, some indicate that this is because they have already adapted their lifestyle (e.g., "*None, I already consume 'green'.*"), while others don't see climate change as a problem or deny its existence (e.g., "*What climate change?*").

Chart 7

How will climate change affect you and the economy?



Source: NBB.

6. Fourth topic: communicating with the public

Introductory text

We know that understanding monetary policy helps people make decisions about consuming, saving, investing, and borrowing. We would like to know how well we manage to explain what we do and why, but also how we can do it better.

Communication: Question 1

- *To what extent do you feel well informed by the NBB and the ECB? (For example, about our recent measures in response to the corona crisis.)*

Fifty-six per cent of respondents affirmed that they felt informed by or about the NBB (or ECB). Several respondents mentioned that they were indirectly informed via the press (e.g., "*The newspapers do their job well, that's enough for me for this information.*"), while others appreciated the direct communication efforts from the NBB (e.g., "*I appreciate the recent webinars very much.*") or wrote that they were informed through their professional occupation.

By contrast, 30 % of respondents wrote that they did not feel informed. Respondents in this category lament the lack of direct communication and find that the information is not tailored to the general public. As one respondent puts it: "*I feel completely uninformed unless I am very consciously looking for it. The info is not easy to find, not in an attractive format and difficult to read for people without a doctorate in economics.*" Another respondent writes, "*The communication of the NBB and the ECB must be strengthened, simplified and accessible to a greater number.*" Some respondents urged the NBB to communicate with the public via social media ("*To reach people today, you have to go through social networks. I personally see nothing on Facebook, for example.*").

Finally, 14 % of respondents were classified in the residual "Other" category. Several people in this group made general statements about the broader population lacking economic knowledge or interest in the material. For example, one respondent writes, "*People who are interested and/or have received economic training are well informed by the NBB and the ECB, but I fear for the vast majority of the population.*" while another notes, "*I think you overestimate to what extent the average citizen is aware of the activities of the NBB and the ECB (and considers it important to know).*"

Communication: Question 2

- *Are you familiar with the NBB and ECB monetary policy speeches, press conferences and publications?*

As shown in Chart 8, most respondents (60 %) affirmed that they are familiar with the NBB and ECB main communication outlets through either direct or indirect communication (e.g., "*I hear a lot on TV and radio.*"). In a separate third-ranked category, an additional 12 % of respondents mentioned feeling familiar, but only to a limited extent (e.g., "*Sporadically. It is too remote from ordinary people.*").

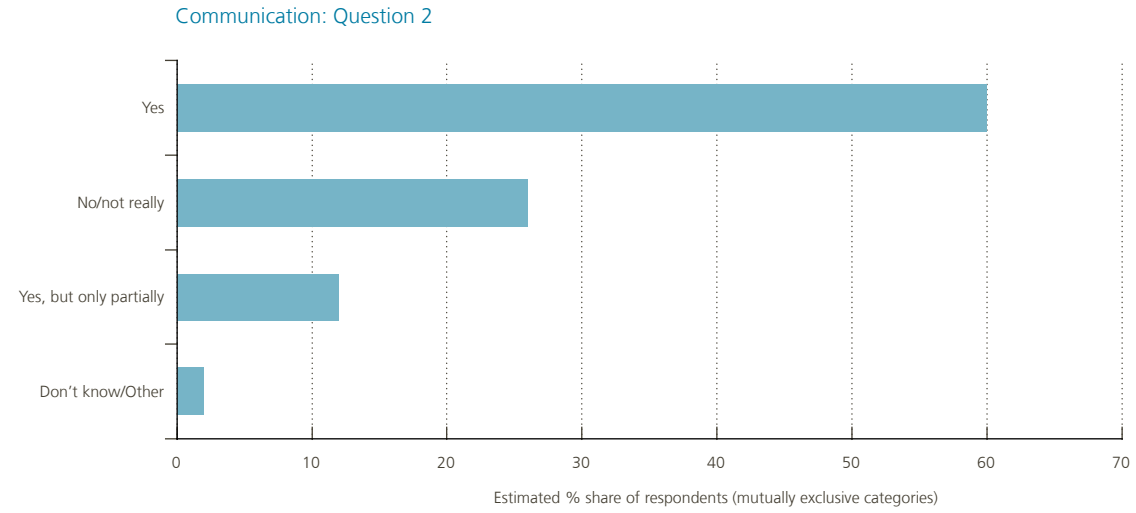
About one in four respondents (26 %), by contrast, report feeling unfamiliar. Several respondents – also among those in the first category – mention the difficulty in understanding the material: "*I know they exist, but it's usually Chinese to me...*", or "*These publications are usually written in a jargon that cannot be readily understood.*"

For both the current and previous question, the share of respondents feeling well-informed was higher for the Dutch-speaking respondents than their French-speaking counterparts (e.g., 64 % vs 49 % chose "Yes" in question 2)[1]. These differences could be due to the composition of the sample, such as relatively more economists in the Dutch-speaking group. However, we lack the data to verify this hypothesis. For both questions, the share of respondents feeling informed showed a hump-shaped pattern across age categories, in the sense that the shares peaked for age groups 35-44 or 45-54, and then declined for older or younger age groups.

1 For the first question, the shares of those feeling informed are 60 % and 44 % for, respectively, Dutch- and French-speaking respondents. For both questions, the differences are statistically significant at the 1 % level in a comparison of proportions test and remain so in a multinomial logit regression with age and gender as control variables.

Chart 8

Are you familiar with the NBB and ECB monetary policy speeches, press conferences and publications?



Source: NBB.

Communication: Questions 3 and 4

- *Question 3: How could the NBB and the ECB better explain the benefits of price stability and the risks of too high or too low inflation?*
- *Question 4: What could we do to increase your understanding of our policy decisions and their impact on you?*

The response shares for both questions are shown in Chart 9. The first four response categories concern strategies for enhancing communication: "Explaining" more clearly, "Engaging" (e.g., more outreach), more attention to"Being transparent", and "Educating" the public, for instance, through presentations in schools.

For both questions, "Explaining" was top-ranked of the first four response categories. These respondents urged the central bank(s) to address the general public in simple language and use illustrative examples in their communication. As one respondent puts it: "*Practical examples, and especially explaining the advantages/disadvantages for daily life or average wages. Most people do not think in abstract economic models.*"

The second-ranked category was "Engaging". On average, one in five respondents called for more communication and interaction with the public. A few of those respondents welcomed the NBB listens portal in this regard: "*By engaging in discussion and listening. This survey is a great example of how it should be.*"

To a lesser extent (shares below 8 %), respondents called for more transparency – also expressed as honesty or openness – in communication by central banks.

Finally, respectively 14 % and 6 % of respondents selected "Educating" for both questions. Several suggested that central bankers could raise financial literacy through visits to schools or by providing training: "*Financial education movements regularly organise training courses, in which NBB representatives could take part.*"

The following three response categories together make up a second group: the channels through which the central banks should communicate. With shares of 16 % and 22 % for both questions, the overall main response category is communication through "Traditional media", such as newspapers, radio, TV, and the like.

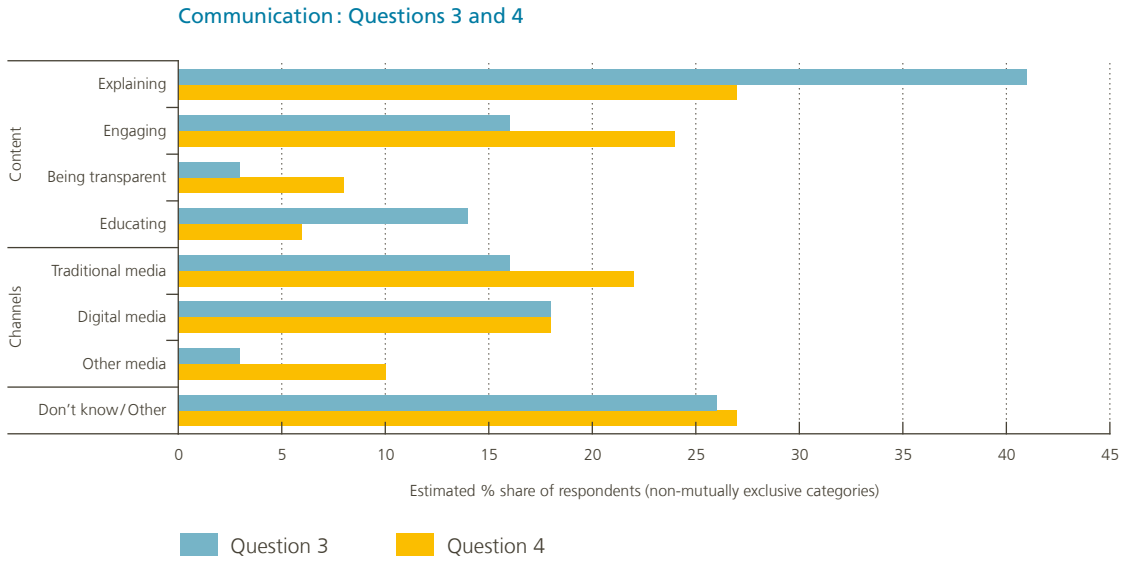
Next, 18 % of respondents suggest using digital media to reach a broad audience. Respondents mentioned using intuitive (YouTube) videos and disseminating information via digital means, such as social media, webinars, and the website. Across age categories, the share of "digital media" was highest for the younger cohorts.

Finally, less than 10 % of respondents referred to "Other media" channels, such as newsletters via e-mail or other regular reports.

Chart 9

Question 3: How could the NBB and the ECB better explain the benefits of price stability and the risks of too high or too low inflation?

Question 4: What could we do to increase your understanding of our policy decisions and their impact on you?



Source: NBB.

Around a quarter of respondents were assigned to a residual third group ("Don't know/Other"). Some respondents in this mixed group did not have an answer or were content with the current communication strategy (e.g., "*I think you're doing well! And thank you.*"). Several other respondents in this group saw a lack of financial education in school (or a general lack of interest) as a more fundamental reason why the public is uninformed. In their view, central banks might not necessarily be best placed to solve this issue. According to one respondent, "*I think that both institutions are doing enough. The wider demand for more economic and financial literacy must be answered by the Ministers of Education.*"

Conclusion

Analysis summary

This article reports on the main findings from the "NBB Listens portal", an online questionnaire for Belgian citizens that was part of the strategy review undertaken by the ECB and the national central banks of the Eurosystem. The open-ended responses were classified by combining human reading with text analysis tools.

Respondents mostly find predictable inflation to be important. When asked whether they worry about too low or too high inflation, the largest share mentioned high inflation only. Respondents mainly feel changes in the price level through changes in the purchasing power of wages and salaries and the real return on their savings. Housing was the most frequently mentioned type of good for which price changes are felt the most.

The economic outlook was given as the main economic concern of respondents, followed by their savings and pensions. About half of respondents had not experienced any negative impact from economic changes over the past ten years. However, when asked how low interest rates and monetary policy affect them in general, a large majority (62 %) claimed to be negatively affected or concerned by the recent monetary policy measures.

When asked about which other themes the NBB and ECB should pay attention to, almost half of the respondents opted for 'climate change'. Climate change would mainly affect respondents by altering their daily lives (changing consumption habits, natural disasters, etc.). The second commonest theme was higher costs, such as a higher tax burden.

Fifty-six per cent of respondents feel informed by or about the NBB (or ECB), and 60 % report being familiar with NBB and ECB monetary policy speeches, press conferences and publications. However, a large percentage urged the central banks to better explain themselves by addressing the public in simple language and using illustrative examples in their communication. To reach a wide audience, respondents suggested using both traditional and digital media channels.

Comparison with related surveys

Overall, the above findings echo the qualitative conclusions of the NBB's online listening event with civil society organisations. For instance, these organisations also saw climate change as a priority consideration for monetary policy, and they also advocated more accessible communication.

By contrast, the organisations appeared relatively more positive in their assessment of the recent monetary policy measures. The deployment of stimulus measures in response to the Covid-19 crisis was generally seen as benign, as the measures preserved firms' access to credit. In addition, the organisations suggested developing and monitoring indicators that measure the heterogeneous impact of monetary policy (e.g., inflation indices that differ by household type).

The above findings are also similar to those from the ECB Listens Portal[1]. Again, the impact of housing-related costs and climate change were found to be important, and most respondents felt they had been negatively affected by low interest rates and monetary policy.

However, the ECB listens portal respondents mostly thought that changing economic conditions had a negative impact on their situation over the last decade. Moreover, when asked about how climate change would affect them, they opted primarily for the impact on the economy and the financial system.

1 The ECB Listens Portal was closed around the time that the Belgian one opened. Belgian citizens make up the fourth most prevalent group in their survey (share of about 7.5 %).

Link with the outcome of the strategy review

The outcome of the strategy review, presented by the ECB on 8 July 2021 (while this report was being written), addresses several concerns that emerge from the analysis of the responses. First, the Governing Council recognised that "*the inclusion of the costs related to owner-occupied housing in the HICP would better represent the inflation rate that is relevant for households.*" Since this inclusion entails a multi-year project, inflation measures that include initial estimates of owner-occupied housing costs would meanwhile be considered by the Governing Council in its monetary policy assessments.

Second, the Governing Council has decided on a comprehensive action plan to further incorporate climate change considerations in its monetary policy assessments and the design of the monetary policy operational framework.

Third, traditional monetary policy communication channels will be complemented with more accessible communication geared towards the wider public to ensure "*public understanding of and trust in the actions of the ECB.*" In addition, the Governing Council intends to make outreach events a structural feature of the Eurosystem's interaction with the public. In this vein, the NBB plans to launch a blog and continue the webinars and the media presence of its governor and experts.

Caveats

In closing, I highlight two caveats in this analysis and offer suggestions for future surveys. The first caveat is that the sample over-represents specific sub-populations, such as senior Dutch-speaking male citizens. To better represent the Belgian population as a whole, a survey based on random population sampling could be considered. Moreover, the sophisticated economic reasoning in many responses suggests that many respondents are financially literate. Therefore, it could be insightful to ask respondents for their occupation and level of education or financial literacy. This information could, for example, potentially explain diverging views on whether central banks communicate adequately with the public.

Second, the phrasing of a couple of questions may have nudged responses in a particular direction. Notably, two questions in this survey refer to housing or climate change as examples, as these topics would a priori be focal points of the strategy review. Future surveys should pay attention to whether the question's formulation matters, e.g., by wording the question in two (or more) slightly different ways. Alternatively, multiple-choice response categories could complement (optional) open-ended responses.

Annex

Text analysis approach

In the data preparation stage, all Dutch and French responses were translated to English using the European Commission's eTranslation tool[1] and spell-checked. Other checks were also necessary to ensure, for example, that a space was present after a full stop, or that empty or identical submissions were removed, etc.

The responses were classified by combining human reading with quantitative text analysis using RStudio software and the R package Quanteda (Benoit *et al.*, 2018; Welbers *et al.*, 2017)[2]. The questions were analysed one by one using one of two methods. If multiple response categories could be selected for a question, a "dictionary-based approach" was used. In the first stage, this method requires the analyst to pre-define relevant keywords or expressions for each response category. Relevant keywords were partly selected based on statistics of the most frequently occurring words in the responses to the question (in the form of unigrams, bigrams, etc., and after discarding stopwords). In the following stage, the software reports which responses contained words that matched the pre-defined keywords of the categories. All responses that were unmatched with any category were manually classified. (These responses typically belonged to the "Other" category.)

For questions where only one response category was allowed (i.e., mutually exclusive categories), a combination of manual classification and "supervised learning" was applied. As a first check, duplicate responses were highlighted, and the responses were alphabetically sorted, so that clusters of the same responses (e.g., "Yes") were visually spotted and manually classified[3]. The subsequent first stage of supervised learning consisted in manually classifying a large set of consecutive responses (e.g., the first 300 observations), after which machine learning models were used to predict the remaining responses. The predictive models considered were Naïve Bayes, LASSO, Support Vector Machines, and Random Forests. When applicable, their hyperparameters were tuned using cross-validation. The block of pre-classified responses was divided into a training sample and a test sample. The former served to train the predictive models, while the latter was used for out-of-sample predictive tests. The most accurate model was chosen for the predictions if this model provided non-zero predictions for all categories. For this dataset, Naïve Bayes and Support Vector Machines typically performed best. (The manually classified responses from the initial stage were not overwritten by the model-based predictions.) As an extension, experiments were done where information on the characteristics of the respondents (i.e., age, gender, and language) was included in the predictive models. However, the predictive accuracy did not improve in general by including this data.

Following the recommendations of Grimmer and Stewart (2013), care was taken to validate the output from the quantitative text analysis by the human reading of a large batch of responses and their predicted categories. Moreover, for the questions that were processed with supervised learning, the response category shares were compared with and without the model predictions to check if the estimated shares changed remarkably – while also considering the estimated confidence intervals.

1 https://ec.europa.eu/cefdigital/wiki/display/CEFDIGITAL/eTranslation.

2 See https://www.rstudio.com/ and https://tutorials.quanteda.io/.

3 The second question in the fourth "Communication" topic consisted of about 60% duplicate responses and was, therefore, fully manually classified.

Non-response rates

The non-response rate for the questions averaged 13 %. While for most questions the share was below 10 %, it reached about 30 % for the second question in the third topic on "Other themes" and was also relatively high for the last two questions in the fourth topic on "Communication".

Table 2

Non-response rates per question

(in %)

	Price stability			Expectations and concerns			Other themes			Communication with the public			
	Q1	Q2	Q3	Q1	Q2	Q3	Q1	Q2	Q3	Q1	Q2	Q3	Q4
Share	9	4	6	8	11	7	7	30	16	11	9	23	31

Source: NBB.

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Who pays ?
An analysis of the cost of consumer credit in Belgium, regulation and implications

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Introduction

While consumer credit generally only accounts for a relatively small fraction of Belgian households' total debt – which mainly consists of mortgages – it can play an important role in easing budget constraints when it comes to some big-ticket spending items. But this type of "instant" credit can easily lead to an excessive debt burden for the most vulnerable households, that in turn can be exacerbated by excessively high borrowing costs. To alleviate that risk, one of the aims of consumer credit regulation, in Belgium as elsewhere in Europe, is to limit the cost of borrowing for households. The legislation therefore lays down a definition of the annual percentage rate of charge (APR) and a ceiling on those rates.

The latest change in these ceilings in Belgium dates from June 2021, when the maximum APR for credit lines and overdrafts was lowered by one percentage point. The maximum rates for other loans were not changed. Against this background, the purpose of this article is to document the importance of high APRs in the Belgian credit market and to assess how changes in maximum rates might affect borrowers and lenders.

Although there is currently no detailed information on the interest rates and charges applied to individual loans granted in Belgium, several series of variables collected by the National Bank may shed some light on the consumer loan market and enable us to study the implications of any change in the maximum APRs charged on consumer loans for the financial sector and for households. Data from the Central Individual Credit Register, data obtained from prudential reporting, and the average interest rates charged on loans reported to the NBB by Belgian banks are among the sources used. This article also analyses the results of the Household Finance and Consumption Survey (HFCS) conducted on a representative sample of Belgian households. These various sources are supplemented by survey data received from the Federal Public Service Economy (FPS Economy) to ascertain the prevalence of loans at relatively high interest rates, both among Belgian households and in the financial sector. The assumption is that some types of households, expenditure categories and lenders are more likely to relate to highly-priced loans and, therefore, be affected by any revision of the maximum APRs. Under certain circumstances, a lower maximum APR could also have implications in terms of the supply of loans.

The text is structured as follows. Section 1 sets out the current regulations in Belgium and describes the situation in the three neighbouring countries. Section 2 offers an overview of the consumer credit market in Belgium, in particular assessing the prevalence of the loan categories generally associated with high interest rates.

Sections 3 and 4 examine the distribution of the loans according to their cost, from the respective points of view of borrowers and lenders. Finally, section 5 includes some considerations relating to other aspects of consumer credit derived from the literature. The conclusion summarises the main findings of the analysis.

1. Legislation on APRs charged on consumer credit

1.1 Limit on the cost of consumer credit

In the European Union, national laws on consumer credit have to comply with the Consumer Credit Directive, applicable since 11 June 2008[1], which aims to ensure transparent and efficient credit markets while also protecting consumers. The Directive stipulates that the APR must be mentioned when a loan agreement is concluded. The APR indicates the cost of the loan by a standardised method which permits comparison between offers of credit obtained from lenders who may perhaps be located in different Member States. Thus defined, the cost (for the customer) must include all the charges relating to the credit provided, namely the market interest rate, operating costs, a risk premium (for expected or unexpected losses) and the credit provider's margin.

The main element of the APR is the interest rate, i.e. the percentage paid on the outstanding amount. That rate is generally lower in the case of a loan for the purchase of a specific item, since the purpose of the credit is known (the asset may be pledged if necessary); that is not the case for a credit line (opened without any time limit), nor for a personal loan, since the bank does not know the reason for the loan and therefore has fewer safeguards.

1.2 The situation in Belgium

1.2.1 Maximum rates

In Belgium, the APR on a consumer loan is limited by law. So, lenders cannot charge more than the legal maximum rates. Those maximum rates depend on two factors: the amount of the loan and the type of loan

1 Directive 2008/48/EC of the European Parliament and of the Council of 23 April 2008 on credit agreements for consumers and repealing Council Directive 87/102/EEC.

Table 1

Maximum APRs on consumer credit granted in Belgium

(November 2021, in %)

Amount borrowed	Loans and hire purchase	Credit facilities and all other types of loan	
		with card[1]	without card[1]
Up to € 1 250	17.5 (from 01.12.2019)	13.5 (from 01.06.2021)	9.5 (from 01.06.2021)
Between € 1 251 and € 5 000	12.5 (from 01.06.2016)	11.5 (from 01.06.2021)	8.5 (from 01.06.2021)
Over € 5 000	10.0 (from 01.12.2015)	10.5 (from 01.06.2021)	8.5 (from 01.06.2021)

Source: FPS Economy.
1 Card with electronic functions.

agreement. Changes in the legal maximum APRs only concern new agreements and those at variable interest rates. The maximum rates may change every six months according to the methodology described below. In November 2021, the rates in force could not exceed the limits set out in table 1.

1.2.2 Setting of maximum APRs

The method of calculation currently used in Belgium to set the maximum APRs was introduced on 1 February 2007.

Each year, at the end of March and the end of September, a review is conducted to check whether the maximum APRs need adjusting, following a change of at least 0.75 p.p. in the reference indices. The reference index used depends on the type of loan:

- for credit lines and overdrafts, it is the monthly average of the three-month Euribor interbank interest rate;
- for other forms of loan, depending on the amount borrowed the benchmark is reference index A, B or C applicable to mortgage loans, namely the interest rate on 12-month treasury certificates, 2-year Belgian government bonds or 3-year Belgian government bonds.

Finally, the new maximum APRs come into force on the first day of the second month following their publication in the *Moniteur belge*. As the revision is carried out in March and September, the changes will typically apply from the following month of June or December, respectively.

A change in the legal maximum APRs only affects new agreements and current agreements at variable interest rates, for example credit facilities offered with cards issued by banks, major retailers and mail order companies.

For current agreements at variable rates, if the new maximum rates are lowered any rates that exceed the maximum must be reduced accordingly. If the maximum rates are increased, lower rates can be raised to the level of the new maximum so long as consumers are warned of this change in advance and informed of the new APR.

The change in the maximum rates also influences debit interest rates on sight accounts, which are charged in the event of the account being temporarily overdrawn. Such overdrawing, treated as short-term credit, is in fact regulated as if it were an open-ended credit facility without a card, for an amount up to € 1 250.

The latest change in maximum APRs dates from June 2021: the maximum rate of charge for credit lines and overdrafts was lowered by one percentage point for all loan amounts, as, in March 2021, the three-month Euribor was 0.75 of a percentage point lower than that observed at the time of the previous revision (September 2012). The maximum APR for other loans remained unchanged, as their respective reference indices were more stable.

1.3 Comparison with neighbouring countries

Belgium's three main neighbouring countries have also set a limit on the interest rates charged on consumer credit. Specific rules were introduced there at the beginning of the 20th century, or even earlier in Germany, and have been adjusted several times since then.

In France, this subject is governed by the Consumer Code, which defines an exorbitant loan as any credit granted at an annual percentage rate more than one-third higher than the average real interest rate charged during the preceding quarter by credit institutions and finance companies for transactions of the same type entailing similar risks. That average rate is calculated by the Banque de France every three months and varies according to the type and amount of the loan. In addition, credit providers are obliged to offer consumers an instalment loan and not a renewable loan (such as a credit card), if the amount requested exceeds € 1 000. However, the French law does not cover the charges on small bank overdrafts for which banks can impose a minimum flat-rate charge,

the amount being determined arbitrarily (generally around € 5 but possibly up to € 22[1]). This supplement is not included in the APR, but if it is taken into account it may increase the APR considerably, to well over the exorbitant level as defined above.

In Germany, restrictions on interest rates are applied indirectly via case-law rather than by a regulatory authority setting maximum limits. An agreement subject to an interest rate deemed unethical can therefore be invalidated. Thus, the Supreme Court has ruled that interest rates twice as high as the relevant market rate calculated by the central bank (or 12 % above such a market rate) are *contra bonos mores* (*sittenwidrig* – immoral).

In the Netherlands, the maximum rate is set at the statutory rate of 2 % plus 12 % (*Wet op het consumentenkrediet*), taking it to 14 %. Owing to the pandemic, that supplement was temporarily cut to 8 % on new loans between 15 July 2020 and 1 March 2021[2]. A change in the law is currently under consideration in order to make that reduction permanent. People unable to obtain credit can turn to municipal credit institutions which offer social consumer loans. Despite these schemes, some consumers excluded from traditional channels turn to online loans from companies based in other European Union countries.

1 As at 8 January 2021.
2 To our knowledge, the Dutch government has not yet evaluated the temporary reduction in the maximum rate, nor has it assessed the impact, if any, on the provision of consumer credit.

Table 2

Maximum APRs in Belgium, Germany, France and the Netherlands

	Date of introduction	Reasons for introduction	Current method of setting the limit
Belgium	Introduced in 1990	Protecting consumers Preventing excessive rates Preventing excessive volatility in variable rates	According to the movement in the benchmark rate (per 75 basis point change)
Germany	Introduced in the 19th century (abolished between 1940 and 1969)	Avoiding lending at excessive rates	2 × the average rate or 12 % above the average
France	Introduced in 1935	Preventing abusive practices due to banks' market power Preventing the development of predatory lending to households Balancing the relationship between lenders and borrowers	1.33 × the average percentage rate charged in the previous quarter by credit institutions and finance companies
The Netherlands	Introduced between 1900 and 1939	Controlling illegal financial activities Protecting consumers Curbing risk-taking by some credit providers	Statutory interest rate + 12 %

Source: Faherty M. *et al.* (2017).

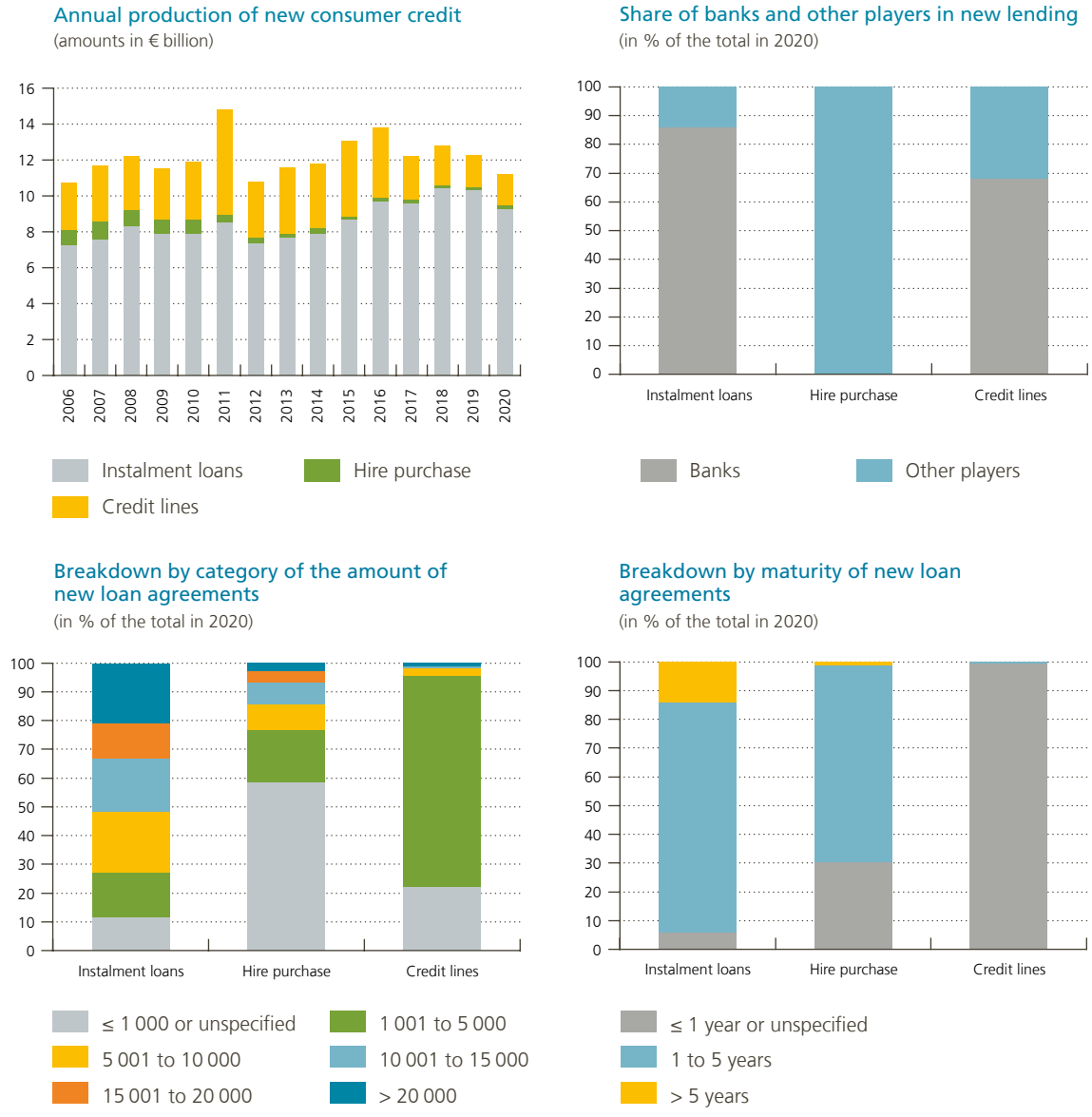
2. The consumer credit market in Belgium

2.1 Amounts and characteristics of consumer loans granted

According to the data recorded in the Central Individual Credit Register, consumer credit amounting to € 11.1 billion was granted in Belgium during 2020. That is lower than the previous year's figure (loans totalling € 12.4 billion), in the context of the COVID-19 crisis which triggered a fall in household consumption expenditure.

Chart 1

Consumer credit trends and characteristics in Belgium



Source: NBB (Central Individual Credit Register).

The great majority of consumer credit consists of instalment loans, i.e. loans part of which must be repaid at set intervals (generally monthly) at the same time as payment of the interest. These loans, which totalled € 9.3 billion in 2020, are usually granted by banks. Although the economic code does not stipulate any specific purpose for this type of product, lenders usually grant these loans mainly to finance a particular good or service, such as the purchase of a car, renovation of a property, or a holiday booking. They most often concern amounts in excess of € 5 000, and most of them have a maturity of between 1 and 5 years.

Hire purchase sales – being confined to a small number of specialist companies linked to retail businesses – represent only a very small proportion of consumer credit, amounting to € 220 million in 2020. Although some of these agreements are concluded for the purchase of a vehicle, more than half concern sums of less than € 1 000. These are usually medium-term loans with a maturity of between 1 and 5 years. That suggests that the "typical" hire purchase involves relatively small monthly payments but over a long period.

Credit lines form the third category of consumer credit. These consist of spare liquidity made available to individuals, practically always for an indefinite period and in most cases by banks via overdraft facilities. In 2020, credit lines had totalled € 1.7 billion, but that figure is only a guide since it concerns "authorised" borrowing. The Central Credit Register does not provide information on the amounts that individuals actually draw. The vast majority of agreements limit authorised drawings to at most € 5 000[1].

2.2 APRs charged by lenders

According to the data from a six-monthly survey conducted by FPS Economy between 2015 and 2019 among a number of players active in the consumer credit market and relating to four "typical" agreements[2], the rates charged on credit facilities are generally the highest, averaging 9.91 % for credit lines with no card and 12.48 % for credit lines with a card. The latter figure is close to the maximum rate (14.50 %, between 1 December 2012 and 1 June 2021) permitted by the regulations for the "typical" agreement considered by the survey, concerning a maximum overdraft of € 1 250.

Many market players also charge rates close or equal to the legal maximum for instalment loans. Half the lenders polled between 2018 and 2019 by FPS Economy stated that they charged an APR of between 8 % and 10 % for a € 10 000 loan (the maximum being set at 10 % from 1 December 2015). However, other lenders reported much lower average rates, in some cases under 5 %.

The last "typical" agreement considered in the FPS Economy survey concerns a hire purchase for a vehicle, the amount borrowed being € 15 000 repayable in 48 monthly instalments. Here, the APRs are much lower than those charged for a € 10 000 instalment loan, probably on account of the existence of collateral, namely the vehicle acquired by the borrower. Moreover, there is presumably keener competition on the car finance market, with some lenders – namely the vehicle vendors – being motivated to offer low interest rates in order to boost their sales. As in the case of instalment loans, the rates charged for this type of agreement also vary widely, with the average APR per lender ranging between 1 % and 5 %. Although drawn from fewer observations, creditors declaring that they are charging higher rates for this type of contract seem to grant larger loans, on average[3].

The scale of the variations is more apparent in aggregate data which encompass all types of credit, such as the data collected by the MIR (Monetary Financial Institutions' Interest Rate) survey. However, that survey only

1 The breakdown of our data (into the following amounts: up to € 1 000, from € 1000 to € 5 000, and from € 5 000 to € 10 000) does not enable us to specifically select amounts of less than € 1 250 (often the limit set when a credit card is issued).

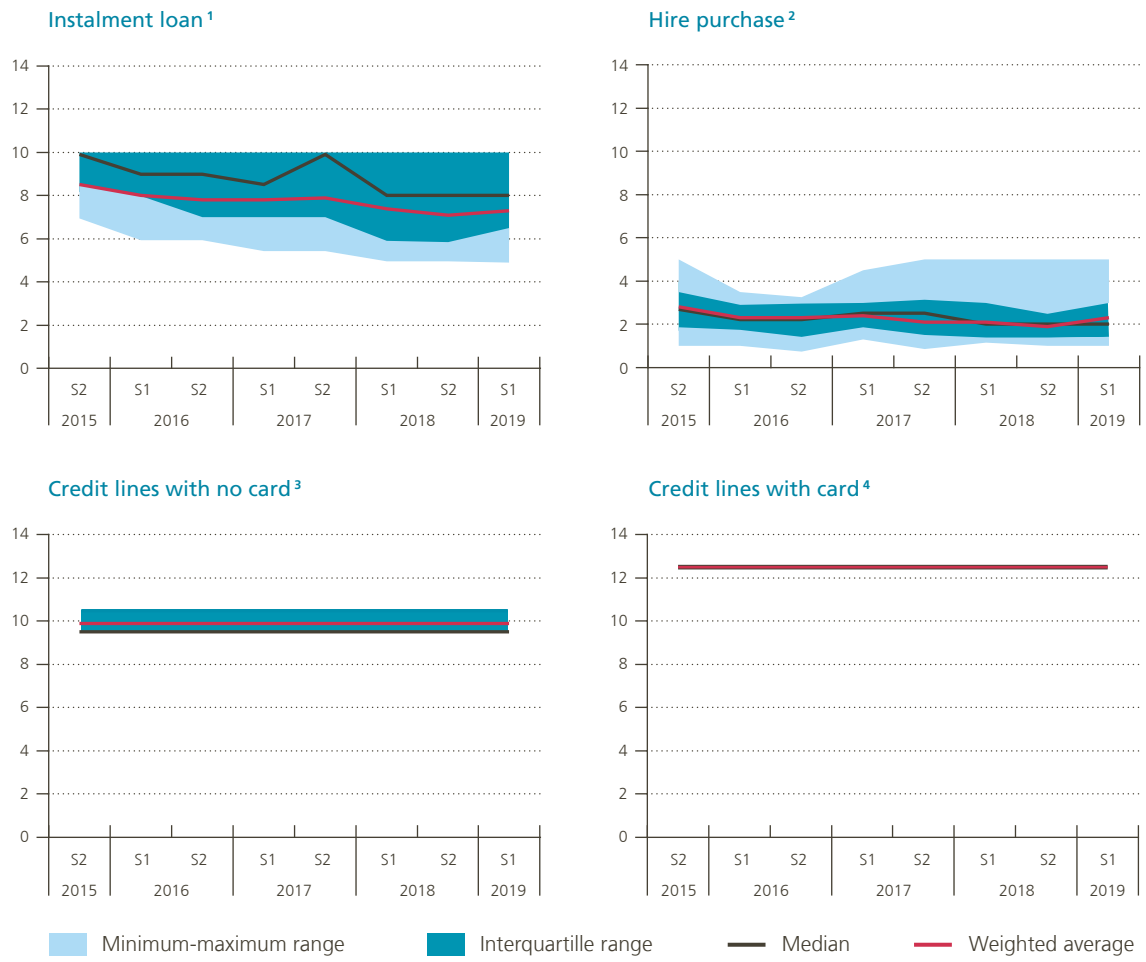
2 In this survey, four "typical" agreements representative of the various forms of consumer credit were selected: (1) car purchase finance as representative of hire purchase (€ 15 000 over a period of 48 months); (2) instalment loan (€ 10 000 over a period of 48 months); (3) credit line with card (€ 2 000 for an indefinite period); (4) credit line without card (€ 1 250 for an indefinite period).

3 No such relationship appears for the other credit types considered in the survey.

Chart 2

Trend in APR on four "typical" agreements

(in %)



Source: FPS Economy (six-monthly survey of annual percentage rates charged on consumer credit).
1 € 10 000 over a period of 48 months.
2 Car finance amounting to € 15 000 repayable over 48 months.
3 € 2 000 for an indefinite period.
4 € 1 250 for an indefinite period.

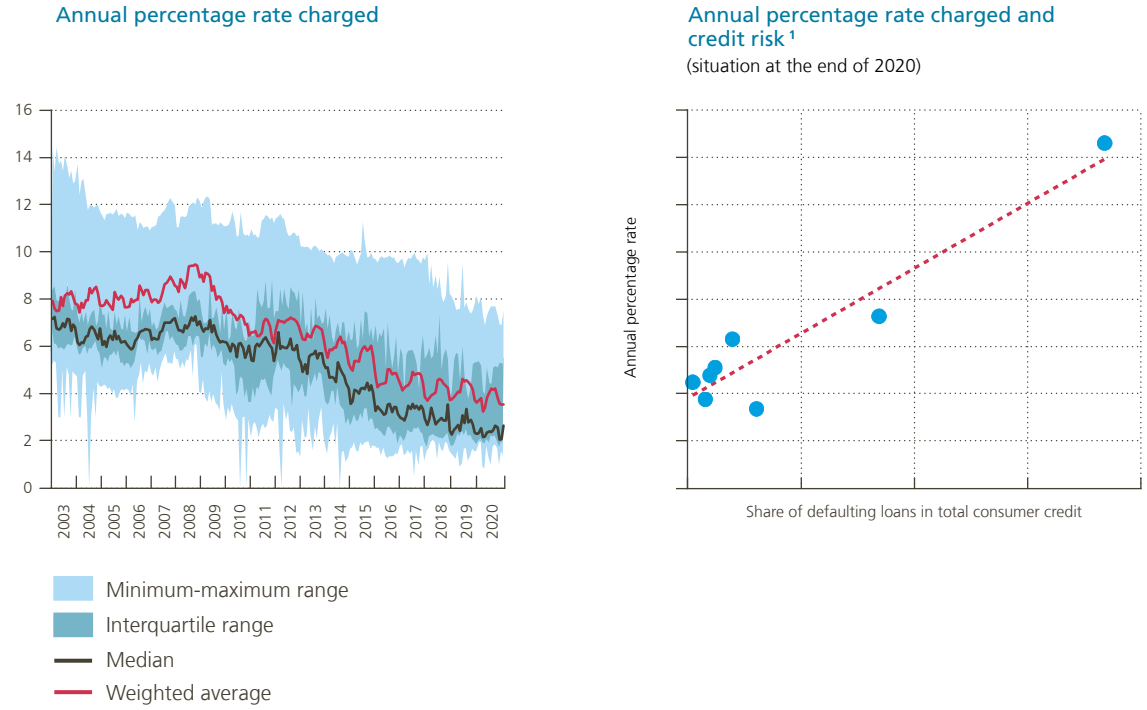
covers Belgian banks, and therefore excludes other companies active in consumer credit (including subsidiaries of traditional banks specialising in that sphere). Examination of the individual data from each institution participating in the MIR survey – not reported here for confidentiality reasons – identifies two factors which may at least partly explain the variations in average APRs. First, since lending rates are generally higher for credit facilities, the average rate on the consumer credit portfolios of banks specialising in this type of product is naturally higher. Next, as chart 3 shows, there is a positive correlation between the banks' average APR and the percentage of riskier loans in their portfolio. In particular, the two banks notable for their high APR are also the ones with a larger proportion of defaulting loans in their portfolio.

Moreover, the average APRs charged on consumer credit are essentially determined by the rates on instalment loans and, on the whole, have mirrored the general trend in lending rates charged by Belgian banks since the 2008-2009 financial crisis. Thus, they declined steadily over a period of more than ten years as a result of the successive easing of monetary policy and the reduction in the banks' funding costs.

Chart 3

Annual percentage rate charged by Belgian banks and share of defaulting loans in their portfolio

(in %)



Source: NBB (MIR survey and prudential reporting).

1 For confidentiality reasons, the scales are not shown on this chart.

3. Higher interest rates on consumer loans: from the borrowers' perspective

The information obtained from the Central Individual Credit Register plus the survey data presented in the previous section are insufficient on their own to gauge the importance of high-interest-rate consumer loans among Belgian households and assess the possible effects of any change in the maximum interest rates. One reason is that they do not provide sufficiently granular information linking the amounts borrowed and the rates charged on each agreement, or information on the debtors.

However, with the data from the HFCS, it is possible to document Belgian consumers' recourse to this type of credit, as well as the characteristics of the borrower households, the purpose of the loans and the associated interest rate levels.

The HFCS is an initiative of the national central banks of the European Union, coordinated by the European Central Bank. In Belgium, the entity responsible for the survey is the NBB, with the cooperation of the National Register and Statbel. We currently have three waves of the survey available (for reference years 2010, 2014 and 2017). The HFCS provides very detailed data on the financial situation of households, including their income, assets and debts. It thus offers information on the distribution of consumer credit among Belgian households.

At present it is the only source in Belgium permitting analysis of the (financial and demographic) characteristics of indebted households.

However, in view of the constraints relating to the sample (around 2 000 households polled in each wave of the survey, less than 20 % of which report having consumer credit), the results need to be interpreted with caution as the margins of error could be relatively large.

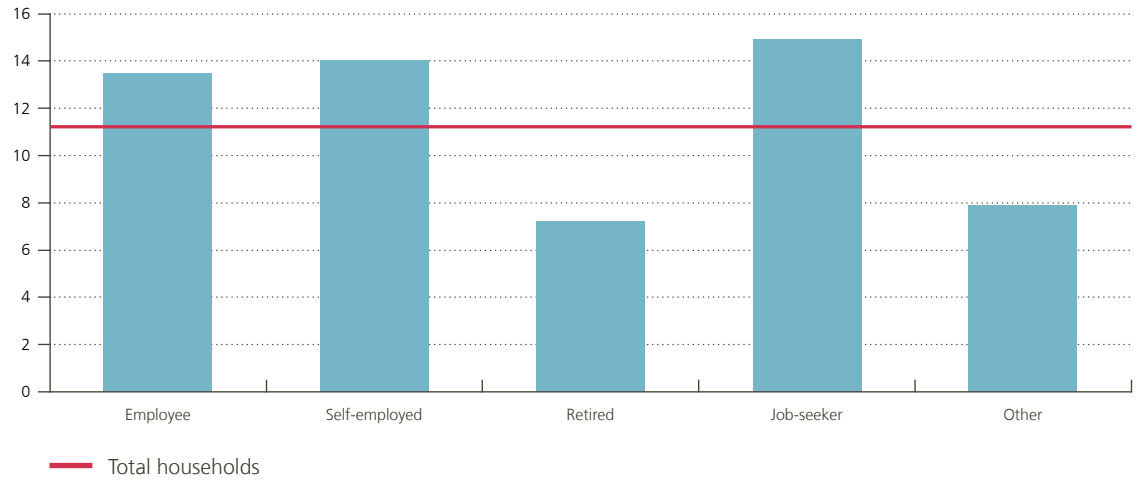
3.1 Level and distribution of consumer credit among Belgian households

According to the HFCS, 11 % of Belgian households had at least one consumer loan in 2017; that was lower than the percentage seen in previous waves (18 % in 2010, 12 % in 2014).

Chart 4

Households with at least one consumer loan

(in %; by activity status of the reference person; 2017 data)



Source: NBB (HFCS).

In addition, among households in which the reference person was not retired[1], 13 % had at least one consumer loan current in 2017 (compared to 15 % in 2014 and 23 % in 2010).

The median outstanding amount on consumer loans declined between 2010 (€ 16 289) and 2017 (€ 10 819). According to the households, the purposes of these loans were manifold[2]. In 2017, the main reasons for contracting a consumer loan were to purchase a vehicle, to renovate or convert the household's main residence, to repay other consumer credit or to cover current expenses.

1 Debt levels are very low when people retire. At the same time, these households have higher levels of net wealth and relatively lower income levels. Therefore, to avoid an excessive impact on the statistics shown, in this first part of the analysis of the HFCS data, we disregard households in which the reference person is retired.

2 This analysis only takes account of the primary purpose indicated by the household.

In 2017, among the households in which the reference person was not retired, those which had contracted consumer loans[1] had a lower equivalent gross income[2] than households which did not have this type of debt. The differences in terms of net wealth[3] were even more pronounced: the net wealth of households contracting consumer loans was 32 % lower than that of other households.

Furthermore, a higher proportion of households contracting consumer loans had also taken out a mortgage loan (56 %, compared to 52 % for households without consumer credit in 2017). If we consider indebted households on their own, the median ratio between debts and assets – still in 2017 – was more unfavourable for households resorting to consumer credit, but this observation is not constant over time. Conversely, the debt/income ratio was considerably more favourable, with the consumer credit generally concerning smaller amounts.

A smaller proportion of households which had contracted consumer loans stated that they could save regularly (40 %, compared to 57 % for households with no consumer credit). A slightly higher percentage of households with this type of loan reported that they faced credit constraints, in that they had not asked for an additional loan because they thought it would not be granted or had asked for at least one loan which had been refused in whole or in part. For these "constrained" households, the top of the rate distribution displayed wider dispersion.

1 Excluding unsecured loans to finance the purchase or construction of real estate.

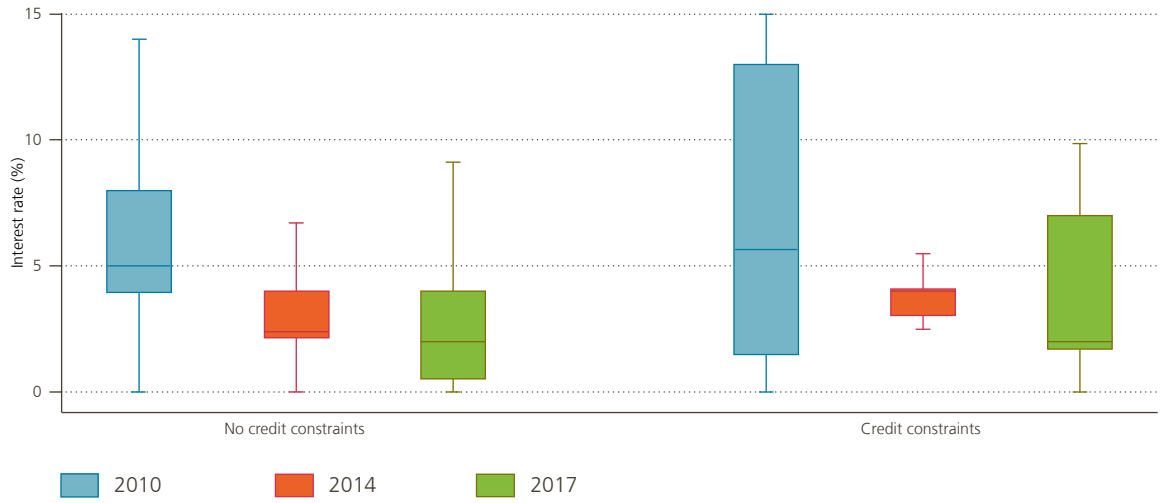
2 The household's total gross income per member, according to the OECD equivalence scale (1/0,5/0,3): equivalence "means adjusting a household's income for its size, so that we can look at the income of all households on a comparable basis. The needs of a household grow with each additional member but – due to economies of scale in consumption – not in a proportional way". Source: OECD, "Compare your income – methodology and conceptual issues", June 2020.

3 Net wealth comprises all the assets held by the household, both real and financial, minus its debts.

Chart 5

Rates on consumer loans, by household credit constraints

(excluding loans to finance real estate)



Source: NBB (HFCS).

Note: The rectangle contains the values between the lower and upper quartiles. The horizontal line in the rectangle indicates the median. The vertical lines comprise the values between the lower quartile less 1.5 times the interquartile range and the upper quartile plus 1.5 times the interquartile range.

3.2 Distribution of interest rates

In the analysis below, we have disregarded loans mainly used to finance the purchase or construction of a dwelling, in order to stick to the definition of consumer credit in the other data sources. But the HFCS data provide no information on the specific type of loan[1], the year of granting or the lender institution (bank or other). In addition, the reported interest rates do not include charges, and they applied at the time when the household responded to the survey. Thus, in the case of a variable interest rate, the rate may have differed from the rate applied when the loan was granted.

As already mentioned in section 3, interest rates have maintained a downward trend in recent years, and that is also reflected in the rates on consumer loans reported by households in the HFCS. However, the dispersion of the rates has remained significant on loans obtained to pay off debts and cover current expenditure or other purchases. In other words, some households have continued to pay very high interest on such loans, despite the generally shorter loan maturity and lower amounts borrowed.

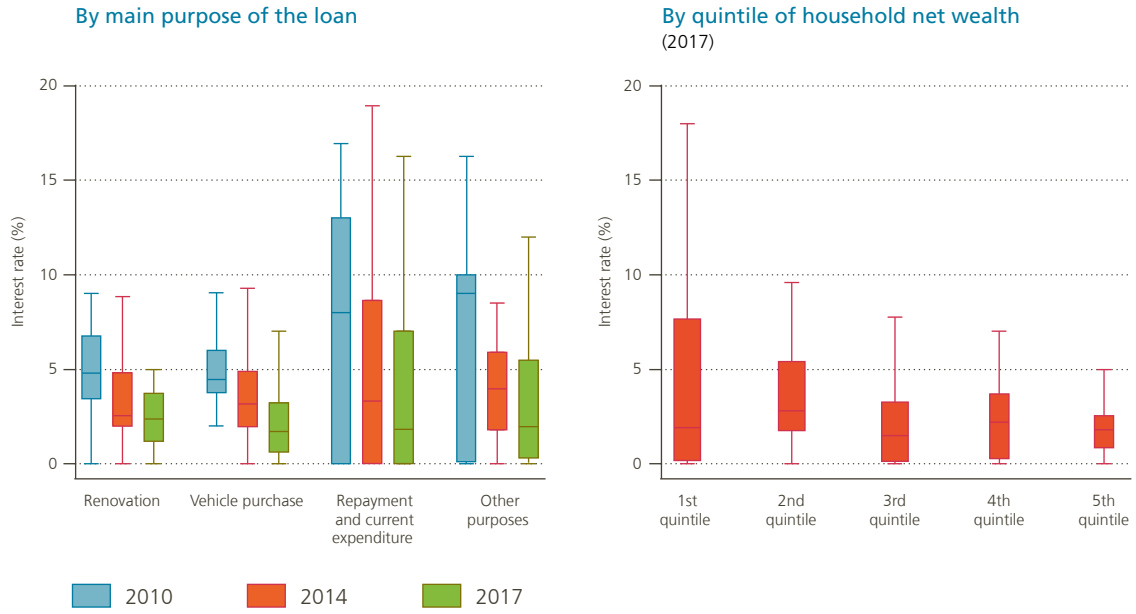
There are significant differences between households according to the purpose of their borrowings. For example, those that had taken out a loan to buy a vehicle had a considerably higher (total and equivalent) income and considerably greater net wealth than households that had borrowed in order to pay off other debts or to finance current expenditure or other purchases. Only 9 % of the latter households stated that they could save regularly, and 22 % said that they were subject to credit constraints (compared to 43 % and 2 % respectively for households taking out a vehicle loan). In general, the less well-off households were much more likely to pay considerably higher interest than the more affluent.

1 Instalment loan or hire purchase. The HFCS does not include data on the interest rates charged on credit lines or credit cards.

Chart 6

Interest rates

(excluding loans for the purpose of the purchase or construction of real estate)



Source: NBB (HFCS).

Note: The rectangle contains the values between the lower and upper quartiles. The horizontal line in the rectangle indicates the median. The vertical lines comprise the values between the lower quartile less 1.5 times the interquartile range and the upper quartile plus 1.5 times the interquartile range.

Table 3

Equivalent gross income and total net wealth per interest rate quintile

(in €, unless otherwise stated; 2017 data)

	Gross income	Net wealth	Share of loans for current expenditure and other purchases [1]	Share of loans for repayment of other credit [1]
			(in %)	
1st quintile	29 055	215 331	1	18
2nd quintile	31 601	196 810	2	2
3rd quintile	32 210	139 973	3	1
4th quintile	31 973	165 120	1	4
5th quintile	31 284	83 420	14	18
Households with no consumer loan	29 182	227 568		
Non-retired households with no consumer loan	34 670	192 335		

Source: NBB (HFCS).

1 In % of loans included in each quintile for which the main purpose was to pay off other consumer loans or to finance current expenditure and other purchases except vehicles.

The main feature of households paying higher interest (i.e. those in the last quintile of the rate distribution) was that they had considerably less net wealth than the others, which confirms the existence of a negative correlation between the rates paid and household wealth. Conversely, there is no clear trend regarding total gross income (not shown) or equivalent gross income.

In median terms, the ratios between total debt and assets, total debt and income, and debt service and income are relatively high for households paying the highest interest rates.

The majority of the loans at higher interest rates (top quintile) were intended to finance the purchase of a vehicle or the renovation of the household's main residence (34 % and 21 % respectively), followed by loans granted to repay other consumer credit (18 %) and those covering current expenditure or other purchases (14 %). This last type of loan is, proportionally, more heavily represented in the top quintile of the interest rate distribution (they only represent 1 % of the loans granted at the lowest rates – first quintile).

Regardless of purpose, the loans at the highest interest rates had relatively long maturities (over-representation of loans with a maturity of between five and ten years). However, in 2017, 13 % of loans included in the quintile with the highest interest rates had a maturity of between 2 and 3.5 years, and 18 % between 3.5 and 5 years.

In 2017, 54 % of households had a credit line or overdraft, a higher share than in previous years. Among them, only 12 % had an outstanding balance (potentially incurring interest and other charges) which, on average, amounted to € 1 945 (the median conditional amount was lower, at € 600). The share of households with an open balance was higher among the unemployed (11 %) and lower for households where the reference person was retired (4 %). All in all, households that could access a credit line or overdraft were in a better financial position than those that could not (higher income and net wealth, more likely to be owner of their main residence). But among them, those with an outstanding balance were clearly worse off than those who had not incurred any actual debt through the available credit facilities. While the HFCS does not provide information about the rates charged for credit lines and overdrafts, section 2 of this article shows that the rates offered by creditors are very close to the authorised maxima, with very little variation. Households with outstanding balances are also more likely to pay higher rates on other consumer credit.

3.3 How do changes in maximum rates affect the financial situation of households?

In 2017, according to the HFCS data, the upward dispersion of interest rates was greater for loans intended to repay other consumer credit and to finance current expenditure or other purchases. This type of borrowing made up almost one-third of the loans associated with the highest interest rates. In general, households contracting this form of credit had significantly lower incomes and net wealth than households which borrowed for other purposes or had not contracted any consumer loans.

It is therefore likely that any change in the maximum APRs on loans would have a more direct impact on these household categories, which are more vulnerable in terms of financial security. Any reduction in these maximum rates would mean either that these households could borrow at more moderate interest rates or that they would be denied access to credit if the lenders consider that lower rates do not cover the risks. Conversely, a rise in these maximum rates, while providing incentives for lenders to loan to riskier consumers, could also overburden the borrowers. The question of a possible impact on the supply of riskier loans, especially in the event of a reduction in the maximum rates, is examined in the next section.

4. Sensitivity of lenders' profitability and credit supply to changes in maximum rates

A change in the maximum APRs on consumer credit could affect lenders in various ways. As a rule of thumb, if business remains the same, a reduction in maximum APRs could erode the generation of interest income. If consumer credit makes up a significant share of a lender's business, that could lead to a deterioration in his general profitability. A lender might equally consider that the new maximum rates no longer allow him to set his tariffs so as to cover various costs (risk of non-repayment, provision of liquidity to finance the loan, capital requirements, etc.) while still generating an adequate profit margin. That could cause lenders to cease offering certain types of loan. If consumer credit represents a significant part of a lender's activities, that could have a major impact on his business model.

If such effects – on profitability and business models – are significant for a large number of lenders, that could potentially threaten financial stability. In terms of the supply of financial services, it should be borne in mind that, even if some lenders were to withdraw from (part of) the market in the event of a significant decline in maximum rates, other credit providers ready to accept lower maximum rates might take over their market shares.

The next sections address the impact of a possible reduction in the maximum APRs on bank lenders and non-bank lenders, and on the stability of the financial system and the supply of financial services.

4.1 Bank lenders

As mentioned in section 3 above, the major part of the Belgian consumer credit market (especially the instalment loan segment) is covered by the banking sector, either directly or indirectly via specialist subsidiaries. Among the Belgian banks operating on the Belgian consumer credit market, there are evidently significant differences, notably as regards the share of consumer credit in their total assets and interest income.

For most banks, Belgian consumer credit represents only a small part of their business. The implicit interest rates (calculated by comparing the interest income on consumer credit with the stock of consumer credit) also show relatively low average levels for the majority of banks. That suggests that the share of the banks' business for which the rates charged are close to the maximum levels is small. A reduction in the maximum APRs is therefore unlikely to have a significant effect on the profitability and business model of these institutions.

Differences in the average implicit interest rate between lenders mainly reflect differences in the consumer credit portfolio mix. The rates offered in fact vary widely between, for example, a loan for the purchase of a car, a credit line or a personal loan for an unspecified purpose (see section 3). Interest rate differentials may also reflect a difference in the average quality of the portfolio.

For a small number of bank lenders, Belgian consumer credit represents a more significant part of their business (up to one-third of their total assets). Some of them operate on the private banking market. For those banks, consumer credit forms part of their general customer relationship management and the average interest rates are relatively low. The rules on the maximum APRs are therefore unlikely to have any significant impact. For a similarly limited number of players (though their cumulative share of the market is estimated at around 10 % of consumer credit in Belgium), the implicit interest rates are on the whole higher. That reflects a generally larger proportion of credit lines in their consumer credit activities. It may also indicate that the share of instalment loans for which the rates charged are close to the current maximum rates is greater than for the majority of banks. Therefore, a reduction in the maximum APRs could have an impact on those institutions. However, it should be noted that some of those banks belong to a Belgian banking group in which consumer credit represents a much smaller part of the business.

4.2 Non-bank lenders

A large percentage of non-bank lenders feature a significant proportion of hire purchase agreements (e.g. in the mass retail sector) or have links with the automotive sector. In these segments of activity, the rates offered are usually well below the maximum APRs (see section 3). A reduction in the maximum APRs is therefore unlikely to have any significant impact.

In contrast, other lenders typically have a higher percentage of credit lines and instalment loans for various purposes. The rates that these credit providers offer, particularly on credit lines and instalment loans for no specified purpose, are generally close to the maximum APRs (see section 3). It follows that a reduction in the maximum APRs could have an effect on these institutions.

4.3 Potential impact of a reduction in the maximum APRs on financial stability and the supply of financial services

A reduction in the maximum APRs charged on consumer credit is likely to have little impact on financial stability. For most lenders, such a change is unlikely to have any significant impact. However, a change in the maximum permitted APRs on consumer credit could have an impact on a small number of lenders, but their market share in terms of total banking assets or the supply of credit and financial services in Belgium is marginal.

If we consider the supply of consumer credit in Belgium on its own, the share of these lenders potentially affected by a change in the maximum APRs is more significant, especially in the case of credit lines and instalment loans for an unspecified purpose. In these specific segments a reduction in the supply cannot be ruled out. That also applies to the specialist subsidiaries of banking groups in which the supply of certain types of consumer credit could be reduced. It should nevertheless be noted that scope for substitution could (partially) offset such a negative effect on lending.

5. Beyond the APR: some additional considerations

The price reflected by the APR is only one dimension of a consumer loan agreement. The literature addresses other issues relating to this type of credit which likewise merit attention. Some of those issues are mentioned in the following paragraphs.

According to the FSUG report, Belgium is one of the ten largest consumer credit markets in the European Union, along with Germany, France and the Netherlands, among others. An efficient consumer credit market is deemed to benefit households, businesses and sellers of goods and services, and to stimulate economic growth. But if credit creates an excessive debt burden which becomes unsustainable, that can have a significant impact on some categories of households and lenders, because although consumer credit represents only a small part of household debt, its influence on the household budget may be greater if it is granted without the necessary safeguards (BEUC, 2019).

A study by the European Commission (EC, 2017) estimated that, in 2016, the financial detriment that consumers suffered via the market in loans and credit cards could be put at € 12.8 billion. The main problems affecting the consumer credit market concerned the cost of credit obtained at very short notice (particularly via mobile applications, speedy but expensive because of the high estimated default risk), poor use of consumer credit (poor matching between the purpose of the loan and the type of credit offered), the proliferation of marketing channels encouraging borrowing, inadequate assessment of borrower solvency, and inadequate contract and pre-contract information, particularly regarding the credit terms and conditions, penalties and early repayment (EBA, 2019[1]).

More particularly in the case of very short-term credit ("payday loan" type) in France, for instance, this type of credit concerning modest sums (€ 200 to € 600) is negotiated on loan platforms on a peer-to-peer basis, circumventing the national legislation. Companies operating on this segment do not generally assess the consumers' borrowing capacity correctly and do not include any APR in their offers. In the Netherlands, this type of loan is called "flash credit" or "mini loan" (*flitskrediet* or *minilening*). *Minilening* providers must have a licence and are subject to the regulator's supervision. The maximum permitted charges on these agreements come to 10 % on an annual basis. Owing to the existence of this strict regulation, the Netherlands is no longer attractive for the payday loan market; some credit providers based in other Member States therefore circumvented the law by making offers on the internet. In response, the advertising of these loans was banned (Cherednychenko and Meindertsma, 2019).

There is also a recurring problem with the cost of insurance linked to the loan (cross selling) which is not generally taken into account in the APR (because the insurance is optional and depends on the borrower's personal situation). One way of remedying this would be to ask lenders to offer the consumer two APRs (with and without the premiums for such insurance). In addition, the sale of this type of insurance, deemed to protect consumers facing circumstances that prevent repayment of their loan (sickness, disability, unemployment, etc.), seems to have caused a lot of trouble (particularly a lack of clarity over whether or not certain clauses apply) in a number of European countries (including Germany, Belgium and France) (BEUC, 2019), causing some countries to pass legislation to enhance transparency and disclosure in this sphere.

Another aspect of the question concerns the current context of low interest rates, encouraging the granting of consumer credit. However, the risk that future interest rate rises may lead to payment defaults and a rise in excess debt levels is particularly significant the bigger the share of variable rate loans, i.e. loans indexed to benchmarks such as Euribor. The low interest rate environment may have led consumers to contract more expensive loans while ignoring the effects of a potential interest rate rise. If rates go up, that could have adverse implications for the financial system as a whole if the portfolio of consumer loans in some institutions is of poor quality (EBA, 2019).

1 This study only considers loans by credit institutions.

Finally, excess debt often goes hand in hand with inadequate or underdeveloped (digital) financial literacy among consumers. That concerns in particular a lack of knowledge about the methods of calculating product prices or interest rates, a limited understanding of the terms and conditions associated with loans, ignorance of basic financial terminology and a lack of understanding of the risks inherent in financial products such as consumer credit (EBA, 2019). Research in the United States and Germany also shows that financial institutions offer products on far less favourable terms to persons with a lower (average) level of financial literacy (Bucher-Koenen *et al.*, 2021 ; Ru and Schoar, 2019). In that regard, the most vulnerable groups are poorly educated consumers, young people, the unemployed, and the elderly and migrants (EBA, 2019). To remedy this problem, some countries have programmes offering financial education right from primary school or providing training for the elderly, and for consumers in vulnerable groups.

Conclusion

The consumer credit market in Belgium is diversified and comprises several categories of lenders and loans to meet the seemingly varied needs of households. Analysis of the available data shows that most of these loans are provided at rates far below the maximum APRs legally established. Nonetheless, it is possible to identify two market segments where that is less the case. First, on the supply side, this concerns instalment loans for an unspecified purpose and credit lines, on which interest rates are very uniform, both over time and for different lenders, and close to the permitted maximum. Next, on the demand side, it would mainly concern financially vulnerable borrowers, who seem to be the ones more often having to pay higher rates.

From the lenders' viewpoint, changes in the statutory maximum APRs should have little impact on financial stability, but they could nevertheless affect the commercial margins where the rates charged are close to the maximum. However, the data available do not enable us to estimate the scale of that effect on the profitability of the various types of lenders. Yet we should stress that, if the margins on riskier loans – such as unsecured loans, loans for an indefinite period or loans to households considered vulnerable – were to be reduced, that could hinder some households' access to traditional credit channels and prompt them to turn to alternative sources of finance (subject to little or no regulation).

In that connection, the experience of the Netherlands where foreign entities target customers on the fringes of the credit market is interesting, as it shows that regulations can have an impact on access to finance for certain categories of persons and, at the same time, increase the risks of excess debt, especially in groups with low financial literacy. Measures intended for households facing credit constraints could therefore be envisaged. The market entry of lenders not subject to national regulation also highlights the need for uniform legislation throughout the European Union.

That said, it is equally possible that, despite the cut in the commercial margins on the loans concerned, those loans may remain viable, even for the riskiest market segments. In that case, the debt burden of the most vulnerable households would be eased. Also, supply could shift to more efficient lenders (with more scope to reduce their margins).

Finally, it would likewise be useful to assess the competition on the various segments of the consumer credit market so as to estimate the impact of any change in the statutory maximum rates, particularly for the market segments where tariffs have not kept so closely to the general (downward) trend in interest rates and financing costs.

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Household savings during and after the COVID-19 crisis: lessons from surveys

R. Basselier
G. Minne

Introduction

From March 2020 onwards, many European countries, including Belgium, introduced severe containment measures in response to the worsening COVID-19 health crisis. Person-to-person interactions were limited, international trade and travel were severely disrupted, non-essential production sites and shops were closed for long periods and consumption possibilities were reduced.

The lockdown measures have had a significant negative effect on households' expenditure in the short term, but part of this effect seems to be lasting over time (longer than in other economic crises). By way of illustration, while business investment has returned to its pre-crisis level after only a few quarters, household consumption still seems to be struggling to recover its pre-crisis level. It is true that government measures to protect employment and workers' income have safeguarded a major part of the purchasing power of households, but the very nature of the health crisis may, in some respects, go beyond purely economic rationale and certain changes in habits may also be reflected in different consumption patterns. Both the underlying (economic and heath) uncertainty and post-pandemic economic development are still expected to influence consumption expenditure for some time.

In this article, we first shed light on the macroeconomic consequences of the pandemic for households, using national and sectoral accounts. However, the crisis has most likely affected different households in different ways and the macroeconomic figures do not enable the impact to be distinguished between different groups. It is therefore useful to look at data from targeted surveys[1] that were held during the COVID-19 crisis to complement the general picture and, in particular, improve the understanding of households' saving behaviour during the pandemic. A better understanding of which categories of households increased their savings during the COVID-19 crisis matters from a policy perspective as it could shape the speed of the recovery of private consumption and, therefore, GDP.

1 Please refer to Annex 1 for a (non-exhaustive) list of survey data gathered during the COVID crisis, mainly focusing on NBB and ECB sources.

1. The COVID-19 crisis has led to a drop in spending and a surge in household savings

1.1 Household purchasing power and the ability to spend were preserved by government support measures

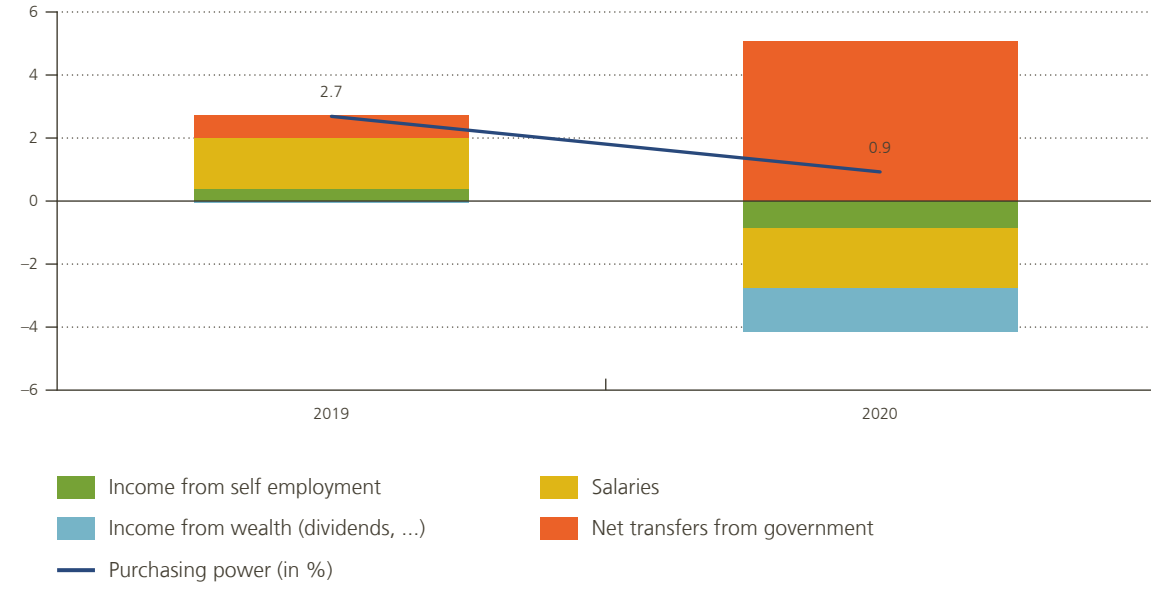
The health crisis and the containment measures, among other things, have put strains on the labour market and clouded the outlook for household incomes. Average hours worked fell sharply in 2020 and depressed both employee compensation and the mixed income of the self-employed. However, in an attempt to minimise the economic fallout, various support measures, such as the temporary unemployment or bridging rights systems, were put in place or reinforced by the government. At the peak of the crisis, in April 2020, 36 % of salaried workers and 50 % of self-employed were affected by these support schemes. Their use gradually became less intensive, as restrictions were relaxed and businesses and self-employed learned to operate in a "coronaproof" way, paving the way for an economic rebound.

As highlighted by Coppens *et al.* (2021), the government measures cushioned the blow on household incomes and substantially reduced the labour market impact. Thanks to these support systems and the large positive contribution of net social transfers to disposable income growth, households' purchasing power was, quite remarkably, preserved throughout the largest post-war crisis. Household disposable income did not shrink in 2020, but actually improved by € 4 billion in nominal terms compared to 2019. In constant prices, this represents an increase of 0.9 %, which boils down to 0.6 % per capita and is just a tad below the per capita purchasing power growth that was expected for 2020 in the NBB's December 2019 projections. However, even though those projections were made prior to the pandemic, they do not entirely represent a "counterfactual no-COVID scenario", considering how other variables with an effect on households' purchasing power, such as energy prices, have also turned out differently than projected at the time.

Chart 1

Composition of households' real disposable income

(contributions to annual growth, unless otherwise mentioned)



Sources: NAI, NBB.

1.2 Household consumption collapsed (especially during the first lockdown) while the saving rate surged to unseen heights

Lockdown measures have weighed on certain purchases (e.g. non-food items) or made certain forms of consumption difficult or impossible (events, tourism, contact professions, bars and restaurants, etc.) over long periods of time. At the same time, groups that suffered the largest financial impact of the crisis generally cut back on spending.

To some extent, the decline in spending may have been a voluntary choice for some households; either because they did not want to risk getting ill or because they felt uncertain about the future. The severe drop in consumer confidence – and in particular the sub-components related to unemployment and the economic situation – in April 2020 demonstrated that uncertainty was on the rise. It is possible that households decided to increase precautionary savings in the face of economic or job uncertainty, or in anticipation of possible future tax hikes, considering the rapid worsening of public finances.

All in all, a huge drop in household spending was recorded in the first half of 2020, down by nearly 18 % in real terms. Consumption recovered strongly in the third quarter, thanks to the relaxation of some containment measures, but took another – more modest – hit at the end of the year as the number of infections rose again and restrictive measures were re-instated. In 2020, this put (nominal) private consumption nearly € 20 billion below the level of 2019.

Within the range of consumer goods and services, the COVID-19 crisis and the ensuing restrictions had a different impact. Consumption data classified according to purpose (COICOP[1]) show a significant decrease in the volume of consumption related to travel, transport, apparel and footwear, healthcare, personal care, recreative services and the catering industry in 2020[2]. Taken together, this expenditure accounted for 35 % of total household expenditure in 2019, but only 30 % in 2020. In fact, this drop explains nearly all of the annual 7.5 % decline in household expenditure in 2020, the sum of the other categories being stable. To a large extent, the drop in this type of expenditure does not come as a surprise, as these goods and services were either directly affected by the lockdown measures through a formal ban (e.g. restaurants, international travel), or in a more indirect manner through the pandemic fallout (e.g. postponement of medical operations, or less extensive use of transport thanks to teleworking). Most basic goods, such as food or non-alcoholic beverages, and quasi-fixed expenditure were not negatively affected in 2020, as a large part of these two categories is irreducible. Mechanically, they represented a larger part of total expenditure in 2020 than in 2019, even if neither of the two increased significantly.

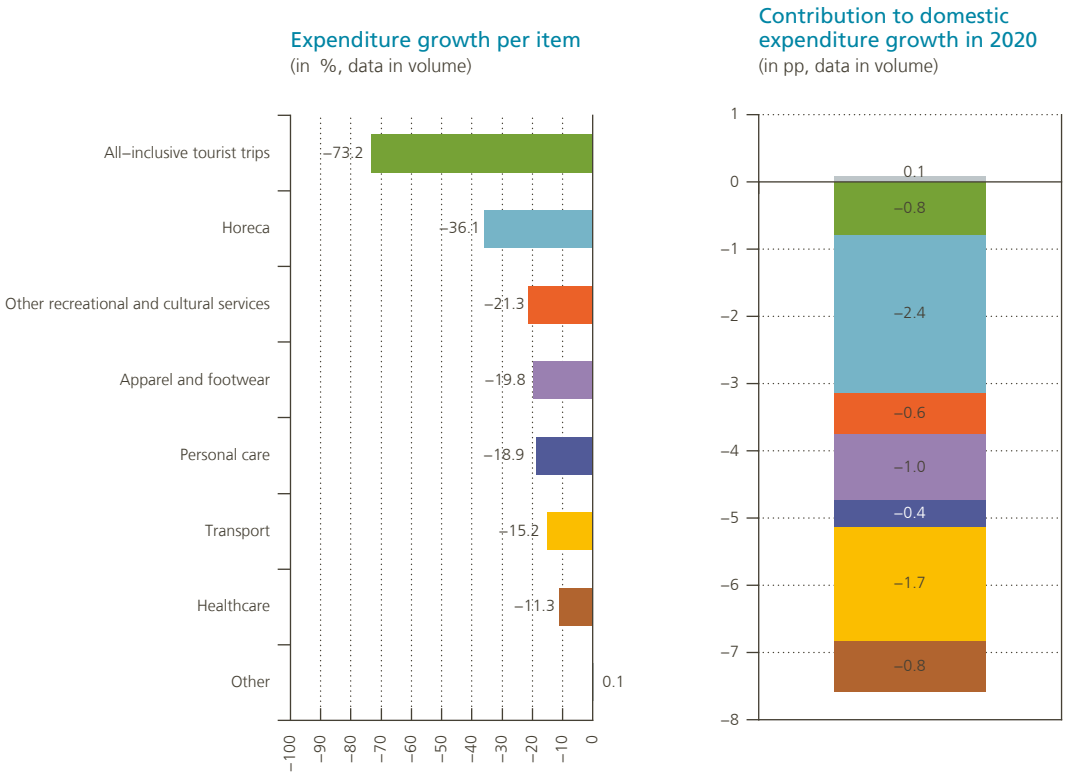
The sharp decline in household consumption, in spite of stable household revenue, implied an unprecedented surge in savings, with the saving rate peaking at 26 % of disposable income in the second quarter of 2020, at the height of the first lockdown. For the year 2020 as a whole, the saving rate worked out at over 20 % on average and additional household savings were accumulated to the tune of € 23 billion (or about € 4 700 per household), largely exceeding the previous high of 18 % recorded during the 2008-09 great financial crisis.

1 The Classification of Individual Consumption by Purpose, abbreviated as COICOP, is a classification developed by the United Nations Statistics Division to classify and analyse individual consumption expenditure incurred by households. This concept of household consumption is slightly different from that used in other parts of this article. More particularly, the concept of private consumption as defined by the National Accounts Institute refers to household consumption expenditure, as well as (individual) expenditure by non-profit institutions serving households that directly benefit households. Household consumption according to the COICOP classification, however, only includes spending by households. Moreover, it measures expenditure for different goods that were bought in Belgium. It therefore includes consumption expenditure from non-residents in Belgium but excludes Belgian consumption expenditure abroad (also known as the domestic concept). The opposite goes for private consumption, which the NAI bases on the national concept. In terms of year-on-year growth rates, both aggregate concepts are actually close, but a decomposition per product type only exists for the domestic concept (currently until 2020).

2 Cotton *et al.* (2021) categorised this expenditure as "social-distancing-sensitive spending". Expenditure such as restaurant, dining and travel is very sensitive to social distancing and experienced much larger and more persistent falls throughout the COVID-19 crisis in the US.

Chart 2

Final consumption of households classified according to purpose – annual growth in 2020



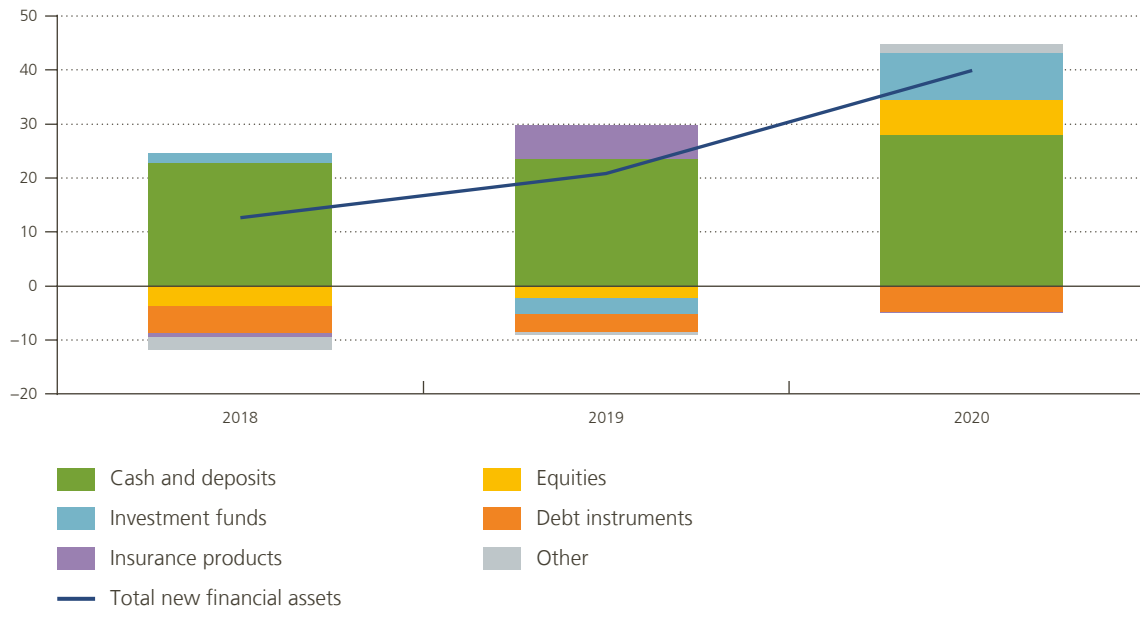
Source: NBB.
Note: The expenditure data are based on the domestic concept, i.e. goods/services that were bought in Belgium. Consumption related to education is not included in the graphs because it is not very representative of the total expenditure of the Belgian economy on this item. The category "transport" includes transport services, purchase of personal vehicles and costs related to the use of personal vehicles, while the category "healthcare" includes medicines, other pharmaceutical products and therapeutic equipment, services of doctors, dentists and paramedics (excluding hospitals) and care provided in hospitals and similar institutions.

An exceptionally large share of household income was saved and while savings accounts remained the main investment outlet, illiquid assets attracted more interest than is usually the case. First, it should be noted that household residential investment recovered very quickly from the first lockdown in the spring of 2020 and remained highly resilient afterwards. By the first quarter of 2021, it had already exceeded its pre-crisis level. Households having more cash on hand in a low-interest rate environment decided to renovate their property as they were forced by the lockdown measures to spend more time at home and as teleworking is expected to become established for many workers. Secondly, Belgian households also turned to riskier assets and bought equities and investment fund units to the tune of € 15 billion (or about € 3 000 per Belgian household) in 2020, whereas net transactions in these assets were negative in 2019.

Chart 3

The share of equities and investment funds in saving rose strongly in 2020

(formation of financial assets, in € billion)



Sources: NAI, NBB.

1.3 Forced saving explains most of the strong increase in the savings ratio

The drop in consumer spending may have either been involuntary, as consumers were faced with restrictions that forced them to change their behaviour, or it could have also been a voluntary choice, as explained above. Understanding which of these explanations is predominant is important because it has implications for the recovery in consumer spending in a post-pandemic world.

In July 2020, an ad-hoc NBB online survey[1] asked consumers about the reasons for reducing their spending. The most popular answer related to the impossibility of spending on certain goods/services, as cited by nearly half of all respondents, which points in the direction of forced and involuntary savings. On top of that, strict lockdown measures as well as health concerns were cited as having prevented nearly half of all respondent households from shopping. Loss of income was mentioned by only 13 % of households as one of the reasons for reducing their spending.

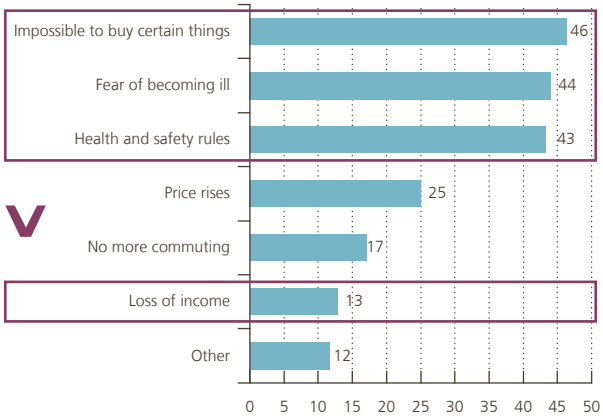
Similarly, results based on the ECB's Consumer Expectations Survey (CES) which was launched several weeks prior to the outbreak of the pandemic, show that only about half of the Belgian respondents who had strongly reduced their spending over the past year indicated that their financial situation had worsened in the last twelve months. For the other half of them, their financial situation had stabilised or even improved. For the households who cut their spending sharply while their financial situation was either unchanged or better, the reason behind reducing their spending must lie elsewhere.

1 For more results, please refer to the press release issued by the NBB on 29 July 2020 (only available in Dutch/French).

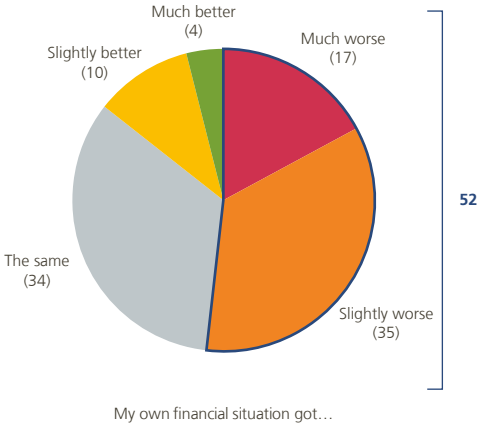
Chart 4

Survey evidence suggests that the decline in household consumption is not only due to a loss of income

NBB online household survey: Why has your expenditure fallen?
(in %, survey conducted in July 2020, jointly with Microsoft Innovation Center)



CES survey: In the past 12 months, my spending decreased a lot, depending on own financial situation
(in %)

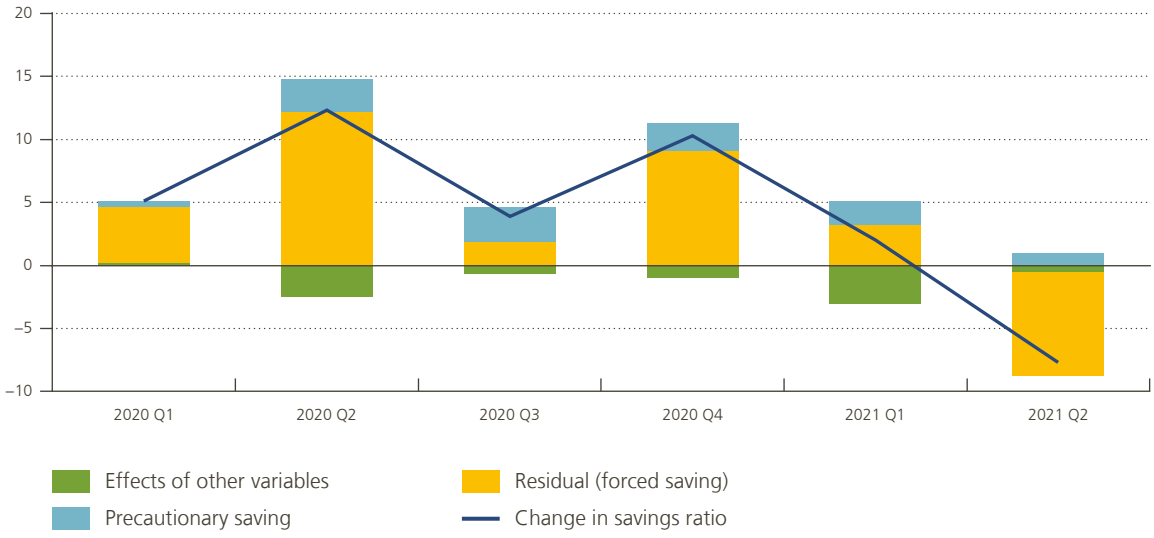


Sources: ECB CES pilot survey, NBB.

Chart 5

Decomposition of the annual change in the savings ratio

(in %)



Sources: NAI, NBB.

These survey results are corroborated by the findings from an econometric analysis. Following the approach in Dossche and Zlatanos (2020), the (change in) Belgian households' savings ratio is regressed upon its presumed determinants, such as real disposable household income, real net financial wealth and households' expectations about (un)employment from the NBB consumer survey as a proxy for uncertainty, to estimate the impact of precautionary savings. Whatever part of the rise in the savings rate that is left unexplained by these determinants is considered here as forced savings. In fact, this unexplained residual is quite substantial in the recent period, suggesting an important role for involuntary savings during the pandemic. The uncertainty and the precautionary motives also exerted a significant influence on savings constitution, but remained secondary compared to the contribution of restrictive constraints. As of the second quarter of 2021, the savings ratio turned out lower than last year, as more consumer outlets were accessible again. The savings ratio remains a bit more elevated than is usually the case, though, which seems to be attributable to precautionary saving.

2. Uneven impact across households on consumption and savings

2.1 The income shock of the COVID-19 crisis has been asymmetric

While, at macroeconomic level, the impact on households' purchasing power remained relatively limited during the COVID-19 crisis and purchasing power still increased, this was not necessarily the case for each individual household or specific group. Since April 2020, the NBB's monthly consumer survey has included two additional questions to monitor the impact of the health crisis on both income and saving buffers of households. At the height of the first lockdown, in April 2020, no less than one-third of 1 850 consumers experienced some income loss related to the crisis. For more than 10 % of respondents, their income loss exceeded 30 %. While the proportion of households suffering income losses due to the pandemic has declined somewhat over time, about one-sixth of all respondents are still affected negatively to date (the most recent observation dates from October 2021, with 5 % reporting substantial income losses of more than 30 %).

As hinted by Cotton *et al.* (2021), the magnitude of the impact of the COVID-19 crisis has differed across households, in various dimensions such as the composition and size of the household, education level or job status. The wide array of repercussions from the COVID-19 shock is demonstrated by survey data. People receiving a guaranteed income, such as pensioners and benefit claimants, typically did not experience big income losses. The relative loss of household income was – obviously – more significant for the working population, and specific categories proved to be particularly vulnerable. Self-employed workers were proportionally more affected: in May 2020, more than two-thirds of self-employed workers faced an income loss. This share has steadily decreased over time, possibly reflecting the fact that people learned to live with the restrictive measures to a certain extent and that some self-employed workers managed to restart part (or all) of their activities within the new restrictive framework (resorting to e-commerce or take-away concepts). Still, according to the most recent observations, in October 2021, close to half of all self-employed people saw an impact on their income and for one-sixth of respondents it even amounted to a loss of at least 30 % of household income. Another survey which was topical and carried out online among more than 5 000 households in May 2020 by the NBB[1] confirmed the more fragile position of the self-employed during the pandemic. Furthermore, it revealed that other categories of workers, such as those on temporary unemployment or student workers, also incurred hefty income losses at the height of the spring lockdown.

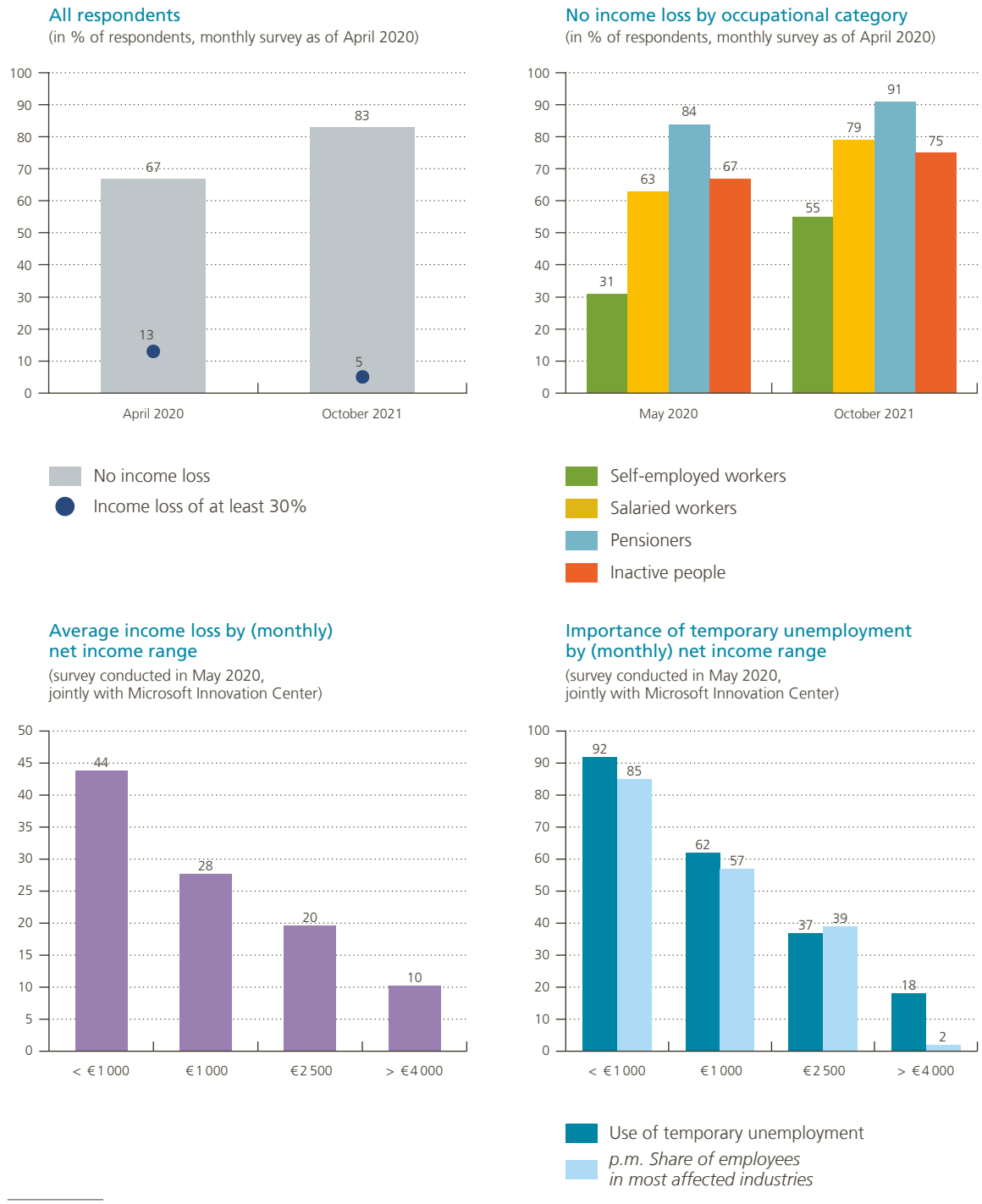
Remarkably, the latter survey specifically showed that average pandemic-related income losses were more substantial for the lowest-income households[2], regardless of the occupational status of the respondent. Income earners in these households are more likely to be employed under flexible and temporary contracts, which were cut back in large numbers at the start of the crisis. In addition, relatively larger income losses tie in with the fact that a larger share of low-income households was affected by temporary unemployment. The lowest-income households also had a less

1 For more results, please refer to the press release issued by the NBB on 17 June 2020.
2 This finding is corroborated by other analyses, such as that by Capéau, Decoster, Vanderkelen and Van Houtven (2021).

"intensive" use of the temporary unemployment scheme as a large share of them were in full-time unemployment, while for other households it was more often limited to part-time unemployment. One of the explanatory factors is that they tend to work more often in the industries that were hit hardest by the crisis, such as arts, entertainment and recreation, catering and accommodation, tourism, or non-food retail.

Chart 6

Income losses tend to be more substantial for self-employed workers and lowest-income households



Source: NBB.

2.2 Households that suffered larger income losses were more likely to strongly cut their spending…

Interestingly, the CES dataset has plenty of background information about the respondents, making it possible to identify the key characteristics of the households that have sharply cut their spending in response to the crisis. To this end, a logit model was estimated to compute the probability of an individual having strongly reduced his/her spending in the past 12 months. In the regression, the dependent variable is a dummy variable taking the value of one if the respondent selected "strong decrease" to the corresponding question and zero elsewhere.

In this regression, we use a pooled sample at the individual level compiled between March 2020 and August 2021 and time dummies corresponding to the month of the survey are included among the explanatory variables. The results confirm that the likelihood of an individual having sharply reduced his or her spending in the past year soared with the outbreak of the pandemic and has been very dependent on the restrictive measures taken month after month. In March 2021, the average respondent was 2.8 times more likely to have cut back her/his spending sharply over the past year than in February 2020 (predicted probability at means reaching respectively 8.6 % and 3.3 %)[1].

In those econometric specifications, we also take into account the perceived evolution of the financial situation of the household, the fact that some households do not have sufficient savings buffers to make an unexpected payment equal to one month of their household income[2], the region of residence, employment status, household size and the respondent's age. Results show that the small group of financially-hit households is three times more likely to have reduced their spending sharply compared to those with a stable financial situation (i.e. the probability reaching 12 % for the financially-hit households against 4 % for those with a stable situation). Besides, several factors tend to increase the probability to strongly diminish spending : residing in Brussels or in Wallonia, being in the active population, living in a household of two or more people, and having low saving buffers. Note that, all things being equal, a temporarily unemployed worker has a predicted probability of strongly reducing his/her spending that is greater than that for an employee who is full-time employed, but the difference is considered as statistically non-significant (notably due to the limited size of the sample of temporarily unemployed respondents). Even so, this latter result could suggest that government's support measures largely cushioned the blow for workers affected by temporary unemployment. It is interesting to note that the predicted probability of strongly reducing spending based on the dimensions taken into account remains relatively low for all individuals and that other unobserved factors could then exert a strong influence on consumers' behaviour, such as the day-to-day evolution of the epidemic, the incidence of some restrictive measures or even individual political views (Alexander and Karger, 2021, Chen *et al.*, 2020, or Cotton *et al.,* 2021).

On average, in the pooled sample, about one third of all CES respondents considers his- or herself to be financially worse off than one year ago at the time of the survey. Within this group, 12 % have cut spending sharply in the past year. While the overall incidence of financially-hit households sharply cutting their consumption is rather small (some 4 % of all Belgian CES respondents), they constitute an important target group from a policy perspective. It is important to understand who they are and what they experienced through the COVID-19 crisis.

The share of financially-hit households is slightly higher among those with low income[3] (44 %) and clearly went up (temporarily) during the lockdowns. Several factors may have contributed to people feeling financially

1 The CES was launched in the first quarter of 2020 and the full size of the sample was reached in March 2020 (about 1 000 Belgian respondents per month). The results based on the February 2020 sample should therefore be interpreted with caution.

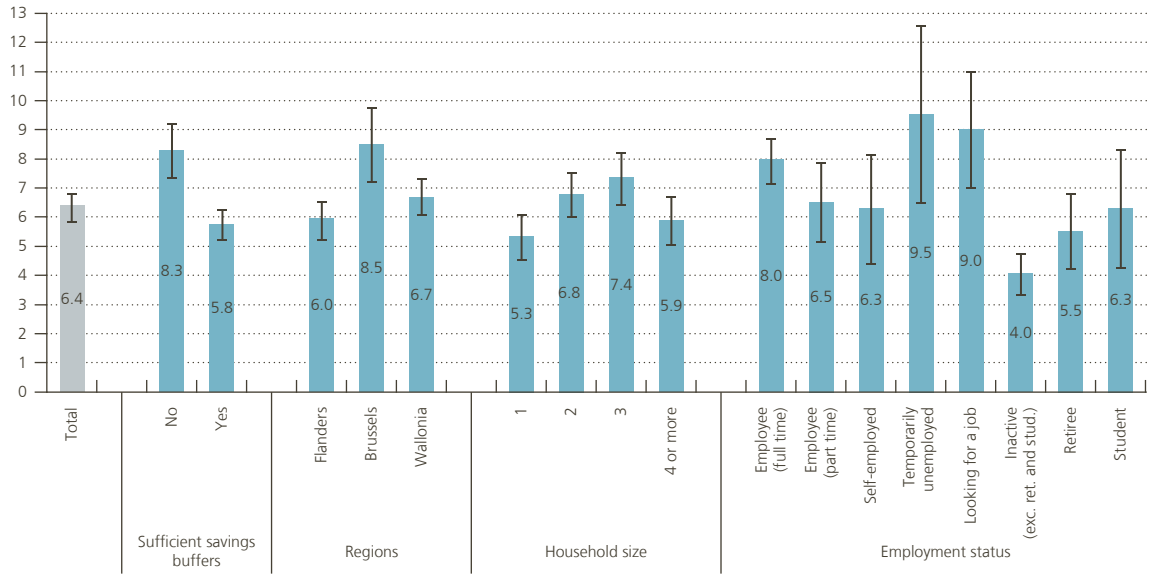
2 More precisely, the question to assess whether a household has sufficient savings buffers is the following : "Please think about your available financial resources, including access to credit, savings, loans from relatives or friends, etc. Suppose that you had to make an unexpected payment equal to one month of your household income. Would you have sufficient financial resources to pay for the entire amount ?"

3 In the CES background questionnaire, respondents were asked about their household's total net annual income. Low-income households are considered as those with less than € 25 000 annually.

Chart 7

Predicted probability of having sharply cut spending in the last 12 months, depending on several key variables with a marked asymmetry

(in %, not all regressors are shown in the chart, other variables taken at means, data from February 2020 to August 2021, 95 % confidence interval)



Source: ECB CES pilot survey.
Please refer to Annex 2 for the complete specification of the logit model.

worse off. (Perceived) tougher credit access since the crisis could be one of those factors. Some 40 % of respondents[1] consider it harder to obtain a credit line or a loan compared to a year ago, while this share rises to nearly 70 % for those feeling financially worse off. The sentiment may also tie in with (perceived) price rises. In an open-ended question, CES respondents are asked to provide a guess of the percentage price change compared with 12 months ago. For respondents feeling financially worse off, the average inflation perception amounts to 6 %, clearly above the 3.3 % average for respondents with a stable or improved financial situation. It is not unlikely that, due to the composition of their consumption basket, financially vulnerable households have actually experienced larger price hikes, *inter alia* due to the bans on supermarket promotions that were issued during the first lockdown.

2.3 … but pandemic-related excess savings are concentrated among high-income households

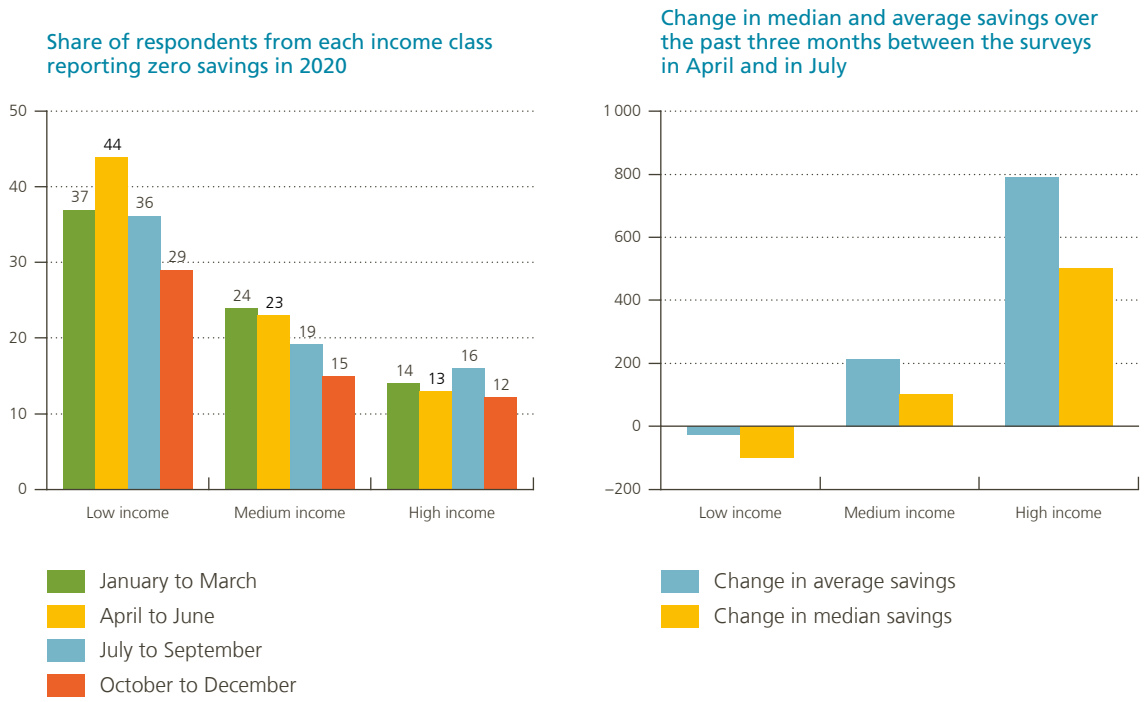
Similar to the heterogeneity observed in terms of purchasing power, the accumulation of savings and the motivation behind it are also likely to have differed across households. Knowing that low-income households experienced, on average, the largest income losses because of the pandemic and associated measures, they have probably contributed less than proportionally to the pandemic-related excess savings. This is corroborated by evidence from the CES survey. Some 44 % of Belgian low-income respondents reported to have been unable to save during the second quarter of 2020 (which roughly corresponds to the time of the first lockdown). This share was clearly higher than in other quarters of 2020. This stands in stark contrast with high-income respondents,

1 This share takes only into account the respondents who deemed this credit question relevant and therefore excludes about 25% of all respondents who considered it "Not applicable".

only 13 % of whom reported zero savings during the second quarter of 2020; a share that was much more stable over the year.

Chart 8

CES data imply that pandemic-related excess savings are concentrated among high-income households



Source: ECB CES pilot survey.

In the April and July 2020 CES, respondents were asked to fill in an amount in euros relating to their savings over the past quarter. The difference between those two waves could roughly be interpreted as the difference in savings linked to the pandemic, as first-quarter savings are assumed to have been much less affected by the health crisis and the containment measures. Open-ended survey responses should be interpreted with a bit more caution, as there is a larger chance of respondents misinterpreting the question or providing inaccurate information, even if obvious outliers or errors have been filtered out. Still, the results suggest that the high-income group noted the strongest increase in savings during the pandemic. This may be related to the fact that the consumption of services, which was rendered more difficult or even impossible during the lockdown, typically takes up a larger part in the budget of higher-income households[1]. So, this could suggest that forced saving was most significant for higher-income households[2].

For low-income households, on the other hand, average and median savings in the second quarter of 2020 were actually a bit lower than in the first quarter, which is in line with the above-mentioned survey results (with a larger share of low-income households being financially hit harder during the pandemic). For this group, the decline in spending resulting from the lockdown was lower than their income loss.

1 According to Statbel's household budget survey for 2018, consumption of transport services, recreational and cultural services and services by hotels, restaurants and cafeterias makes up 16 % of the spending by those with incomes in the fourth quartile, against only 8 % of the lowest income quartile's spending.

2 A similar conclusion was drawn for the UK households by Davenport et al. (2020) through the analysis of financial transactions via a budgetary app.

3. Implications for future consumption

One may think that the fact that the drop in consumer spending was mostly of a forced and involuntary nature bodes well for the recovery in private consumption as it could imply that the relaxation or lifting of the restrictions will suffice to provide a boost to consumer spending. Part of these pandemic-related savings could in principle be spent later on to meet pent-up demand for certain products or even be used for 'revenge' consumption.

However, several elements are expected to weaken the link between extra savings and future consumption. First, as the extra savings seem to be largely concentrated among high-income households, they will not necessarily be spent in the future as these households have a relatively low propensity to consume out of their income. Second, not all foregone consumption can obviously be compensated: one will most likely not get two consecutive haircuts, for example, just because it was impossible to go to the hairdresser for some time. Third, the existing capacity constraints could put a limit on consumption growth. Fourth, the precautionary motive (also in view of a possible future fiscal consolidation or price rises) could lead households to keep saving at a somewhat higher level than before the crisis. Furthermore, it cannot be ruled out that households have grown accustomed to some of the habits cultured by the health crisis. They could, for example, permanently dine out less as they prefer home cooking (Deloitte, 2021). Last but not least, as indicated earlier, the pandemic-related savings have been invested more than usual in more risky financial products, which makes a quick withdrawal perhaps less likely. In fact, some of the extra savings may have been spent already in the housing renovation spree.

Against this background, it seems more likely that pent-up demand or revenge consumption will be limited to a specific number of products, rather than constitute a broad-based phenomenon. Leisure activities, such as travelling or going to restaurants and bars, may be in high demand for some time, as people feel the urge to entertain and enjoy social contacts again. This does not mean, however, that a significant share of the 2020 extra savings will support consumption growth in the post-pandemic period.

In order to shed more light on this, the CES questions about past and expected spending can be analysed together. It appears that, at the "micro level", there is a large share of respondents who replied to these questions in the same way: about half of the respondents who have already cut their spending in the past 12 months envisage a further decrease in consumer expenditure in the next year. If, for both questions, we look at the "macro level" and calculate a net balance that represents the difference between the percentage of respondents seeing an increase (+) and the percentage of those seeing a decrease (–) for each month between February 2020 and August 2021, there was a clear downward trend in the indicator for past spending between the start of the survey and March 2021. After that, the indicator started to edge up again. For expected spending, however, the net balance is much more stable and the indicator only shows a moderate increase after March 2021. In other words, while – up to March 2021 – there was a rising share of respondents who said they had cut back on actual/past spending, there was no growing share of respondents planning to increase their future spending. The fact that the developments in the curves of past and future spending did not (more or less) mirror each other suggests that there is no clear evidence of a strong catching-up of foregone consumption. Even if the net indicator on past spending has significantly improved since March 2021, reflecting a rebound in consumption from its pandemic lows, the indicator on expected spending remains more stable.

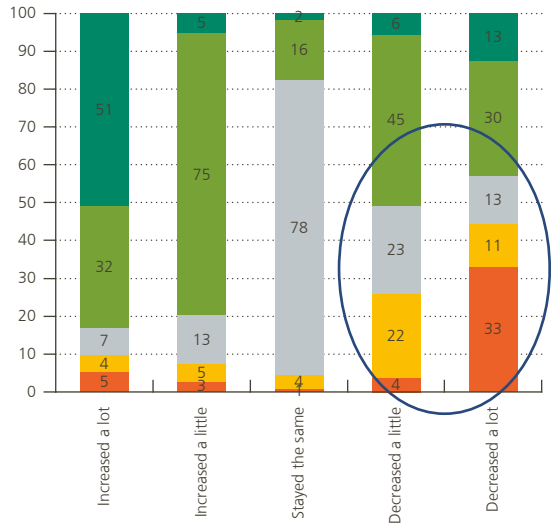
Moreover, in March 2021, the CES included a question specifically targeting households who had added more money to their savings or financial investments than they had withdrawn since 2020. Those households were asked how they expected to use those savings or financial investments over the coming year. The distribution of the responses largely points to the higher level of savings or financial investments being maintained, while a much smaller share is intended for pent-up consumption.

Chart 9

No convincing evidence of any strong catching-up of foregone consumption

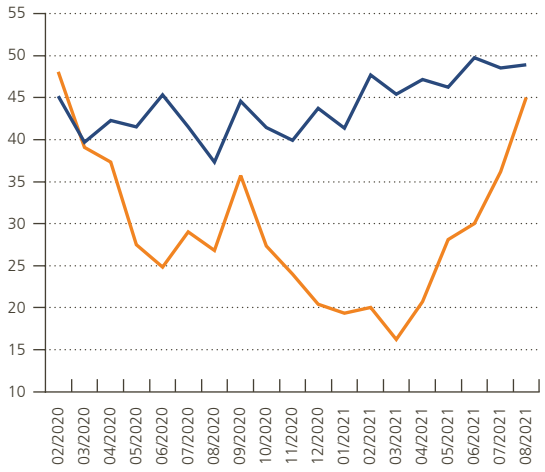
(data from February 2020 to August 2021)

Strong correlation between past spending and spending intentions



Net change in past and expected household spending

(net balance of 'increase (+)' and 'decrease (–)', in % of wave respondents)



Will increase a lot
Will increase a little
Will stay the same
Will decrease a little
Will decrease a lot

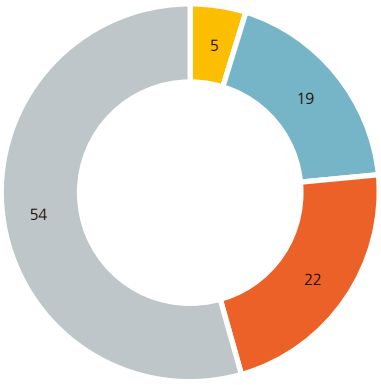
Compared with 12 months ago
Expected over the next 12 months

Source: ECB CES pilot survey.

Chart 10

Respondents who have accumulated savings or financial investments since the start of 2020 largely plan to keep those at a higher level over the next year rather than to spend them

(in %, data from March 2021, sample limited to the respondents who have accumulated savings or financial investments since January 2020 and who are asked how they plan to use the money over the next twelve months)



Buy goods and services that don't last for a long time (e.g. food, clothes, cosmetics, travel, holidays, entertainment, etc.)
Buy long-lasting goods and services (e.g. a car, home improvement, furniture, electronics, etc.)
Maintain a higher level of savings or financial investments
Borrow less money or repay more debt

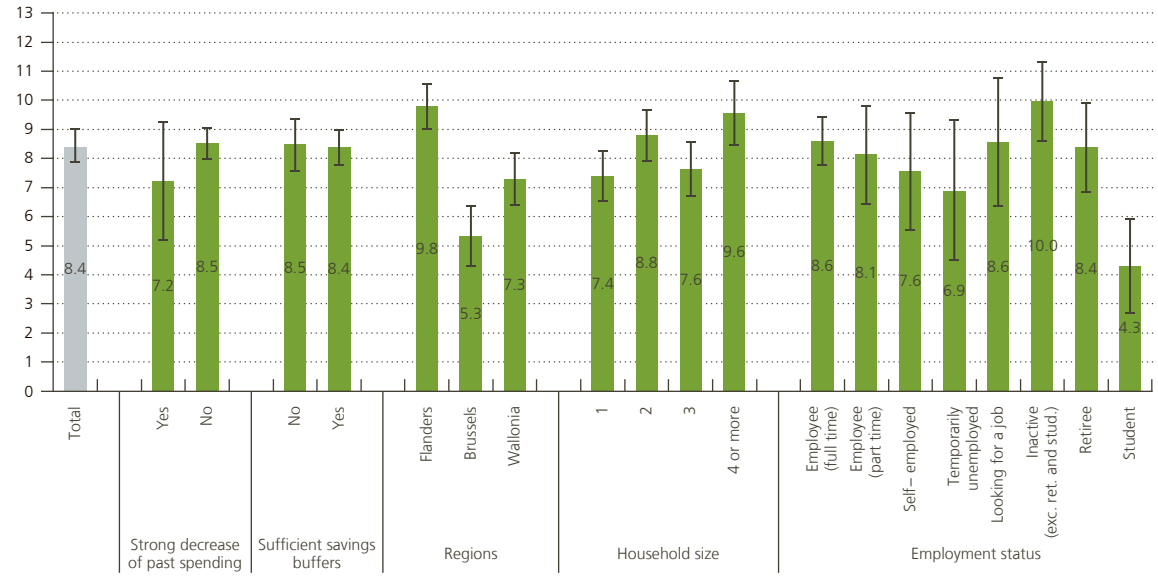
Source: ECB CES pilot survey.

We also computed the probability that an individual indicates that he/she will strongly increase his/her spending in the next 12 months, by using a logit model where the dependent variable is a dummy variable taking the value of one if the respondent selected "strong increase" to the corresponding question and zero elsewhere. The results show that the consumers who have sharply cut their spending do not expect any strong rebound in their spending in the coming months. On the contrary, those who indicated that they have strongly reduced their spending in the past year have a lower predicted probability of strongly increasing it in the next year, refuting the "revenge consumption" assumption for now. Looking at the regional dimension, the Flemish respondents who were less affected by a decrease in spending in the past year (see chart 6) are actually the ones that are the most eager to increase their spending in the coming months and vice versa for the two other Belgian Regions.

Chart 11

Predicted probability of strongly increasing spending in the next 12 months, varying according to several key variables with a marked asymmetry

(in %, not all regressors are shown in the chart, other variables taken at means, data from February 2020 to August 2021, 95 % confidence interval)



Source: ECB CES pilot survey.
Please refer to Annex 3 for the complete specification of the logit model.

Conclusion

The fall in private consumption and the surge in savings rank among the major macroeconomic issues of the COVID-19 crisis at the current juncture. At the aggregate level, a shock of this scale has not been seen in peacetime and one should keep in mind that the total figure hides a very heterogenous pattern among households. The first difference between households lies in the magnitude of the financial income shock, which, despite massive government support, has been severe for a small share of the population.

Even if the deterioration in the financial situation may explain the drop in some households' spending, (many) other explanatory factors come into play and the most obvious one pertains to the restrictions imposed on the consumption basket. In the ECB's consumer expectation survey, for about half of the respondents who reduced their spending, the financial situation had not worsened. The likelihood of reducing expenditure depends, among others, on place of residence, working status, family size and the time frame. The presence of savings previously accumulated is also a crucial factor, as is usual in an economic recession, and those who could rely on financial buffers could more easily withstand the pandemic without having to reduce their spending. During the COVID-19 crisis, the increase in savings was also heterogenous and the worst-hit and more fragile households were (and are still) unable to save part of their income.

One may expect, at a first reading, that the extra savings could be used as soon as the health situation normalises, leading to a strong and quick recovery of private consumption in the aftermath of a shock mostly considered of a temporary nature, but survey data do not confirm this hypothesis. This may pertain to the identity of the savers (those who have accumulated extra savings do not have a high propensity to consume), the uncertainty (notably with respect to the expected length of the crisis, as well as the possible fiscal fallout), or the categories of goods or services being prohibited during the lockdowns (consumers are unlikely to get a double hair cut in the aftermath of the crisis). Most of the worst-hit households, who are proportionally more represented among the low-income ones, have been unable to save since March 2020 and we do not expect them to be eager to undertake "revenge consumption" spending.

Still, according to the NBB's June macroeconomic projections, the outlook for purchasing power is favourable and it is expected to further support consumption growth. Hence, private consumption should become the main engine of economic growth going forward, even without households tapping into their additional savings accumulated during the pandemic. However, the above survey analysis has taught us that all households cannot be lumped together and serves as a reminder that policy-makers should keep an eye out for the (small) share of worst-hit Belgian households when phasing out the COVID support measures.

Annexes

Annex 1: The impact of COVID-19 on Belgian households – relevant surveys [1]

Since April 2020, the NBB's monthly consumer survey, polling a representative sample of 1 850 consumers, has included two additional questions to monitor the impact of the health crisis on the financial situation of households. The first question relates to households' loss of income, while the second question concerns the size of the savings buffer expressed as a number of months, to cover necessary expenditure. The National Bank of Belgium publishes the results of the consumer survey on its NBB.stat website. Generally, the survey findings make it possible to distinguish the financial impact of the crisis between different sections of the population, with some socio-occupational categories having been hit significantly more. An income loss is found to be much easier to bear if the household has substantial savings which can be used to cushion the shock.

In addition, the NBB has organised two specific large-scale online surveys, in cooperation with Microsoft Innovation Center. The first survey was carried out in May 2020 and got 5 688 responses (on a voluntary basis). It focused on income losses resulting from the crisis and singled out certain categories of workers in order to get a grasp of the financial impact for vulnerable households at the height of the crisis. The second of these surveys was conducted in July 2020 and focused on household consumption since the gradual reopening of stores and the hospitality sector. It got 3 036 replies and showed that household consumption was likely to remain affected for some time due to fear or permanently altered habits.

The ECB's Consumer Expectations Survey (CES) also contains information about the impact of the COVID-19 crisis on Belgian households. It is an online high-frequency panel survey that was launched in January 2020 and targets households from the six largest euro area countries, including Belgium. At the time of the writing, the survey is still in a pilot phase. Respondents are invited to answer online questionnaires every month and must leave the panel between 12 and 18 months after joining; they are encouraged to take part as they receive a gratuity with a relatively modest monetary value. The CES is a relatively new tool that quickly adapted to incorporate new topical and targeted questions linked to the impact of COVID-19 on households as of April 2020 (Christelis *et al.*, 2020). Questions were added or amended throughout the different waves and cover a wide range of topics deemed relevant for households.

Survey information has proved crucial to monitor the impact of the health crisis. First, it has the advantage of timeliness, as survey data are available much earlier than the official macroeconomic data. Second, the survey information also enables the possible asymmetric impact of the shock to be investigated; in the case of the CES, for example, a broad range of background data (e.g. family size and composition, household annual income) is available for each respondent.

1 This annex provides a non-exhaustive list of survey data gathered during the COVID crisis. It mainly focuses on NBB and ECB sources.

Annex 2: Logit model to explain the propensity to have strongly decreased the spending in the previous 12 months

Equation 1

Logistic regression whose dependent variable pertains to past spending

(1 = "Compared with 12 months ago, my household spending decreased a lot", 0 = otherwise)

Variables	Odds ratio	(Robust std. err.)
Time dummies:		
March 2020	1.75**	(0.46)
April 2020	1.73**	(0.46)
May 2020	1.92**	(0.52)
June 2020	2.11***	(0.56)
July 2020	2.00**	(0.55)
August 2020	2.21***	(0.60)
September 2020	1.62*	(0.45)
October 2020	2.14***	(0.57)
November 2020	2.66***	(0.74)
December 2020	2.53***	(0.68)
January 2021	2.90***	(0.78)
February 2021	2.16***	(0.56)
March 2021	2.77***	(0.78)
April 2021	2.27***	(0.62)
May 2021	1.89**	(0.55)
June 2021	2.27***	(0.64)
July 2021	2.10***	(0.59)
August 2021	1.41	(0.41)
Financial situation: (past 12M)		
Somewhat worse	0.92	(0.10)
Stable	0.33***	(0.04)
Somewhat better	0.78	(0.12)
Much better	1.43	(0.34)
Sufficient liquidity buffer:		
Yes	0.68***	(0.05)
Region:		
Brussels	1.47***	(0.15)
Wallonia	1.12*	(0.08)
Individual age categories:		
5-54 years	0.86*	(0.07)
55-70 years	0.73***	(0.08)
71 years or older	1.16	(0.25)
Education level:		
Upper secondary education / post- secondary non-tertiary education	0.99	(0.12)
Tertiary education / short-cycle non-tertiary education	1.02	(0.13)
Household size:		
2 persons	1.29***	(0.12)
3 persons	1.41***	(0.14)
4 persons or more	1.11	(0.12)
Employment status:		
Part-time employee	0.81*	(0.09)
Self-employed	0.78	(0.13)
Temporarily unemployed	1.22	(0.23)
Unemployed looking for a job	1.15	(0.15)
Inactive (excl. retiree and student)	0.49***	(0.05)
Retiree	0.68***	(0.10)
Student	0.78	(0.14)
Constant	0.10***	(0.03)
Pseudo R-squared	0.06	
Sample	17 490 obs. 2020 M2 – 2021 M8	

Source: ECB CES pilot survey, own calculations.

Note: The reference categories (February 2020, much worse financial situation, Flanders, 18-34 year, primary or lower secondary education / no education, single-person household, and full-time employee are not included to avoid collinearity issues. The odds ratio represents the odds that an outcome will occur given a particular exposure, compared to the odds of the reference category (i.e. an odds ratio above 1 means that the analysed category is associated with higher odds of outcome than the reference category).

Annex 3: Logit model to explain the propensity to strongly increase the spending in the next 12 months

Equation 2

Logistic regression whose dependent variable pertains to past spending

(1 = "Compared with 12 months ago, my household spending decreased a lot", 0 = otherwise)

Variables	Odds ratio	(Robust std. err.)
Time dummies:		
March 2020	1.13	(0.23)
April 2020	1.73***	(0.34)
May 2020	0.86	(0.17)
June 2020	1.08	(0.22)
July 2020	1.18	(0.25)
August 2020	0.76	(0.16)
September 2020	1.08	(0.22)
October 2020	1.16	(0.24)
November 2020	1.15	(0.24)
December 2020	1.08	(0.24)
January 2021	1.22	(0.26)
February 2021	1.27	(0.27)
March 2021	1.28	(0.28)
April 2021	1.31	(0.30)
May 2021	1.51*	(0.32)
June 2021	1.37	(0.30)
July 2021	1.47*	(0.31)
August 2021	1.46*	(0.30)
Strong spending decrease:		
Yes	0.84	(0.13)
Financial situation: (past 12M)		
Somewhat worse	0.27***	(0.02)
Stable	0.10***	(0.01)
Somewhat better	0.11***	(0.02)
Much better	0.17***	(0.04)
Sufficient liquidity buffer:		
Yes	0.98	(0.07)
Region:		
Brussels	0.52***	(0.06)
Wallonia	0.73***	(0.06)
Individual age categories:		
5-54 years	1.01	(0.08)
55-70 years	1.09	(0.10)
71 years or older	1.15	(0.24)
Education level:		
Upper secondary education / post- secondary non-tertiary education	1.03	(0.12)
Tertiary education / short-cycle non-tertiary education	1.02	(0.11)
Household size:		
2 persons	1.21**	(0.10)
3 persons	1.04	(0.10)
4 persons or more	1.32***	(0.12)
Employment status:		
Part-time employee	0.94	(0.11)
Self-employed	0.87	(0.13)
Temporarily unemployed	0.79	(0.15)
Unemployed looking for a job	1.00	(0.14)
Inactive (excl. retiree and student)	1.17*	(0.10)
Retiree	0.97	(0.12)
Student	0.48***	(0.10)
Constant	0.52***	(0.12)
Pseudo R-squared	0.11	
Sample	17 490 obs. 2020 M2 – 2021 M8	

Source: ECB CES pilot survey, own calculations.

Note: The reference categories (February 2020, no strong decrease of past spending, much worse financial situation, Flanders, 18-34 year, primary or lower secondary education / no education, single-person household, and full-time employee are not included to avoid collinearity issues. The odds ratio represents the odds that an outcome will occur given a particular exposure, compared to the odds of the reference category (i.e. an odds ratio above 1 means that the analysed category is associated with higher odds of outcome than the reference category).

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Fiscal policy instruments to mitigate climate change – A Belgian perspective

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Introduction

Countries worldwide are increasingly committing to reducing greenhouse gas (GHG) emissions to net zero by mid-century. In that perspective, the European Union anchored its goal of climate neutrality in the European Climate Law – recently approved by both the European Parliament and the Council. In line with the zero-carbon emission goal, the European Commission proposed to raise the EU's ambitions to cut GHG emissions to at least 55 % below 1990 levels by 2030 – which is a substantial increase compared to the current adopted target of at least 40 % (EC, 2020a). However, making sufficient progress to stabilise the climate, to cut global CO_2 emissions along with other greenhouse gases and to reach intermediate goals requires additional action to be taken as is shown by, among others, Parry *et al.* (2021).

Taking into account existing policy measures, Parry *et al.* (2021) illustrate that global CO_2 emission projections will rise from around 30 billion tonnes in 2020 to 37 billion by 2030. However, limiting global warming to 2 °C and ideally to 1.5 °C above pre-industrial levels requires global CO_2 emissions to be cut by between 10 and 60 percent. Cutting emissions at this rate requires significant additional government measures, even if countries commit to their Nationally Determined Contributions[1] set out in the Paris agreement. Parry *et al.* (2021) further calculate that the extra measures to be taken are equivalent to the introduction of a global carbon tax – starting at $ 15 per tonne of CO_2 and rising steadily thereafter towards $ 75 per tonne of CO_2 in 2030[2].

The need for tougher climate policy is confirmed when looking at the EU level. To reach climate goals, the EU is counting on its European Emissions Trading System (EU ETS), which will be discussed later in the article. Backing up the EU ETS, an "effort-sharing" mechanism (ESD) has been put in place with binding national emission targets for non-EU-ETS sectors (i.e. road transport, non-industry heating, agriculture and waste)[3]. Targets vary across Member States and take into account differences in economic activity as well as cost-efficiency considerations. Based on 2019 estimates by the European Environment Agency (EEA), most EU countries will miss their 2030 ESD targets, often by a long way. In the case of Belgium, the 2030 ESD-target amounts to a 35 % reduction of GHG emissions with respect to the 2005 level, whereas with existing policy measures the reduction is estimated to be at around 12 %.

* The authors would like to thank Estelle Canitllon, Jan De Mulder, Carine Swartenbroekx, Jonas Teusch and other OECD staff members, and Pierre Wunsch for useful comments and suggestions.

1 Nationally Determined Contributions (NDCs) embody efforts that countries intend to make to achieve the objectives of the Paris Agreement. They are updated every five years and contain information on targets, policies and measures for reducing national emissions (UN, 2021).

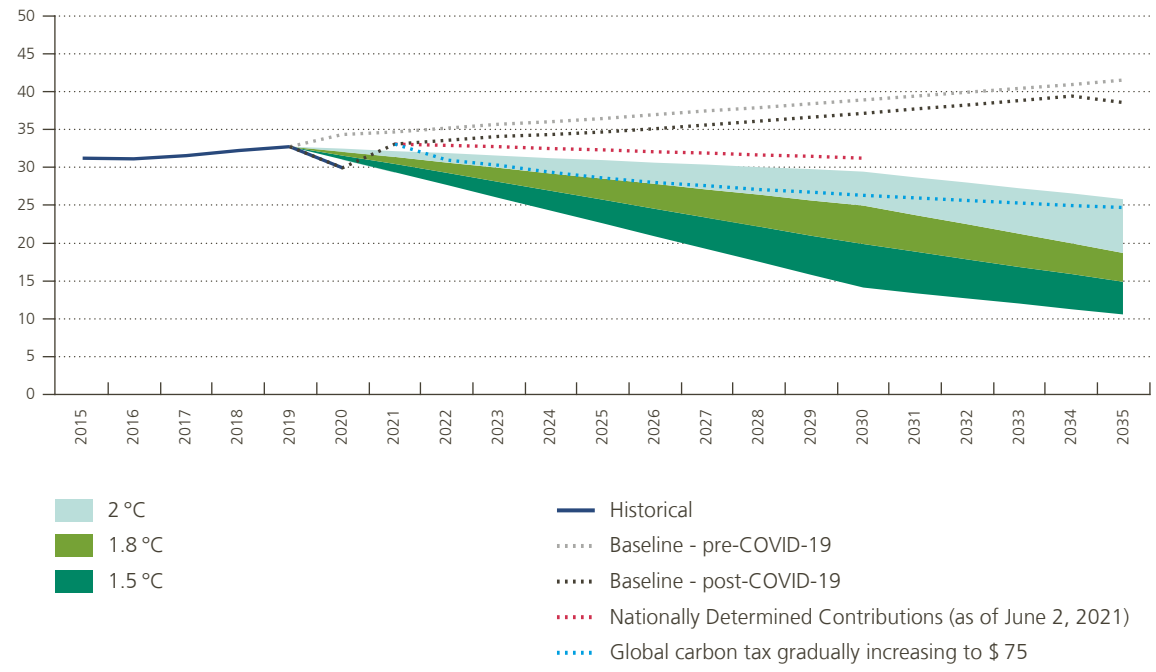
2 To be on track to stabilise global warming to "well below" 2 °C, the tax should rise further beyond 2030.

3 The EU's current Effort Sharing Regulation (EU 2018) imposes binding annual GHG emission targets for Member States for the period 2021-20230. These targets correspond with an EU-wide emission reduction target of 29 %. As part the EU's more ambitious target of achieving net emission reductions of at least 55 % by 2030, the EC is proposing a series of amendments to the Effort Sharing Regulation in order to increase the EU-wide emission reduction target for the Effort Sharing sectors to 40 % by 2030.

Chart 1

Additional policy action needed to tackle climate change

(billion tonnes CO_2 emission per year)



2 °C
1.8 °C
1.5 °C

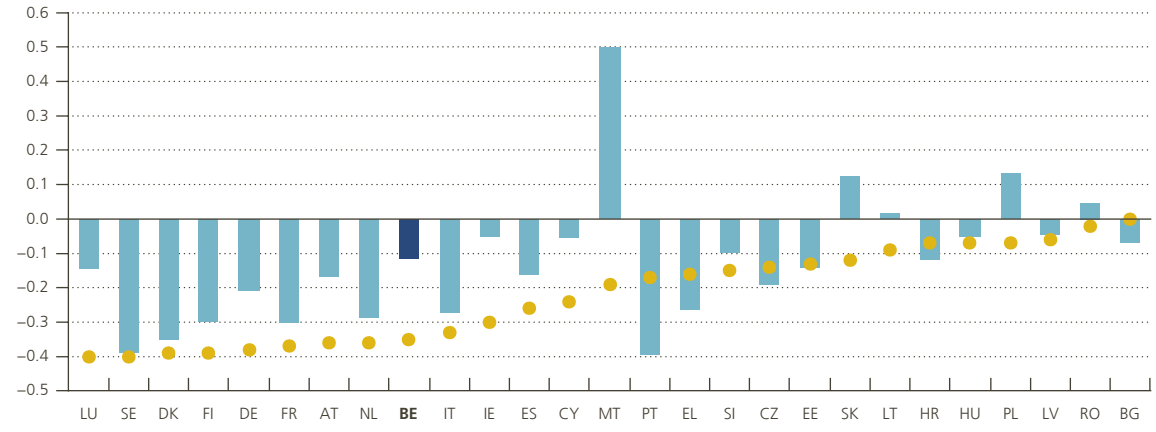
Historical
Baseline - pre-COVID-19
Baseline - post-COVID-19
Nationally Determined Contributions (as of June 2, 2021)
Global carbon tax gradually increasing to $ 75

Source: Parry *et al.* (2021).

Chart 2

Expected progress towards ESD targets

(% change compared to 2005)



Projected greenhouse gas emissions 2030 – with existing measures

2030 target

Sources: EEA, EC.

This article discusses fiscal policy instruments and their role in reaching the proposed climate goals. The focus is therefore on mitigation instruments, that aim at reducing greenhouse gas emissions, and not on adaptation policies, that cope with the consequences of climate change. We investigate different environmental instruments in Belgium, with particular attention to fiscal policy instruments that affect the private cost of emitting CO_2, also called market-based instruments. The remainder of the article is structured as follows. Section 1 gives an overview of different types of environmental policy instruments and discusses the rationale for market-based instruments. Section 2 gives a short discussion of CO_2 emissions in Belgium, whereas section 3 analyses different Belgian fiscal policy instruments and their cost-effectiveness. In section 4, we look at the distributional consequences of environmental policies and section 5 concludes.

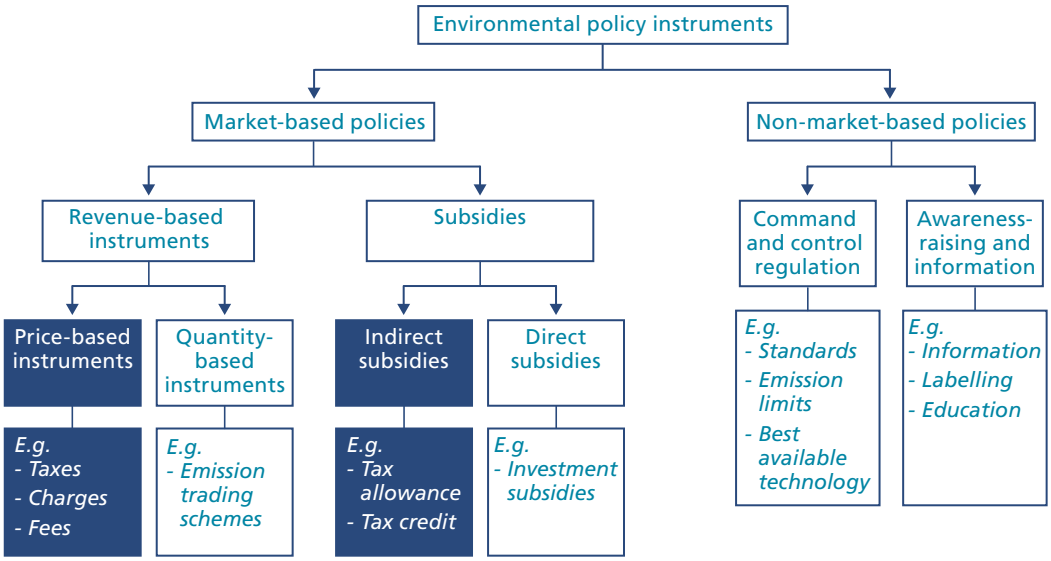
1. The rationale for environmental taxation

1.1 Typology of environmental policy instruments

Governments have a wide range of instruments available for mitigating climate change. As illustrated in Figure 1, they can be divided into different categories. Two basic groups of instruments can be distinguished: the market-based or fiscal instruments on the one hand and the non-market-based instruments on the other hand (EC, 2020b). Market-based instruments are also called incentive-based policies because they provide polluters with market incentives to reduce pollution, by pushing up the relative price of pollution. Basically, these instruments increase the opportunity cost of polluting by making environmentally undesirable behaviour more expensive – the revenue-based instruments – or by promoting environmentally desirable behaviour – government subsidies. Typical revenue-based instruments are either price-based like an explicit carbon tax that directly raises the price of pollution or quantity-based instruments like an emission trading scheme. The latter directly reduces pollution and by allowing trading in emissions effectively raises the cost of polluting. In general, fiscal

Figure 1

Typology of environmental policies



Source: EC (2020b).

instruments give polluters a lot of flexibility as to how they can reduce their emissions and who should reduce pollution. This article will focus on market-based instruments.

The non-market-based policies mainly consist of command-and-control regulations and softer instruments such as raising public awareness. Command-and-control regulations can take a variety of forms but in general they are less flexible than fiscal instruments. One example is the existence of a technology standard which requires polluters to install a certain, more ecological, technology. As a consequence, firms get no incentive to look for cheaper or more efficient ways to reduce pollution. Therefore, a technology standard is unlikely to be cost effective.

In addition, one could also introduce a performance standard – setting an emission goal for each polluter – which is more flexible and cost-effective than a performance standard. However, as a performance standard sets a pollution reduction goal for each producer, the effort of reducing pollution cannot be shifted to firms that can achieve it more cheaply. The next section will show how cost-effective pollution reduction can be obtained when using fiscal instruments.

1.2 Theoretical framework [1]

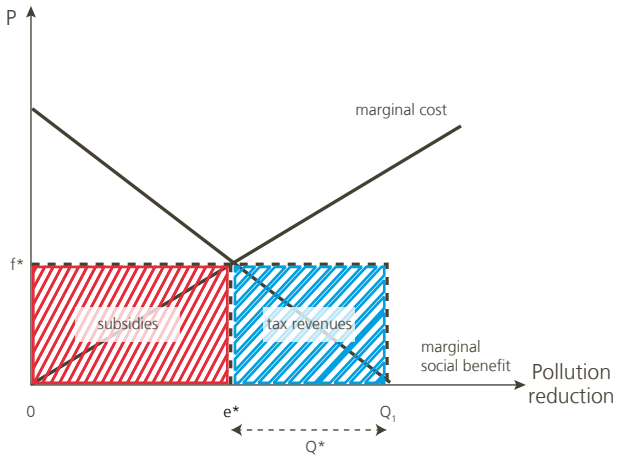
As there are negative external costs accompanying certain forms of production and consumption, that are not borne by the private producer or consumer, pollution in the economy is above its socially efficient level. Putting a price on pollution and thus internalising the environmental costs when making producer and consumer decisions can lead to the socially efficient amount of pollution reduction. In that sense, it should be noted that, from an efficiency perspective, the aim is not necessarily to have zero pollution, but rather a level of pollution that is acceptable in economic terms, i.e. taking into account the costs for current and future generations (Van Cauter *et al.*, 2009).

Putting a price on pollution can be done directly by taxing each unit of pollution – a Pigouvian tax – or by subsidising each unit of pollution reduction – a Pigouvian subsidy. Both instruments can lead to the market efficient outcome as is shown in chart 3.

1 The overview of the theoretical framework is mainly based on Harvey *et al.* (2010).

Chart 3

The introduction of a Pigouvian tax or subsidy can trigger efficient pollution reduction



Let us assume that the production of a certain product is accompanied by some degree of pollution, e.g. the emission of CO_2 into the atmosphere. The cost for producers of reducing one unit of pollution is represented by the rising marginal cost curve, while benefits to society are depicted by the declining marginal social benefit curve. With no government intervention in place, producers will not reduce emissions (point 0 in chart 3), and there will be Q1 units of pollution. The maximum amount of pollution reduction is therefore equal to Q1.

When the government decides to tax each unit of pollution, pollution is reduced as long as the tax per unit of pollution exceeds the cost producers face to reduce one extra unit of pollution. Producers will therefore cut pollution to the point where the tax equals the marginal cost. The exact choice of the level of taxes per each unit of pollution is thus very important. To reach the market efficient level of pollution reduction, represented by e*, the level of tax per unit of pollution, f*, should be chosen so that the marginal private cost of producing a certain product equals the marginal social cost incurring all environmental costs[1]. It is interesting to note that at the efficient point e*, there is still some pollution left (Q*), which is equal to maximum amount of pollution reduction Q1 minus the realized reduction in pollution e*.

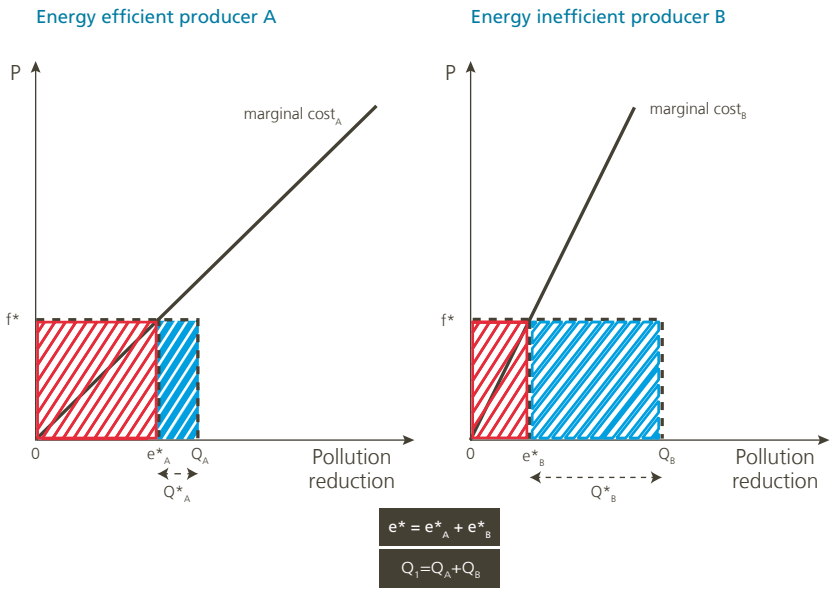
The same efficient amount of pollution reduction e* can also be obtained by giving subsidies to producers for cutting their pollution. If producers receive a subsidy equal to f* for each unit of pollution reduction, they will cut pollution to the point where the subsidy received equals the marginal cost they face for reducing one extra unit of pollution. Again, this leads to the same efficient amount of pollution reduction e* if the subsidy f* is determined adequately.

Although the introduction of a Pigouvian tax and subsidy can result in the same market-efficient outcome, the public finance or distributional consequences differ importantly. With an environmental tax, government revenues increase as producers have to pay taxes for the amount of pollution they still cause – the corresponding tax revenue is represented by the blue shaded area in chart 3 – while when giving subsidies to polluting producers, government expenditure rises – the corresponding budgetary cost is represented by the red shaded area. In the first case, the polluter pays society, while in the second, society pays the polluter not to pollute.

1 As illustrated in Chart 3, this is equal to the point where the marginal cost of reducing pollution equals the marginal social benefit of the reduction in pollution.

Chart 4

A Pigouvian tax or subsidy is cost-effective



From a public finance perspective, a Pigouvian tax is thus more favourable. It should be noted that a thorough analysis of the tax incidence is needed to get a full picture of the (re)-distributional impact of taxes and subsidies. Who finally bears the tax burden or takes advantage of the subsidy depends on how taxes or subsidies feed into consumer prices and depends on market structure, demand and supply elasticities, etc.

One important feature of a Pigouvian tax or subsidy is its cost-effectiveness, meaning pollution is reduced at the lowest possible cost. We assume that the economy consists of two producers, i.e. an energy-efficient producer A and an energy-inefficient producer B. This is illustrated by chart 4, where producer A faces a lower marginal cost for reducing pollution than producer B. For a given Pigouvian tax or subsidy f*, A will reduce pollution much more than B and pollution will first be reduced where the marginal cost is the lowest. Of course, one may ask whether it is fair that A reduces pollution much more than B? It is, because A is also rewarded for being much more efficient. If a Pigouvian tax is installed, A will have to pay less tax (smaller blue shaded area) and if a subsidy scheme is in place, A will get more money from the government (bigger red shaded area).

It should also be noted that a Pigouvian tax or subsidy on pollution is only effective if the amount of pollution can be monitored adequately. Some forms of pollution like GHG emissions are easy to monitor, while for others like chemical waste this is more difficult or costly. In the latter case, a command-and-control approach like a technology standard might be more efficient, because it is relatively easy to monitor whether a firm has installed the technology.

Finally, the efficient level of pollution reduction e* can also be obtained by installing an emission trading system, i.e. for each unit of pollution that is emitted, producers need to submit a government-issued permit. Instead of deciding on the size of the emission fee, governments now need to choose the total permits they want to issue. So, they directly limit the permits to Q*, in order to reach the efficient level of pollution reduction e*. If then polluters are allowed to trade permits, the outcome will also be cost-effective with the market price of the permit equal to f* which is the same as the Pigouvian tax on pollution. From an efficiency standpoint, the initial allocation of permits among producers does not matter at all[1], but it affects the income distribution between polluters.

2. Carbon emissions in Belgium

In 2018, a total amount of more than 130 million tonnes of GHG – expressed in CO_2 equivalent numbers – were emitted by Belgian resident economic units, including households[2]. In per capita terms, this implies emissions of 11.6 tonnes per person. From a European perspective, this means a slightly better performance than neighbouring countries like the Netherlands and Germany, but not as good as France, which has one of the lowest emissions per capita in the EU. When comparing the GHG intensity of our economy in terms of GDP, Belgium is performing much better and even finds itself among the most energy-efficient EU countries. As such, the relatively high Belgian emissions per capita are not the consequence of being relatively energy-inefficient but the result of high economic activity.

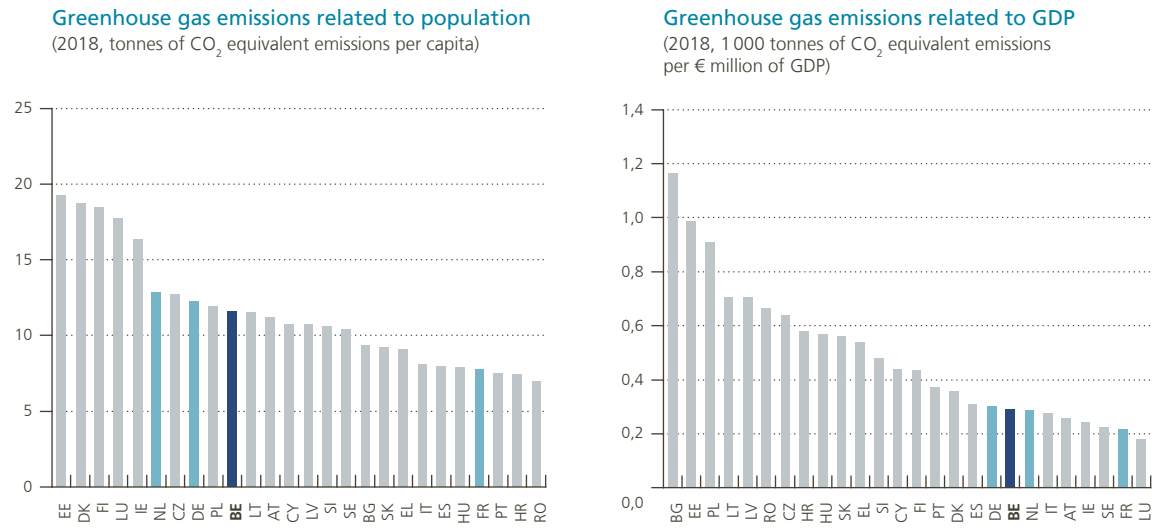
Carbon emissions account for approximately 86 % of GHG emissions in Belgium in 2018. About one-quarter comes from households, with heating and/or cooling of residential dwellings and transport as the main polluting activities. As far as enterprises are concerned, large differences are found between branches of activity. In 2018, the industry and market services branch of activity together accounted for about two-thirds of Belgian total emissions. A more detailed overview of Belgian CO_2 emissions and how they have changed over time can be found in Burggraeve *et al.* (2020).

1 This is the case if the market for permits is a competitive market.

2 A unit is said to be a resident unit of a country when it has a centre of economic interest in the economic territory of that country. As such, emissions from resident units' activities are recorded, regardless of where they occur.

Chart 5

Greenhouse gas intensity [1]



Source: Eurostat.
1 Including emissions from the combustion of biofuels.

Finally, one should be aware that any attempt to fully assess the Belgian burden on global warming must also take into account CO_2 emissions generated abroad in order to produce goods and services that are used or consumed by domestic companies and households and correct for emissions made for goods and services which are later exported and finally used elsewhere (Burggraeve *et al.*, 2020).

3. Belgian fiscal policy instruments to mitigate climate change

In this section, we will analyse whether Belgian market-based policy instruments are effective in terms of mitigating climate change. We will do this by evaluating how these policies succeed in correcting inefficient market outcomes by putting a price on carbon emissions.

3.1 Revenue-based fiscal instruments

To reduce pollution, environmental taxes should ideally have the actual level of pollution as their tax base, implying that the tax can directly be linked to the damage done to the environment. When it comes to taxing the use of combustible energy sources, the amount of carbon emitted into the air is the correct tax base. Belgium does not have a direct carbon tax but there is one in other European countries like Sweden, Denmark and France[1]. However, based on existing Belgian fiscal instruments, an implicit carbon price signal could be calculated. For that, we rely on work done by the OECD.

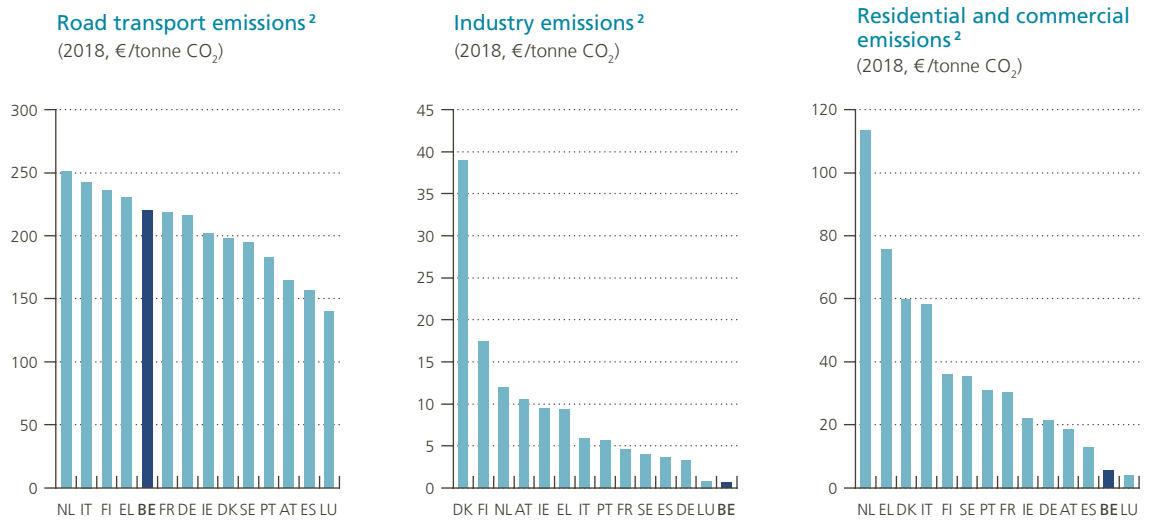
1 An overview of international carbon pricing initiatives is given by the World Bank's Carbon Pricing Dashboard (Carbon Pricing Dashboard | Up-to-date overview of carbon pricing initiatives, worldbank.org).

In its "Taxing Energy Use" publications, the OECD calculates effective carbon tax rates for different combustible energy sources used for different activities. More specifically, they convert taxes on energy use and direct taxes on CO_2 emissions from energy use into tax rates per tonne of CO_2, by taking into account the carbon content of the energy source and by correcting for applicable tax exemptions, rate reductions and tax refunds (OECD, 2019).

For Belgium, the OECD considers existing fuel excise duties and the EU ETS system to determine the effective carbon price signal for different energy sources. Taking the price of a European Union Emission Allowance (EUA) into account is relatively straightforward as EU ETS is designed to price directly the amount of pollution caused by the electricity and industry sector, i.e. firms in energy-intensive industries have to buy emission rights for the amount of CO_2 they send into the atmosphere[1]. In the case of fuel excise duties, it is a bit more complicated. When calculating their contribution to the effective carbon tax rate, the excise duty per unit for each CO_2-emitting energy source is fully converted into a tax per tonne of CO_2 emitted due to the use of the energy source. This means that the excise duty is fully labelled as an energy tax as the scope for behavioural responses is determined by the calculated tax base. Of course, there are also other elements than can explain the exact excise duty rate. For example, in the case of excise duties on different energy sources used in road transport, the level of the tax rate should be chosen not only to correct for negative externalities coming from pollution but also to take into account congestion and the cost of using road infrastructure. Finally, it should also be noted that VAT or sales taxes are not included as they generally apply equally to a wide range of goods and do not change relative prices between energy sources (OECD, 2019).

Chart 6

Average effective carbon tax rates in a European perspective[1]



Source: OECD (2019).

1 In these figures, the impact of EU ETS is not taken into account.

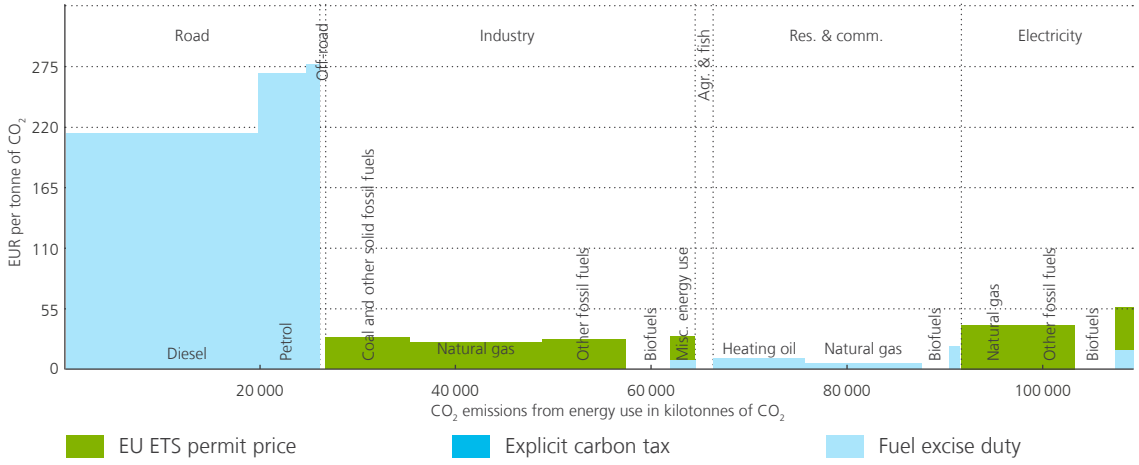
2 Including emissions from the combustion of biofuels.

A comparison of effective CO_2 price signals across different European countries immediately points up a wide dispersion across countries and between activities. In general, road transport emissions are taxed the highest in terms of actual CO_2 taxation; this is also the case in Belgium, that ranks in the upper half of the European

1 It should be noted that determining the precise ETS coverage for specific subsectors can require detailed work especially in countries where the industry and power sector is not dominated by facilities above the EU ETS threshold for inclusion. Also note that EU ETS applies to emissions, not fuels, which requires estimating the fuel mix of facilities covered by the EU ETS to be able to estimate instrument overlap.

Chart 7

Detailed effective carbon tax rates in Belgium[1] (€ per tonne of $C0_2$, 2021)



Source: OECD (2022, forthcoming).

1 Taxes on energy use and greenhouse gas emissions, as applicable on 1 April 2021 (for EU ETS this implies a permit price of € 44 per tonne CO_2), are assigned to energy use data adapted from the IEA, World Energy Statistics and Balances, which is also used to calculate CO_2 emissions from energy use, by applying the appropriate conversion factors. The latest available energy use and emissions data was from 2018, which was used as a proxy for the 2021 tax base.

league table. Industry emissions, on the other hand, are not taxed very much in most EU countries[1]. Belgium even ranks lowest here, with barely any levy applied apart from the ETS. For emissions from residential and commercial heating, the picture is more dispersed, with a relatively high effective tax rate in the Netherlands, but relatively low rates in France and Germany. Here too, Belgium scores very badly.

Chart 7 shows a more detailed analysis of the effective taxation of carbon emission in Belgium for different sectors of activity and different energy sources. Below, we will focus on the resulting carbon price signals for each sector of activity.

Taxing emissions from road transport

As can be seen from chart 7, the road transport sector accounts for almost a quarter of total CO_2 emissions originating from energy use. Compared to other European countries, diesel is taxed the highest in Belgium whereas the tax rate for petrol (gasoline) is somewhat higher in neighbouring countries. In most European countries, diesel enjoys a discount as it is taxed at lower rates than petrol. Belgium has had no diesel discount since the end of 2018 and both motor fuels now have the same tax rate per litre. From a climate perspective, taxing diesel at higher rates would be sound as CO_2 emissions per litre for diesel are higher than for petrol. However, and as mentioned by the OECD (2019), this is challenging considering that many governments have long encouraged consumers to buy diesel vehicles.

When converting the excise duty rates on motor fuels into their respective carbon price signal, one can see that the price of pollution – the emission of CO_2 – varies significantly across motor fuels. So, the tax system is not environmentally neutral with respect to the use of energy sources. Although both diesel and petrol have the same excise duty rate, the effective carbon tax rate for the use of petrol is almost 20 % higher, confirming that diesel is more polluting in terms of CO_2 emissions per litre. Moreover, existing Belgian fiscal legislation provides a partial repayment of the excise

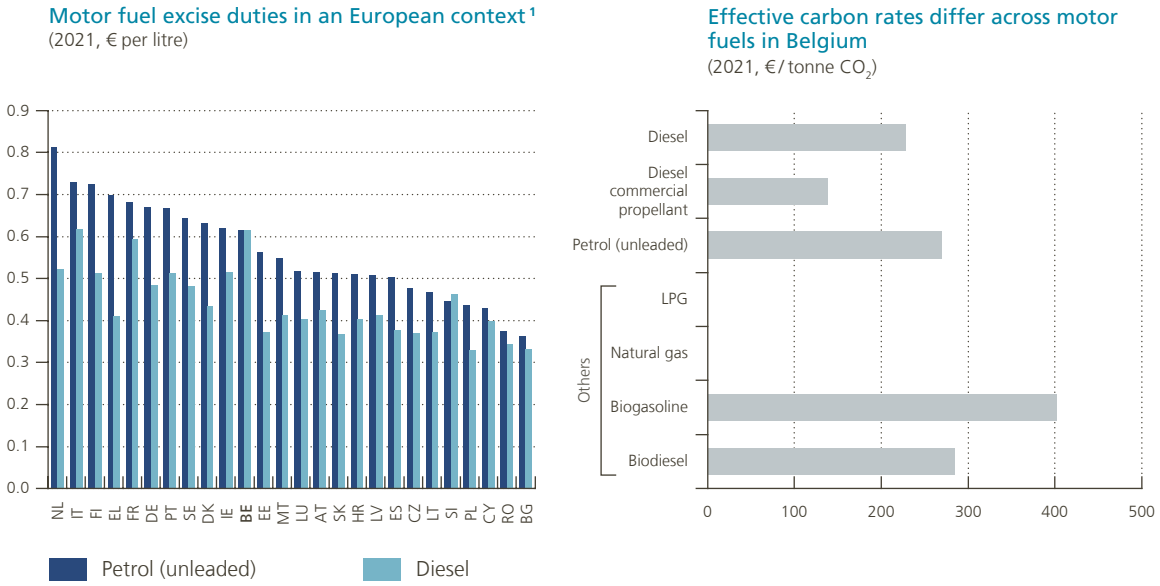
1 Taking into account the impact of EU ETS – which is not the case with the OECD (2019) numbers – would of course increase the average effective carbon tax rate in the industry sector. A first analysis, that allows for the impact of EU ETS can be found in OECD (2021). Of course, the taxation of industry emissions including EU ETS is still significantly below the taxation of road transport emissions.

duty on diesel for professional use[1] in order to align the excise duty with the European minimum rate. Importantly, this exemption is not just limited to professional users whose vehicles are registered in Belgium but also applies to all hauliers that buy diesel as a motor fuel on Belgian territory (FPSF, 2021). The effectiveness of such a policy measure in terms of boosting the competitiveness of Belgian transporters could therefore be questioned. However, its budgetary impact is not negligible as, according to the FPSF (2020), the repayment was estimated to have a budgetary cost of € 733 million in 2019. Recently, the federal government announced that – starting from 2022 – it will slightly reduce the partial repayment of excise duties on professional diesel.

Finally, it is important to stress that the carbon price signal given to road transport is – at least – partially offset by the beneficial tax treatment of company cars which leads to more car use. Especially in combination with a company fuel card, the cost of driving is fully externalized as the marginal cost for the individual of 1 extra kilometre is 0. As such, the cost of carbon emissions due to car use is not borne by the final polluter. According to Laine and Van Steenbergen (2017), the budgetary cost for the Belgian federal government of this environmental unfriendly measure amounts to around € 1,5 billion a year.

Chart 8

Taxing road emissions



Sources: EC (2021), OECD (2022, forthcoming).

1 If different rates exist, the one with the highest sulfur content is taken. Potential discounts for the professional use of diesel are not taken into account.

Taxing residential and commercial emissions

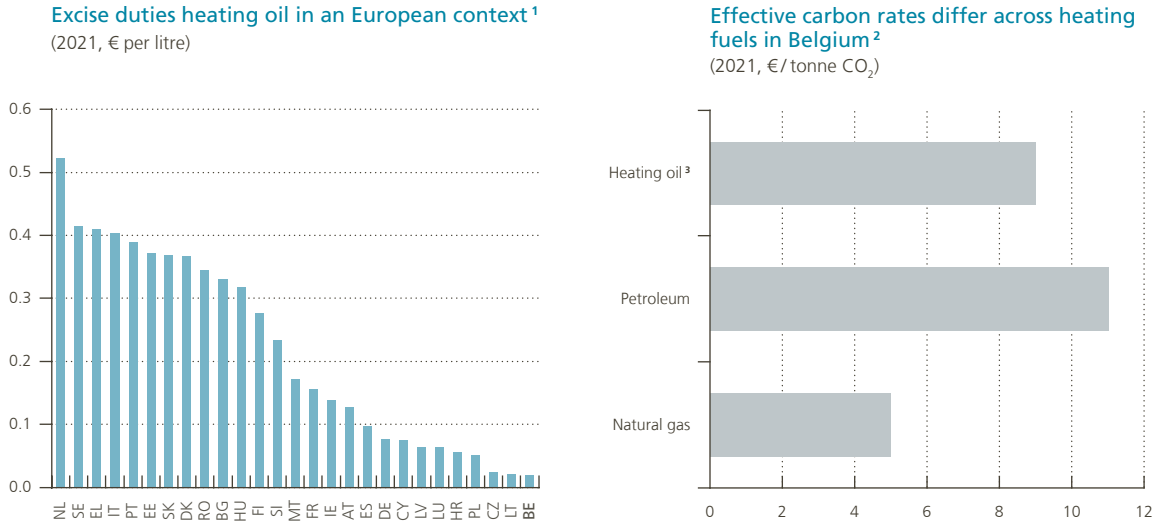
Residential and commercial emissions are mainly the consequence of the heating of dwellings. When it comes to the taxation of heating oil as energy source, chart 9 shows that excise duties in Belgium are negligible both in absolute terms and compared to other European countries, the reason being that, in Belgium, only an inspection fee and a levy on energy needs to be paid. When looking at the average effective taxation of CO_2,

1 Diesel is considered as professional diesel when it is used as an energy source for taxis, motor vehicles intended for the transport of disabled persons, motor vehicles having more than 8 seats – excluding the driver's seat – intended for the transport of passengers, and vehicles with a maximum authorised mass equal to or exceeding 7.5 tonnes and which are exclusively intended for the carriage of goods by road (FPSF, 2021b)..

it is confirmed that the price signal in terms of taxing pollution is very low – especially when comparing this with the CO_2 taxation of energy source for other activities. Moreover, the effective taxation of CO_2 emissions from natural gas used for heating dwellings is even lower than for heating oil. Existing Belgian tax rates on energy sources for heating barely touch the amount of pollution caused and do not give a significant price signal that internalises the cost of pollution and promotes more environmentally-friendly energy sources.

Chart 9

Taxing residential and commercial emissions



Sources: EC (2021), OECD (2022, forthcoming).
1 When different rates apply, the one for the fuel with the highest sulphur content is taken.
2 For non-professional use.
3 Excluding biofuels.

Taxing industry emissions

Greenhouse gas emissions from the industry sector account for one-third of total Belgian emissions from energy use. Their implicit cost in terms of effective carbon taxation is solely determined by the presence of the European Emission Trading System (EU ETS).

Companies that are bound by EU ETS need to obtain emission allowances covering their carbon emissions. EU ETS is a large-scale "cap and trade" system designed to reduce greenhouse gas emissions, with total emissions controlled by a cap and where a market is created allowing firms to trade emission allowances.

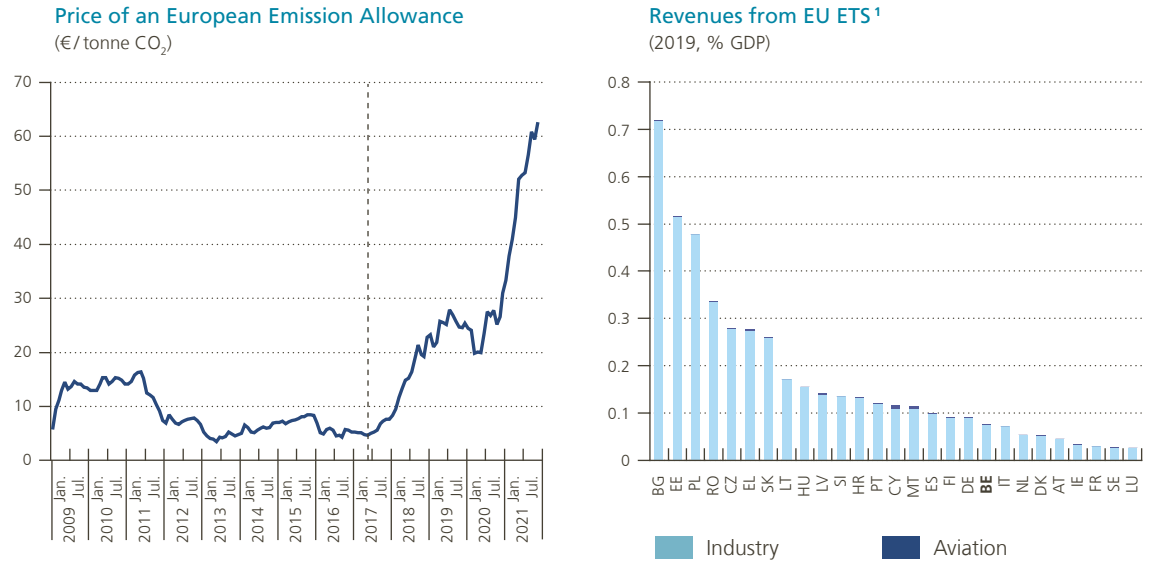
The EU ETS was launched in 2005 by the European Union and has been reformed during different trading phases. From phase 1, the EU ETS covered GHG emissions from the most GHG-intensive sectors in the power and manufacturing industries. In 2012, the scope was expanded to cover CO_2 emissions from the aviation sector as well – although limited to flights within the European Economic Area. From phase 3, the sectoral scope was further expanded to other sectors such as aluminium and other chemicals (EC, 2015). Currently, EU ETS regulates emissions from nearly 11 000 power plants and manufacturing plants as well as around 600 aircraft operators (EC, 2020c) [1].

1 According to the EC's Carbon Market Report (EC, 2020c), it covers around 38 % of the EU's GHG emissions.

Emission allowances are given to firms either through auctioning or for free. The amount of emission allowances an installation gets for free each year is determined before the start of a regulatory cycle using information from a reference period and it is determined by three factors: (i) the size of the installation – the amount of free emission allowances is proportional to the production of the installation, (ii) the sector's emission efficiency benchmark, which forms the upper limit of the amounts received for free as it shows with how few emissions it is possible to produce the product and (iii) the sector the firms operates in, i.e. sectors with a higher risk of carbon leakage receive a higher share of free allowances[1]. Finally, a share of allowances is also set aside in the New Entrants' Reserve for free allocation to new firms.

Chart 10

The European Emission Trading System



Sources: De Jonghe et al. (2022), EC (2020c), Refinitiv.
1 An EU ETS revenue year t runs from April t until March t+1.

The remaining part of emission allowances will then be auctioned, with the auctioning rights shared among Member States[2]. More specifically, 90 % of these auctioning rights are distributed among Member States in shares that are identical to their proportion of verified emissions under EU ETS for 2005 (or the average of the period 2005-2007, whichever is the highest), whereas a further 10 % is divided between Member States with a relatively low per capita income – a so-called solidarity mechanism (EU, 2020).

Chart 10 shows the latest available national revenue figures from the auctioning of emission allowances. In that sense, it should be noted that Member States are obliged to inform the European Commission as to how they will use the revenue. They need to use at least half of the auction proceeds to reduce GHG emissions, to mitigate and adapt to climate change (EC, 2015).

The efficiency of EU ETS in terms of reducing GHG emissions depends on the price of a European emission allowance (EUA). However, since 2009, a surplus of emission allowances has built up – largely due to the

1 Carbon leakage means that, for reasons of costs related to climate policies, businesses will transfer their production to other countries with less emission constraints.
2 It should be noted that some European funds – like the Innovation and Modernisation Funds, both of which stimulate durable energy transition, also receive part of the auctioning allowances to cover their financing costs.

economic and financial crisis – leading to a low carbon price and a weak incentive to reduce emissions. As a long-term solution to this problem, the European Commission introduced the Market Stability Reserve (MSR) which has effectively been in place since January 2019. The MSR effectively addresses the structural over-supply of allowances by automatically removing a percentage of the emission allowances from the market and putting it in a reserve if the total volume of emission allowances exceeds a certain threshold. Each year, the EU communicates on this excess supply allowing market participants to form expectations about the number of allowances that will be added to the MSR (EC, 2021b).

Since the first announcement of the introduction of the MSR, the price of an EUA seems to have increased gradually, implying that the MSR is an effective instrument in raising the efficiency of EU ETS. Moreover, as analysed by De Jonghe *et al.* (2020), the introduction of the MSR and thus the tightening of EU ETS regulations has raised the emission efficiency of polluting firms.

When it comes to taxing industry emissions, it is also worth mentioning that international maritime transport is not covered under the EU ETS. This sector can also benefit from an exemption from payment of excise duties for fossil fuels used as motor fuel or heating. However, if its emissions are compared with country-wide emissions, international shipping would be the world's 9th largest emitter of CO_2 (OECD, 2019). Recently, the European Commission proposed, as part of its Fit for 55 package[1], to gradually add international shipping to EU ETS starting from 2023.

The aviation sector also benefits from preferential treatment in terms of taxing carbon emissions. No excise duties have to be paid on the use of fuels, i.e. kerosene and the impact of EU ETS is very limited as only flights within the EEA are considered. Moreover, around 80 % of emission allowances for the aviation sector are provided for free (ECA, 2020). Again, it should be noted that initiatives under the Fit for 55 package also seek to strengthen the existing scope and rules for the aviation sector. In addition, in its budget agreement for 2022, the Belgian federal government decided to introduce an embarkation tax on airline passengers. But the precise details of this tax still need to be elaborated.

Taxing emissions in the electricity sector

The effective taxation of emissions from the use of primary combustible energy sources needed to generate electricity is also mainly determined by the EU ETS and thus by changes in the price of an EUA. In contrast to other sectors, there is no free allocation of emission rights to electricity generators, implying that the strong price rise of an EUA in recent years could have a significant impact on the cost of producing electricity.

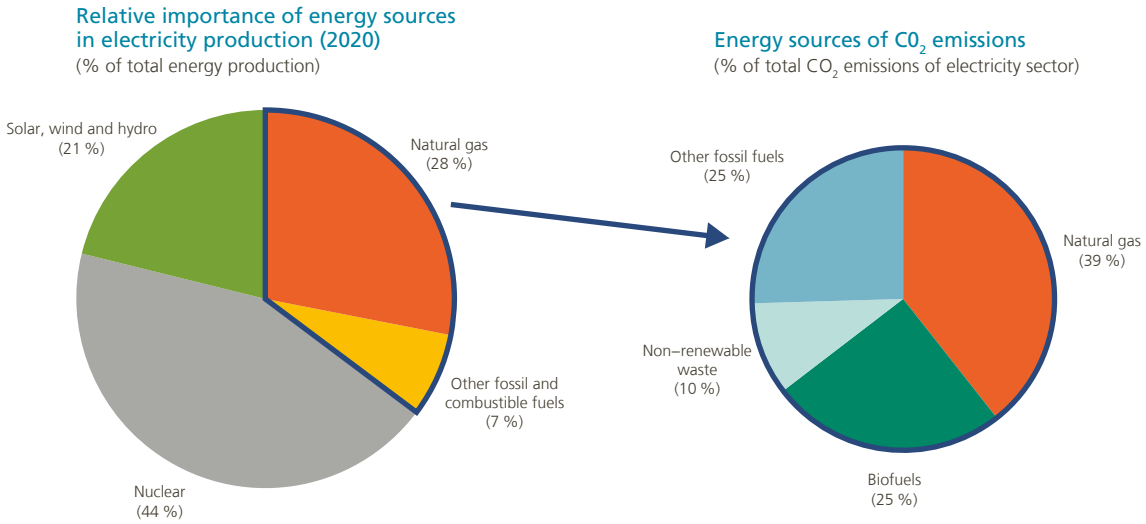
To analyse the impact of the price of an EUA on the average cost per MWh of electricity produced, it is necessary to take into account different factors, as is shown in figure 2. More specifically, four different elements should be combined: (i) the price of an EUA, i.e. the cost of emitting a tonne of CO_2, (ii) the amount of CO_2 emissions released by each primary energy source when used as an input in the electricity generation process, (iii) the efficiency of the electricity generation process in transforming each primary energy input source into electricity and (iv) the relative importance of each combustible energy source as an input for generating electricity (see chart 11).

To compute the average cost of CO_2 emissions by MWh of electricity produced for a specific energy source, it is worth noting that the volume of CO_2 emissions caused by the generation of one unit of electricity depends on the combination of two factors. The first factor is the amount of CO_2 released by each unit of input when used in the electricity generation process. It is a property determined by physics and specific to each energy source. The second factor is the efficiency of the technology used to transform that unit of energy input into electricity. In the case of electricity plants using natural gas as fuel, the efficiency is generally estimated to be

1 Initiatives linked to the European Green Deal, particularly including the climate target of a net reduction in GHG emissions of 55 %, are presented under the Fit for 55 package.

Chart 11

Electricity sector $C0_2$ emissions



Sources: Belgium's greenhouse gas inventory, CREG.

between 50 % and 60 %. It is the most efficient fossil technology; other power plants generally hover around an efficiency ratio between 35 % and 40 % (Mira, 2019). Moreover, compared to most other fossil fuels, the use of natural gas as a primary energy source also leads to less CO_2 emissions per unit of energy used. Finally, when assuming that the cost of an EUA equals € 61, which was the price paid in mid-September 2021, and using the calculation approach illustrated in figure 2, one can estimate the average cost of emitting CO_2 by using natural gas as a primary energy source to be around € 22 per MWh of electricity produced. For other combustible energy sources the average cost per MWh electricity produced is higher. This is because of a lower efficiency rate in terms of electricity production and a higher CO_2 content of the fossil fuel. That cost could be

Figure 2

The average cost of CO_2 emissions for electricity producers

Average CO_2 $Cost_i$ =	$Cost_i^{CO_2}$ / MWh_i =	$Price^{CO_2}$ / $tonne^{CO_2}$	Price per tonne CO_2 (EU ETS)
		x	
		$tonne^{CO_2}$ / $Input_i$	CO_2 emissions by unit of energy input i
		x	
		$Input_i$ / MWh_i	Electricity generation efficiency, reflecting the amount of energy input i needed to produce one MWh of electricity
Average CO_2 $Cost_{TOTAL}$ =	$\sum_i$	[$Cost^{CO_2}$ / MWh_i	Average cost of CO_2 emission by MWh produced from input i
		x	
		MWh_i / MWh_{TOTAL}]	Share of electricity produced from fuel input i in the total electricity production

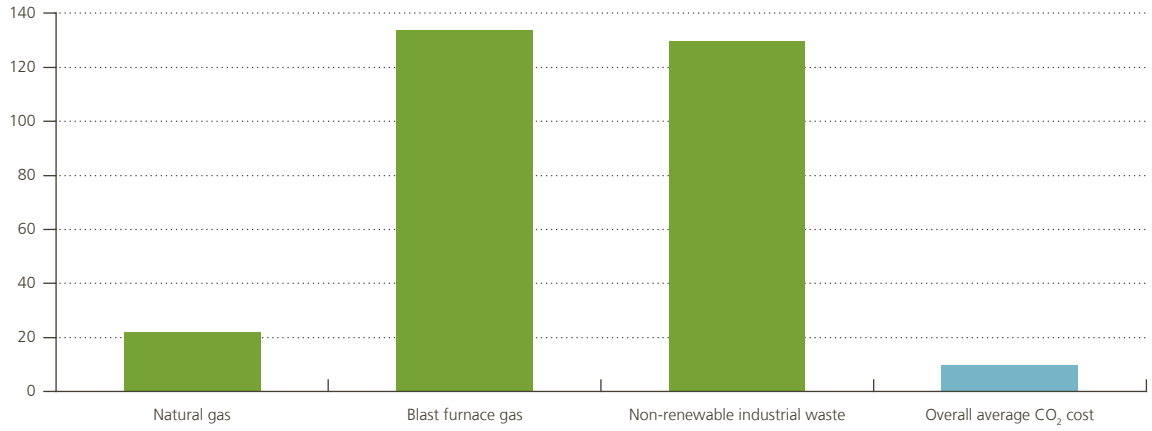
Average cost of CO_2 emission by MWh produced from energy input i (i can be natural gas, waste, etc.)

Source: NBB.

Chart 12

Estimated average cost of EU ETS per MWh of electricity production [1]

(€ per MWh of produced electricity)



Sources: Eurostat, NBB.

1 With EU ETS price of CO_2 per tonne of € 61.

higher than € 100 per MWh for electricity produced using Blast furnace gas or non-renewable industrial waste for instance. To estimate the overall average cost of CO_2 by MWh of electricity produced, we need to weigh the average cost of CO_2 emissions by MWh produced for all different primary energy input sources by their share in the total production of electricity (see the second expression in figure 2). This requires detailed information for each combustible energy source used as an input for electricity generation. Using the energy balance for Belgium published by Eurostat, and taking into account electricity produced from other energy sources that emit (almost) no CO_2 (solar, wind, nuclear, …) and/or that are not covered by EU ETS (biomass, municipal waste, …), the overall average cost is estimated around € 10 per MWh.

Finally, it is important to stress that the impact of EU ETS, and thus the price of an EUA, on consumer electricity prices is different from this average cost because consumer prices are largely influenced by the market price of electricity. Many additional factors come into play here, which makes a precise estimate highly complex. A general feature, however, is that the market price for electricity is most of the time determined by the marginal production price of electricity generated by natural gas plants [1]. As gas plants have to buy emission allowances to cover their CO_2 emissions, their marginal production cost is affected by the EUA price. As a result, the impact of EU ETS on the energy content of final consumer prices is probably higher than the overall average cost and more in line with our estimated average cost per MWh for electricity produced using natural gas.

3.2 Expenditure-based instruments

Besides the above-mentioned instruments on the revenue side, targeted spending can also correct the price signal and encourage the reduction of greenhouse gas emissions (see section 1.1). Public spending to mitigate climate change can be understood with the help of the Classification of the Functions of Government (COFOG). This classification notably makes it possible to identify expenditure devoted to environmental protection, of which pollution abatement is a sub-category that accounted for € 2.8 billion worth of expenditure by Belgium in 2019.

1 A short and simplified explanation of the price-setting mechanism for electricity based on the "merit order" of the different technologies can be found on https://www.febeg.be/fr/merit-order.

Green certificates: an incentive that proves difficult to balance

The bulk of this spending, € 2.4 billion, took the form of subsidies granted via the green certificate system. From 2002 on, the federal government and the three Regions drew up mechanisms of this type, with a view to encouraging production of renewable energy. Green certificates are securities granted by the authorities to green power generators, that are supposed to speed up the investment payback time for these clean sources of energy. Typically, that concerns households who invest in the installation of photovoltaic solar panels. Green power generators are given certificates by the public authorities, in proportion to their production, that they can cash in with energy suppliers (against a guaranteed minimum price). Suppliers effectively need these certificates to meet their obligation to pass on a certain quota to the public authorities, de facto guaranteeing the supply of a corresponding quantity of green electricity. In return for that, electricity suppliers have the option of passing the costs of green certificates on to their customers' bills.

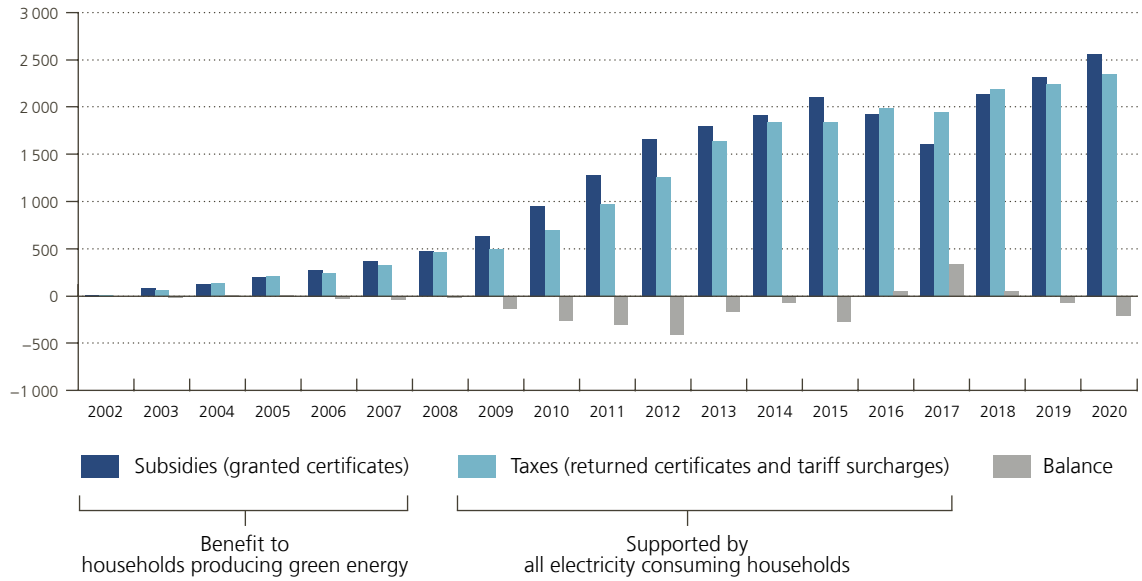
In this context, there is no cash flow passing through government accounts. But the system has an important mandatory redistribution component (between consumers and producers of green energy), which according to the official national accounting rules (ESA) for the statistical recording of these transactions is considered as a typical government function. So, from a statistical point of view, the green certificate mechanism boils down to a system whereby the public authorities grant subsidies to green power generators and levy taxes on electricity suppliers. The subsidies presented in this section are therefore counterbalanced by taxes collected.

In principle, this mechanism should be neutral for the State budget. In practice, however, that has not always been the case. From 2009-2010 onwards, a big gap has been observed between the level of spending on and revenue from green certificates. Both in Flanders and in Wallonia, the system soon became a victim of its own success. The attraction of photovoltaic solar energy has led to an over-supply of green certificates offered by producers in relation to the limited demand from energy suppliers. In these circumstances, it is the transmission system operator (Elia) that is under the obligation to buy back surplus certificates at a guaranteed price, and

Chart 13

Budgetary impact of the green certificate system

(cumulation of Flemish, Walloon, Brussels and federal schemes, in € million)



Sources: NAI, NBB.

this is what has happened in practice. The transmission system operator can in turn pass this cost on to the consumer's bill, but this tariff surcharge has often not been enough to balance the mechanism's books. That has led to recurrent deficits, both in Flanders and in Wallonia. Meanwhile, adjustments have been made at the level of regional schemes, like scrapping grants of green certificates to new domestic installations or the introduction of additional taxes. These measures have helped re-establish some form of budget balance, at least temporarily. The green certificates nevertheless still come with a heavy debt burden at the moment, especially on the Walloon side. This debt comes on top of the cost of the schemes that energy consumers have already had to bear, either in the form of taxes and surcharges, or from suppliers passing on the cost of the certificates in their electricity bills. These liabilities will inevitably have to be met in the future, at the taxpayers' expense.

So far, the public expenditure that has accumulated since 2002 in the various green certificate schemes comes to as much as € 22 billion. This begs the question of the very relevance of these mechanisms : is the heavy bill for green certificates justified in terms of the desired objectives and results obtained in terms of production of renewable energy ? The literature devoted to this question suggests that these schemes may have cost more than was necessary. A recent study on the scheme in Flanders concludes for example that start-up aid for investment in solar panels cost twice as little as the recurrent grants of green certificates for solar panel production (De Groote and Verboven, 2019). The authors show that the beneficiaries of green certificates largely opt to receive the subsidies immediately : they apparently underestimate the future savings on energy bills or do not entirely trust the government to pay out future subsidies. Another study analyses a French scheme, with a guaranteed price of € 0.18 per KWh for all households who want to install solar panels on their roof [1]. It deduces a very high price for each tonne of CO_2 saved : € 304, to be compared with the value of one tonne of CO_2 less, currently estimated at around € 60 under the ETS system (Gollier *et al.*, 2021). All this appears to indicate that government intervention has not been optimal and could have been more efficient. Moreover, De Groote *et al.* (2016) show that it is the well-off households that have benefited more from green certificates. Not because of their higher incomes as such, but rather because they are more likely to take on board solar panels as major users and more frequent owners because they live in houses that are better adapted to their installation.

The experience with support schemes for solar panels and their shortcomings underlines the importance of designing support mechanisms that do not favour technological choices but rather focus on the contribution to the aim of reducing the carbon footprint. The extent of public support should be proportional to that aim. It also highlights the risks associated with mechanisms involving recurrent costs that are difficult to forecast accurately at the start. Such a renewed approach should ideally lead to relatively more support for other technologies such as heat pumps. Wide use of heat pumps [2], especially in residential heating systems, is often mentioned as a key element in reducing the carbon footprint of heating (see, for instance, IMF, 2021 ; Gollier *et al.*, 2021 ; SERV, 2021 ; or IEA, 2020). In many cases, the use of heat pumps is more expensive than conventional alternatives because of a high initial capital cost and because relative running costs are much higher, especially in Belgium where consumer prices for electricity are very high relative to natural gas. An increase in carbon taxes for natural gas used for heating and/or a reduction in surcharges on electricity could reduce that gap and help make alternative technologies more equally attractive (specific electricity tariffs and meters for houses equipped with efficient technologies such as heat pumps could also make a contribution). To address the issue of high initial capital costs, public authorities could resort to subsidies. In Belgium, the three Regions provide subsidies of this kind [3]. Nevertheless, current public support is relatively low compared to other technologies. In Flanders, specific subsidies for heat pumps amounted to € 3.8 million in 2020 or 8 % of the total energy subsidies granted. In Brussels, less than € 5 000 from a total budget of € 17 million was allocated to heat pumps for heating in 2019, the last year for which statistics are available. What is more, the subsidy that is most widely used, and

1 By way of comparison, in Flanders, the system provided for a subsidy of € 0.45 per kWh when it was launched in 2006, a rate which gradually came down to € 0.09 for solar panel owners who had joined the system at the end of 2012 (De Groote and Verboven, 2019).

2 Heat pumps rely on electricity to extract renewable energy from the air, from the ground or from water. They do that with an efficiency rate of 300 % : one unit of electricity energy produces 3 unit of heat (to be compared with 1.1 unit of heat in the case of the best condensing gas boiler). In theory, the technology is therefore more energy/CO_2 efficient than condensing gas boiler, even when the electricity is generated with natural gas.

3 Information on existing subsidies can be found on www.energiesparen.be for Flanders, on www.energie.wallonie.be for Wallonia and www.brugel.be for Brussels.

that eats up 26 % of the total budget for energy subsidies, is the subsidy for new condensing gas boilers for space heating. Between 2019 and 2021 the subsidy policies for heat pumps remained relatively stable in the three Regions, with a potential financial support between € 300 and about € 8000 depending on the technology used, the localisation, or the income level of the beneficiaries. In the coming years, regulations relative to the interdiction of heating oil or even natural gas as heating sources are expected to increase the share of installed heat pumps, provided they are accompanied by adequate support [1].

Finally, it should be pointed out that a lot of expenditure contributing, among other objectives, to reduce greenhouse gas emissions is still recorded in various functional classes not directly related to environmental protection. For instance, as far as mobility is concerned, the Infrabel budget should be considered as well as that of regional transport operators, which are an integral part of the general government sector, or the subsidies and investment aids given to the Belgian railway company SNCB. As regards capital spending, a potential boost can be expected from the National Recovery and Resilience Plan that Belgium submitted to the European Commission in June.

Recovery Plans: a potential boost for green investment

To help meet climate targets, reducing greenhouse gas emissions is a key concern of the Next Generation EU programme, which finances the EU Member States' national plans through the Recovery and Resilience Facility (RRF). Firstly, each country has to devote at least 37 % of this European budget to climate action. Moreover, the planned investment has to be in line with the country-specific recommendations, which include instructions regarding the green transition, while ensuring that none of the projects considered individually has any significant adverse impact on the environmental objectives (concerning climate change, biodiversity, pollution, the circular economy and water and marine resources).

As far as Belgium is concerned, the proportion of "green" spending included in the National Recovery and Resilience Plan ratified by the EU Council of Ministers is estimated to be 50 %, which accounts for around € 3 billion of the projected € 5.9 billion. The vast majority of climate-related projects can be found in the plan's pillars 1 (Climate, sustainability and innovation) and 3 (Mobility). More specifically, the plan covers a lot of investment in renovation of public buildings, implementation of the hydrogen energy option and a good many cycling path and rail infrastructure development projects.

This expenditure will be spread out over time, scheduled up until 2026. Consequently, the corresponding "green" sum comes to about € 500 million each year, which is still relatively modest in relation to the State budget. That is undoubtedly the reason why these EU-financed projects are backed up by other projects put forward by the Regions and the federal authorities, because each of these entities has their own recovery plan that sometimes exceeds the amount of the European budget allocated to it. The green dimension is certainly there in these additional plans, although difficult to estimate at this stage.

4. Redistribution issues for households

The existing taxation of energy products does not affect all households equally in proportion to their income or consumption level. And the same is true for any reform of indirect taxation involving an explicit carbon tax.

1 The commercialisation of oil boilers will be forbidden from 2030 onwards in Wallonia, and from 2025 in Brussels. In Flanders they cannot be installed anymore in new buildings since January 2021, and from 2022 onwards they will no longer be permitted in existing buildings as replacement of older boiler if a connection to the natural gas network is possible. Moreover, according to the new measures added in November 2021 to the Flemish Energy and Climate Plan 2021-2030, owners of new buildings will be required to install a (hybrid) heat pump from 1 January 2023 onwards, and from 2026 they will no longer be allowed to connect to the natural gas grid.

How the effort is split among the population is important to be able to correct social distortions that could lead to opposition to reforms targeted at lower emissions using the indirect taxation lever to manage the price signals.

The consumption share of transport fuel is lower for low-income households

The Household Budget Survey for Belgium makes it possible to identify four income classes. It reveals that households in the lowest income quartile devote a lower share of their consumption to transport fuels than the other, richer, households. This means that additional taxes on transport fuels would generally be progressive, i.e. the richer will on average be proportionally taxed more than the poorer households, which is a good thing in terms of social equity. However, it is also interesting to analyse whether the same distribution holds across the three Belgian Regions, which have very different characteristics, not least with respect to urban planning and infrastructure. Brussels is mostly urban, whereas the other two Regions have consumers in urban and rural areas, with a higher share of rural households in Wallonia. In Brussels, transport fuel is used less because distances are shorter and alternative transport modes are more widely available (public transport, cycling, walking). Only in the higher income category is the share of transport fuels higher than the average of the region. This could tentatively be explained by the equipment (more than one car, larger cars), by higher demand for individual transport for leisure purposes, or by geography if richer households are more peripherally located (more affluent neighbourhoods are often found on the outskirts of Brussels).

In contrast, Wallonia, and to a lesser extent Flanders, devote a higher share of consumption to transport, a trend that can be linked to higher demand for private motorised transport in more rural or peripheral locations. Demand from low-income groups is lower than the three other groups that all have a similar share.

Diversity within each income group implies that consumers within an income group do not face the same cost structure for transport fuel, as illustrated by the differences between regions with different rural/urban characteristics. This is also the case for other energy sources such as electricity, gas and heating oil.

The share of electricity consumption is higher for low-income households

For Belgium as a whole, the share of electricity consumption in total consumption clearly declines with income. This means that an additional (carbon) tax on electricity would be regressive.

From a geographical angle, the decreasing share of electricity consumption with income holds for Wallonia and Flanders, but less so for Brussels, where that share is lower and similar between income groups. There is no straightforward explanation for these observations because the data presented do not enable any distinction between electricity consumption for heating and electricity for other uses (hot water, cooking, lighting and other electric appliances). The better off the household, the more it tends to intensify its use of energy-consuming services.

Given that electricity consumption is highly dependent on the household's available equipment running on electricity (heating, hot water boilers, cookers, number of electrical appliances), the horizontal heterogeneity between households in the same income category is therefore extremely high and can even be higher than between income categories, as described in Douenne (2020).

Electricity is not the main fuel used for heating, usually being far less common than gas or heating oil. With the more recent growing awareness of the importance of energy performance of buildings, electricity is making a comeback as a primary heating source for high-quality buildings. The tandem of well-insulated buildings and technologically more mature heat pumps – that rely on electricity – is now seen as an efficient solution for buildings. Therefore, electricity is likely to become more important in the consumption basket so that redistribution aspects of electricity pricing will require renewed attention in the future.

Chart 14

Energy consumption as a share of total consumption, per income quartile

(2018, in %)

Sources: Household Budget Survey, Statbel.

The share of natural gas and heating oil consumption is higher for low-income households

The share of heating in the consumption basket of households (natural gas and heating oil) clearly declines with income in Belgium. This holds for the three Regions, but with differences in the fuel mix between gas and heating oil.

People from lower income groups have to allocate a larger part of their income for the purpose of heating. At least in the short run, there is a large incompressible part for this type of consumption. Although higher income groups can allocate a smaller share of their consumption to heating, their consumption is usually higher in terms of energy used. With higher incomes, they are able to lift the budget constraint on energy use (Cayla *et al.*, 2011).

The share of consumption allocated to natural gas is particularly high for low-income households and especially in Brussels. In the Brussels-Capital Region, the share of gas in energy consumption is systematically higher than in Flanders and in Wallonia. This is related to the availability of natural gas, which is widespread in urban areas, and virtually inexistent in many rural areas. The picture for heating oil backs up the consumption profile for gas. Where natural gas is not available, the main alternative is heating oil, and therefore the share of consumption of that fuel is significantly high in Wallonia. It is lower in Flanders, and very low in Brussels where natural gas is virtually available everywhere.

Our regional analysis indicates that differences across Belgian Regions are related to characteristics of rural and urban areas. This seems to confirm microeconomic research findings that energy consumption is characterised by significant horizontal heterogeneity in terms of energy mix and energy intensity, with differences within an income group often exceeding those between income groups. In a paper on the redistributive effect of green taxation in France, which relies on the micro data from the Household Budget Survey, Douenne (2019) finds that the horizontal heterogeneity is significant and largely due to households' equipment. Rural areas rely more on heating oil for heating, and on diesel for transport.

Lower income groups live in less insulated houses

Energy consumption is linked to the type and quality of household equipment. There are indications that the quality of equipment is linked to income. For instance, based on data for Flanders, it can be illustrated that households from the lower income quintile are systematically less well equipped than the higher income groups in term of glass, roof, pipe, wall or floor insulation, and that they are less well equipped with economical boilers or renewable energy.

Households from the lower income groups are mostly not able to make the investment in higher-performing equipment that would help them to reduce their energy bills. Many households are constrained in terms of access to capital. The Woonsurvey (Heylen and Vanderstaeten, 2019) estimates that 50 % of households in Flanders do not have sufficient financial wealth to pay for a deep "energy-efficient" renovation of their dwelling.

Chart 15

Full or partial presence of insulation in homes, per income quintile

(Flanders, 2018, in %)

Sources: Woonsurvey 2018 (Heylen and Vanderstaeten, 2019).

Carbon taxation needs to be accompanied by additional measure to compensate distributional issues

Because many households in the lower part of the income distribution are financially constrained, they will not be able to cushion their reduced purchasing power following the introduction of carbon taxes. That risks leading to welfare loss. Principally, social policy should focus on general income support that compensates for the (adverse) income effect from carbon emission price rises, while preserving the substitution effect that makes carbon emissions relatively more expensive. This could be accompanied by easier and cheaper access to capital and subsidies in favour of efficient technologies.

The design of efficient accompanying measures with a substantial budget will be a delicate mission. Given the significant heterogeneity within income groups, the identification of potential "losers" and "winners" of the pricing of pollution is difficult, which implies that measures should ideally not only be based on the income of recipients. The government will also have to contribute to the provision of infrastructure that facilitates the use of less (polluting) energy. Moreover, any additional measures should prevent opportunistic behaviour (misuse of subsidies, windfall effects, etc.), and special attention is required to prevent or limit the size of the probable rebound effect. Many authors (for instance, Cayla *et al.*, 2011; SERV, 2021; EC, 2020 or Bartiaux *et al.*, 2006) stress that a trend towards catching up with the level of comfort of the middle class is probable and risks partially compensating the targeted emission reduction.

Concluding remarks

Limiting global warming to 2 °C and preferably to 1,5 °C above pre-industrial levels requires a significant drop in global GHG emissions. To reach these targets, additional government measures are necessary as current climate mitigation policies are insufficient. Market-based or fiscal policy instruments are crucial in a government's toolbox. By increasing the relative price of pollution, they provide polluters with market incentives to reduce pollution and promote energy efficient technologies, if emissions are priced adequately.

Ideally, environmental tax instruments should have the actual level of pollution as their tax base such that the tax can be linked directly to the level of pollution. However, when it comes to taxing the use of combustible energy sources in Belgium, a direct carbon tax is not present. Based on existing Belgian fiscal instruments, an indirect price signal could be calculated.

In Belgium, there is ample room for increasing the effectiveness of CO_2 taxation. Emissions from road transport are taxed relatively high, but the resulting price signal is disturbed by the beneficial tax treatment of company cars. Especially in combination with a company fuel card, the cost of driving is fully externalized implying that the cost of pollution is not borne by the final polluter. Concerning household heating, effective CO_2 rates are close to zero, and among the lowest in Europe. Industry emissions' CO_2 price is solely determined by the European Emission Trading System (EU ETS), of which the price has recently shoot up to more than € 60 per tonne CO_2. The EU ETS also applies to the production of electricity. With the current mix of energy sources used for electricity production, the overall average cost from EU ETS of electricity production is limited to approximately € 10 per MWh.

The unequal taxation of CO_2 emissions across sectors and activities proves that, apart from a general tax shift towards environmental taxes, a tax shift within greenhouse gas related levies is desirable to make them more neutral with regard to greenhouse gas emissions. Basides promoting the most efficient emission reduction technology, this is important to create a level playing field that avoids free riding.

When making use of subsidies to steer consumers' or producers' behaviour, it is equally important to give a central place to the effective cost per ton of CO_2 emission reduction. From subsidies for solar panels,

for example, it became clear that upfront investment subsidies are much more efficient than subsidies on future energy production. The efficient use of subsidies also benefits from carbon tax neutrality. For example, subsidies for heat pumps making use of electricity would see their effectiveness increase if the price of natural gas would rise relative to the electricity price.

Given the unequal share of energy consumption across household income quartiles, with the lower incomes generally consuming higher shares of energy, it is important to watch the distributional impact of carbon related taxes and subsidies. Compensations for those low-income groups that are proportionally most hit by rising energy prices are warranted. Yet, compensation should preferably come in the form of general income support that does not distort the carbon price signal, rather than support that reduces the energy price. Further, it is crucial for the government to contribute to the provision of the necessary infrastructure that facilitates the use of alternative energy sources. The advantage of carbon taxation, in comparison with subsidies, is that it raises money that – among other things – can be used to compensate the least well off. Subsidies on new green technologies often benefit higher income households more, as turned out to be the case with support for solar panels. Their adverse impact on the income distribution should be compensated elsewhere in the overall benefit and tax system.

Finally, increases in environmental tax revenues should be wisely used in view of all government objectives, without earmarking. This means that a rise in environmental tax revenues could be used to finance an increase in social benefits, as well as a reduction in labour taxation that increases labour market participation, or a reduction of the budget deficit that benefits future generations, or something else. Analogously, subsidies from greener electricity production should not necessarily be financed with taxes or levies on electricity consumption, but rather from the general budget means. This should ensure that any budgetary decision is justified in its own right, and not coupled to other decisions.

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Investment and reform in Germany, France, Italy, Spain and Belgium's National Recovery and Resilience Plans

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Introduction

Early in the COVID-19 crisis, European Union authorities and the Member States' governments have reacted promptly and set up a forceful common policy response in the form of an EU-wide recovery plan, the Next Generation EU.

A first article on the subject published in September's Economic Review (Bisciari *et al.*, 2021) explained the economic rationale behind this plan and argued that it may be a game changer for the European Union, albeit with the qualifier that it would critically depend on how it is implemented.

Around 90 % of the Next Generation EU Recovery Plan goes to the Recovery and Resilience Facility (RRF), whose grants are themselves allocated across countries depending on parameters reflecting their economic vulnerability before the pandemic and the economic losses they incur due to the pandemic. In exchange for grants, Member States have to submit National Recovery and Resilience Plans (NRRPs) detailing investment projects and reforms designed to speed up the recovery and reinforce the resilience of their economies.

In this article, we analyse the NRRPs of the four main euro area economies (Germany, France, Italy and Spain) as well as Belgium. These five countries are expected to receive around € 210 billion of the € 390 billion total RRF grants. Italy and Spain are the two main beneficiaries of the grants (receiving close to € 70 billion each) and they are both expected to request loans. Italy has already done so for € 122.6 billion while Spain is expected to request around € 70 billion later on. So, together they would receive more than half of the total amount of loans projected for RRF. The success of the Next Generation EU therefore depends to a substantial extent on the content and implementation of the NRRPs of the countries examined in this article, and in particular Italy and Spain. Since our focus is on NRRPs, we neither consider supplementary national funding of recovery or investment plans nor support measures decided by other authorities (e.g. the ECB) to prevent the economy and financial markets from crashing during the pandemic.

* The authors would like to thank, without implicating, Paul Butzen, Johannes Clemens, Naïm Cordemans, Francesco Corti, Marta Dominguez Jiménez, Hans Geeroms, Jan In't Veldt, Boris Julien-Vauzelle, Chantal Kegels, Pilar L'Hotellerie-Fallois, Géraldine Mahieu, Silvia Merler, Stefano Messina, Enrique Moral, Marco Savegnago, Katja Schmidt, Ruben Schoonackers, Pierrick Stinglhamber and Stefan Van Parys for helpful comments and suggestions.

We show that investment and reforms go hand in hand in the NRRPs and that the more EU-funded grants governments receive, the more they are expected to deliver in terms of reforms. Combining reforms and investment is projected to be most beneficial in terms of future potential growth and resilience.

This article is organised as follows. The first section looks at the rationale for the NRRPs based on economic developments in the different countries. In the second section, we describe the Belgian NRRP both in terms of expenditure and reforms, distinguishing what is undertaken by the federal government, the Flemish government and the other governments. In the third section, we compare the NRRPs of the five countries under review, looking both at expenditure and reforms. In the fourth section, we analyse the macroeconomic impact of the investment arm of the RRF, taking into account the spillover effects across EU Member States.

1. Context of the National Recovery and Resilience Plans

The COVID-19 virus came into Europe via Italy and then Spain. These two countries were hit harder by the first wave of the epidemic than other countries, with the central and eastern European countries being largely spared in the spring of 2020. The asymmetric effects of this exogenous shock were all the greater because it hit the services sector hardest, and most notably tourism and the hospitality sector both of which are crucial for the economies of the Mediterranean rim.

Besides, Italy and Spain had suffered badly from the sovereign debt crisis in the euro area between 2011 and 2014 (see chart 1). At the time, GDP had fallen sharply in real terms and, even by 2019, the Italian economy was still far below the level of activity that it had seen before the 2008 financial crisis.

Even before the financial crisis, Italy had already faced sluggish growth. Apart from the small contribution made by investment, it was also a case of low total factor productivity, most notably less innovation potential, brain drain (young graduates emigrating towards other parts of Europe) and misallocation. Added to that were other factors of imbalance that the European Commission (EC) had felt to be excessive in its Macroeconomic Imbalance Procedure (MIP) : very high government debt, inefficient public authorities and a fragile banking sector.

Unlike Italy, after the property bubble burst, Spain had returned to stronger and sustainable growth since 2014 but it was building up even more macroeconomic imbalances. For instance, the Commission had pointed up its vulnerability related to the high debt, both external and internal and both private and public, in a context of high unemployment. Under the structural challenges, Ecofin (2021a) also noted the high proportion of workers on fixed-term contracts, structurally low productivity growth and shortfalls in terms of investment.

Germany, France and Belgium had approached the pandemic in less unfavourable conditions than Italy and Spain. In Belgium, the government sector has a relatively high debt and the EC acknowledged that France had macroeconomic imbalances, "in particular relating to high government debt, weak competitiveness and low productivity growth" (Ecofin, 2021a). Germany, however, was confronted with a rather different macroeconomic imbalance, namely the fact that it had posted very high surpluses on its current account in a context of under-investment. Albeit to varying degrees, a lack of investment was a fairly widespread concern within the euro area. Governments had effectively sacrificed this politically less costly spending during their fiscal consolidation efforts.

Italy and Spain's more pronounced weaknesses gave rise to specific recommendations from the Ecofin Council in July 2019 and 2020 for these countries, covering a wider field and a firmer attitude towards them than in the cases of Germany, France and Belgium.

Owing to the lopsided effects of the COVID-19 shock which hit the initially more vulnerable countries disproportionally hard, the acute economic crisis generated by the pandemic risked rekindling the tendency

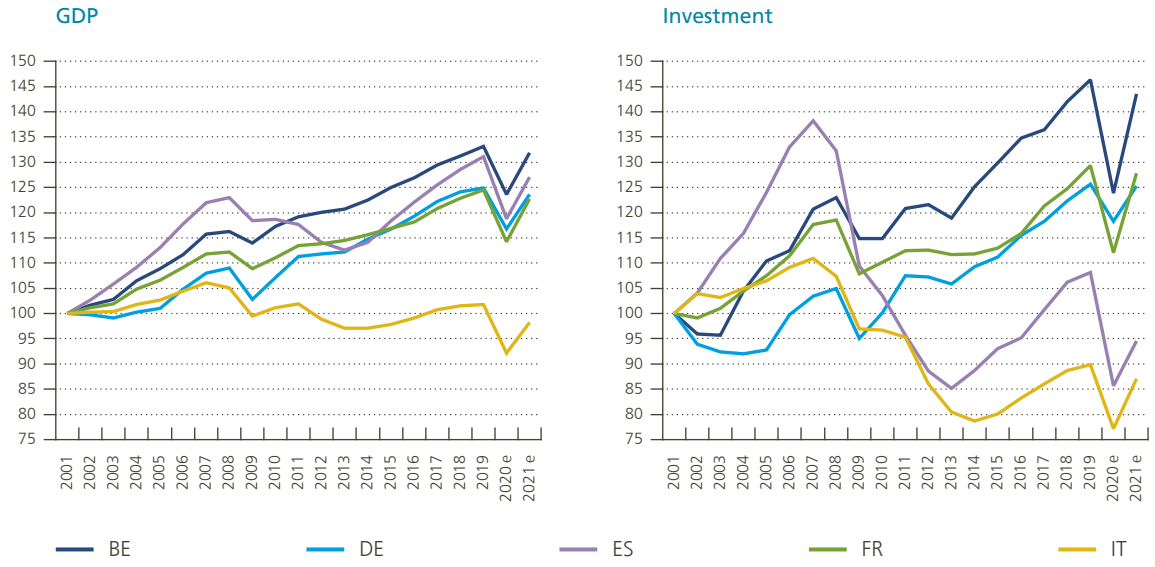
towards divergence between the main economies of the euro area that had been observed during the sovereign debt crisis. For instance, in its spring economic forecasts in May 2020, the EC said it was expecting the Italian economy to bounce back less strongly than other countries' economies. Moreover, at one point in March 2020, financial market participants were actually varying their sovereign bond purchase and sale habits between Germany, on the one hand, and Italy and Spain, on the other hand, which risked limiting the latter two countries' fiscal space.

The crisis that was triggered by the exogenous shock of the pandemic therefore provided the motivation for the European-level implementation of a coordinated recovery plan that involved an aspect of solidarity through grants and by taking into account both the initial vulnerability and the economic damage caused by COVID-19 in the Recovery and Resilience Facility (RRF) allocation criteria. Involving both grants and loans, this Facility constitutes the main instrument of the Next Generation EU recovery plan on which the Heads of State and Government agreed in Brussels on 21 July 2020.

Chart 1

In May 2020, COVID-19 was expected to exacerbate the differences in GDP and in investment among the main euro area economies

(index 2001 = 100)



Source: EC, May 2020 economic forecasts.

In exchange for European funds, the Member States had to commit to investing the money largely in the green and digital transitions, two major challenges for the long term for which the von der Leyen Commission had reserved a central role in its programme, as well as to adopting reforms intended to reduce their vulnerability and strengthen their resilience. To this end, all countries have to submit investment and reform plans as well as a precise implementation schedule. These are the National Recovery and Resilience Plans.

Among the *ex-ante* assessment criteria for the plans (and also in step with their implementation), investment and reforms have to tackle all, or at the very least, a significant sub-set of challenges identified in the specific recommendations addressed by the Ecofin Council to EU countries in the 2019 and 2020 cycles of the European Semester; at least 37 % of all expenditure has to contribute to the climate transition (although the plans also have to target other dimensions of the green transition like biodiversity) and no measure included in the plans

Table 1

Structural challenges identified by the European Commission

Structural challenges	DE	FR	IT	ES	BE
Labour market					
High unemployment rate			youth	×	×
High share of workers on temporary contracts				×	
Low participation / activity rates	vulnerable groups		women		×
Macroeconomic imbalances	×	×	excessive	×	
High current account surplus	×				
High external debt				×	
High private debt				×	
High public debt		×	×	×	×
Banking sector fragilities			×		
Lack of competitiveness		×			
Other structural vulnerabilities					
Low productivity growth		×	×	×	
Shortfalls in investment	×			×	
Inefficiencies in public administration			×		
High tax burden on labour					×
Business environment					×

Source: Ecofin (2021a).

1 The selection of challenges has been made on the basis of two sources: those identified as problematic in the Macroeconomic Imbalance Procedure and the long-standing aspects with an impact on medium-term economic performance singled out in the Council Implementing Decisions.

may harm the environmental objectives in any significant manner; at least 20 % of all expenditure must go into the digital transition; it has to have a lasting effect on economies; investment and reforms need to make up a coherent set of actions.

2. Belgium's National Recovery and Resilience Plan

2.1 General description of the Plan

Belgium submitted its National Recovery and Resilience Plan (NRRP) on 30 April 2021 (Secretary of State for Economic Recovery and Strategic Investments, 2021). It was the fruit of successful cooperation between the federal and regional governments. The RRF grants allocated to Belgium amount to maximum € 5.9 billion [1], i.e. 1.2 % of GDP over the period 2021-2026. Belgium has not applied for the RRF loans. The expenditure financed by the RRF and included in the Belgian National Recovery and Resilience Plan fits into a broader national recovery strategy, pursued at the federal and regional levels of government [2].

1 This amount is provisional and will be revised in June 2022 once the first official GDP figure for 2021 is published. In the case of Belgium, as indicated in our previous article (Bisciari *et al.*, 2021), there could be a downward revision of this amount.

2 The Federal Transformation Fund, the Flemish *Plan Vlaamse Veerkracht* and the *Plan de relance* in Wallonia are worth citing among the most important elements.

According to the official text, the Plan wants to accelerate Belgium's transition to more sustainable, smarter and more inclusive growth, while strengthening social, economic and climate resilience. It also supports the objective of raising public investment, by helping to make up for the structural gap in public investment. The proposed measures in the Plan largely focus on climate objectives and the digital transition of the Belgian economy. The transition to a low-carbon, sustainable and climate-resilient economy is the central element. The Plan should also help speed up the digital transformation while making Belgium more resilient to the risk of cyber threats.

The Plan looks very ambitious, and this raises the question whether these claims are realistic. In this respect mention can be made of the follow-up of the implementation of the many different measures taken by different governments, which looks quite challenging. Additionally, there are doubts regarding the front-loading of the expenditures (Chart 2). Taking account of possible bottlenecks and delays in the execution of the projects, this seems rather ambitious. Finally, as the Plan is a collection of measures proposed by different governments, a recurring criticism is that it seems to lack some coherence.

The Commission concluded after its assessment of the Plan that "taking into consideration all investments and reforms envisaged by Belgium, its Recovery and Resilience Plan represents to a large extent a comprehensive and adequately balanced response to the economic and social situation" (EC, 2021b). However, the EC also felt the Plan could have been more ambitious in several areas. These will be elaborated upon in more detail in the presentation of the different measures. The Federal Planning Bureau made different impact studies of the NRRP on demand of the Secretary of State for Recovery and Strategic Investments. The study on the macroeconomic impact (Federal Planning Bureau, 2021a) came to the conclusion that the impact of the Plan will be positive but rather limited. The macroeconomic impact is discussed in more detail in section 4. The main conclusion of the study on the Sustainable Development Goals (Federal Planning Bureau, 2021b) is that the different measures should have many positive effects on the social cohesion and resilience, but much will depend on how they will be carried out[1].

2.2 Expenditure

Based on the anticipated timing of the proposed measures, the planned expenditure under Belgium's NRRP can be divided over the calendar years 2021-2026. The Plan is clearly front-loaded with most of the measures scheduled for the first four years.

The RRF grants can be spent either by the federal or the regional governments. The distribution of RRF grants between the government entities (Federal State, Flemish Community and other Communities and Regions (French and German-speaking Communities and Walloon and Brussels-Capital Regions)) is the result of a political negotiation in the Consultative Committee. Accordingly, most of the spending is expected from the Flemish Community (38 %), followed by the Walloon Region (25 %) and the Federal State (21 %). Projects by the Brussels-Capital Region, the French Community and the German-speaking Community make up the rest of the expenditure.

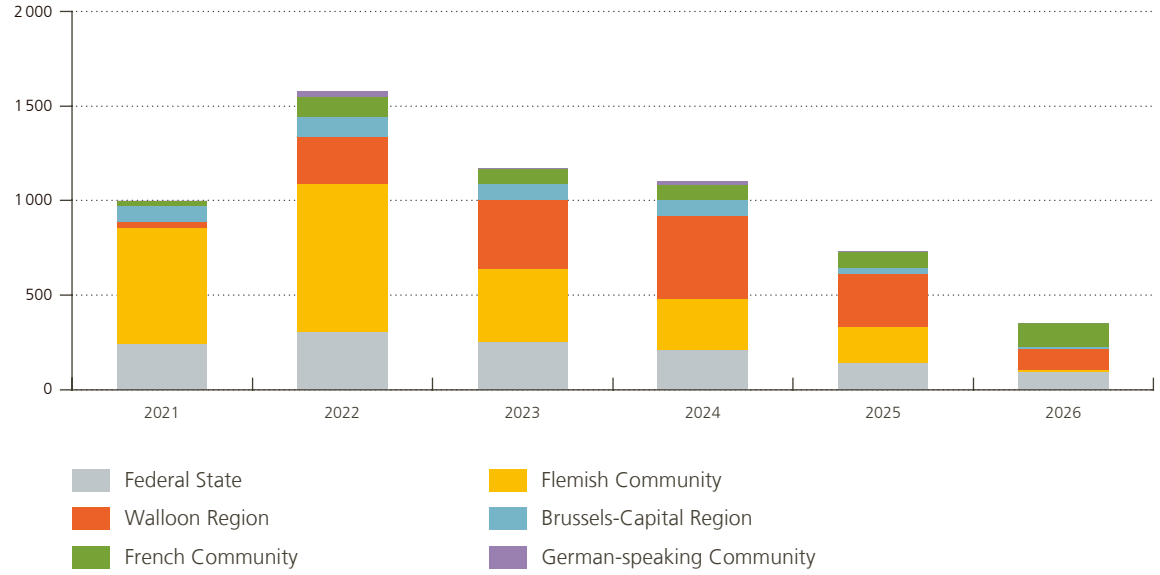
The Plan is structured around six strategic axes. Each axis has several components, 17 in all, which themselves contain different measures, consisting of investment projects and structural reforms. Table 2 gives a breakdown of the Belgian National Recovery and Resilience Plan both in terms of axis and components and in terms of the government entity in charge of its implementation.

1 The other studies analysed whether the different measures comply with the "Do not significant harm"-principle (Federal Planning Bureau, 2021c) and whether the measures in the NRRP are consistent or complementary with the Belgian National Energy and Climate Plan of December 2019 (Federal Planning Bureau, 2021d).

Chart 2

Planned expenditure under Belgium's National Plan for Recovery and Resilience is front-loaded

(€ million)



Sources: FPB, National Recovery and Resilience Plan of Belgium, own calculations.

The first axis, *Climate, sustainability and innovation*, aims to speed up the transition to a decarbonised, sustainable and climate-resilient economy and is the most important, representing over € 2 billion, i.e. more than one-third of total expenditure under the NRRP. The first and the most important component proposes a renovation programme focused on improving the energy and resource efficiency of existing buildings, almost entirely at the regional level. This includes public and residential buildings. The spending is much higher in the Walloon and Brussels-Capital Region and the French and German-speaking Communities taken together than in the Flemish Community. A second component relates to measures concerning technological developments to support the energy transition and system integration to further reduce CO_2 emissions, with emphasis on industrial sectors. For this component, the planned spending is highest for the Federal State and includes, amongst other things, promotion of innovative hydrogen technologies, the construction of an offshore energy hub and a network for H_2 and CO_2 transport. Finally, the climate and environment component aims at conservation and restoration of biodiversity, while strengthening adaptability and resilience to climate change. Environment is a regional matter and here the bulk of spending is situated in Flanders and focuses on the so-called Blue Deal, which seeks to improve water management and infrastructure in times of water scarcity and drought.

The measures under the second axis, *Digital transformation*, should help speed up the digital transformation while at the same time making Belgium more resilient to the risk of cyber threats. The first component, which is very limited in size and exclusively at federal level, aims to tackle cyber threats through projects that strengthen Belgium's resilience and ability to deal with new cybercrime phenomena. The second and most important component in this axis aims to use digital technologies to make action at all levels of government more efficient, both in internal processes and interaction with citizens and businesses. Most of the spending is foreseen at the federal level and encompasses such initiatives as a digital platform for interaction between the social security authorities and citizens, as well as digital transformation at the Department of Justice. Finally, a third component is mainly targeted at improving connectivity by continuing the development of very high-speed fibre optic networks, but also developing 5G corridors that enable universal and affordable access to connectivity in all urban and rural areas. This component also seeks to benefit from the development of new technologies, such

as artificial intelligence, by ensuring that they have a positive social impact through tackling societal challenges like health and well-being, environment, mobility and energy. This kind of infrastructure spending is mainly in the Walloon Region where connectivity of schools and business parks is being improved.

The third axis, *Mobility*, has the intention to improve mobility and better connect Belgian regions, while ensuring a modal shift in transport which benefits both the environment and the citizens. It is the second most important axis of the Plan, representing almost € 1.3 billion, i.e. more than 20 % of the total amount. The first component of this axis focuses on the development of cycling and walking infrastructure, with most expenditure in Flanders. The second and most important component of this axis stimulates a modal shift in transport mainly by improving public transport services. EU grants will be used amongst others by the Federal State to invest in rail infrastructure and by the Walloon government to extend a tramway network in Liège and metro lines in Charleroi. For freight transport, too, major works will be funded to support the modal shift from road to water and rail. The last component aims to accelerate the transition towards greener, mainly electric road transport by providing more electric buses for public transport (Flemish Community and Brussels-Capital Region) and accelerate the development of charging infrastructure (Federal State and Flemish Community).

A fourth axis, *Social and living together*, focuses on strengthening the social cohesion and at the same time ensuring effective and inclusive education systems by integrating the most vulnerable groups. A first component aims at making education systems more inclusive and at the same time improve their performance to ensure that the competences taught are better in line with those in demand in the labour market. The Flemish Community allocates more RRF grants towards developing digital skills than the other Regions and Communities. The most important project is the so-called *Digisprong* (Digijump) which intends to provide schools with digital instruments and tools and support them with the digitalisation of their teaching programmes. Further, under the second component, the social and labour market participation of so-called vulnerable groups (low-skilled, women, people with an immigrant background, people with disabilities, youngsters, prisoners, people with a risk of digital exclusion) is financed mostly in the Brussels-Capital Region by the NRRP. The proposed project aims to remove barriers to employment and strengthen activation policies and also to improve performance and the inclusiveness of the support and training systems. The third component in this axis contains only projects in the Walloon Region and is focused on providing infrastructure for vulnerable groups so they can cope with the social consequences of the coronavirus crisis and improve their living conditions and thus facilitate their integration into the labour market and in the wider society. This concerns new social housing and the increase in and renovation of childcare capacity.

The fifth axis, *Economy of the future and productivity*, contains measures to strengthen the foundations of the economy for smart and sustainable growth. The first component aims to boost the employment rate and at the same time ensure an inclusive labour market. The proposed, exclusively regional, measures are focused on the acquisition of skills relevant to current and future labour market needs. Most of the measures are proposed by the Walloon government and include setting up a centre for digital and technological innovation and education and the upgrading of leading-edge training infrastructure integrating techniques based on simulation and virtualisation. A second component will support research and innovation. In this regard, different federal and regional measures are proposed, the most important of which are a boost for R&D in Flanders, with special focus on digitalisation, sustainability and health, and the relocation of food and logistics platforms in Wallonia to promote the establishment of an agri-food system based on a short chain and the relocation of food production. The last component contains mainly regional measures that contribute to the development of a circular and low-carbon economy, most notably the measures proposed by the Walloon government on the roll-out of a circular economy.

The last axis, *Public finances*, features measures to improve the quality and composition of government finances. The idea is to have better control over expenditure through spending reviews at different levels of government and to free up resources for new policies or help with fiscal consolidation and ensure greater fiscal resilience. There is only one item of expenditure, for the Flemish Community, included in the Plan.

Table 2

The Belgian National Recovery and Resilience Plan is structured around six strategic axes

(in € million)

Axes	Components [1]	Planned expenditure			
		Total	Federal state	Flemish community	Other communities and regions [2]
1. Climate, sustainability and innovation	Total	2 020	256	783	981
	1.1 Renovation of buildings	1 012	11	298	703
	1.2 Emerging energy technologies	608	245	169	194
	1.3 Climate and environment	400	0	316	84
2. Digital transformation	Total	763	396	121	246
	2.1 Cyber security	79	79	0	0
	2.2 Public administration	585	318	121	146
	2.3 Optic fibre, 5G and new technologies	100	0	0	100
3. Mobility	Total	1 292	428	468	396
	3.1 Cycling and walking infrastructure	411	32	345	34
	3.2 Modal shift	672	365	0	307
	3.3 Greening road transport	209	32	122	55
4. Social and living together	Total	834	45	422	367
	4.1 Education 2.0	442	0	372	70
	4.2 Training and employment of vulnerable groups	165	45	50	70
	4.3 Social infrastructure	227	0	0	227
5. Economy of the future and productivity	Total	1 008	124	453	431
	5.1 Training and labour market	371	0	118	252
	5.2 Supporting economic activity	439	95	280	64
	5.3 Circular economy	198	29	55	114
6. Public finances	Total	8	0	8	0
	6.1 Spending reviews	8	0	8	0
Total RRP		5 925	1 250	2 255	2 420

Sources: Belgian National Recovery and Resilience Plan, own calculations.

1 Only components with an indicated expenditure in the Plan are mentioned.

2 Walloon Region, French Community, Brussels-Capital Region and German-speaking Community.

2.3 Reforms

Belgium's NRRP contains reforms spread across the different axes. In its July 2021 Council Implementing Decision on the approval of the assessment of the Recovery and Resilience Plan for Belgium, Ecofin (2021a) noted that "the RRP is expected to contribute to effectively addressing all or a significant subset of challenges identified in the relevant (for the years 2019 and 2020) country-specific recommendations (CSR)" [1]. However, the proposed

1 The 2020 country-specific recommendations related to support measures and liquidity assistance to combat the COVID-19 crisis are not considered in this article.

reforms often lack detail. This section gives a systematic overview of the reforms proposed in Belgium's NRRP based on the CSRs for the years 2019 and 2020 (EC, 2019; EC, 2020a)[1].

The first CSR for the year 2019 relates to public finances and, in particular, the budget path, evaluation of expenditure and coordination of fiscal policies at different levels of government. The NRRP contains a commitment to introduce the structural use of spending reviews at different government levels (component 6.1), which should help address the recommendation to improve the composition and efficiency of public expenditure. This elaborates on the experience with projects on expenditure control that had already been carried out in previous years, like a project for optimising public sector spending and improving the efficiency of public services at federal level and the targeted spending review in the service voucher sector in Flanders. The same CSR also mentions the need for further reforms to ensure the fiscal sustainability of long-term care and pension systems, not least by limiting early labour market exit possibilities. The component 4.4 of the NRRP announces an end of career and pension reform at federal level. The envisaged reform seeks to guarantee the financial sustainability of the social security and the public finances and improve the adequacy and social fairness of the pension system. To achieve financial sustainability, authorities plan to achieve an employment rate of 80 %, which seems rather ambitious. The focus will be on retaining older workers on the labour market. Different measures are being considered to contribute to this objective, such as introduction of part-time pensions, introduction of a pension bonus and more investment in life-long learning. The Council Implementing Decision mentions in the milestones and targets the fourth quarter of 2021 as a target for submitting the pension reform for approval by the federal government's Council of Ministers and the second quarter of 2024 for the Federal Parliament to pass it into law. A proposal setting out the general lines and timing of the pension reform was submitted by the Pensions Minister to the Council of Ministers at the beginning of September[2]. This proposal is budgetary neutral and relies on the targeted increase in the employment rate to 80 %. Further information on the design and implementation strategy is needed to fully assess the potential for achieving lasting improvements.

The second CSR (for the years 2019 and 2020) deals with three aspects of the labour market: to remove disincentives to work, strengthen the effectiveness of active labour market policies, in particular for the low-skilled, older workers and people with a migrant background, and address skills mismatches. Different reform proposals to address these recommendations are included in the NRRP under the training and employment of vulnerable groups (4.2), end of career and pensions (4.4) and training and labour market (5.1) components. The Commission notes in its assessment that "the Plan falls short of presenting a holistic and integrated approach to support social and labour market inclusion for vulnerable groups". In the Plan, reference is also made to preparations for a broad tax reform that notably aims to cut labour taxation and thereby increase the net return from work[3]. The Commission goes on to say that "the Plan does not provide a commitment and timeline for the adoption of the announced tax reform" (EC, 2021b). Consequently, the reform has not been included by the Commission as an RRP measure supported by the Facility. Other proposed reforms concern measures to promote lifelong learning, to improve coaching for the unemployed and to counter discrimination in the labour market. The second CSR for the year 2019 also focuses on the performance and inclusiveness of education and training systems. Reforms under component 4.1 in the RRP target this recommendation. They are focused on raising ICT literacy in education, better matching of education and demand in the corporate sector and reducing school drop-out rates. Here too, the EC assessment makes some critical remarks: "although some measures have been included, the Plan does not present a comprehensive strategy to strengthen participation in lifelong learning, focusing on the vulnerable groups. Several measures included in the Plan aim at improving education systems and to address skills mismatches, but only to a limited extent basic and green skills" (EC, 2021b).

1 Although also investment projects address the CSRs, this section is limited to the impact of the reforms.

2 The increase of the minimum pension, the increase in the wage ceiling taken into consideration for the calculation of the pension and the abolishment of the correction coefficient for the calculation of the pensions of independent workers has already been agreed upon in the first stage of the reform.

3 A first step in the reform was taken in the 2022 budget by the decision to phase out the special contribution to social security, introduced in 1994.

Table 3

Proposed reforms in the NRRP and country challenges identified in the 2019 and 2020 country specific recommendations for Belgium

Country specific recommendation (CSR)	Proposed reform in the RRP	Axis / Component	Federal state	Flemish community	Other regions and communities [1]
Public finances / Fiscal sustainability of long-term care and pension systems (CSR #1 of 2019)					
	End of career and pensions	4.4	×	–	–
	Spending Reviews	6.1	×	×	FWB, RBC, WAL
Labour market / Education (CSR #2 of 2019 and 2020)					
	Digisprong	4.1	–	×	–
	Higher Education Advancement Fund	4.1	–	×	–
	Fight against school dropout	4.1	–	–	FWB
	Fight against discrimination in the labour market	4.2	×	–	–
	Skills qualification strategy	4.2	–	–	RBC
	More inclusive labour market	4.2	–	×	–
	Cumulative regime and mobility towards sectors with shortages	5.1	×	–	–
	Tax reform on labour [2]	5.1	×	–	–
	Learning account	5.1	×	–	–
	Training and labour market	5.1	–	×	–
	Support scheme for job seekers	5.1	–	–	WAL
Investment (CSR #3 of 2019 and 2020)					
	Improved energy subsidy scheme	1.1	–	×	GER, RBC
	Regulatory framework for H_2 and CO_2 markets	1.2	×	×	RBC, WAL
	Fiscal reform of fossil fuels [2]	1.2	×	–	–
	Introduction of 5G – National plan	2.3	×	–	–
	Performance contracts Infrabel / SNCB	3.2	×	–	–
	Mobility budget	3.2	×	–	–
	Zero-emission company cars	3.3	×	–	–
	Recharging infrastructure	3.3	–	–	RBC
	Durable mobility	3.3	–	–	WAL
	Stimulating zero-emission transport	3.3	–	×	–
	New approach on emission fraud	3.3	–	×	–
	Broadening Innovation Base	5.2	–	×	–
	Regional strategy for economic transition	5.3	–	–	RBC
	Governance Circular Flanders	5.3	–	×	–
Business climate (CSR#4 of 2019 and CSR #3 of 2020)					
	Simplification of administrative procedures: e-government for enterprises	2.2	×	–	–
	e-government: tendering procedure	2.2	×	–	–
	Faster permit and appeal processes	5.2	–	×	–

Sources: EC (2021b), Belgian National Recovery and Resilience Plan.

1 Walloon Region (WAL), French Community (FWB), Brussels-Capital Region (RBC) and German-speaking Community (GER).

2 There are no milestones and targets for this reform.

The third CSR for the year 2020 recommends that Belgium front-loads mature public investment projects and promotes private investment. Investment should focus on the green and digital transition, in particular on infrastructure for sustainable transport, clean and efficient production and use of energy, digital infrastructure, such as 5G and gigabit networks, and research and innovation. This aligns mostly with the preferred investment domains in the third CSR for the year 2019. These recommendations are targeted by different reforms under the following components: renovation of buildings (1.1), emerging energy technologies (1.2), optic fibre, 5G & new technologies (2.3), modal shift (3.2), greening road transport (3.3), supporting economic activity (5.2) and circular economy (5.3). The reforms aim to improve energy subsidy schemes, make federal fiscality more climate friendly, promote further the mobility budget as an alternative for company cars and emission-free transport, promote the circular economy and remove obstacles to the introduction of 5G and a better internet accessibility.

The fourth CSR of the year 2019 and part of the third recommendation of the year 2020 are targeted at improving the business climate. More specifically, they intend to reduce the regulatory and administrative burden to encourage entrepreneurship and remove barriers to competition in services, particularly telecommunication, retail and professional services. Reforms under the public administration (2.2) and supporting economic activity (5.2) components aim to address this recommendation by simplifying administrative procedures through the digital transformation of government services and accelerating different procedures for enterprises and citizens. The EC remarks that the Plan only partially addresses the recommendation to reduce the regulatory and administrative burden as the Plan does not address the complexity of labour law nor the recommendation to remove barriers to competition in services, in particular regulated professions (EC, 2021b).

3. Comparison with the other National Recovery and Resilience Plans

For the sake of comparing data, the comparison only covers the contents of the National Recovery and Resilience Plans as accepted by the EC in June 2021 and endorsed by the (Ecofin) Council in July. Priority has been given to European documents and sources insofar as the NRRPs were drafted following different structures.

Taking the amounts set out in the recovery plans as approved by Ecofin also implies that the grant figures are assumed to correspond to those set provisionally under the EU 2021/241 Regulation relative to the Recovery and Resilience Facility[1].

Also, in our comparison, no consideration is taken of spending outside the NRRP under (separate) national recovery plans[2] or investment plans. In reality, Germany, France and Belgium and, to a lesser extent, Italy have devoted more own resources to recovery or investment plans than they have received in grants under the RRF. For instance, the German National Recovery and Resilience Plan (worth around € 25 billion) finances part of the € 50 billion "Future Package" (*Zukunftspaket*) which is itself part of a fiscal stimulus of € 130 billion announced in June 2020. In France, the France Relance programme unveiled in September 2020 officially involved some € 100 billion[3] and only € 40 billion of that was financed by RRF grants. In Belgium, the regional governments have also planned substantial additional expenditure for recovery outside of the NRRP as their recovery plans are only financed partially by the RRF. The most important are the *Plan de relance* of € 7.6 billion initiated by the Walloon government, which is financed by the RRF only for an amount of € 1.48 billion, and the Flemish government's € 4.3 billion *Plan Vlaamse Veerkracht*, which is financed to the tune of € 2.255 billion by the RRF.

1 The declines in GDP over 2020 and 2021 are based on the European Commission's autumn 2020 economic forecasts. The allocation of grants will nevertheless be reviewed in June 2022 on the basis of the first national accounts estimate endorsed by Eurostat in spring 2022. Also, some countries could receive more grants under the RRF and other less.

2 The first report from the France Relance plan's assessment committee in October 2021 gives a comparison of the German, French, Italian, Spanish and UK national recovery plans in the broad sense (i.e. going beyond just the NRRPs).

3 According to the OECD (2021a), only € 87.3 billion has an impact on the general government financing balance according to the national accounts concepts.

On 12 October 2021, the French government (2021b) announced the France 2030 investment plan: with its budget of € 30 billion until 2025, it will back up *France Relance* and target further investment most notably in the energy sector (€ 8 billion), as well as the health (€ 7 billion) and transport sectors (€ 4 billion) (OECD, 2021a). In Germany, the traffic-light coalition is envisaging an additional climate and digital investment plan and, in Belgium, as part of the budget for 2022, the federal government has given its stamp of approval to the recovery and investment plan proposed by the Secretary of State for Economic Recovery and Strategic Investments (2021). In addition to the federal investment under the Belgian NRRP, this plan includes € 328 million worth of federal-government-level investment already added to own funds in April 2021 plus another one billion worth of investment added to Belgium's plan for growth and transition in October 2021[1].

In the same vein, in Italy, the global recovery plan has a budget of € 235 billion, but RRF funding accounts for € 191 billion (including € 69 billion in grants) and React-EU, another programme under the Next Generation EU Recovery Plan, also brings in € 13.5 billion. The Italian government has nevertheless planned to top all this up with national resources to the tune of € 30 billion via a supplementary investment fund (OECD, 2021b). In the 2022 budget, it has injected an additional fiscal stimulus of € 30 billion, in the form of tax cuts, public investment and social spending.

Likewise, as far as the reforms are concerned, this article sticks to those set out in the milestones and targets in the Council Implementing Decisions for individual NRRPs, putting more emphasis on the milestones than the targets[2].

Structural reforms could have been implemented before the NRRPs were adopted or can still be freely implemented by governments over the 2021-2026 period without having to be included in the milestones. Some governments have actually preferred to not be seen imposing any constraints in terms of schedules for sensitive reforms such as pension reform. This was most notably the case with the German government as it did not want to reveal anything about this type of reform, with the NRRP due to be approved by the Ecofin Council in July, too close to the general election scheduled for September.

Lastly, for the purposes of the analysis given in this comparative section, the plans are considered as presented:

- European funds are not ultimately used to finance tax cuts or some other kind of spending to that envisaged in the plan;
- governments manage to carry out all the investment on schedule, with no uptake or administrative management problems, nor supply constraints (no shortage of labour, equipment, etc.).

3.1 Expenditure

3.1.1 Grants

The scale of the NRRP resources differ substantially among the five countries under consideration. Italy is the only one to have applied directly for loans and it has asked for the maximum amount of loans allowed, i.e. € 122.6 billion, 6.8 % of its 2019 gross national income (Sapala and Thomassen, 2021). Together with € 68.9 billion worth of grants, Italy is expected to receive no less than € 191.5 billion of RRF funding.

1 Like the NRRP, the supplementary federal projects concern renovation of buildings, emerging technologies (hydrogen and offshore solar power), digitalisation of the public sector, cyber security, connection to 5G in underserved "white areas" and development of 6G, rail transport, reinforcing scientific research, as well as various initiatives under inclusion policies.

2 Milestones consist of legislative, decree, regulatory measures or reform elements, while targets tend to represent quantified objectives in terms of results to be achieved.

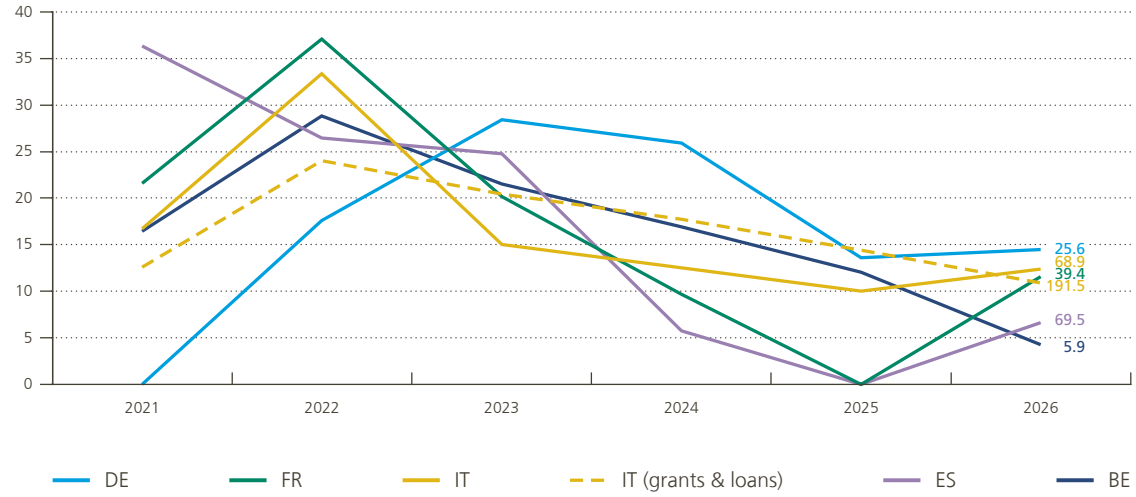
Spain may apply for loans later for a potential amount of around € 70 billion[1], probably for the 2024-2026 period. It will receive the highest absolute amount of RRF grants: € 69.5 billion. As Spain is the smallest of the four big euro area economies, it will thus also receive the highest share of RRF grants in relation to GDP.

While being a smaller economy than Germany, France will get € 39.4 billion worth of RRF grants, whereas Germany will be entitled to € 25.6 billion. And as mentioned in section 2, Belgium is expected to receive € 5.9 billion.

Chart 3

The time profile of RRF grants and loans is hump-shaped and frontloaded in the five countries

(percentage of the total amount to be received, in € billion on the right)



Sources: EC (2021m, n, o, p and q), Ecofin (2021b), own calculations.
In this chart and in the text, we don't take the prefinancing of 13% into account.

Based on the timing of the instalments foreseen in EC documents in June and July (2021), the time profile for the grants and loans to be received is fairly similar across the five countries considered and is hump-shaped, with smaller amounts at the beginning and at the end than in the middle of the period. Expenditure is expected to have started and/or take place before the payment request so that the time profile of spending may be even more frontloaded than that for the grants as illustrated for Belgium in section 2.

The timing of the instalments has been slightly delayed in Spain as Spain has concluded its Operational Arrangements with the EC (2021s) and sent its first payment request only in November. France and Italy may come up with their first payment request by the end of this year too.

3.1.2 Expenditure breakdown

Capital expenditure dominates in the National Recovery and Resilience Plans (NRRPs) of the five countries considered. These expenditures comprise both public investment and transfers to the private sector (firms and households). Some current expenditure is however also part of the NRRPs.

1 The Spanish recovery plan "envisages a mobilisation of more than € 140 billion in public investment until 2026 with a significant concentration of investments (and reforms) in the first phase of the Next Generation EU plan, covering the 2021-2023 period. Given the high level of uncertainty with regard to key variables, the Plan provides greater details for the initial phase entailing the mobilisation of nearly € 70 billion in transfers from the RRF. This initial programme is intended to be supplemented by the loans set forth in the RRF to finance the continuation of the investment programmes after 2023" (Gobierno de España, 2021b).

All NRRPs are required to allocate at least 37 % to climate and 20 % to digital spending[1]. The European Commission's assessment (see chart 4) shows that all countries meet those targets, sometimes spending substantially more than required on these issues.

Belgium is allocating the highest share to climate funding (50 %), followed by France (46 %). Italy, in contrast, only just reaches its target with 37.5 % of climate spending. These numbers nevertheless need to be put in perspective. Countries for which the NRRP is only a small part of their overall recovery plan, like Germany and France, could easily allocate most of their climate spending to their NRRP and finance other types of spending themselves. This differs from Italy and Spain, where most of the recovery plan is financed through the RRF. The targets thus do not really appear to matter for countries with larger recovery plans, and the share of climate spending in their NRRP overstates the actual share in their overall national recovery plans[2].

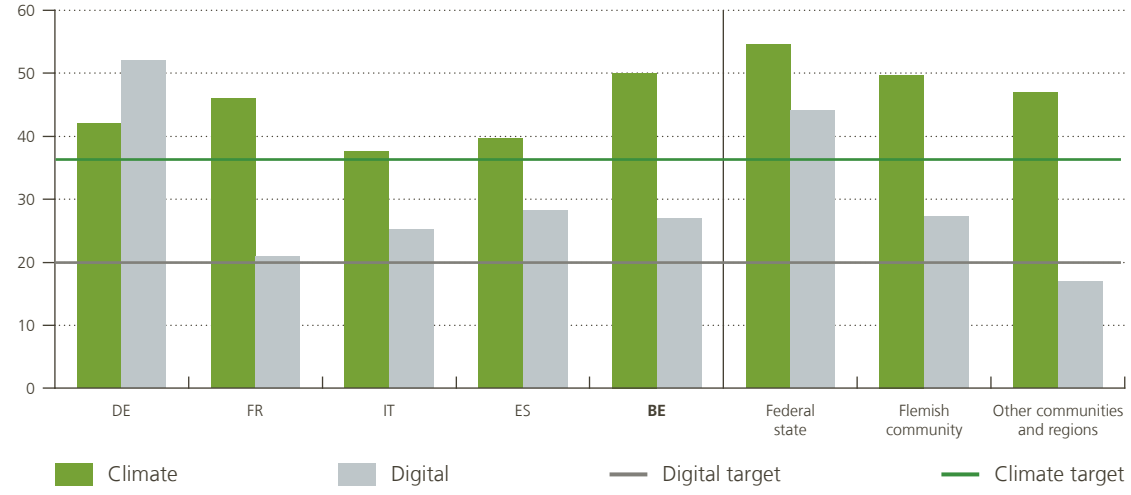
Keeping the same caveat for comparisons in mind, the share of digital expenditure also differs between countries. In Germany, digitalisation (52 %) is the main objective financed in the NRRP. Additional investment in this area is warranted as Germany scores barely above the EU average in the EC's Digital Economy and Society Index (EC, 2020c), lower than might be expected given its level of national income. Other countries spend a much lower share, between 20 and 30 %, on digitalisation, although they perform only slightly better (Belgium and Spain) or even (slightly) worse (France and Italy) on the same index.

1 The target only concerns spending on climate mitigation and adaptation. Below, we also discuss other aspects of the green transition. To calculate the share of climate and digital spending, the EC labels each investment as fully (100%) or partially (40%) climate or digital (Mahieu, 2021).

2 In fact, the Green Recovery Tracker (2021) analyses the share of climate spending for the full recovery plans. Using a methodology similar to the EC's, but stricter in terms of classifying expenditure as "climate", it comes up with the following shares: France (19 %, against 29 % in the NRRP) and Germany (21 %, against 38 % in the NRRP).

Chart 4

According to the official EC's accounting methodology, the five countries considered have planned to allocate more than 37 % of their RRF grants (and loans) to climate spending and more than 20 % to digital spending



Sources: Ecofin (2021b), EC (2021b), own calculations.
"Other communities and regions" comprises the Walloon Region, French Community, Brussels-Capital Region and German-speaking Community. Climate and digital spending are not mutually exclusive as the same investment can be considered both (partially) green and digital.

It should also be noted that, in Italy, Spain and France, about one-third of RRF grants and loans go towards financing other expenditure which is neither green nor digital[1]. This highlights the fact that, in Italy and Spain, the RRF constitutes most of the recovery funding, which needs to be used to cover a wide set of priorities.

Below, we analyse in detail what constitutes green, digital and other spending in these countries' plans. On the surface, the plans look similar since they all focus on the green and digital transition. However, within these topics, they sometimes focus on different issues, or on different approaches to address those issues. For these comparisons, we will rely on a classification of expenditure published by Bruegel (Darvas *et al.*, 2021)[2], which provides a detailed picture of what constitutes this green and digital spending. A table with countries' spending per category according to this classification (in absolute amounts) can be found in Annex 1.

3.1.2.1 Green transition

All countries spend most of the RRF grants (and loans) for the green transition on similar broad categories – mobility, energy and energy efficiency – but with important differences in their approaches. However, not all green funding is directed towards climate change as the plans also include spending on topics such as biodiversity and clean water and air for which the primary objective is not climate change mitigation.

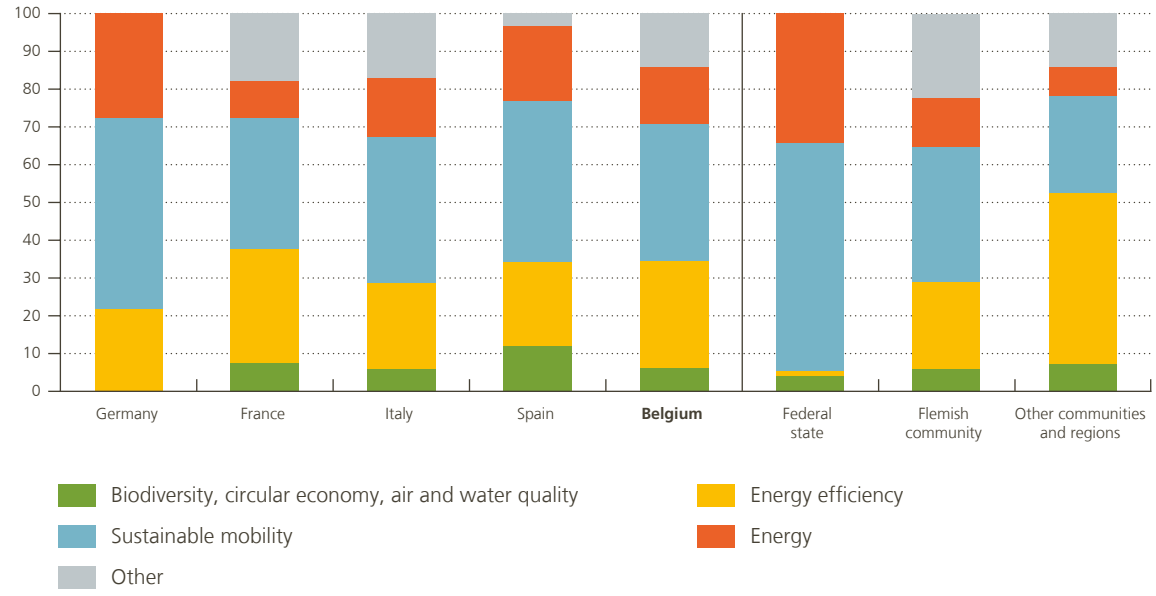
1 Note that in the EC's assessment, climate and digital are not necessarily mutually exclusive. An investment can be counted, for example, as 100 % climate and 40 % digital. Nonetheless, this kind of overlap is rare and the share of "other spending" is close to the amount of non-digital and non-green spending.

2 Darvas *et al.* (2021) allocate to each spending item a "primary classification" which corresponds to its most important field of intervention. For example, the primary classification for a climate intervention with a digital component would be climate (and it would also receive a secondary classification as digital). We will use the primary classification of expenditure. This differs from the EC's assessment which classifies some spending as partly (40 %) climate or digital. Nevertheless, the share of spending allocated to digital and climate in Bruegel's and the EC's classification is broadly similar.

Chart 5

Breakdown of green spending in National Recovery and Resilience Plans

(share of green spending)



Sources: Darvas et al. (2021), Belgian National Recovery and Resilience Plan, own calculations.
The "Energy" category consists of hydrogen, renewable energy sources and electricity grids. The "Other" category covers climate change adaptation projects, green tech innovation and sustainable agriculture. "Other communities and regions" comprises the Walloon Region, French Community, Brussels-Capital Region and German-speaking Community.

Sustainable mobility is the most important green expenditure in all countries, ranging from 35 % (France) to 50 % (Germany) of overall green spending. This kind of spending goes mostly into high-speed trains (40 %), electric mobility (33 %) and public transport (23 %)[1], albeit with big differences between countries. In Italy, most mobility expenditure goes towards the development of high-speed rail lines. Germany and Spain, on the other hand, prioritise electric mobility. But, the German scheme, which provides incentives for purchasing electric cars has been criticised for also including hybrid cars (Green Recovery Tracker, 2021). Belgium and France favour a variety of measures supporting public transport and soft mobility. In Belgium, the Federal State invests most in trains, Flanders in cycling infrastructure and Wallonia in other forms of public transport (tram, bus and metro).

Energy efficiency is the second most important category of green spending for all countries except Germany. Its share ranges from around 20 % of green spending for Germany, Italy and Spain to around 30 % for Belgium and France. Energy efficiency of buildings captures 98 % of this spending[2]. Indeed, reaching the 2030 targets on energy efficiency will be a challenge, especially in Belgium. Belgium will need to increase its annual rate of renovation of public and private buildings from 0.5 % to 3 % to reach its 2030 emissions reduction target (EC 2021b).

The approach to improve energy efficiency in buildings differs between countries. In Italy, for example, most of this spending will be devoted to providing tax deductions – the so-called "Ecobonus" – to encourage energy improvements in private homes. In Belgium, funding goes mostly towards renovation of social housing and public buildings (mainly in Wallonia and Brussels), but also to improved subsidy schemes (most important in Flanders).

Energy is the third main category of green spending, with a share of around 20 % in the different countries, ranging from 10 % in France to 28 % in Germany. This funding goes mostly into renewable energy and hydrogen (78 %) and to a lesser extent into electricity grids (22 %).

All countries devote funding to the development of hydrogen, which includes projects for the production, transport and use of hydrogen in hard-to-abate sectors. In Germany, in particular, most energy projects are hydrogen related, in support of its National Hydrogen Strategy. With respect to renewable energy, Belgium and France were two out of only three EU countries that were at a "severe risk" of failing to meet their targets for 2020 (EC 2020b)[3]. Nonetheless, they also invest more in the development of (green) hydrogen than in the expansion of renewables, though the Belgian plan does include support for offshore wind and networks for renewable heat.

In the biodiversity, circular economy, and air and water quality category, more than half of the funding goes towards biodiversity and a bit less than a quarter to the other topics. Spain, in particular, devotes a lot of its funding to preserving coastal spaces, ecosystems and biodiversity.

Other topics which receive less attention are climate change adaptation projects (6 % of green spending), which include the Blue Deal in Flanders to improve the availability of water; support for green tech innovation (4 %), mostly in France; and sustainable agriculture (3 %).

3.1.2.2 Digital transition

Digital spending in the five countries covers four topics: digital public sector (31 %); digitalisation of business (22 %); digital skills and inclusion (16 %); and R&D, advanced technologies and connectivity (30 %). However, the different countries focus on different topics.

1 Throughout section 3.1.2, such overall shares of spending on categories refer to non-weighted shares of spending in the five countries considered.

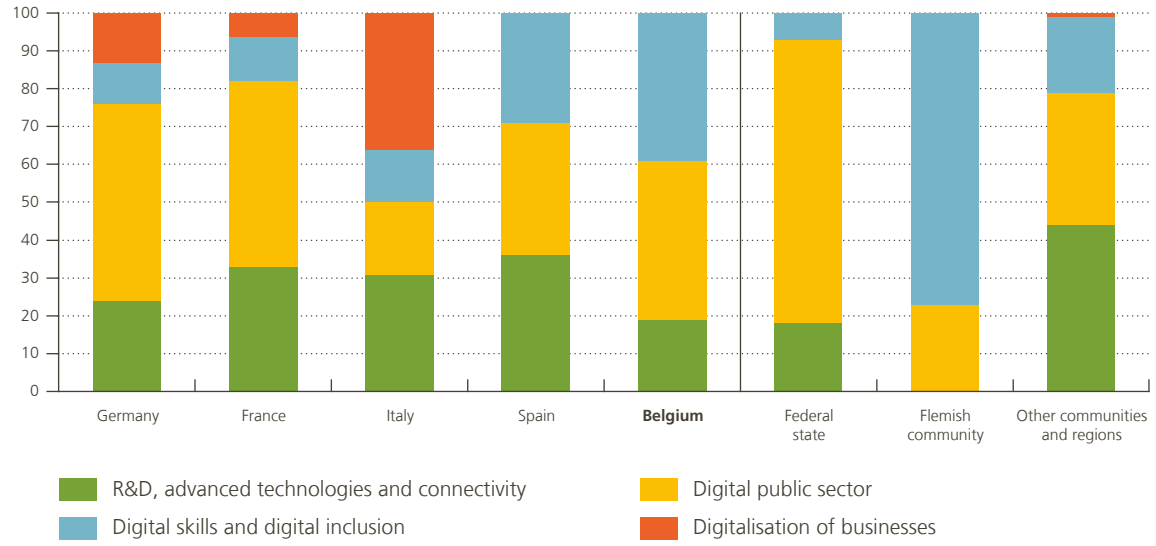
2 The remaining 2% concerns non-building energy efficiency, which includes investment to improve energy efficiency of production processes in France.

3 The final assessment of whether countries met their 2020 target will not be made until April 2022.

Chart 6

Breakdown of digital spending in National Recovery and Resilience Plans

(share of digital spending)



Sources: Darvas *et al.* (2021), Belgian National Recovery and Resilience Plan, own calculations.

The "R&D, advanced technologies and connectivity" category comprises "Digital-related investment in R&D", "Investment in digital capacities and deployment of advanced technologies (including cyber security)" and "Connectivity". "Other communities and regions" comprises the Walloon Region, French Community, Brussels-Capital Region and German-speaking Community.

Digitalisation of the public sector is an important component representing about half of all digital spending in Germany and France, 42 % in Belgium and 35 % in Spain, but only 20 % in Italy. Germany's focus on the public sector is understandable as it scores well below the EU average on an index of digital public services (20th out of 27 in the EU) according to the EC (2020c). The plans contain a variety of measures including digitalisation of the workplace, e-government and access to services, open data and digitalisation of health.

Digital skills and digital inclusion receive by far the most attention in Spain (29 % of digital spending) and Belgium (38 %). Spain is aiming to improve digital skills in the general population, with a focus on SME employees. Belgium's plans consist to a large extent of Flemish investment in digital schools.

Digitalisation of business is a priority for Italy (36 % of digital spending) and to a lesser extent in Germany (13 %). In the other countries' NRRPs, it is conspicuous by its absence, but businesses will also benefit (directly or indirectly) from progress in the other areas of digitalisation covered in the plans. As in many areas of digitalisation, Italy is actually the worst performer among the five countries when it comes to businesses (ranking 21st out of 27 in the EU, EC 2020c). The Italian NRRP aims to boost the uptake of digital technologies by businesses through a system of tax credits mostly for the acquisition of tangible and intangible assets. The German plan, by contrast, specifically supports the automotive industry in its digital transformation.

The last category of digital spending – R&D, advanced technologies and connectivity – is important in all plans, ranging from 19 % of digital spending in Belgium to 36 % in Spain. Italy and Spain invest much of this funding in connectivity, both through broadband and 5G, with the objective of bringing fast internet to underserved households and other places such as hospitals and schools. In Belgium, the federal government invests in cyber security and Wallonia in improving connections for schools and business parks. Throughout the plans, there is much attention paid to upcoming topics, notably artificial intelligence, 5G and cyber security.

3.1.2.3 Other spending (neither green nor digital)

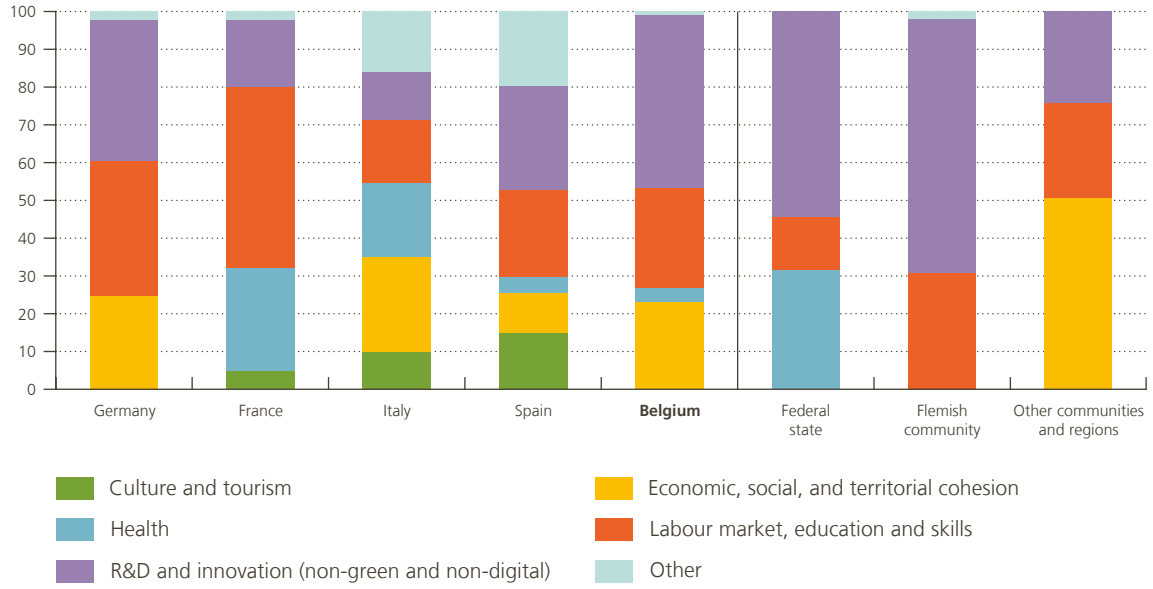
While green and digital investment receive most attention, many other components of the plans are important as well. Italy, Spain and France spend about one-third on such other topics, against 16 % in Belgium and 7 % in Germany, according to Bruegel's classification. Given the large size of Italy's and Spain's plans, they spend important amounts of money on these other topics.

A variety of topics beyond the green and digital transition are covered by the plans: labour market, education and skills (23 %); R&D and innovation (18 %); economic, social and territorial cohesion (18 %); health (16 %); and culture and tourism (10 %). Many of these domains also have a digital or green component, which has already been covered in the previous sections. Here we focus, unless otherwise stated, on the non-digital and non-green aspects of these topics.

Chart 7

Other spending (neither green nor digital) in National Recovery and Resilience Plans

(share of overall amount of other spending in the NRRP)



Sources: Darvas et al. (2021), Belgian National Recovery and Resilience Plan, own calculations.

The "Other" category contains spending on SMEs; sports; infrastructure; justice and combatting corruption; and crisis preparedness and resilience, as well as spending that could not be categorised. "Labour market, education and skills (non-digital)" combines education and skills (non-digital) with labour market and job creation. "Other communities and regions" comprises the Walloon Region, French Community, Brussels-Capital Region and German-speaking Community.

Much R&D and innovation in the plans is directed towards green and digital topics. But in other areas, too, there is support for R&D, notably in Belgium (46 % of neither green nor digital spending) and Germany (37 %). Germany finances vaccine research. In Belgium, this includes support for an "EU Biotech School and health hub" in Wallonia, for the aerospace and space sector by the federal level and for a variety of sectors, with the focus on digitalisation, sustainability and health, by the Flemish government.

Spending classified as economic, social and territorial cohesion is highest in Italy (25 %), Germany (25 %) and Belgium (23 %). However, many of the projects we have already discussed also contribute to different

forms of cohesion within countries. This category covers mostly projects that address social cohesion. In each of these countries, this involves investment in childcare, while Italy and Belgium (Wallonia) will also invest in social housing.

Health is an important aspect of the French (27 %) and Italian (19 %) plans. On top of the efforts for further digitalisation of the health system, the French plan funds renovation and equipment for hospitals and care homes for the elderly. Italy invests in hospital infrastructure and technology as well, but also focuses on proximity in health services, by funding telemedicine, local health services and care at home.

Investment in the labour market, education and skills (non-digital) is highest in France (48 %) and Germany (36 %). In France, this includes subsidies for hiring interns, trainings for people in short-term work schemes and subsidies for employers using "professionalisation contracts" (combination of work and training). Similarly, Germany will support apprenticeships by giving financial support to firms for hiring apprentices. Belgium funds several projects in this domain, including investments in higher education and life-long learning in Flanders, and in the integration of vulnerable people on the labour market in Brussels.

Both Spain (15 %) and Italy (10 %) use the plans to support their cultural and touristic sectors, with most funding going towards the latter and an emphasis on the green and digital transition of these sectors. Given the impact of COVID-19 on tourism, Spain will support, in particular, its islands that are heavily reliant on tourism. It will also fund implementation of sustainability plans more broadly on its territory in different destinations and invest in digitalisation, energy efficiency and the rehabilitation of historical sites. Similarly, Italy will support the digitalisation and competitiveness of the tourism sector, including by enhancing the attraction of small historical towns.

Finally, the "Other" category covers a wide variety of topics. In the case of Spain, it involves almost exclusively support to SMEs (19 % of neither green nor digital spending). For Italy, it consists of a mixture of spending on infrastructure (3 %), justice and combatting corruption (4 %), SMEs (3 %), sports (1 %) and uncategorised investment (4 %).

3.2 Reforms

In section 1, we illustrated that Italy and Spain were facing more structural challenges – and more comprehensive ones – than Germany, France and Belgium[1]. These were translated into more in-depth country-specific recommendations for the years 2019 and 2020 compared to their peers. In this section, we first show that, in exchange for higher grants and loans, reforms are more numerous and deeper in Italy and Spain than in the other countries, then that both Southern European countries have responded in a satisfactory manner to a higher number of CSRs and, finally, that most major reforms are frontloaded in these countries.

3.2.1 Number and depth of reforms

In the case of Italy and Spain, the National Recovery and Resilience Plans contain more reforms and the Council Implementing Decisions refer to more targets and milestones than in the other three countries considered, even if we should take these numbers with a pinch of salt for several reasons. First, in some cases, reforms may be divided into small components spread over time. For example, in some countries like Belgium, we find milestones for spending reviews every year. Second, France regards the extra targeting of its coronavirus support measures (including the short-time work scheme) as a reform, while equivalent measures have not been recognised as reforms or milestones in other countries. Third, in some cases, recurrent instruments are presented as reforms: for instance, the Belgian federal government has concluded performance contracts with the railway infrastructure (Infrabel) and operator (SNCB) for more than two decades. Fourth, the distinction made by the EC between investment and reforms is not always straightforward.

1 See section 2 for a full description of the reforms planned in Belgium.

Table 4

More reforms are included in the Italian and Spanish National Recovery and Resilience Plans than in the Plans of the other countries

	DE	FR	IT	ES	BE
Reforms	15	21	58	102	35
Milestones and targets (covering reforms and investment)	129	175	527	416	210
of which:					
Milestones	54	70	213	169	126
Targets	75	105	314	247	84

Sources: EC (2021r), ECOFIN (2021b), Ministero dell'Economia e delle Finanze (2021b).

The reforms envisaged in the NRRPs and translated into milestones in the annexes to the Council Implementing Decisions are deeper and more comprehensive in Italy and Spain than in the other countries.

Germany is the country that has integrated the least reforms and milestones into its NRRP. The milestones to which the German government committed to are mostly enabling and sectoral reforms. The main German reforms seek to unlock long-standing investment bottlenecks thanks to a simplification of the planning and approval procedure for the transport sector, a joint programme between the federal government and the *Länder* to remove barriers to investment and an increase of staff of the public consulting agency supporting municipalities and other public entities. Digitalisation of the public sector and/or specific public services such as health is a reform that will be (at least partly) financed by the RRF grants in all countries under consideration. It is also often part of the efforts to reduce the administrative burden for citizens and businesses.

In Belgium, the reforms are both more numerous and more diverse than in Germany. Several horizontal structural reforms are mentioned such as those related to pensions and labour market (including a focus on the end of career). They are notified as milestones but they remain at this stage largely unspecified. The introduction of spending reviews may also be considered as a tool for a horizontal structural reform. Such a tool is also mentioned in all countries considered but Germany. Enabling and sectoral reforms are also components of the Belgian NRRP.

In France, there are not many or any in-depth horizontal structural reforms in the NRRP and the related milestones are also few and far between, so some reforms that have already been implemented have been recorded as creation of a new branch within Social Security in 2020 to cover people against the loss of autonomy. The NRRP covers the reform of unemployment which should encourage companies to offer more permanent contracts instead of fixed-term contracts. Health system reforms should make the careers of healthcare workers more attractive and facilitate the organisation of local care. Other reforms (notably the Law on the acceleration and simplification of public action, *loi ASAP*[1]) are helping to reduce the administrative and regulatory burden weighing on companies and citizens.

France may be distinguished from the other countries under consideration by its reform of the public finances governance framework, especially by (re)establishing a multi-annual spending norm and reinforcing the prerogatives of its fiscal policy council. As for public administration, recruitment procedures will be revised. Besides, the modalities of transfer of powers between the State and local authorities should be simplified[2].

1 By way of example, this Law simplifies prior authorisation procedures for the construction of an industrial plant, relaxes the rules governing online sales of medicine as well as the right to public procurement for SMEs and facilitates offshore wind farms or the use of energy cheques.

2 Via the 4D law for "decentralisation, differentiation, deconcentration" and "decomplexification".

At the other extreme, Italy and Spain are countries where numerous substantial horizontal structural reforms are both planned and subject to milestones, besides enabling and sectoral reforms. In both countries, such reforms relate to active labour market policies, compulsory education and universities, health, tax administration and fight against tax evasion and fraud, public procurement and insolvency framework.

A comprehensive (mostly parametric) pension reform to be implemented in several steps is one of the 30 components of the Spanish NRRP and these steps are translated into hard milestones[1]. The Italian NRRP does not include any such reform since the "quota 100" – a temporary mechanism allowing people to retire at 62 after 38 years of work introduced by the Conte I Government – was expected[2] to come to an end by the end of 2021.

The Spanish government is also more committed to labour market reforms than Italy. Such reforms are planned to reduce the use of temporary contracts, to set up a new flexibility and stabilisation mechanism to provide internal flexibility for firms and stability for workers in the face of cyclical and structural shocks, to move back partly from local to sectoral bargaining, to align the rights of people working in subcontracting companies with those of employees in the contracting company, to simplify and enhance the effectiveness of recruitment incentives and to reform the regulation of non-contributory unemployment support[3].

As for pension reforms, several of these labour market reforms are subject to the outcome of the social dialogue process and their final design is therefore yet to be determined. The ongoing implementation of the latter reforms is not taking place without tension within the minority coalition government (Dombey and Hall, 2021) and the "disjointed pieces of reforms could clash with each other" as some measures tend to introduce more flexicurity and others less flexibility (Corti *et al.*, 2021). In a more diplomatic tone, the Ecofin Council (2021a) noted that "these reforms should be part of a comprehensive approach that balances the need for flexibility and security in the labour market" and added that "this applies in particular to the flexibility and stabilisation mechanism and to the reform of collective bargaining".

In Italy, besides measures tackling undeclared work, the two main labour market reforms identified by Corti *et al.* (2021) are a national programme for employment guarantee and a national new skills plan[4].

Conversely, Italy is implementing a comprehensive reform of both the public administration and justice, the lack of it in Spain being criticised notably by Corti *et al.* (2021). The Italian reform of the public administration encompasses several dimensions: public employment including hiring processes, simplification, career, skills (also reforming the teaching profession) and reduction of late payments to citizens and businesses. In Spain, initiatives are limited to reduce temporary employment in the public sector. The main targets of the justice reform are the reduction in both the length of legal proceedings and the backlog of cases, while significant milestones comprise, on top of the reform of the insolvency framework and the digitalisation of justice, reforms of civil justice, criminal justice and tax courts.

1 The final design of the Spanish pension reform has been left open, as it depends on the outcome of the social dialogue process. Nevertheless, it builds on the Toledo Pact recommendations, which benefit from a broad parliamentary consensus (EC, 2021f). It aims at striking the right balance between preserving adequacy and long-term sustainability. Some elements will raise pension expenditure in the medium to long term, in particular measures re-linking pensions to the consumer price index on a permanent basis and dissociating initial pension levels from changes in life expectancy. Other measures are expected to partially mitigate the impact of the reform on fiscal sustainability: measures seeking to bring the effective retirement age closer to the statutory retirement age, changing the tax base for the self-employed, widening the contribution period for the calculation of pension benefits and increasing the maximum contribution bases together with the corresponding pension benefit levels.

2 In the Budget 2022, the Draghi government closed this opportunity for early retirement but allowed a last step with a "quota 102" in 2022, meaning that people aged 64 would be allowed to retire if they have contributed to the system for 38 years. Also, the age at which women may retire earlier has been postponed by two years from 58 to 60 years for salaried workers and 59 to 61 for self-employed, an 18-month window still being included on top of it. Conversely, further jobs have been recognised as arduous allowing early retirement, including kindergarten and primary teachers, warehouse, delivery and cleaning workers, beauticians, porters and health technicians (il Sole 24 ore, 2021).

3 This reform pursues the following objectives: (i) to extend unemployment protection; (ii) to simplify the system; (iii) to link the benefit to a personalised activation itinerary; (iv) to facilitate the transition to social protection when the beneficiary does not return to work and is in a vulnerable situation (Ecofin, 2021b).

4 Both plans have to be adopted by the national government after agreement with the Regions. The aim of the first is to overcome the excessive heterogeneity of the services provided at the local level while the second aims to reorganise training of workers in transition or unemployed, through strengthening the vocational training system and defining essential quality levels for upskilling and re-skilling activities in favour of the unemployed, the beneficiaries of a citizenship income and workers in short-time work schemes or derogating from wage integration.

Italy is also committed to competition reforms. In particular, annual competition laws (to be adopted each year over the 2021-2024 period) aim to remove barriers to competition in various sectors, notably in utilities, waste management and transport (ports, etc.).

3.2.2 Coverage of country-specific recommendations

In its Council Implementing Decisions on the NRRPs of the five countries considered, the Ecofin Council (2021a) expects the reforms undertaken by the five countries to contribute to effectively addressing a significant sub-set of the challenges identified in the relevant country-specific recommendations.

Table 5

Italy and Spain are expected to meet more of their 2019 and 2020 Country-Specific Recommendations in the National Recovery and Resilience Plans than the other three countries

Broad Category	Policy areas	DE	FR	IT	ES	BE
Public finance and taxation	Fiscal policy and governance					
	Sustainability of public finances					
	Tax burden on labour					
	Broaden tax bases		done			
	Tax evasion, administration and avoidance					
Financial sector	Financial services		done			
	Housing market					
	Access to finance		done			
Labour market, education and social policies	Employment Protection Legislation and labour contracts		done			
	Unemployment benefits					
	Active labour market policies					
	Incentives to work, job creation and market participation					
	Wages and wage setting					
	Health and long-term care					
	Poverty reduction and social inclusion		done			
	Education					
	Skills and life-long learning					
Structural policies	Research and innovation					
	Competition and regulatory framework					
	Competition in services					
	Telecom, postal and local public services					
	Energy, resources and climate change					
	Transport					
Public administration and business environment	Business environment					
	Public administration					
	Civil justice					
	Shadow economy and corruption					

Sources: EC (2021l), own selection and presentation.

Dark green = fully satisfy the CSR; light green = significantly satisfy the CSR; orange = only partially satisfy the CSR; blank = there is no CSR in this matter; done = this CSR was satisfied before the NRRP was endorsed. For Spain, we have noticed that the colour of several cases differs in the EC (2021q) presentation but we have given priority to the horizontal analysis.

The share of CSRs with satisfactory coverage in the RRP (green cases in the table above) is larger in countries like Italy and Spain that get a larger share of RRF grants in relation to the size of their economy and have had to face more challenges and more comprehensive recommendations.

Belgium is the sole country considered where the CSRs are mostly only partially covered in the NRRP (orange cases). This has to be read in relation with a worse assessment by the EC and Ecofin (2021) on the "coherence" criterion. While acknowledging that the plan displays a set of reforms and investments that support the objectives of recovery, green and digital transition and resilience, the individual measures are coherent with these objectives and the plan does not present any inconsistencies or contradictions and some measures are mutually reinforcing and complementary also across government levels, Ecofin (2021) notes in its Implementing Decision for Belgium that "In some instances, the potential of some investments could have been further reinforced by more far-reaching complementary reforms. In particular, the measures to increase employment and improve labour market performance are not accompanied by concrete measures to reduce disincentives to work from the tax system". Lack of specification for the tax reform in energy and labour has been criticised. The lack of reform for competition in services has also been stressed by the EC and endorsed by Ecofin.

3.2.3 Timing of reforms

In all five countries, most milestones[1] for reforms are expected to be reached by the end of 2023 (see table in Annex 2). The reforms are thus frontloaded. And with the exception of Germany where legislative elections took place in September 2021 and where the first milestones are set only for 2022, very significant reforms are even expected by the end of this year. In most countries, governments needed to put in place the governance framework for an as smooth as possible implementation of the Plan and to remove barriers and bottlenecks to investment.

The time pressure put on governments and parliaments to approve reforms has been very high especially in Spain as this country has been the first to introduce a request to receive RRF grants[2]. The first list of structural reforms relate notably to the labour market, pensions, education, spending reviews,…

The Italian government is also working very hard to reach the first list of 27 reform milestones to be met by the end of the year which includes a range of issues including the entry into force of legislation for civil and criminal justice and insolvency framework, the simplification and entry into force of a procurement system, the approval of Decrees on the two main labour market reforms (guaranteeing employability of workers and national plan for new skills), the reinforcement of the Economic and Finance Ministry for the spending review that will take place in the next few years, a university reform, etc.

In exchange for the loans to be received, the Italian government is also required to meet further milestones, mainly in terms of investment but also reforms, in particular the approval of simplification and acceleration of procedures[3].

In Belgium, the milestones expected to be met by the end of 2021 for a first instalment to be received in the first half of 2022 include a submission for approval by the Council of Ministers of the federal government of the pension reform proposal, the federal decisions on the learning account, the mobility budget and the zero-emission company car reform, as well as a national plan for the introduction of 5G, the Walloon revision of the support scheme for job-seekers and the Flemish decisions on the governance of Circular Flanders and on stimulating zero-emission transport.

1 Targets of reforms are mostly expected to be reached in the second part of the programme (2024-2026).

2 The timing used in the table in the Annex is that mentioned by EC staff in their presentations in meetings to discuss the Council Implementing Decisions on the approval of the assessment of the individual National Recovery and Resilience Plans.

3 These include the creation of Commissioners in special economic zones and the ownership transfer of bridges.

4. Macroeconomic impact

All National Recovery and Resilience Plans (NRRPs) contain an estimate of the short- to medium-term as well as long-term macroeconomic impact on their domestic economies. These estimates were made within individual national governments (DG Trésor in France) or through independent institutions like the Federal Planning Bureau (2021a) in Belgium or DIW Berlin (2021) in Germany. These estimates rely on different modelling approaches so it is difficult to compare them. Moreover, these estimates generally do not take into account the fiscal spillover that each NRRP may have on the other EU economies.

Therefore, we refer to the Quest simulations performed by Pfeiffer *et al.* (2021) as they are consistent for all EU Member States and they quantify spillovers from NGEU investment[1]. They rely on several assumptions including the following:

- they include not only RRF grants but also other smaller NGEU grants;
- the (RRF) loans are only those requested by Member States before 8 June 2021. Therefore, an amount of € 122 billion in loans is included for Italy but nothing for Spain (even though the Spanish government intends to request RRF loans later on);

1 Other institutions and analysts have produced simulations of the macroeconomic impact of the NGEU for the euro area or the EU as a whole. Some of these simulations also include results for some or all (individual) countries. The four big euro area economies are illustrated in Bankowski *et al.* (2021). Codogno and van den Noord (2021a and b) have focused their discussion on the core versus periphery but they have illustrated results for Italy and Spain. However, in a previous stylised simulation, Codogno (2020) had estimated the additional GDP growth that could be expected by each EU country on the basis of an *ad-hoc* set of multipliers. Amiot and Broyer (2021) also simulated implied annual GDP growth and cumulative GDP growth for all EU27 countries in both a low-impact and high-impact GDP growth scenario with the differences between the two scenarios reflecting different assumptions in terms of absorption rates and multipliers.

Chart 8

The impact of the NGEU on real GDP is higher in Member States receiving a larger share of grants while smaller economies may also benefit greatly from spillovers

(contribution in percentage points to the deviation of real GDP from a no-NGEU baseline, implementation over 2021-2024)

Chart 8 (next)

The impact of the NGEU on real GDP is higher in Member States receiving a larger share of grants while smaller economies may also benefit greatly from spillovers

(contribution in percentage points to the deviation of real GDP from a no-NGEU baseline, implementation over 2021-2024)

Source: Pfeiffer *et al.* (2021).

- all grants are assumed to be spent on additional and productive investment projects, while EU loans are assumed to be 50 % additional [1];
- in the fast scenario that we consider here, all Member States allocate spending evenly across four years (2021-2024);
- they do not consider any further expenditure financed by the Member States while most Recovery Plans actually incorporate further spending financed from national resources and governments have considered

1 This assumption is more binding for some countries than others. In Germany, most expenditure is not found to be additional as "Germany allocates a large part of its investment funding to already planned projects" (Corti *et al.*, 2021). For Belgium, we do not consider all NRRP expenditure as additional. In other words, we consider that some Belgian projects would also have been implemented without NGEU.

additional investment plans notably with a view to accelerating the green and digital transitions or closing the accumulated public investment gap.

In all countries, as a result of a similar four-year implementation period, the impact on real GDP increases during the investment period, reaches a maximum in the fourth year and then decreases as there is no new public investment contributing automatically to GDP. From the fifth year onwards, there will still be a positive impact of public investment on private investment and productivity.

The macroeconomic impact of the Next Generation EU is estimated to be over 2.5 percentage points of GDP in Italy and Spain as they receive substantial grants. Even though Spain will get more grants than Italy, the impact on real GDP is greater in Italy than in Spain as, unlike its Iberian neighbour, Italy has requested huge loans.

Reflecting significant uncertainty, the order of magnitude found in the EC simulations may to some extent differ from that found in the simulations performed by the recipient countries themselves. The Spanish authorities estimate a cumulative increase in GDP level of 2.8 %, 4.1 % and 4.2 % for the first three full years of implementation of the NRRP (2022 and 2024) when strong demand effects will be accompanied by a gradual contribution from the supply side. This estimate is higher than that of the EC estimates because of the use of higher multipliers[1] and because of more frontloaded and concentrated expenditure.

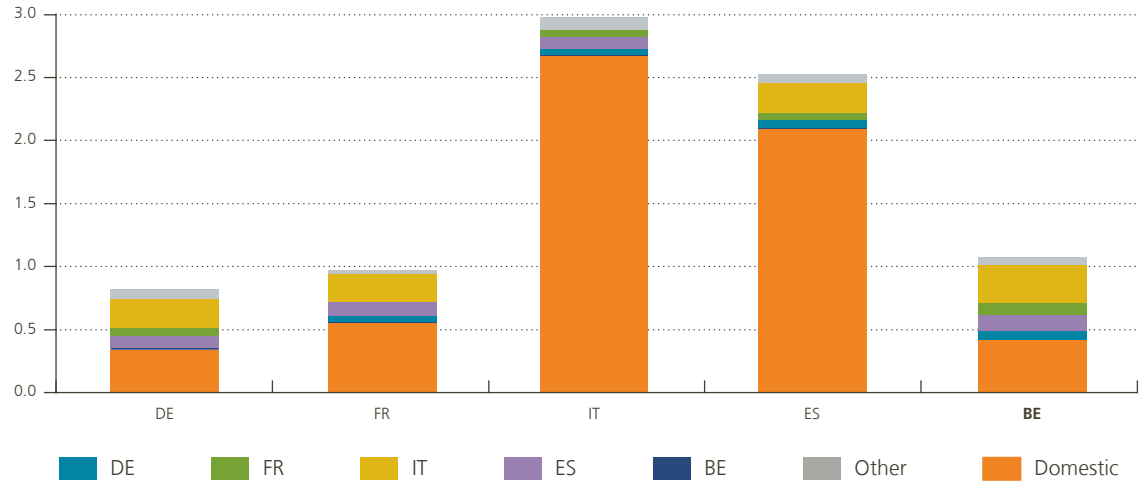
The Italian authorities also estimate a higher impact of the NRRP on the GDP than in the EC simulations: by 2026, Italian GDP is expected to rise by 3.6 % according to the Ministero dell'Economia e delle Finanze (2021b), rather than the 1.5 to 2.5 % estimated by the Commission. Part of the gap stems from differences in size of the NRRPs: while the EC considers only € 144 billion, the Italian Finance Ministry included € 183 billion worth of spending,

1 The Spanish authorities justify the higher and more persistent multipliers used in their projections on the assumption that deeper and more persistent negative output gaps amplify the effectiveness of fiscal stimulus in crisis years (EC, 2021f).

Chart 9

The four big euro area economies are generating most of the fiscal spillovers

(contribution in percentage points to the deviation of real GDP after four years from a no-NGEU baseline, implementation over 2021-2024)



Sources: Pfeiffer *et al.* (2021), own calculations.

(EC, 2021e), but it says only around 62 % of these resources are expected to be used for public investment[1]. The Italian projections also assume a higher efficiency of public capital than the Commission analysis.

In Belgium, the impact estimated by the Federal Planning Bureau (2021a) is smaller than that calculated by the Commission, even when spillover effects are not taken into account. The FPB found that economic activity would be on average 0.14 % of real GDP higher over the period 2021-2026 than in a baseline scenario without a Recovery Plan, with a maximum impact of 0.21 % in 2022. Among the factors explaining the difference, first, the Commission considers all expenditure as investments while FPB has used the expected economic breakdown of the spending, with 88 % of the NRRP's expenditure directly intended to increase the capital stock through public investment and aid to private investment and, secondly, the FPB has only considered the RRF while the Commission has also included the non-RRF items of the NGEU (such as React-EU, …). In Germany[2] and France[3], the national estimates are closer to the Commission's results.

In all Member States, fiscal spillovers from the public investment by other Member States contribute to the positive impact of the NGEU on the volume of economic activity. These spillovers benefit small open economies like Belgium more than the four big economies. Belgium is even expected to benefit more from the spillovers from the other NRRPs than from its own Recovery Plan.

Due to their size, the four big euro area economies are generating most of the fiscal spillover effects across each other and on the other (smaller) economies such as Belgium.

Boxes within the Commission's analysis of the individual NRRPs (EC, 2021b, c, d, e and f) contain further information on the maximum number of jobs created thanks to the NGEU. These figures correspond to the peak deviation from the baseline in the Pfeiffer *et al.* (2021) simulations. Given the much higher fiscal stimulus (especially when loans are included), the number of job creations is estimated to be much higher in Italy and Spain than in the other countries. Expressed in relation to the scope of fiscal stimulus facilitated by NGEU grants and loans, the NRRPs are found in the simulations to be more job-intensive in Germany and France than in the other Member States surveyed. This result confirms the poor employment content of the extra growth generated by the Italian NRRP found by Merler (2021).

1 A minor share of the funding will be used for incentives for business investment and reducing taxes on labour and, to a limited extent, for current government expenditure and transfers to households (EC, 2021e).

2 On behalf of the German Federal Ministry of Finance, DIW Berlin (Clemens et al., 2021) found a maximum impact of just the German NRRP (thus without any spillover from the NRRPs of the other EU27 countries) of 0.16 percentage point of GDP in 2025 (deviation from the baseline in that year).

3 As can be read in the French NRRP (Gouvernement français, 2021a), DG Trésor estimated the impact of the NRRP on its own at around 1.5 % of GDP in 2021 (including a 0.2 percentage point contribution of spillovers, knowing that Germany, Italy, Spain and Belgium account for 40 % of world demand addressed to France) while the impact fluctuates between 0.5 and 1 % of GDP up to 2040.

Table 6

Estimates of jobs created per billion euro spent vary substantially from one country to another

	Number of jobs created	Fiscal stimulus in € billion (NGEU grants)	Jobs created per € billion injected
DE	135 000	31.2	4 300
FR	157 000	46.2	3 400
IT	240 000	88.8 (210.8)	2 700 (1 100)
ES	250 000	88.6	2 800
BE	12 000	6.7	1 800

Sources: EC (2021a), EC (2021 b, c, d, e and f), Pfeiffer *et al.* (2021), own calculations.
Figures within brackets for Italy include loans.

In Belgium, even taking the spillover effects of the other NRRPs into account, the NRRP is expected to generate only 12 000 new jobs, less than 2 000 per billion euro received (and spent). Hence, it appears that the Belgian NRRP is more geared towards achieving productivity gains (and wage increases) than employment gains. In its economic impact assessment (that neither included the impact of the reforms nor the spillovers), the Federal Planning Bureau (2021a) drew a similar conclusion.

Besides, as for some national simulations like that performed by the Federal Planning Bureau (2021a), the macroeconomic impact simulated by Pfeiffer *et al.* (2021) relates only to the expenditure side of the NRRPs while the reforms are also adopted with a view to boosting the economies' growth potential. Also, positive interactions between investment projects and reforms are not considered in these July 2021 simulations.

The lasting impact of reforms is nevertheless discussed qualitatively[1] in the Commission's analysis of the individual NRRPs as it is one of the 13 criteria to be taken into consideration in the assessment.

Conclusion

This article has analysed the National Recovery and Resilience Plans (NRRPs) of the largest EU Member States – Germany, France, Italy and Spain – as well as Belgium. In exchange for EU grants and loans, these countries have submitted NRRPs describing the investment and reforms that they intend to carry out with a view to strengthening their economies both in the short term and in the medium and long run. Together, these countries account for more than half of all grants (and loans) from the EU Recovery and Resilience Facility (RRF). Owing to their vulnerabilities before the COVID-19 crisis and the severe economic damage caused by the pandemic itself, Italy and Spain will be the main beneficiaries.

According to these plans, grants (and loans) will be used mainly to finance green and digital investment as requested. Italy, Spain and France also intend to spend about one-third on projects other than green and digital ones (either other investment or current expenditure), a much higher share than in Belgium and Germany. Given the large size of Italy's and Spain's NRRP, they are expected to spend significant amounts on these other projects. Reflecting the need to remedy existing economic vulnerabilities and their specialisation in tourism, Italy and Spain have diversified their spending across categories such as labour market, education and skills; R&D and innovation; economic, social and territorial cohesion; health; culture and tourism.

As expected, the countries that have received the biggest amount of grants are also found to be those that have committed to more comprehensive reforms designed to effectively address all or a significant sub-set of challenges identified in the relevant country-specific recommendations, the latter reflecting imbalances and structural weaknesses. As the RRF is a performance-based programme, the countries need to attain the agreed milestones to receive the grants according to a hump-shaped and frontloaded disbursement timeline. Italy and Spain were also planning to reach substantial reform milestones across a wide array of domains in a very short period of time. Substantial reforms, even horizontal ones, have already been implemented in 2021 before the first instalment of grants was requested.

Reforms to be implemented in 2022 and over the next few years are still significant, especially in Italy and Spain. Their governments seem to have fully understood that the RRF is a once-in-a-lifetime opportunity for the less resilient countries and/or those most affected by the COVID-19 crisis to help remedy their structural problems through investment and reform. Going forward, the success of the NGEU will depend on the actual implementation.

1 The boxes on the growth impact of the NRRPs also mention previous estimates (Varga and in't Veld, 2014), where simulations were made of the GDP-generating impact over 10 and 20 years of structural reforms halving the gap vis-à-vis the best performers in terms of indicators of structural reforms.

The analysis in this article also puts the Belgian investment projects and reforms into perspective. In exchange for much less RRF grant money (maximum € 5.9 billion), the reforms Belgium has committed to the EU are more limited in number and depth and less comprehensive than in the case of Italy and Spain. For Belgium too, this is a good opportunity to help push through structural reforms supporting the green and digital transitions and enhancing the growth potential of its economy in a sustainable way.

Annexes

Annex 1

Comparison of digital, green and other spending in the National Recovery and Resilience Plans

(in € million, unless otherwise stated)

	Germany [2]	France [2]	Italy	Spain	Belgium	Federal state	Flemish community	Other communities and regions [1]
Digital spending								
R&D, advanced technologies and connectivity	3 466	2 040	12 270	4 499	266	79	0	187
Digital public sector	7 323	3 014	7 750	4 315	585	318	121	146
Digital skills and digital inclusion	1 473	739	5 460	3 593	526	30	411	85
Digitalisation of businesses	1 899	385	14 330	0	3	0	0	3
Sub-total digital	**14 161**	**6 178**	**39 810**	**12 407**	**1 379**	**426**	**532**	**421**
Green spending								
Biodiversity, circular economy, air and water quality	0	1 516	5 290	3 733	2 223	29	80	114
Energy efficiency	2 577	6 125	19 420	6 820	1 012	11	298	703
Other	0	3 590	14 810	1 051	512	0	291	221
Sustainable mobility	5 928	6 980	33 360	13 203	1 293	429	468	396
Energy	3 259	1 975	13 400	6 085	531	245	169	117
Sub-total green	**11 764**	**20 186**	**86 280**	**30 892**	**3 571**	**713**	**1 306**	**1 552**
Other spending (neither green nor digital)								
Other	50	340	10 530	5 194	8	0	8	0
Culture and tourism	0	703	6 410	3 925	0	0	0	0
Economic, social, and territorial cohesion	500	0	16 590	2 792	227	0	0	227
Labour market, education and skills (non-digital)	725	6 949	10 970	6 087	256	15	129	112
Health	0	4 003	12 690	1 069	35	35	0	0
R&D and innovation (non-green and non-digital)	750	2 593	8 220	7 162	449	60	280	109
Sub-total other spending	**2 025**	**14 588**	**65 410**	**26 229**	**975**	**110**	**417**	**448**
Total (in € billion)	**27.9**	**40.9**	**191.5**	**69.5**	**5.9**	**1.2**	**2.3**	**2.4**

Sources: Darvas *et al.* (2021), Belgian National Recovery and Resilience Plan, own calculations.

1 Walloon Region, French Community, Brussels-Capital Region and German-speaking Community.

2 The total amounts in the German and French plans exceed their allocated RRF grants because these represent gross (including VAT) amounts.

Annex 2

In Italy and Spain, the most comprehensive reforms are frontloaded

(calendar of the main reform milestones)

	Germany	France	Italy	Spain	Belgium
June 2021				RD teleworking Digital competence plan Organic law on **education** Law on **climate change and energy transition** + RDs on energy Reduce temporary employment in **PA** RD **minimum vital income** Various **spending reviews** Various changes in **taxes**	
December 2021		**Labour market:** Short-time work schemes Unemployment insurance Health and security at work Loss of autonomy as a new branch of Social security Simplification of governance of hospitals Various governance of public finance [1] Green budget and transfer of management of the rail network of local interest to the regions Housing: better targeting of "aides personnelles au logement"	**Public administration:** steps to implement the NRRP (governance, …) Simplification and entry into force of **procurement** system Civil and criminal **Justice** and **insolvency** framework: entry into force of enabling legislation Entry into force of RD "ICT procurement" and "Cloud first and interoperability" Review of possible actions to reduce tax evasion **Spending review** (reinforcement of Finance Ministry) Law to promote renewable **gas** production and consumption Management and sustainable use of **water** Single customs desk Whole **university** system Framework law for disability RDs **Guaranteed employability** of workers and national plan for new **skills** Loans: Various simplification and acceleration of procedures/processes (+ Commissioner in Special economic zones + ownership transfer of bridges, …) New organisational model for territorial healthcare assistance network National program on air pollution control	**Labour market:** Simplification of **contracts** Internal **flexibility**, job **stability** and reskilling of workers in transition Collective bargaining Rights of persons working in subcontracted companies Access to professions of lawyers and procuradores Assignment of 700 MHz spectrum band and reduction of 5G spectrum taxation Modernisation of **tax agency** and enhanced assistance to taxpayers Indexation of **pensions** and alignment of the effective and the legal retirement ages	End of career and pensions (proposal submitted for approval to the Council of Ministers of the federal government) Learning account (FED) Support scheme for job seekers (WAL) Introduction of 5G (national plan) Mobility budget and zero-emission company cars (FED) Governance Circular Flanders and stimulating zero-emission transport (FLA) Spending review (pilot)

Annex 2

In Italy and Spain, the most comprehensive reforms are frontloaded (continued 1)

(calendar of the main reform milestones)

	Germany	France	Italy	Spain	Belgium
June 2022	Extension of tax exemption for purely EVs Acceleration of **planning and approval procedures** in the transport sector Digitalisation of PA: implementation of the Online access Act **Social guarantee** 2021 Childcare financing Act		**Public employment** in the PA: entry into force of enabling legislation + reform of teaching profession **Tax administration** **Justice:** recruitment procedures for administrative courts **Public procurement:** entry into force of the Code Spending review: savings target 2023-2025 National strategy for circular economy Technical support for local authorities Procedures for energy-efficiency interventions & management of hydrological risk Loans: National program on waste management	General and integrated framework for the provision of public **health** Integrated **VET** **Insolvency**, telecom and audio-visual communication laws (entry into force) Taxes on fluorinated gases (+vehicle registration and traffic) Law tax evasion and fraud Social security contribution and pensions for the **self-employed**	End of career (action plan) Lifelong learning (FLA) Improved energy subsidy scheme (FLA, RBC, GER) Regulatory framework for H_2 and CO_2 markets (FED) Recharging infrastructure and strategy for economic transition (RBC) e-government tender (FED)
December 2022		Law Climate & Resilience and RD anti-waste and circular economy Acceleration and simplification of public action, 4D law (entry into force of the laws) Civil service transformation (recruitment & equal opportunities) Reorganisation of the provision of services by Pôle Emploi	Tax courts and administration **Civil and criminal justice and insolvency:** entry into force of delegated acts **Annual Competition Law 2021** Integrated water services (entry into force) Competitive award of concessions in **ports** Procedures for the strategic planning process **Compulsory education** Tertiary advanced schools ALMPs and VET: entry into force at the regional level of all plans for the **PES** Loans: Student housing regulation (entry into force)	**Labour market:** Activation policies (modernisation) Hiring incentives Unemployment support Assignment of 26 GHz spectrum band National **procurement** strategy Entry into force of many laws[2] Anti-fraud law **Various pension reforms**	Digisprong (FLA) Fight against school dropout (FWB) Faster permit and appeal processes (FLA) Broadening innovation base (FLA) 5G: revision of legislative framework on radiation standards (FLA, WAL, RBC) Durable mobility (WAL) Spending review

Annex 2

In Italy and Spain, the most comprehensive reforms are frontloaded (continued 2)

(calendar of the main reform milestones)

	Germany	France	Italy	Spain	Belgium
June 2023	Digitalisation of PA (implementation of the online access act and European identity ecosystem)		**Civil and criminal justice:** entry into force of the reform **Public employment:** entry into force of legal acts for the reform **Public procurement:** entry into force of the reform of the Code **Reduction of late payments** by PA and health authorities Entry into force of a framework law which strengthens the actions in favour of non-self-sufficient elderly people	Whole **university** system Entry into force of Family diversity law & social services law **Tax benefit** review and modifications	Performance contract Infrabel/SNCB (FED) Emission fraud: legal framework for vehicle emission monitoring (FLA)
December 2023		Housing (more targeted "Pinel" scheme[3] and zero-interest rate loans) Research programming law New Public finances programming law	Digitalisation of Justice eProcurement fully operational PA: strategic HR management Industrial property system **Annual competition law** 2022 into force **Compulsory and higher education:** into force	Digitalisation of PES Law on sustainable mobility and transport financing Laws on industry, copyright and cinema Various laws on health[4]	**Labour market:** Fight against discrimination, cumulative regime and mobility towards sectors with shortages (FED) More inclusive labour market and higher education advancement fund (FLA) Requalification strategy (RBC) Simplification of administrative procedure: online creation of business Spending review
June 2024			Public accounting rules Spending review: completion for 2023 Tax administration: operational capacity Simplification procedures (onshore and offshore) **renewable energies** Undeclared work (implementation)		**Adoption of pension reform** by the Federal Parliament
December 2024		Annual assessment of quality of public spending	PA: implementation of **simplification** and digitalisation of 200 critical procedures affecting citizens and business **Annual competition law** 2023	Modern and digital **public administration**	E-government: implementation of a new tool Emission fraud (FLA) Spending review

Annex 2

In Italy and Spain, the most comprehensive reforms are frontloaded (continued 3)

(calendar of the main reform milestones)

	Germany	France	Italy	Spain	Belgium
June 2025			Implementation of the simplification and digitalisation of 50 additional critical procedures PA: increase absorption of investment Spending review: completion for 2024		
December 2025	Reducing administrative burden for citizens and businesses		Annual competition law 2024		
June 2026	Innovative data policy Modernisation of registers Digital pension overview Expansion of consulting agency PD Evaluation of measures	Law Climate & Resilience (implementing act) 4D Law (evaluation) Structural aspects of Research programming law	Accrual accounting system: public entities trained and applied for 90 % of whole public sector Subnational fiscal framework Spending review: completion for 2025	Completion of projects on AI	

Sources: Ecofin (2021b) and National Recovery and Resilience Plans, own selection.

AI = Artificial intelligence, ALMP = Active labour market policy, EV = Electric vehicles, FED = Federal government, FLA = Flemish Community, FWB = Fédération Wallonie-Bruxelles (French Community), GER = German-speaking Community, HR = Human resources, MD = Ministerial decree, PA = Public administration, PD = Partnerscharft Deutschland, PES = Public employment Services, RBC = Région de Bruxelles-Capitale, RD = Royal or Inter-ministerial Decree (or Decree in a republic), VET = Vocational and educational training, WAL = Wallonia.

1 Within the Law "4D" (for "decentralisation, differentiation, deconcentration" and "decomplexification"), local authorities earn the right to differentiation; implementation of several recommendations of the Commission pour l'avenir des finances publiques (multiannual expenditure rule and extension of the "prerogatives" of the fiscal council; COVID-19 debt containment scheme; audit mission of the Court of Auditors on public finances; results of the productivity reforms).

2 Housing; quality of architecture and building environment; horizontal property law to facilitate funding for rehabilitation; strengthening inter-territorial cooperation; reinforcing public policies evaluation; local administrative regimes; efficiency of judicial procedures; waste and contaminated soil; business creation and growth; start-ups; 5G Cybersecurity; sports.

3 The Pinel scheme opens the right to a tax reduction calculated on the purchase price of new or rehabilitated housing to achieve the technical performance of new housing.

4 Laws on Equity, universality and cohesion of the NHS, on the Framework statute for statutory health service staff and on guarantees and rational use of medical products.

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How does parenthood affect the careers of women and men?

M. Nautet
C. Piton*

Introduction

Over the last few decades, the labour market has become more and more feminised. The employment rate of women has gradually risen, converging towards that of men, which has remained relatively stable. The employment rate gap has thus narrowed considerably, from 33.5 percentage points in 1983 (earliest available data) to 7.2 percentage points in 2019. Convergence in terms of work intensity, i.e. the number of hours worked per week, has been less clear-cut. While the number of hours worked by men has shown a downward trend, the number of hours worked by women declined more rapidly, at least until 2006. In that year, the gender gap in hours worked was eight hours per week. From 2006 onwards, the trend in hours worked by women has reversed, actually rising slightly, so that the gap with respect to men has narrowed. So, the employment gap in full-time equivalents worked out at 18 percentage points in 2019.

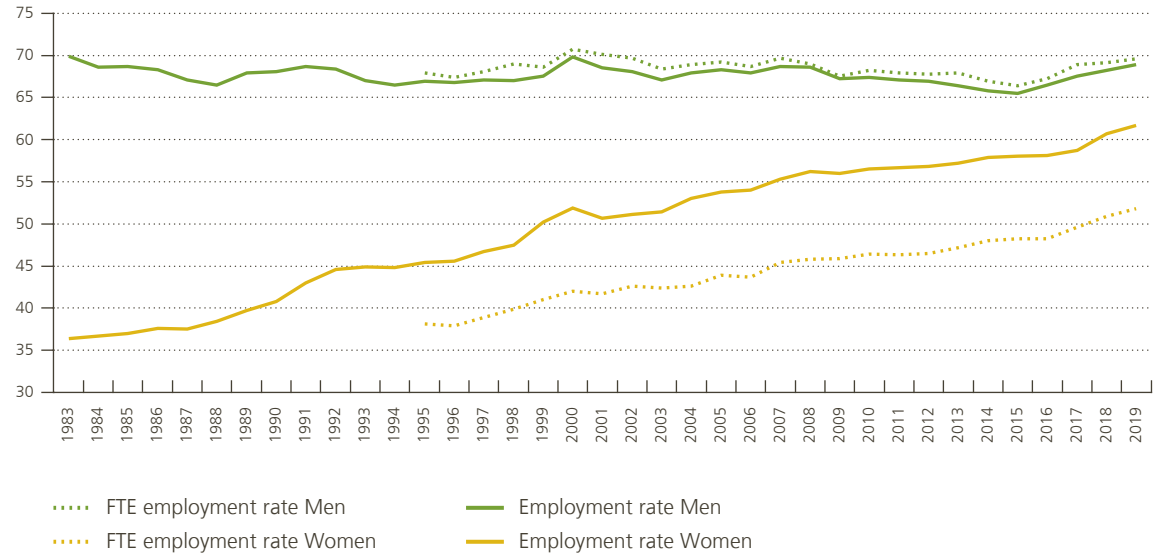
While men's and women's roles within the family and the labour market have evolved over time with the feminisation of the labour market, major differences remain. The occurrence of parenthood is an essential explanatory element for understanding the persistence of gender gaps, whether in terms of wages or intensive and extensive labour market participation. For years, the economic literature has been examining those gender gaps and more recently has tried to link them to parenthood. While women suffer a significant and lasting penalty, for men, parenthood is either neutral (Lundborg *et al.*, 2017, Angelov *et al.*, 2016, Cortes and Pan, 2020) or a plus for their career, in particular in households where the mother cuts back on her working hours to care for children (Lundberg and Rose, 2000). Initially, economists tried to understand through which channels this gap comes about. The main explanatory factors relate to differences in labour market participation rates, working hours, occupation and sectors. These differences have an impact on accumulated experience and human capital and lead to wage and career development gaps (Blau and Khan 2017, Kleven *et al.* 2019, Costa Dia *et al.* 2021, Bertrand 2020). Note that the level of education contributes negatively to explain the gender gap, as women are now on average more highly educated than men. Nevertheless, women concentrate on fields of study associated with less remunerative occupations. By analysing the child penalty according to sector of activity, Fontenay, Murphy & Tojerow (2021) show that job characteristics, and in particular the fact that having atypical or irregular working hours, are strongly correlated with the extent of the child penalty. In jobs where it is harder to reconcile work and family life, the penalty will be greater, and it will be more common for women to opt for a reduction in their working hours. This explains why a sector such as teaching, where schedules and leave are pre-determined, has a lower maternity penalty than the hospital sector, where schedules change weekly, and evening or night work is the norm.

* The authors are grateful to Steven Vanackere, Luc Aucremanne, Philippe Delhez, Wouter Gelade and the members of the NBB Council of Regency for their constructive comments.

Chart 1

Convergence of employment rate between women and men over time, but still a large gap in particular when accounting for full-time equivalents

(in % of the corresponding population aged between 15 and 64 years)



Sources: Eurostat, OECD.

The wage gap observed today seems to be largely attributable to the arrival of the first child (Costa Dia *et al.* 2021). When they become mothers, women more often opt for career breaks or part-time work to care for children and thus accumulate less work experience. They choose occupations close to home and offering flexibility to cope with family life and childcare, but which are less well paid. Women leave their jobs more frequently for family reasons, with a negative effect on their earnings. Men tend to leave their jobs for professional opportunities, with a positive effect on their earnings. Due to their choices when becoming a mother, women are seen by employers as less devoted to work than men. The employer will offer them less training (as it is a less profitable investment), a lower salary or will prefer to hire a man (Correl *et al.* 2014, Lundbergh and Rose 2000).

Contributing to this literature, this article aims to understand how, in Belgium, both women and men adapt their labour supply when becoming a parent and how this can influence their careers later on. While the gender wage gap is not investigated here, the presented impact in terms of labour supply certainly helps to understand how wage evolution differs according to gender and choices linked to parenthood. To provide this analysis, we rely on the labour force survey over the period 1998-2019. While one drawback of this dataset is that we cannot follow individuals, a significant advantage is the richness regarding detailed variables in terms of personal characteristics, household characteristics and job characteristics. This dataset will also enable us to analyse in more depth how decisions change depending on the level of education of mothers and fathers, a factor often ignored in the literature. In the first part, we will look at the impact of parenthood on employment rates of women and men. We will then measure how both genders adapt their working time either through a reduction or a modification (e.g. overtime or atypical hours). And finally, how those intensive and extensive margins are used differently depending on the level of education of the parents. In section 2, we will investigate how decisions linked to parenthood may influence careers of women and men and in particular their probability of getting a job with supervisory responsibilities or a manager position. The next two sections will try to understand what underlies these choices and preferences and to what extent social norms (section 3) or public policies (section 4) could influence them. Our last section concludes, proposes some possible solutions to attenuate the so-called child penalty of women and opens the debate to further required research.

1. Parenthood as part of the remaining employment gender gap ?

This article does not aim to explain the employment gender gap *per se* but to analyse how parenthood influences the labour supply of men and women differently. As presented in this section, however, parenthood appears to be a significant factor influencing the (full-time equivalent) employment gap between genders.

1.1 Impact of parenthood on employment rate

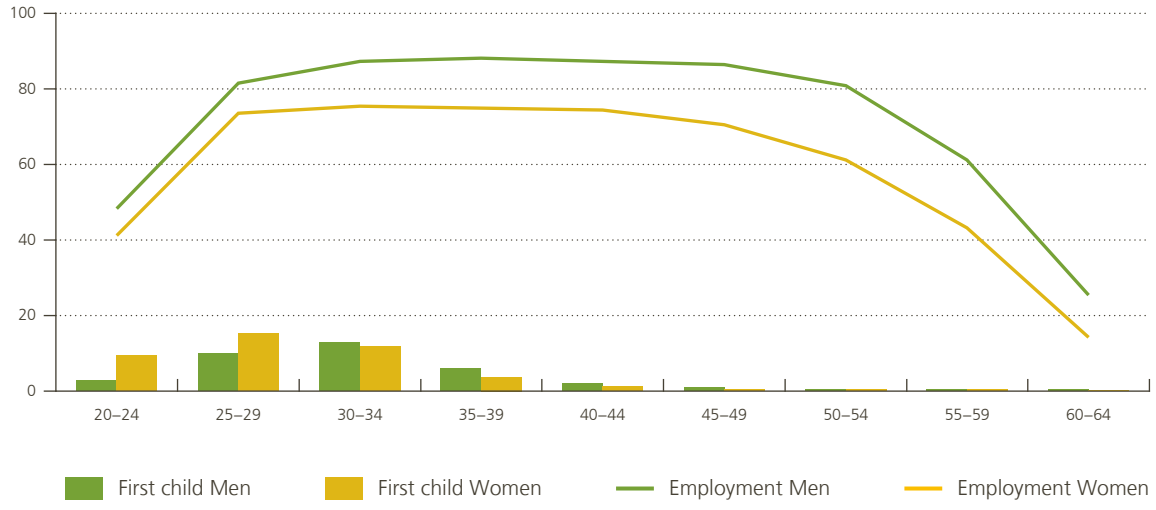
Based on the labour force surveys, we computed, on the one hand, the employment rate for both genders and for each age category and, on the other hand, the share of women and men with a first child who is less than two years old (see chart 2). While there is already a gender gap at the very beginning of the career, it widens significantly between 25 and 29 years old and persists over the rest of the life cycle. This 25-29 years age category corresponds to the age at which women become mothers (15 % of women aged between 25 and 29 years are mothers for the first time, 12 % of those aged between 30 and 34 years). Note that men tend to become fathers later. This is the case for 10 % of men aged between 25 and 29 years and for 13 % aged between 30 and 34 years.

Our dataset also enables us to look at the evolution over time of this gender employment gap. At the beginning of the 2000s, there was already a gender employment gap at the beginning of the career (–9 percentage points), then it increased at the average age of parenthood (–10 percentage points for 25-29 years, –15 percentage points for 30-34 years) and continued to rise over the years until the age of 50 (–27 percentage points) where it started declining mainly because of men leaving the labour market at a faster rate than women. The situation has improved over time. In subsequent periods, the gender employment gap narrowed at all ages, but this change is particularly pronounced at older ages (–11 percentage points for 50-54 years) and less at the beginning of the career (–5 percentage points). For young women, from 20 to 34 years, there is no significantly higher

Chart 2

Employment gender gap widens at the age at which women are becoming mothers

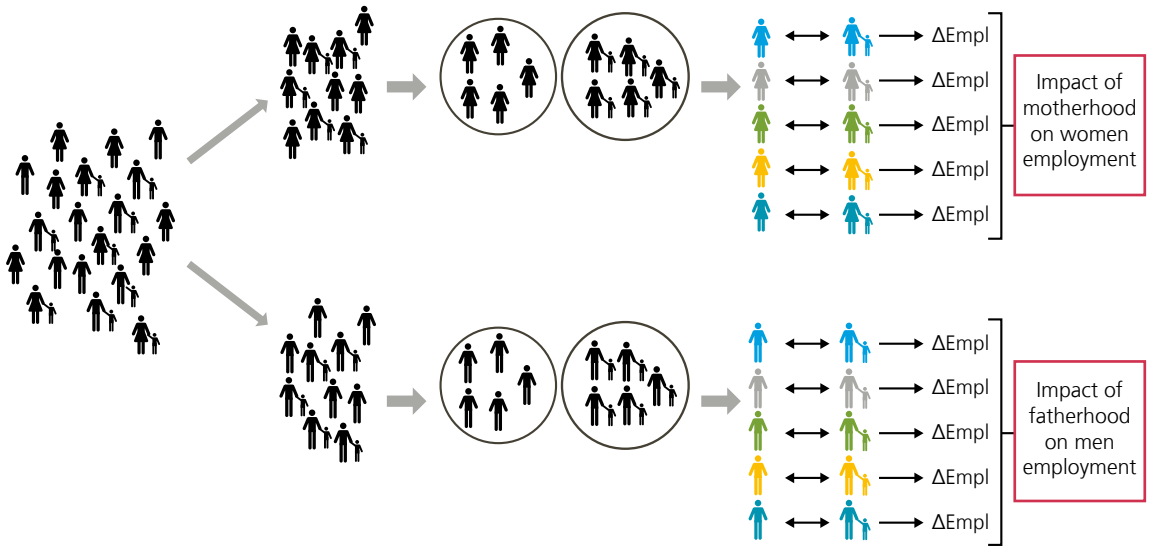
(proportion of people in employment for each age category and share of people having one child who is less than two years in the household, in %, average over the period 1998-2019)



Source : LFS, authors' computations.

Chart 3

A propensity score-matching technique to measure the impact of having children



proportion of employed women. While the gender employment gap has narrowed slightly, this is only due to a reduction in labour market participation among young men.

The timing of the wider gap, at the age of 25-29 years, seems to confirm the existence of a "child penalty" for women. To further analyse this penalty, we computed a variable that distinguishes between people with and without children. The variable "having children" means that, for the surveyed individual, at least one child younger than 15 years old lives in the household.

To measure the impact of having a child in the household on the probability of being employed for men and women, we used a propensity score-matching technique. The estimation is made for men and women separately, so what we analyse is not the gender gap but the actual impact of having a child. We compare women without children with mothers on the one hand and men without children with fathers on the other hand (see chart 3). However, what we want to know is not only what is happening to women (men) as they become a mother (father) and also what would have happened if they did not have children. To do so, we need to construct a "control group" (people without children) which match relevant characteristics (age, province of residence, educational level, marital status, year of the survey) with what we call the "treated group" (people with children). The difference in outcome (i.e. employment) of the computed "couples" (individuals shown in colour in chart 3) is then estimated, and the model gives us an average impact of motherhood (fatherhood) on women (men) in employment.

Our results, presented in chart 4, show that, for two identical women, a mother is 3.2 percentage points less likely to be employed than a woman without children. On the contrary, compared with another identical man, a father is 5.3 percentage points more likely to be employed. The variable identifying parents can also distinguish between those with one child, two children or three children or more. So, we can look at how the employment penalty for women and the positive effect for men change with the number of children. The control group is always people without any children. The same propensity-matching technique is used and matches couples based on age, region of residence, educational level, marital status and the year of the survey. This means that the control group is not similar across specifications. For example, on average, women with three children will be older than those with one child, meaning that the control group of women without children will be older for the estimation of the impact of having three children or more than for the estimation of the impact of having one child. Again, we carry out the analysis separately for men and women.

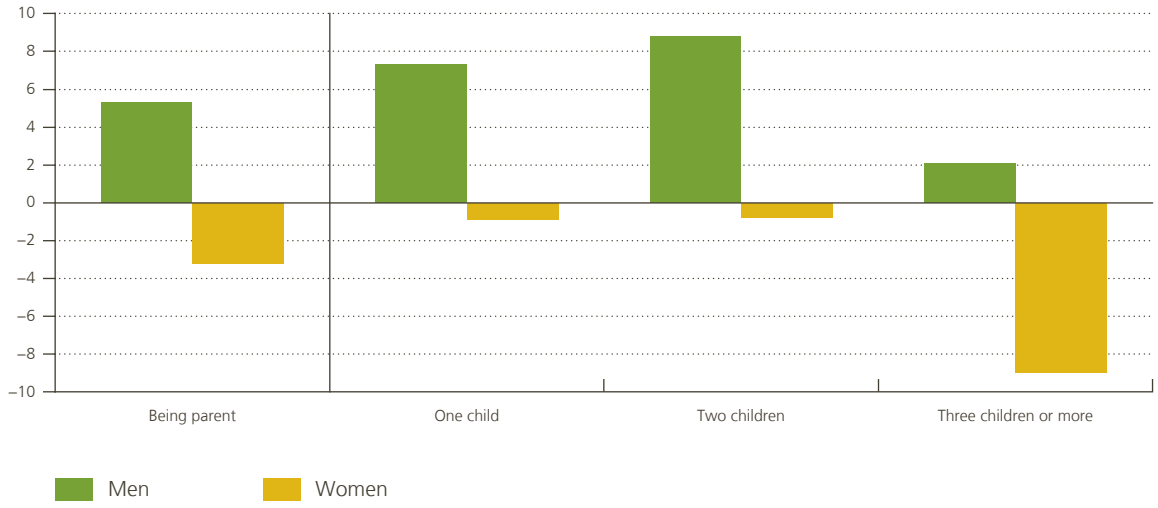
While the child penalty encountered by women is already evident for the first child, it is small at less than 1 percentage point. The same goes for women with two children. However, having three children or more induces mothers to leave (at least temporarily) the labour market so that, compared with women without children who have similar personal characteristics, they have an employment penalty of 9 percentage points. For men, however, being a father for the first time has a large and significant impact regarding the employment rate (+7.3 percentage points) and this "bonus" increases further with the second child (+8.8 percentage points). This higher propensity to be employed is nevertheless reduced when there are three children or more in the male's household. In other words, compared with similar non-parent men, a father of three children or more is only 2 percentage points more likely to be employed.

In the decision whether to stay employed or not in the labour market, not only the number of children in the household is relevant but also the age of those children. Labour force surveys help us to compute the impact of parenthood depending on the age of the youngest child in the household (see chart 5). For fathers, the higher propensity to be employed is true at all ages of the youngest child and do not significantly varies with this age. For mothers, nevertheless, the employment penalty is a reality, reaching 6 %, until the youngest child is three years old. Of course, for women having more than one child, it means that the penalty occurred during more than three years. The penalty disappears when the youngest child is between three and five. After five years, women with children are more likely to be employed than comparable women without children. However, this is an estimation at time *t* for those mothers, meaning that compared with women without children, they still encountered career breaks at an early stage which can have an impact on the type of job they will get at that time.

Chart 4

A child penalty for women and a child bonus for men

(impact* in percentage points of having children in the household on the probability of being employed, by number of children, for people aged between 20 and 64 years, over the period 1998-2019)



Source: LFS, authors' computations.

* Based on estimations provided by treatment effect of propensity score-matching technique, the control group is constructed with the following matched characteristics: age, province of residence, education level, marital status, year of the survey, separate estimates for women and men and for each specification (being parents, one child, two children and three children or more), the reference group being women/men without children.

Chart 5

Women's employment penalty runs until the youngest child is 5 years

(impact* in percentage points of having children in the household on the probability of being employed, by age of the youngest child, for people aged between 20 and 64 years, over the period 1998-2019)

Source: LFS, authors' computations.

* Based on estimations provided by treatment effect of propensity score-matching technique, the control group is constructed with the following matched characteristics: age, province of residence, education level, marital status, year of the survey, separate estimations for women and men and for each age of the youngest child, the reference group being women/men without children.

1.2 Adjustment of labour supply through number or type of hours worked

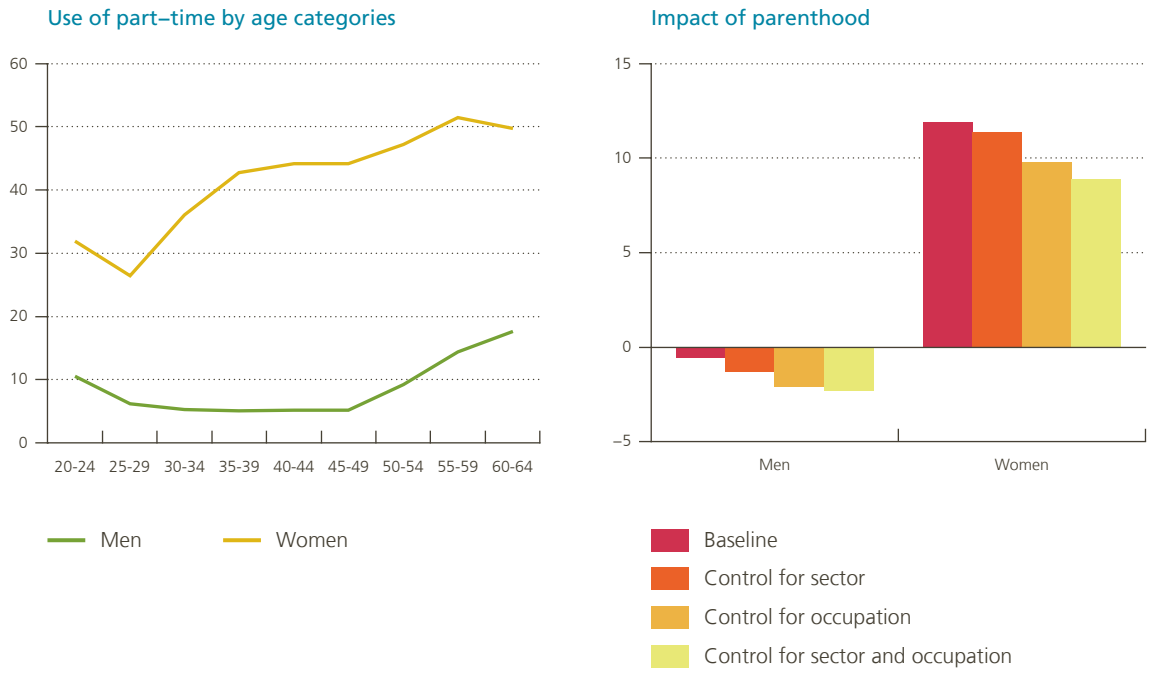
The time to be devoted to children is not only coming from mothers leaving the labour market, as reflected in the previous analysis, but also by a reduction of working time. Here again, these adjustments, through the use of part-time work, are mainly made by women. This phenomenon is already reflected in descriptive statistics. Based on our dataset, part-time work is on average more often used by women, at all ages and largely increases at the age of motherhood, never going back to its initial level for the rest of their working live. Moreover, looking after children or incapacitated adults is the first reason cited by women for opting for part-time work. For men, the curve is clearly lower, with less than 10 % of working men opting for a part-time job, until the age of 50 years when part-time work is more often used probably as a way of smoothly leaving the labour market before retirement. However, it is still largely below the curve for women, at 18 % for men aged between 60 to 64 against 50 % for women of the same age.

In order to test how parenthood affects the propensity to work part-time for both men and women, we use the same estimation technique as for the employment rate, namely propensity score-matching. Results are presented in chart 6. The analysis shows that a father having the same personal characteristics as a man without children and working within the same sector of activity and for the same type of occupation will be less likely, at 2.3 percentage points, to work part-time. On the contrary, a mother is 9 percentage points more likely to work part-time than another similar woman (in terms of age, province of residence, level of education, matrimonial status in a given year) working in the same sector and in the same type of occupation. Note that the decreasing impact of motherhood when we control for the sector of activity and/or the type of occupation indicates that women tend to work in sectors or occupations in which the practice of part-time work is more widespread, unlike men who tend to work in sectors or occupations where this type of flexibility is less common.

Chart 6

Part-time is on average more often used by women, at all ages, but largely increases at motherhood

(left-hand panel : proportion of people working part-time for each age category, in %, average over the period 1998-2019 : right-hand panel : impact* in percentage points of having children in the household on the probability of working part-time, for employed people aged between 20 and 64 years, over the period 1998-2019 and over the period 2011-2019 when controlling for occupation)



Source : LFS, authors' computations.

* Based on estimations provided by treatment effect of propensity score matching technique, the control group is constructed with the following matched characteristics : age, province of residence, education level, marital status, sector of activity (NACE code), type of occupation (ISCO) and year of the survey, separate estimations for women and men, the reference group being working women/men without children.

Working time can also be adjusted through a reduction/rise in the number of overtime hours or by making less/more atypical hours. Those working schemes are less easy to combine with family live but bring extra revenues. Compared with men, women are both less likely to work overtime and atypical hours and this gender gap is even more likely to occur as women are mothers (see chart 7). Interestingly, the impact on men of having children is not significant for overtime and only very marginal for atypical hours (+1.3 percentage points). In other words, while we saw earlier that employment and full-time work increase with paternity, it does not seem that men are working overtime to compensate for loss of their partner's income. Nevertheless, gender gaps within sectors in overtime or of being less flexible to work atypical hours could have an impact on the careers of women and men and their propensity to reach higher positions (see also section 2).

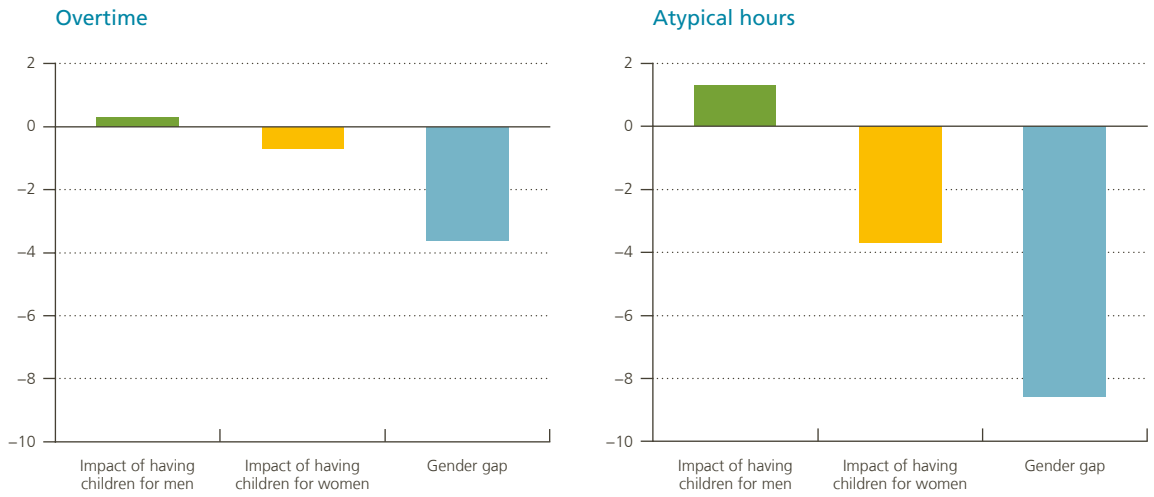
1.3 Different decisions for different levels of education

The two aggregate impacts regarding employment rates and number of hours worked presented in the above sections reflect an average effect for women and men but ignore some heterogeneity that could occur for sub-groups of the population. In fact, different levels of education (intrinsically partly correlated with the revenue) among both men and women could imply different decisions in terms of labour supply after parenthood.

Chart 7

Overtime[1] and atypical hours[2] are less often worked by women and in particular by mothers

(impact* in percentage points of having children in the household on the probability of working overtime or atypical hours and gender gap** in percentage points on the probability of working overtime or atypical hours, for employees aged between 20 and 64 years, over the period 2011-2019)



Source: LFS, authors' computations.

1 Overtime is based on either paid or unpaid overtime mentioned by surveyed individuals, binary variable taking the value of one if employees work overtime and zero otherwise.

2 Atypical hours are either shift work, evening work, night work, Saturday work or Sunday work, binary variable taking the value of one if employees work at least one of the atypical hours and zero otherwise.

* Based on estimations provided by treatment effect (having children) of propensity score matching technique, the control group is constructed with the following matched characteristics: age, province of residence, marital status, level of education, sector of activity (NACE code), type of occupation (ISCO) and year of the survey, separate estimations for women and men, the reference group being women/men working as employees without children.

** Based on estimations provided by treatment effect (being a women) of propensity score matching technique, the control group is constructed with the following matched characteristics: age, province of residence, marital status, level of education, having children or not, sector of activity (NACE code), type of occupation (ISCO) and year of the survey, the reference group being men employees.

Note: coefficient of having children for overtime of men is not significantly different from zero.

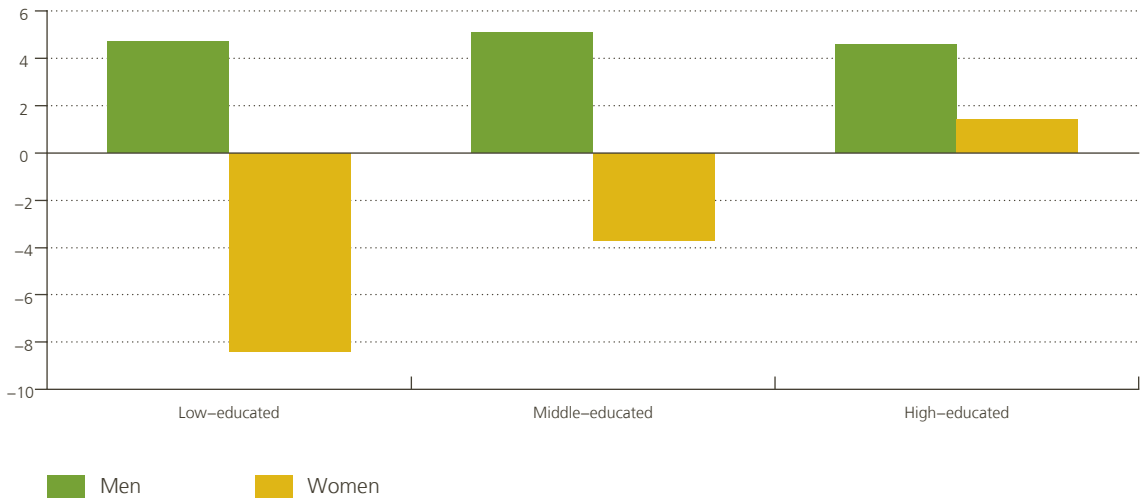
To verify this assumption, previous estimates are calculated once again but this time by dividing men and women into three groups of education level: those with at most a lower secondary degree (low-educated), those with an upper secondary degree (middle-educated) and people with a tertiary degree (high-educated).

The child bonus in employment for fathers is relatively stable across levels of education (see chart 8). The impact of fatherhood is positive in all cases and close to 5 percentage points. However, large disparities emerge when estimating the employment impact of motherhood. Compared to the average penalty of 3.2 percentage points, a woman with a low level of education will have an 8.4% less chance of being employed if she becomes a mother than a similar low-educated woman without children. It is worth noting that, when looking at the number of children, this employment penalty reaches almost 20 percentage points when the low-educated mother has three children or more. Women with a medium level of education also have a motherhood penalty but close to the average at 3.7 percentage points. Interestingly, when comparing two similar women (in terms of age, province of residence, marital status and for a given year of the survey) with a tertiary degree, it appears that the mother is 1.4% more likely to be employed than the woman without children. One possible explanation for that could be that highly-educated women without children could more easily pursue their studies, e.g. doing a PhD or a complementary Master's, than women with children. This would imply that mothers are more likely to be employed and women without children are a bit more likely to stay inactive (i.e. as a student) for a longer period. Moreover, having a family implies a higher responsibility to bring enough revenue into the household and therefore could put some pressure on highly-educated women to be employed. Note also that highly-educated women tend to have their first child at an older age (mainly between 30 and 34 years), meaning that they are already more attached to the labour market than women with a lower level of education.

Chart 8

Large child employment penalty for low-educated women but not for highly-educated women

(impact* in percentage points of having children in the household on the probability of being employed, by level of education, for people aged between 20 and 64 years, over the period 1998-2019)



Source: LFS, authors' computations.

* Based on estimates provided by treatment effect of propensity score-matching technique, the control group is constructed with the following matched characteristics: age, province of residence, marital status, year of the survey, separate estimates for women and men and for each level of education, the reference group being women/men of a certain level of education without children.

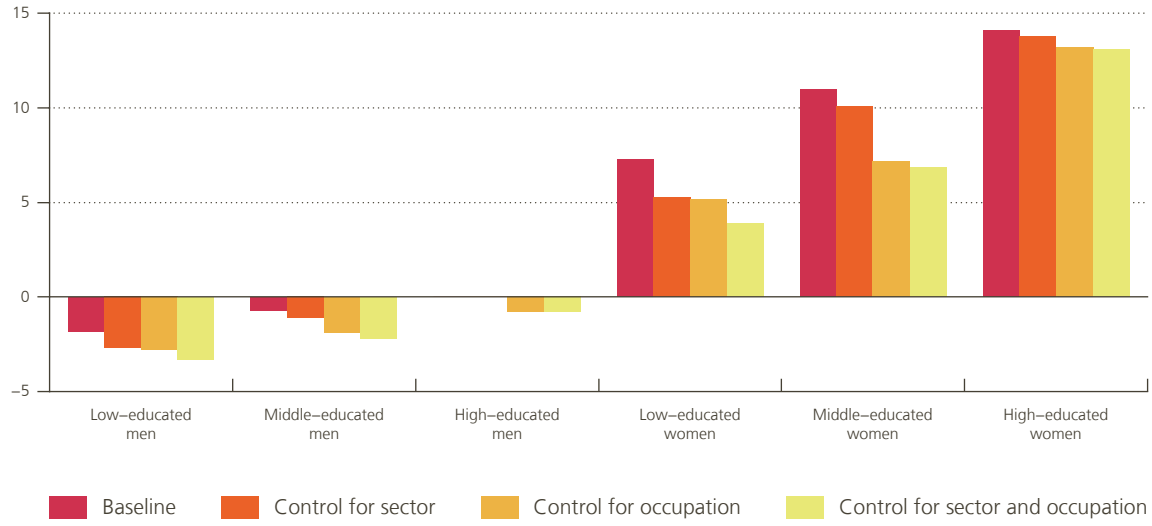
However, those highly-educated mothers, while not leaving the labour market, will be more likely to reduce their working time (see chart 9). More likely than other similar highly-educated women but also more likely than mothers with a medium or low level of education. A mother with a higher education degree is 14 percentage points more likely to work part-time than a similar woman also highly educated. For middle-educated mothers, the impact on part-time is 11 percentage points and for low-educated mothers 7.3 percentage points. However, as we have already highlighted earlier, controlling only for personal characteristics of women is not enough when measuring the impact of motherhood on the propensity to work part-time. Some sectors of activity and some occupations are already more likely to employ part-time workers. In fact, when controlling for the sector of activity and the type of occupation, the higher propensity of low- and middle-educated mothers to work part-time is largely reduced and reaches respectively 3.9 and 6.9 percentage points. This finding implies that low- and middle-educated women tend to work in a sector or for an occupation that allows working time flexibility. Conversely, the higher propensity of high-educated mothers to work part-time is only slightly reduced when controlling for occupation and sector and still works out at 13 percentage points. This impact of motherhood for highly-educated women therefore does not seem to be influenced by a tendency to directly choose flexible sectors or occupations but actually within a sector and an occupation to reduce working time when becoming a mother.

Different types of decisions made by mothers depending on their level of education is to some degree rational. For parents, working implies finding a childcare solution which is expensive and either less affordable or not at all for low- and middle-educated women. It is therefore less costly for them to (temporarily) leave the labour market to take care of their children themselves and that is all the more so when the number of children increases. For highly-educated women, however, despite childcare costs, staying in employment is still a better financial outcome and an important investment for their future career following an already high investment in skills. However, the child burden is not entirely supported by childcare or sufficiently shared by the partner, so more highly-educated mothers tend to reduce their working time.

Chart 9

Significant increase in part-time use for highly-educated women when they become mothers

(impact* in percentage points of having children in the household on the probability of working part-time, for employed people aged between 20 and 64 years, over the period 1998-2019 and over the period 2011-2019 when controlling for occupation)



Source: LFS, authors' computations.

* Based on estimations provided by treatment effect of propensity score-matching technique, the control group is constructed with the following matched characteristics: age, province of residence, marital status, sector of activity (NACE code), type of occupation (ISCO) and year of the survey, separate estimations for women and men and for each level of education, the reference group being working women/men of a certain level of education without children.

Focusing now on the impact of fatherhood, our estimations show that the lower propensity of men to opt for part-time work as they become fathers is particularly pronounced for low-educated men and this lower propensity increases when controlling for the sector of activity and/or the type of occupation. This means first of all that men tend to be in sectors or occupations in which part-time schemes are less widespread. Another explanation is the still strong social norms (see also section 3), that encourage fathers to be the ones who are supposed to bring sufficient money into the family and therefore they are not "allowed" to reduce their working time. This seems particularly true if they have a low level of education, which is highly correlated with an average lower wage.

2. The glass ceiling

Parenthood affects labour supply of both men and women in opposite directions. It implies more career breaks and reduction of working time for mothers and less career breaks and increase in working time for fathers. Those findings, besides previously stated direct incidences, also influence the entire career of mothers and fathers differently. The aim of this section is to further analyse how parenthood could raise or reduce probability of reaching higher positions.

For all workers since 2006, labour force surveys contain a variable indicating whether the job includes supervisory responsibilities. Rather than a managerial position (which will be analysed below), this variable can be true also for lower-skilled occupations. Conversely to what we found for employment or part-time work, it does not seem

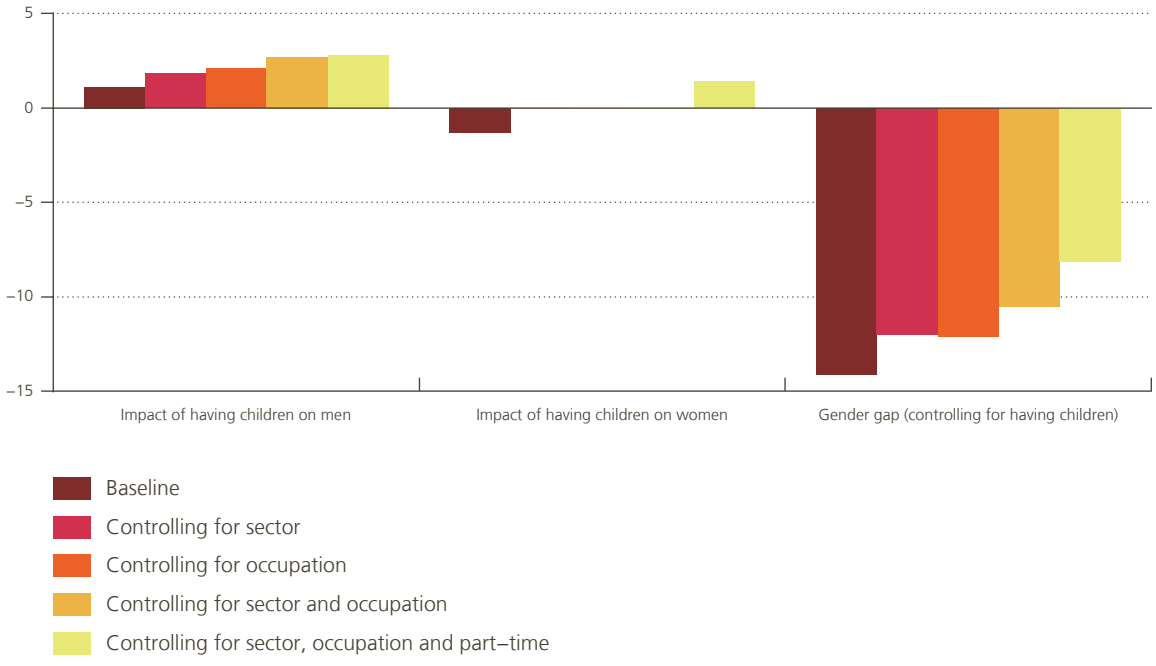
that the presence of children in the household influences the probability of women being in a job with supervisory responsibilities (see chart 10). A motherhood penalty of 1.3 percentage points occurs when comparing similar women, but this penalty disappears when controlling for the sector of activity or/and the type of occupation. The impact even turns positive once we control for part-time, meaning that women who did not opt for a part-time job when they became mothers have a higher probability of getting supervisory responsibilities than women without children who also work full-time. This result could be explained by the positive signal of high attachment to the job given by the mother keeping on working full-time. Becoming a father also seems to work as a positive signal for men since their propensity to work in a job with supervisory responsibilities is higher when they are fathers, and this is particularly true within a sector and within an occupation (+2.7 percentage points). Taking fewer career breaks and being less likely to adapt their working time than their male counterparts without children works as a positive signal of attachment to the job and therefore increases their chances of getting a job with supervisory responsibilities.

As parenthood does not seem to be the most explanatory factor, it is interesting here to go more deeply into the aggregate gender gap in reaching a job with supervisory responsibilities. Controlling for personal characteristics and for the fact of having children or not, a man is 14.1 percentage points more likely to obtain a job with supervisory responsibilities than a woman. This gap is only partially explained by the fact that women will tend to go to sectors or occupations with a lower probability to have this type of job since when controlling for

Chart 10

Large gender gap in supervisory responsibilities not directly linked to motherhood

(impact* in percentage points of having children in the household and gender gap** in percentage points on the probability of working in a job with supervisory responsibilities, for workers aged between 20 and 64 years, over the period 2006-2019 and over the period 2011-2019 when controlling for occupation)



Source: LFS, authors' computations.

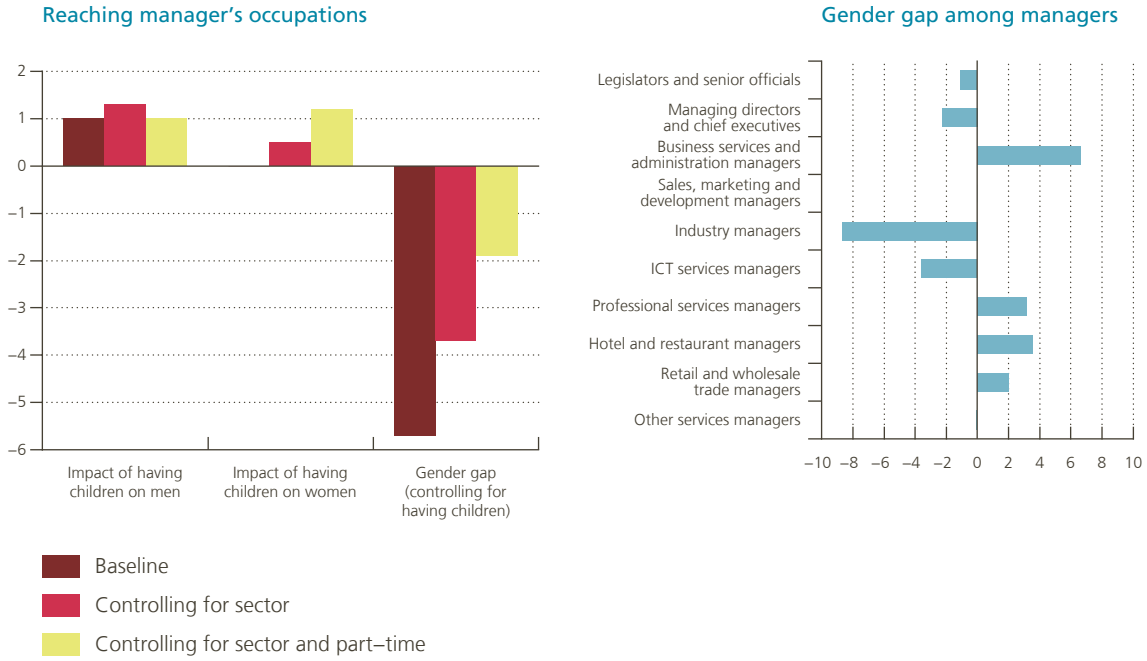
* Based on estimations provided by treatment effect (having children) of propensity score matching technique, the control group is constructed with the following matched characteristics: age, province of residence, marital status, level of education, sector of activity (NACE code), type of occupation (ISCO), working full-time or part-time and year of the survey, separate estimations for women and men, the reference group being working women/men without children.

** Based on estimations provided by treatment effect (being a women) of propensity score matching technique, the control group is constructed with the following matched characteristics: age, province of residence, marital status, level of education, having children or not, sector of activity (NACE code), type of occupation (ISCO), working full-time or parti-time and year of the survey, the reference group being men.

Chart 11

Difficulty to reach (certain types of) manager occupations for women

(left-hand panel: impact* in percentage points of having children in the household and gender gap** in percentage points on the probability of working in a managerial occupation (ISCO-1), for workers aged between 20 and 64 years, over the period 2011-2019: right-hand panel: gender gap among managers*** in percentage points on the probability of working in a certain managerial occupation (ISCO-1 3digits), for managers aged between 20 and 64 years, over the period 2011-2019)



Source: LFS, authors' computations.

* Based on estimations provided by treatment effect (having children) of propensity score matching technique, the control group is constructed with the following matched characteristics: age, province of residence, marital status, level of education, sector of activity (NACE code), working full-time or part-time and year of the survey, separate estimations for women and men, the reference group being working women/men without children.

** Based on estimations provided by treatment effect (being a women) of propensity score matching technique, the control group is constructed with the following matched characteristics: age, province of residence, marital status, level of education, having children or not, sector of activity (NACE code), working full-time or parti-time and year of the survey, the reference group being men.

***Based on estimations provided by treatment effect (being a women) of propensity score matching technique, the control group is constructed with the following matched characteristics: age, province of residence, marital status, level of education, having children or not, sector of activity (NACE code), working full-time or parti-time and year of the survey, the reference group being men managers.

those two factors, the gender gap is reduced to 10.5 percentage points. The higher propensity of women to opt for a part-time job, in particular when they become mothers, also explains lower chances to get supervisory responsibilities. Nevertheless, controlling for personal characteristics, parenthood, sector of activity, type of occupation and working time arrangement, a supervisory responsibility gender gap of 8.1 percentage points is still observed.

In Belgium, 8 % of workers are employed in a managerial function, the highest level of occupation based on the International Standard Classification (ISCO). While for other occupations classified as high-skilled (namely intellectual and scientific occupations as well as technician and associate professionals) gender equality is verified, among managers, only 33 % are women. Despite public support, policies (such as the introduction of quotas in administration board in 2011) and awareness-raising campaigns, women are still under-represented in top positions.

As for jobs with supervisory responsibilities, it is not motherhood *per se* that negatively influences the probability of becoming a manager but rather previously linked choices made in terms of sectors and working time arrangements. Controlling for those factors in our estimations, shown in chart 11, even leads to a positive impact of having children for two similar women. Moreover, while the gender gap in reaching managerial posts is equal to –5.7 percentage points when controlling for personal characteristics, it shrinks to 3.7 percentage points when looking at the penalty within sectors and even comes down to 1.9 percentage points when neutralising for the higher propensity of women to work part-time. Another explanation is related to career breaks taken earlier on in the career and the lower propensity to work overtime (see section 1.2). Temporarily interrupting a career or refusing to work non-standard hours is interpreted as a negative signal for the employer in terms of attachment to the labour market and motivation, while the contrary is associated with higher willingness to work and motivation and therefore with a premium both in wages and in promotions. In fact, results show a small bonus for fathers since they are 1 percentage point more likely to be managers than their non-father counterparts.

It is also of particular relevance to mention that gender disparities also appear among managers. Once women get access to a higher position, this is more likely to be the case as business services and administration managers, hotel and restaurant managers, professional services managers, or retail and wholesale trade managers. Conversely, men are more likely to become industry managers, ICT service managers, managing directors and chief executives or legislators and senior officials. Partly linked to social norms, this also reflects gender differences in fields of study (see next section). For example, while women are more likely to be highly educated, they less often choose STEM orientations.

Such findings highlighting a glass ceiling for women are common in the economic literature (see, for example, Cook and Glass 2014). Even in a country advocating gender/parenthood equality such as Sweden, Keloharju *et al.* (2019) find that the lack of women in top position is mainly due to their slower career progression (career breaks and average shorter hours than men) after childbirth rather than other observables (such as level of education, for example). Moreover, among those who finally reach those executive positions, women tend to be better qualified than men so they need to outperform their male counterparts to overcome barriers related to family life.

More than a glass ceiling, there is an emerging literature pointing to a glass cliff phenomenon, i.e. greater precariousness of women's leadership positions (Ryan *et al.*, 2016). More recently, Gupta *et al.* (2020) found that female CEOs are 45 % more likely to be dismissed than male CEOs and that female dismissal is less sensitive to a firm's performance. So, it is not only more difficult for women to access top positions, but it is also more difficult to stay in those positions.

Nonetheless, economic literature has largely proved that gender diversity could be beneficial to firms. For example, analysing firms' patents and board characteristics across 45 countries, Griffin *et al.* (2021) found that firms with gender-diverse boards have more patents and a higher innovative efficiency. They also highlighted the fact that boards which are more likely to include women are in countries with narrower gender gaps, higher female labour market participation and less male-oriented cultures. Azmat and Boring (2020) also confirm these findings related to firm productivity and performance but also find that one of the factors influencing low gender diversity practices is related to women's reluctance to work in a male-centric environment. Furthermore, family-friendly companies, preferred by women, generally offer fewer career opportunities and pay lower wages.

3. A story of preferences?

After seeking to identify the observable factors explaining the gender gaps, the literature has tried to understand why men and women position themselves differently in the labour market when they become parents.

For a long time, economists have studied the question by assuming that choices were made voluntarily by individuals according to their preferences or due to a comparative advantage within the household. Women would specialise in housework and childcare because they have a preference and/or comparative advantage in these areas, while men would have a preference/comparative advantage for paid work. According to this kind of model, the gender wage gap inevitably induces a specialisation of men in the market and of women at home.

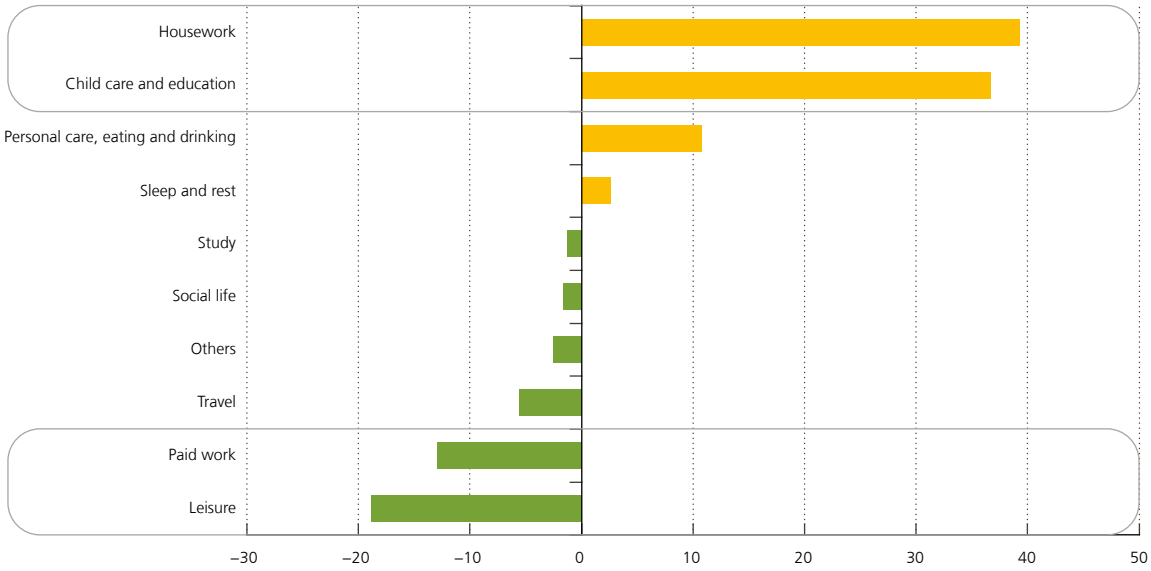
Sociology has brought a new vision by trying to understand what underlies these choices and preferences. Social constraints and conditioning play an important role in the formation of preferences and choices. Harper *et al.* (2020) define the social norms as *"the rules that determine behaviours and attitudes, prejudices and values, and codes of conduct and beliefs"*. Within social norms, gender norms dictate how people must behave to conform to what is expected according to their gender. They are internalised by individuals at an early age and are part of the individual's self-perception and self-esteem. Those rules are implicit and informal but strongly shared by society, both by men and by women (Bertrand 2020). For example, in countries where men feel that if jobs are scarce, they should go to men first, a view that is also shared by women. Individuals who do not behave in line with gender stereotypes are evaluated negatively and are subject to social pressure. It should be highlighted that social norms change with time and place. They are linked to the cultural context but are not limited to it.

Women's choices on the labour market are influenced by those gender norms, i.e. by the need to conform to what is expected as appropriate behaviour from a "good wife" or a "good mother", with detrimental effects on their career. Note that gender stereotypes also hinder men willing to spend time with their children. Even in

Chart 12

Gender specialisation in time devoted to paid work, housework and childcare

(gender time gap[1] in %, average time use for a weekday, 2013)



Source: Statbel.

1 Defined as (time spent by women – time spent by men) / time spent by men.

our modern world, the perception of men's and women's roles differs, whether in the household or in the labour market. According to Kleven *et al.* (2019), social norms and the family environment play a major role in women's choices and preferences for family over career. Using items from the International Social Survey Programme such as: "Should a woman with children under school age or in school work outside the home (full-time or part-time) or stay at home?" as a proxy for gender norms, they find that countries with larger child penalties are characterised by more conservative views.

The daily time use very clearly reflects gender stereotypes. Chart 12 illustrates the gender gap for the time devoted to different activities during a weekday (based on the time use survey, 2013[1]). The gender division of occupations remains traditional: while women spend less time in paid work – and leisure – than men: they devote more time to housework and childcare. The less time dedicated by women to the labour market is more than offset by the time spent in unpaid work like housework or childcare. If we focus on the 25-39 age group having at least one child of less than seven, the gender differences are even more significant[2]. Those mothers spend an average of 16h06 per week on childcare and education, compared to 8h34 for fathers. Mothers spend 18h16 in paid work, fathers 31h51. Domestic tasks account for 20h32 for mothers, 12h25 for fathers. Thus, on average, per week, mothers spend 13h35 less in paid work than fathers, 25h39 more for childcare and domestic chores. And there is little change over time: in 1999 (2013), women spent 5h50 minutes (5h22) cooking, men 2h08 (2h08). The same observations hold true for the time spent cleaning or doing the dishes. If we look at the situation for teenagers, there are already differences in time use. Girls spend more time on education, social life and domestic tasks, boys on free time.

The coronavirus crisis has highlighted the persistence of gender differences in the division of roles between men and women. Although men did a bit more at home, women managed the best part of it. Due to the closure of schools, the volume of childcare increased significantly. It was principally women who took it on in combination with their job. The possibility of teleworking has sometimes resulted in a double day for mothers: childcare and paid work. It comes as no surprise that women reported feeling more tired and stressed during the COVID crisis than men (Mascherini *et al.*, 2020). According to a study by the VUB, lockdown actually reinforced gender inequality[3]. Although men were at home 4 hours longer every day during the lockdown than in 2013 (previous wave of the survey), they did just six minutes more housework. Even when men do not have the possibility to go to work, to the sports club or restaurant, they still do not spend more time on the household[4].

De Rock & Perilleux (2021) have looked at the time allocations within households between paid and unpaid work and its incidence on life satisfaction. They show that, independently of the level of education of their partner, men spend more time in paid work and women in unpaid activities. They found a negative effect on subjective well-being for women when they work full-time and also carry out the majority of the unpaid work, leading to a double burden. In that case, women are happier when working part-time. They conclude that women would be in favour of a more balanced division of paid and unpaid work, but not men. Flèche *et al.* (2020) also find similar results. In households where the woman works more hours on the labour market that the man but still does most of the housework, she feels overwhelmed and dissatisfied. According to the authors, women with egalitarian beliefs perceive this unequal division as unfair, which reduces their life satisfaction. Bertrand (2020) postulates that the social pressure is the reason why women in high positions do not do less at home, but actually more, to conform to what is expected of a good wife and mother. Women do not have a preference for household activities, but rather a fear of the reputational consequences of not doing so. In the same vein, it appears that both partners seem to be apprehensive about the woman earning more than the man, as this undermines the male breadwinner principle. Finally, couples where the woman has a high income have a higher probability of divorce (Bertrand *et al.*, 2015).

1 In 2013, 5 500 respondents aged 10 and more from 2 700 households were interviewed. The next wave of the survey started in 2021.
2 Institut pour l'égalité des femmes et des hommes (2020).
3 Quarantine reinforces gender inequality (vub.ac.be).
4 Mannen waren vaker thuis, maar hielpen amper meer – De Standaard.

Stereotypes do not only shape women's labour market decisions but come into play much earlier. Women's educational choices, in particular, also have potential negative repercussions on their career. The uneven concentration of women and men in different fields of study leads to segregation in the labour market (by occupation and sector). Chart 13 shows the choices of field of study made by young people at higher education by gender. It illustrates the over- or under-representation of women for each field of study relative to men. First of all, there are proportionally more women entering higher education than men. Then, women concentrate their studies in the fields of health, education and social sciences. They are, on the other hand, under-represented in the fields of ICT, engineering and natural sciences, generally leading to higher-paid occupations. These choices thus have consequences in terms of future income and career opportunities.

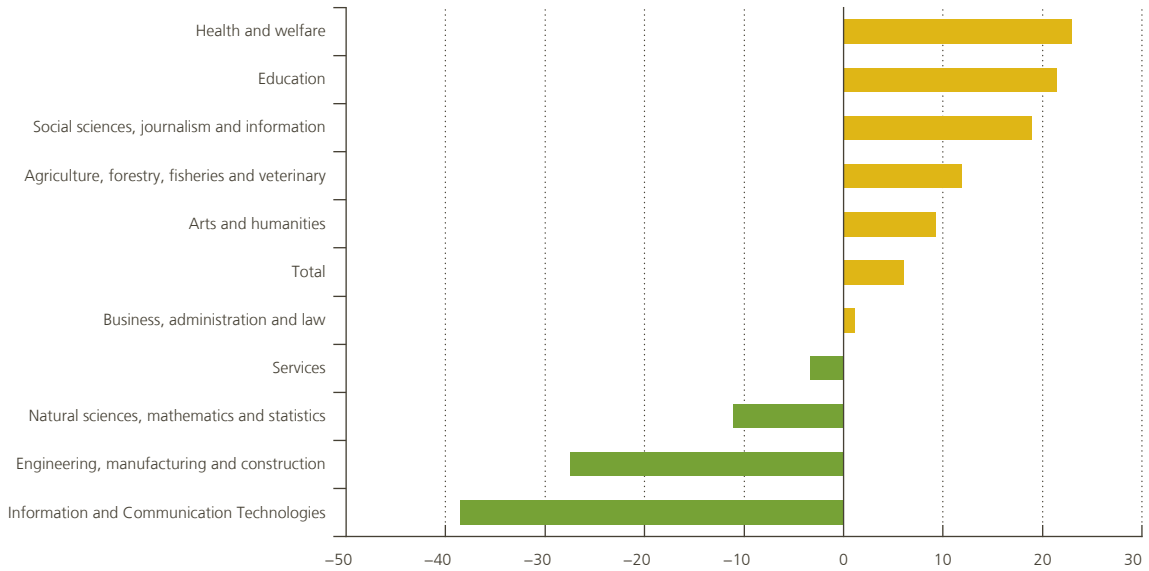
Some claims that gender differences in choices are driven by differences in psychological attributes, such as attitudes to negotiation, competition and risk-taking. Some personality traits are associated with women, such as subordination or being maternal. Women are also considered to be more risk-averse, more sensitive, more stressed and more pessimistic. Men are associated with traits such as authority, a competitive mind or rationality (Bertrand 2020). Men are also perceived to be more efficient than women and generally have higher self-esteem, i.e. more confidence in their relative abilities. For equivalent work, men score higher than their female counterparts, regardless of the gender of the evaluator. Women therefore avoid competitive situations, while men do not (Gneezy *et al.* 2003, Niederle and Vesterlund 2007).

Those gender stereotypes lead women to undervalue their skills in areas considered as masculine (such as STEM). Owing to the lack of confidence in their ability to succeed, they avoid such fields. The opposite is true for men, who overvalue themselves. The belief that women are not good at mathematics can become self-predicting. Gender norms affect the performance of women in school and subsequently in the labour market. In addition, some women anticipate their role as mothers and integrate this factor into their study and career choices, limiting themselves to family-friendly occupations and sectors.

Chart 13

Different study orientations by gender

(over and under-representation of women by field of study in tertiary education in percentage points, 2019)



Source : Eurostat.

These stereotypes are shared – often unconsciously – by society and have an impact on attitudes very early in life. For example, little girls will be taught that "it's not nice" to focus on their own interests. Parents are more tolerant regarding their child's aggressiveness and competitive behaviour if it is a boy. Those stereotypes then remain for the rest of their lives. For example, while men tend to negotiate their salaries when they start work, this is less likely to be the case for women, for whom this type of behaviour is perceived negatively.

How many of these differences are innate and how many are acquired? Behavioural differences – as well as the relative disadvantage of women in STEM subjects – are not observed in matriarchal societies or in single-sex schools (Gneezy *et al.* 2006, Hoffman *et al.* 2011). In fact, there are very few differences between the psychological traits of men and women (Gneezy *et al.* 2003, Niederle & Vesterlund 2007, Bertrand 2020, Hyde 2005). Rather than reflecting innate gender differences, these are socially constructed norms: teachers, the family and the cultural context are determinants of the formation of women's choices and preferences but also of their self-perception (Carlana 2019, Dossi *et al.* 2019, Fernandez and Fogli 2009, Nollenberger, Rodríguez-Planas, and Sevilla 2016).

4. The role of policies

For reasons of equity (women should have the same opportunities as men), but also for reasons of efficiency (diversity in the labour market has a positive impact on economic growth), public authorities use different policies to facilitate the combination of family life and work, and more generally to fight against discrimination and gender gaps. In this section, we will present some of these measures, and their potential effects on the labour supply of women.

The imposition of quota aims to boost gender equity. They are often controversial, but help to reduce inequalities, even if their impact remains tenuous. Indeed, it seems that the impact of a quota imposition is limited to the targeted body, with no "spillover" effect to other levels of the company. A recent article in L'Echo[1] explained that the legal obligation imposed on Belgian administration councils from 2011 onwards (a third of women at least) helps strongly increase the proportion of women from less than 10 % ten years ago to more than one-third in 2020. Nevertheless, the positive impetus does not expand to the composition of boards of directors, not covered by the law. In fact, only 14 % of the members of the boards of Belgian quoted firms are women. Quotas have also another drawback. There is evidence that those hired through quotas are likely to be perceived as less competent and illegitimate (Bertrand, Black, Jensen and Lleras-Muney, 2019).

Some measures are specifically aimed at facilitating the combination of family life and work. These include career breaks and thematic leave. While they help reduce the number of women leaving the labour market for family responsibilities: they also have adverse effects on women's careers. Indeed, they genuinely reduce employment experience and thus pay. Rossin and Salter (2017) showed that maternity leave of more than one year had negative effects on women's careers: and that paternity leave could actually reduce the child penalty for women, directly and indirectly by changing social norms on gender roles. Using Belgian data, Fontenay and Tojerow (2020) showed that the paternity leave extension from three to ten days (for children born after 1 July 2012) reduced the incidence rate of work disability of mothers, especially for first-time mothers under the age of 30. According to the authors, paternity leave would sustainably increase the involvement of fathers in the upbringing of their children, with a positive impact on the health of women.

In addition to the impact on accumulated experience, opting for these career breaks may be perceived as a signal of less attachment to the labour market. As a result, some workers are reluctant to use them.

1 Un comité de direction sur deux est exclusivement masculin – L'Echo (lecho.be).

Men because they are not supposed to use them (*"it is the mother's job to bring up the children"*): women because it confirms that their priority is not their job. Therefore, this type of policy tends to reinforce stereotypes (Olivetti and Petrongolo 2017, Rossin-Slater 2017). In Sweden or Norway, parental leave must at least be partly shared between both parents. Sweden was the first country to explicitly introduce paternity leave in 1974. Swedish parents are entitled to 16 months of parental leave, to be divided between both parents, with a minimum of two months reserved for the father. The aim is to promote their involvement in the upbringing of children and gender equality in the workplace. Nevertheless, even in Sweden, raising children is still seen as a woman's role: it is still mothers who use most of the parental leave (in two-thirds of the cases). This result just goes to show how hard it is to break gender norms. In Belgium, reforms are moving in the right direction as paternity leave has been raised to 15 days in 2021 (instead of 10 days before) and will again go up to 20 days in 2023. As a reminder, maternity leave is 15 weeks, divided into two periods (pre- and post-childbirth[1]). Parental leave (4 months full-time and proportionally more part-time[2]) is eligible for both parents, as is the time credit for "care of child under 8"[3]. Even if men are eligible, the various forms of parental leave and career breaks remain a women's matter: it is mostly women who reduce their working hours or leave – temporarily or not – the labour market at the birth of a child.

Other policies, such as flexible working hours or teleworking, also aim to facilitate the combination of family life and work. However, these arrangements may also be associated with a negative bias on the part of employers. Despite the positive aspects involved in terms of flexibility and time saved from less commuting, working from home could pose a risk for working women as they will be perceived as being more available to carry out housework and childcare. This could exacerbate the imbalance in the division of tasks within their household. In work, women could be perceived as being less invested in their jobs, with repercussions in terms of career and wage (Coppens *et al.* 2021). During the COVID-19 crisis, according to a study based on Dutch data, mothers spent three-quarters of their teleworking time simultaneously looking after children, 30 % more than their spouses. Furthermore, the children interrupted them twice as much as their fathers while working from home[4].

The provision of childcare can help women to remain in the labour market. Blau and Wincker (2017) as Olivetti and Petrongolo (2017) demonstrate that childcare subsidies boost mothers' labour supply without the potential negative impact of parental leave. To be efficient, the scheme must meet several conditions. First, it must be offered in sufficient numbers. Second, it has to be affordable for all workers (even the low-paid). And third, it is also important that the hours covered allow for full-time employment. This last point is not only imperative for small children under three, but also for older children, at school. In Belgium, school timetables and holidays make it difficult to easily combine children at school age and work.

Conclusion

Despite strong convergence in terms of employment rates, being a mother is still associated with a penalty on the labour market. Our results shows that gender gaps – at the intensive and extensive margins – are strongly related to parenthood. Higher labour market participation among women has not led to a more balanced division of unpaid work like housework and childcare. Women still bear most of the burden. However, nowadays, more women have graduated from tertiary education than men. Though they themselves limit their educational choices and career opportunities in order to take care of their children or family members in need. Such choices lead to a child penalty for women until the youngest child of the household is five years. Our results also

1 1 to 6 weeks before childbirth; 9 to 14 after, according to the number of weeks taken before.

2 4 months if suspension full-time, 8 months if half-time, 20 months if 4/5ths, 40 months if 9/10ths, available until child's 12th birthday.

3 Maximum 51 months, whatever the form of interruption full-time or part-time. The duration is deducted from other forms of time credit such as "palliative care" or "following a recognised training course" time credit.

4 "Les femmes qui peuvent télétravailler, même lorsqu'elles ont des enfants, s'en sortent mieux économiquement" – lemonde.fr.

illustrate that the penalty materialises through different channels according to the level of education of the mother. Low-educated women tend to leave the labour market, while highly educated ones reduce their working time. This difference could certainly be linked to the inherent costs of childcare relative to wages. People with a low level of education tend to have lower wages. The costs and inconvenience of working simultaneously while caring for one (or more) young children can exceed the earnings for low-paid jobs. Highly-educated women tend to earn higher wages and therefore prefer to keep their jobs and get a return on the investment in education they made at a younger age. Nevertheless, to manage children and a job, they opt for temporary career interruptions or part-time work. Those choices reduce their opportunities later on to reach top positions and supervisory responsibilities. For men, it appears that the effect of parenthood is neutral or even an advantage for their career. This premium may be related to men compensating for their partner's reduced labour supply – and thus reduced wages – by working more than before or trying to reach better position to get higher wage. This would be in line with gender stereotypes, where women are in charge of children and men are the breadwinners.

As greater labour market participation among women generates economic gains, various public measures aim to facilitate the combination of family and work, and more generally to fight against discrimination and gender gaps. Nevertheless, they appear to generate some adverse effects on women's careers. Indeed, those policies tend to reinforce gender stereotypes. Even if generally eligible for both men and women, the use of these schemes – in order to care for children – is mainly made by mothers.

Gender norms matter a lot in this story as they lead to the persistence of traditional gender roles and thus put a brake on social progress regarding gender equity. In order to reduce the gaps, social norms on the division of roles within the household and in the labour market need to change. To reach a more balanced labour market, caring responsibilities must be shared more equally between men and women. The solution does not lie in helping mothers to reconcile work and family, but to get fathers involved too. Shared use of parental leave, as in Sweden, could contribute to a fairer picture. Availability, affordable and adequate childcare also facilitate both parents' employment. A campaign to raise women's awareness, at an early age, of the consequences of their educational and career choices would certainly also help enhance women's emancipation. More generally, to enable a change in social norms, all actors in society must be involved. In particular, the environment (family, friends, teachers, etc.) and the media, influencing attitudes and behaviour from an early age, have a major role to play. It should also be highlighted that gender equity benefits men too, as some would prefer to work less hours and spend more time with their children. It is important to take the necessary steps now to implement these changes, as changing social norms is a long-term process, taking decades or generations to materialise.

Further work on how decisions are taken within households could make it easier to understand our findings, in particular, depending on the level of education or the working conditions of both partners, also including an analysis to see how decisions change or do not change when the woman is the one who brings the highest wage into the household before parenthood. Specific focus could also be dedicated to single parents, as they become more and more common and as women are mainly at the head of such households.

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Abstracts from the Working Papers series

401. Bank specialization and zombie lending, by O. De Jonghe, K. Mulier, I. Samarin, November 2021

Bank specialization leads to expertise, including knowledge on zombie borrowers and the negative impact they exert on healthy borrowers. This induces specialized banks to reduce zombie lending. The reduction in zombie lending is greater when the scope and opportunity cost of negative spillovers to healthy borrowers is larger; namely, when the fraction of sectoral labor stuck in zombie firms is larger or when the sector is expected to grow faster. Additionally, specialized banks reduce zombie lending less in sectors with higher asset specificity, as zombie firms' defaults (and potential asset fire sales) could trigger reductions in healthy borrowers' collateral values.

Conventional signs

€	euro
$	dollar
%	per cent
°C	Celsius
Bn	billion
e	estimate
e.g.	*exempli gratia* (for example)
EUR	euro
et al.	*et alia* (and others)
etc.	*et cetera*
i.e.	*id est* (that is)
p.m.	*pro memoria*
p.p.	percentage point
vs	versus
USD	US dollar

List of abbreviations

Countries or regions

BE	Belgium
DE	Germany
EE	Estonia
EL	Greece
ES	Spain
IE	Ireland
FI	Finland
FR	France
IT	Italy
CY	Cyprus
LT	Lithuania
LU	Luxembourg
LV	Latvia
MT	Malta
NL	Netherlands
AT	Austria
PT	Portugal
SI	Slovenia
SK	Slovakia
BG	Bulgaria
CZ	Czech Republic
DK	Denmark
HR	Croatia
HU	Hungary
PL	Poland
RO	Romania
SE	Sweden
EU	European Union
EU27	European Union of 27 countries
UK	United Kingdom
US	United States
FLA	Flemish Community
FWB	French Community

GER	German-speaking Community
RBC	Brussels-Capital Region
WAL	Walloon Region

Abbreviations

AI	Artificial intelligence
ALMP	Active labour market policy
APR	Annual percentage rate of charge
ASAP	Law on the acceleration and simplification of public action
BEUC	Bureau Européen des Unions de Consommateurs
CEO	Chief Executive Officer
CEPR	Centre for Economic Policy Research
CES	Consumer Expectations Survey
CO_2	Carbon dioxide
COFOG	Classification of the Functions of Government
COICOP	Classification of Individual Consumption by Purpose
COVID-19	Coronavirus disease-19
CREG	Commission for Electricity and Gas Regulation
CSR	Country-specific recommendations
CST	COVID Safe Ticket
DESI	Digital Economy and Society Index
DG	Directorate General
DIW	*Deutsches Institut für Wirtschaftsforschung*
EBA	European Banking Authority
EC	European Commission
ECA	European Court of Auditors
ECB	European Central Bank
Ecofin	Economic and Financial Affairs Council
EEA	European Environment Agency
ESA	European System of Accounts
ESD	European Sectoral references Database
ETS	Emissions Trading System
EU	European Union
EUA	EU Allowances
Euribor	Euro interbank offered rate
Eurostat	European Statistical Office
EV	Electric vehicles
FED	Federal government
FPB	Federal Planning Bureau
FPS	Federal Public Service
FPSF	Federal Public Service Finance
FSUG	Financial Services User Group
FTE	Full-time equivalent

GDP	Gross domestic product
GHz	Gigahertz
GHG	Greenhouse gas
H_2	Molecular hydrogen
HFCS	Household Finance and Consumption Survey
HICP	Harmonised index of consumer prices
ICT	Information and communication technologies
IEA	International Energy Agency
IMF	International Monetary Fund
ISCO	International Standard Classification of Occupations
KWh	Kilowatt-hour
LFS	Labour force survey
MD	Ministerial Decree
MHz	Megahertz
MIP	Macroeconomic Imbalance Procedure
MIR	Monetary Financial Institutions' Interest Rate
MSR	Market Stability Reserve
MWh	Megawatt-hour
NACE	Nomenclature of economic activities of the European Community
NAI	National Accounts Institute
NBB	National Bank of Belgium
NDC	Nationally Determined Contributions
NEIG	Non-energy industrial goods
NEO	National Employment Office
NGEU	Next Generation EU
NHS	National Health Service
NPI	Non-profit institutions serving households
NRRP	National Recovery and Resilience Plan
OECD	Organisation for Economic Cooperation and Development
PA	Public administration
PD	Partnerschaft Deutschland
PES	Public employment service
PhD	Doctor of Philosophy
RD	Royal or Inter-ministerial Decree (or Decree in a republic)
R&D	Research and development
RRF	Recovery and Resilience Facility
RRP	Recovery and Resilience Plan
S1	Semester 1
S2	Semester 2
SAFE	Survey on the Access to Finance of Enterprises
SME	Small and medium-sized enterprise

SNCB	*Société nationale des Chemins de fer belges* (Belgian National Railway Company)
SSRN	Social Science Research Network
Statbel	Belgian Statistical Office
STEM	Science, technology, engineering and mathematics
VAT	Value added tax
VET	Vocational and educational training
VUB	*Vrije Universiteit Brussel*
UN	United Nations

National Bank of Belgium
Limited liability company
RLP Brussels – Company number: 0203.201.340
Registered office: boulevard de Berlaimont 14 – BE-1000 Brussels
www.nbb.be

Publisher

Pierre Wunsch
Governor

National Bank of Belgium
Boulevard de Berlaimont 14 – BE-1000 Brussels

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Cover and layout: NBB CM – Prepress & Image

Published in December 2021