ECONOMIC REVIEW
June 2019

National Bank OF BELGIUM
Eurosystem

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Economic projections for Belgium – Spring 2019

Introduction

Since the last quarter of 2018 and the finalisation of the Bank's previous projections, the external environment has clearly become less supportive. While growth outside the euro area has so far, all in all, held up well according to the most recent indicators and statistics, this was not the case for international trade : rather than accelerating slightly, as previously foreseen in the common Eurosystem assumptions, it slowed down sharply and actually started to decline at the end of 2018. The downward revision of trade growth, in particular in the first half of the projection period, obviously weighs on euro area foreign demand, as well as on the exports of its individual countries, and is the key change in this set of projections. It explains why the Belgian growth outlook, for 2019 and 2020 in particular, is revised down slightly, after the ECB had already significantly lowered the growth estimates for the euro area in its March 2019 projections.

The global economy has shifted down a gear in the course of last year but the current indicators point to a bottoming-out. Outside the euro area, growth in the advanced countries now seems to be more resilient, with strong first-quarter growth in the United States, for instance. As regards the emerging economies, the slowdown in China continues to be quite gradual and is largely offset by an acceleration for other emerging economies. In the first months of the year, global financial markets have rebounded strongly after the significant correction in the final quarter of 2018. The rebound was partly based upon the expectation that the trade tensions between the US and China would subside. When this turned out to be wrong and further tariff increases were announced in May, volatility immediately returned to the financial markets and headwinds and downside risks for global growth again intensified.

In the euro area, economic activity slowed down throughout last year but has rebounded somewhat in the first quarter of 2019. However, this partly reflects temporary factors. Stockpiling in the UK ahead of the 29 March deadline, when a no-deal Brexit could have occurred, seems to have supported demand for exports in several countries. In addition, construction activity in Germany, in particular, was boosted by the mild winter weather. These factors are likely to support growth to a lesser extent in the second quarter. All in all, most short-term and forward-looking indicators currently suggest that euro area growth will soften again in the near term.

In general, the common assumptions for the Eurosystem projections, of which the main ones are described in the next chapter, are still based on a scenario in which the decline in world trade bottoms out in the second half of the year, so that growth in euro area foreign demand will recover somewhat in the coming years. In addition, according to these assumptions, market interest rates will rise only gradually, while the oil price levels off in the second quarter of 2019 and slowly declines throughout the projection period. It should be noted that the present projections for both the euro area and Belgium are largely conditioned by these common assumptions. However, there are significant, predominantly downside risks to this baseline scenario. Renewed disruptions of international trade, in particular, as well as a further supply-driven increase in oil prices could erode growth to a greater extent than foreseen in the projections.

According to the new Eurosystem estimates – of which the spring projections presented in this article are part – activity growth in the euro area will drop further to 1.2 % this year. This slightly exceeds the March 2019 ECB estimate, mainly due to the impact of the aforementioned better-than-expected outcome for the first quarter, which is not entirely offset by the downward revision of the growth rates in the remaining quarters of the year. The assumed recovery in world trade would fuel euro area exports and gradually bring activity growth back to a level that is closer to the potential rate. In 2019 inflation is lowered by the deceleration in energy prices. However, underlying domestic cost pressures, related to relatively high wage growth in particular, will gradually increase inflation in the projection period, although it will still fall clearly short of 2 % at the end of 2021.

Turning to Belgium, growth in the two previous quarters was fully in line with the December 2018 projections according to the revised NAI statistics. While the same applies to our short-term estimate for the second quarter of 2019, quarterly growth rates have been revised down slightly for the second half of 2019 due to the weaker foreign trade assumptions. All in all, annual activity growth is broadly stable at around 1.2 % throughout the projection period. As in previous projection exercises, business investment is still expected to decelerate while export market shares are set to decline slightly again (following the acceleration in wage costs). However, these elements should be broadly offset by the acceleration in foreign demand, in line with the common assumptions, and the expected pick-up in private consumption supported by stronger growth in purchasing power. All in all, Belgian growth is expected to be below that in the euro area again from next year.

Despite the deceleration in activity, recent employment statistics, including the initial data for the first quarter of 2019, have continued to exceed expectations. This year the employment intensity of growth is projected to continue rising slightly, which also implies that labour productivity will decline marginally again. Going forward, increases in activity will be supported more by a recovery of productivity, as employment growth slows. This is mostly due to the recent and projected acceleration in labour costs, but also because the still important impact of supply constraints on the labour market, as witnessed by the high level of vacancies, will make it increasingly difficult for firms to find suitable staff. The harmonised unemployment rate, which – on the basis of a survey – measures the number of people actually seeking work, has fallen to an exceptionally low level not seen since the 1970s. As the continuing expansion of the labour force - due partly to the measures aimed at limiting early departure from the labour market - is more or less keeping pace with job creation, the unemployment rate will remain particularly low throughout the projection period, despite the weakening activity growth.

Inflation will be lowered this year by the strong deceleration in energy prices. The projected gradual decline in those prices will weigh on inflation over the entire 2019-2021 period. This is broadly offset by rising core inflation during the projection period, even though, just as in the past, the sharp rise in labour costs will not be fully reflected in prices, but will lead to a contraction in profit margins. The latter should continue to drop to a level that corresponds to their long-term average by 2021.

Finally, turning to public finances, the budget deficit has declined to just 0.7 % of GDP but this largely reflects the strong rise in advance payments by businesses in the context of the increased surcharge on any shortfall in those advance payments. As this temporary factor unwinds and higher prepayments are offset by lower tax settlements, the budget deficit will widen again during the projection period, despite the continuing decline in interest charges on the outstanding debt. By the end of the projection period, the deficit is expected to increase again to more than 2 % of GDP, which is a long way from the target of a structurally balanced budget. The government debt ratio edges down, but debt still remains larger than GDP by 2021. Here it should be pointed out that, in accordance with the Eurosystem rules for these projection exercises, account is only taken of measures which, on the cut-off date for the estimates, the government has already specified in sufficient detail and has formally approved, or is very likely to approve. In addition, the estimates of the impact on the budget of certain measures, such as those to combat fraud, deviate from the amounts included in the budget.

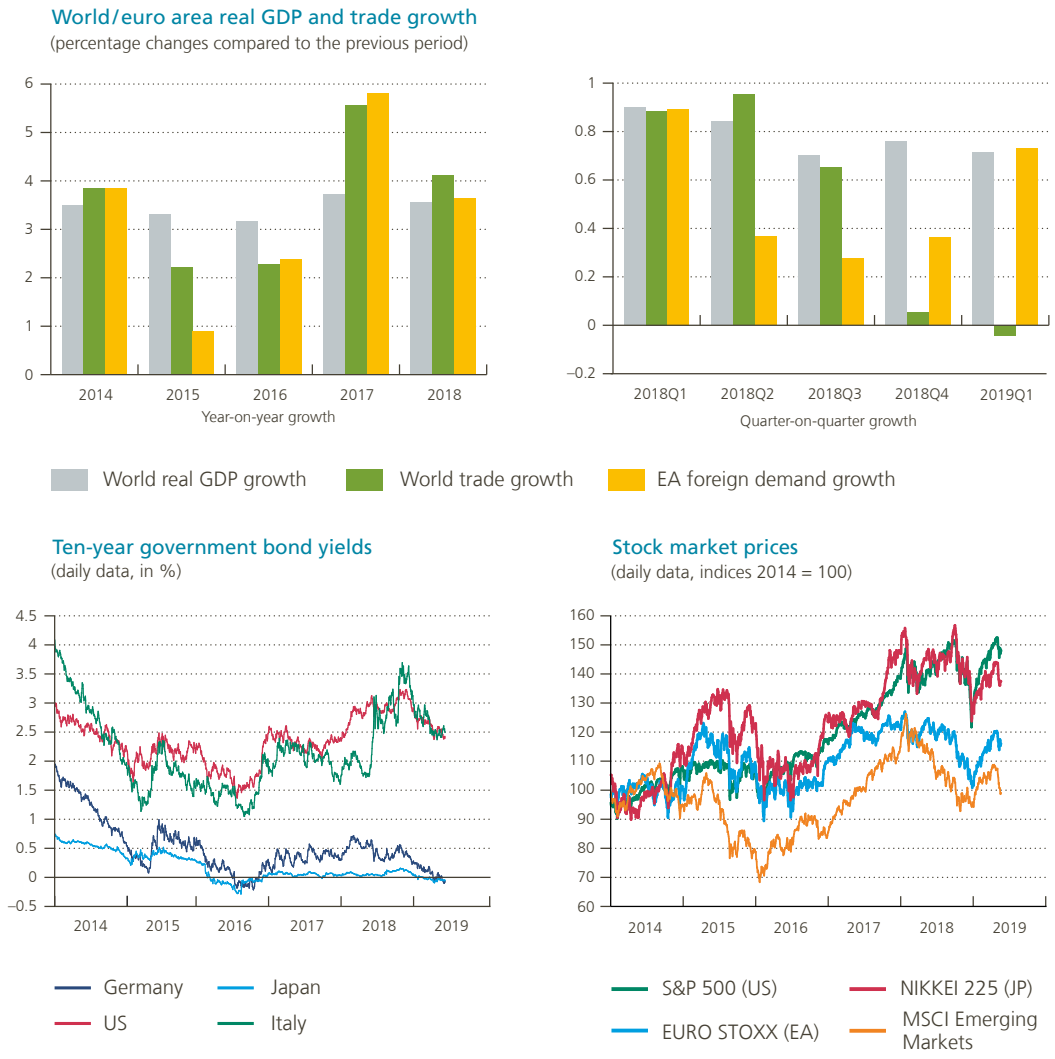
1. International environment and technical assumptions

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 assumptions are based on information available by 21 May 2019.

1.1 World economy and trade

Chart 1

The global economy, trade and developments on the financial markets



Sources: ECB, Thomson Reuters.

Following solid growth in 2017 and at the beginning of 2018, the world economy lost some momentum in the second half of last year and growth continued to moderate into 2019. Overall year-on-year growth in advanced economies edged down in the third quarter of 2018, and more so in the fourth quarter, driven by a greater than expected weakening in euro area growth, due in part to disruptions to the German car industry, and natural disasters causing output to collapse in Japan. In contrast, US growth benefited from an expansionary fiscal policy throughout 2018 and into 2019. Mired in uncertainty by the Brexit negotiations, the UK economy continued to grow at a relatively stable but slower pace than in 2017. Emerging market economies saw, on average, slightly weaker but still firm growth over 2018 and early 2019. However, this again masks great heterogeneity. China's growth gradually declined over the year to the first quarter of 2019, as Chinese authorities engaged in regulatory tightening to dampen credit growth, and trade tensions with the US eventually began to weigh on exports. Vulnerable emerging market economies with substantial domestic and external imbalances, most notably Turkey and Argentina, were hit hard by investor concerns about the balance sheet effects of a strengthening US dollar. The restrictive policy measures that were put in place to stem further currency depreciation and accelerating inflation drove both countries into sharp recessions by the second half of 2018. Conversely, in other large EMEs, particularly in India, growth remained on a much stronger footing.

Most international organisations predict a modest pickup of global growth from its current weakness in the second half of 2019. Medium-term growth is expected to remain relatively steady, close to 3.6 % annually in the outer years of the projection period. In advanced economies, activity is projected to continue to slow down gradually, predicated on the waning impact of US fiscal stimulus. In addition, China – the largest emerging market economy – is estimated to continue its transition towards a lower but more sustainable growth path, notwithstanding increasing policy stimulus. However, these downward forces should be broadly offset by a gradual recovery in several other emerging market economies that are currently, or were until recently, in recession. While the overall outlook for growth remains relatively benign, it is marked by great uncertainty and significant downside risks.

World trade growth took a severe hit and even turned negative in the closing months of 2018 and early 2019, driven by a sharp decline in the volumes of goods exported by emerging Asia. China's exports have been particularly volatile over this period and its imports have been trending down in line with domestic demand. This has happened against the background of increasing trade restrictions, but the sharp deceleration in trade is broad-based and goes beyond the products and countries directly targeted by tariff increases. The indirect impact of trade restrictions spreading through existing global value chains or generated by increased uncertainty is likely to have played a major role.

The fall in world trade has also depressed euro area foreign demand, even though the latter was boosted, in the first quarter of 2019, by a massive surge in import demand from UK companies. This seems to be related to very strong precautionary increases in those companies' inventories in the run-up to the initial 29 March Brexit deadline. A no-deal Brexit on that date was averted in the end, but could have severely disrupted trade relations.

Despite the recent weakness and the current low levels of forward-looking indicators for trade, such as export orders in manufacturing, most international organisations expect the global trade momentum to turn positive again and gain traction as of the second quarter of this year, and to gradually return to a pace that is more in line with that of global activity. The expected recovery of world trade is mirrored by the growth path of euro area foreign demand and Belgian export markets, with the latter being an important determinant of the macroeconomic projections for Belgium in the medium-term. Belgian export market growth declined throughout 2018 but, in accordance with the Eurosystem common assumptions, it is set to pick up slightly in the coming quarters, to an annual growth rate of at least 3 % in the outer years of the projection period.

Table 1

The international environment

(annual percentage changes)

	2018	2019 e	2020 e	2021 e
World (excluding euro area) real GDP	3.8	3.3	3.6	3.6
World (excluding euro area) trade	4.6	0.7	2.8	3.4
Euro area foreign demand [1]	3.6	1.7	2.6	3.1
Belgium's relevant export markets [1]	3.3	2.4	3.0	3.3

Source: Eurosystem.

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

1.2 Technical assumptions about exchange rates, interest rates and commodity prices

After great volatility and sharp corrections in financial markets in late 2018, the first months of 2019 saw a strong rebound in global equity markets and an easing of financial conditions, especially in advanced economies. New concerns about global trade and additional tariff hikes have, however, increased financial volatility again since May. The overall decline in longer-term interest rates that started in the final months of 2018 continued into 2019, supported by recent monetary policy decisions and forward guidance by the major advanced economy central banks. Euro area specific risks have remained contained. Italian bond yields, which jumped higher in the autumn of last year in the context of budget discussions between the Italian government and the European Commission, have softened since and stayed on a downward path since December 2018. Meanwhile, from the last quarter of 2018 onwards, the euro has depreciated slightly and very gradually, both bilaterally against the other main advanced economy currencies and in nominal effective terms.

Oil prices fell sharply between October and December 2018, from a high of around $ 85 to just above $ 50 per barrel, because of record US oil production, as well as weakening global growth prospects. Since the start of the year, prices have rapidly rebounded to about $ 73 in May, mostly due to supply-side factors, such as production cuts by OPEC, interruptions of production in Venezuela and Lybia, and the end to certain waivers of US sanctions on Iran.

In the Eurosystem projections, bilateral exchange rates are assumed to remain unchanged over the projection horizon at the average levels prevailing in the last ten working days before the cut-off date. In the case of the US dollar, this implies an exchange rate of $ 1.12 to the euro.

As usual, the assumptions concerning commodity prices take account of market expectations as reflected in forward contracts on the international markets. At the cut-off date, markets expected the price per barrel of Brent crude oil to edge down again as of the second half of the year.

The interest rate assumptions are also based on market expectations. The three-month interbank deposit rate has been stable for about three years, at around –30 basis points. Markets currently expect the interbank deposit rate to edge up very slowly and stay below zero even at the end of the projection horizon. Long-term yields on Belgian government bonds are currently low as well, and are set to average 0.5 % in 2019. They are expected to rise only gradually to just 0.9 % on average in 2021. Similarly, bank interest rates on business investment loans and household mortgage loans will also record only a moderate rise during the projection period.

All in all, the current Eurosystem assumptions are clearly less favourable than those used in the Bank's autumn 2018 macroeconomic projections. The favourable impact of the lower interest rates is more than offset by the strong downward revision in Belgian export markets, by more than 2 pp over the 2019-2021 period.

Table 2

Technical assumptions

(annual averages; in %, unless otherwise stated)

	2018	2019 e	2020 e	2021 e
EUR/USD exchange rate	1.18	1.12	1.12	1.12
Oil price (US dollars per barrel)	71.1	68.1	65.8	62.7
Interest rate on three-month interbank deposits in euro	–0.3	–0.3	–0.3	–0.2
Yield on ten-year Belgian government bonds	0.8	0.5	0.7	0.9
Business loan interest rate	1.6	1.6	1.7	1.8
Household mortgage interest rate	1.9	1.8	1.9	2.0

Source: Eurosystem.

1.3 Estimates for the euro area

According to the Eurosystem's current estimates and in line with the recent high-frequency indicators, euro area growth would moderate again after the rebound in the first quarter. The latter was indeed in part related to specific factors, including the spike in UK import demand, in anticipation of the initially planned Brexit deadline, as well as the mild winter weather that boosted construction activity in a number of countries. As of the second quarter, growth will benefit less from such temporary factors and weaken again. However, the aforementioned assumed gradual recovery of foreign demand will provide a stronger impetus in the outer years of the projection period. In addition, the euro area expansion will be supported by the still very accommodative stance of monetary policy and some fiscal easing. In annual terms, real GDP growth would decline significantly in 2019 but recover somewhat to a rate that is more in line with potential growth in 2020 and 2021. Even though consumption growth would remain moderate, growth in the euro area will be driven exclusively by domestic demand, as imports will outpace exports.

Inflation would moderate this year, on the back of the strong deceleration in energy prices. Thereafter the further slowdown in energy prices would however be more than offset by the gradual increase in core inflation over the projection period. This reflects rising domestic cost pressures, as past increases in wage costs will feed into prices, allowing profit margins to recover. All in all, inflation will edge up in the 2020-2021 period but stay clearly below the 2 % level at the end of the projection horizon.

While the recent employment growth was very vigorous, it is likely to lose momentum over the projection period owing to the slowdown in activity, rising labour costs and the growing shortage of skilled labour. Growth will be supported by the gradual recovery in labour productivity. The labour force will continue to expand, albeit more slowly. In that context, the impact of population ageing will be offset by increased labour market participation, notably among older workers, but also by the continuing net immigration and the increasing integration of migrants into the labour market. However, the unemployment rate will maintain its downward trend, dropping to 7.3 % in 2021. That corresponds to slightly less than 13 million unemployed, which is still somewhat above the figure recorded before the great recession.

The average budget deficit in the euro area has declined to 0.5 % of GDP in 2018 but will edge up again in the projection period, despite the further decline in interest charges. The widening of the deficit is mostly due to cuts in direct taxes and planned expenditure increases in countries that have already reached budget surpluses, such as Germany and the Netherlands, but also in Italy and France, which both still have government deficits. The fall in the government debt ratio is expected to continue, supported by the low level of interest rates : in 2021 the debt ratio will have contracted by more than 11 percentage points compared to its 2014 peak.

Table 3

Eurosystem projections for the euro area

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

	2017	2018	2019 e	2020 e	2021 e
Real GDP	2.5	1.8	1.2	1.4	1.4
Household and NPI final consumption expenditure	1.8	1.3	1.4	1.4	1.3
General government final consumption expenditure	1.2	1.1	1.4	1.4	1.4
Gross fixed capital formation	2.9	3.3	2.7	2.0	2.0
Exports of goods and services	5.5	3.2	2.2	2.9	3.2
Imports of goods and services	4.1	3.2	2.7	3.2	3.4
Inflation (HICP)	1.5	1.8	1.3	1.4	1.6
Core inflation [1]	1.0	1.0	1.1	1.4	1.6
Domestic employment	1.6	1.5	1.0	0.6	0.6
Unemployment rate [2]	9.1	8.2	7.7	7.5	7.3
General government financing requirement (–) or capacity [3]	–1.0	–0.5	–0.9	–0.9	–0.9

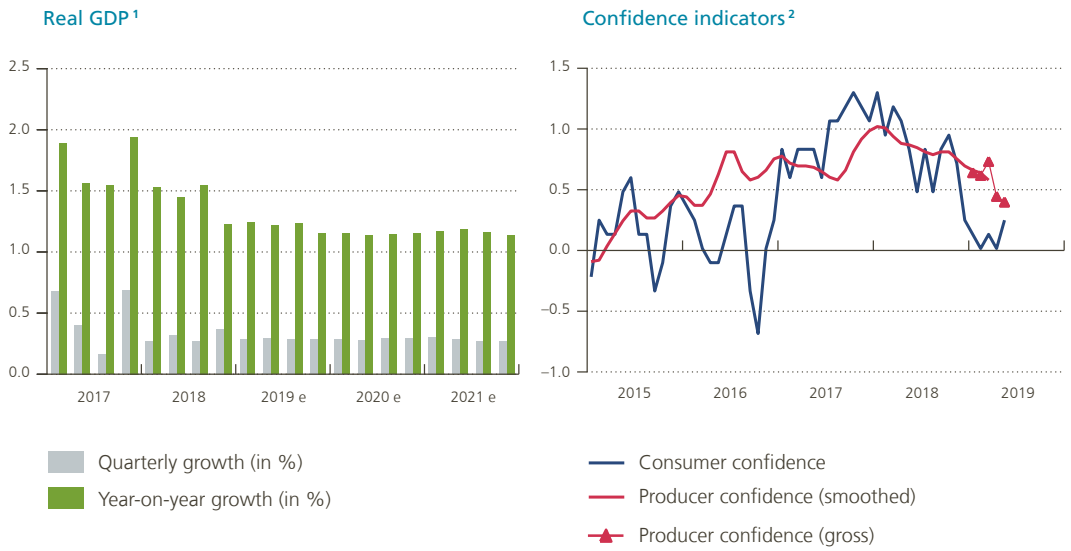
Source : Eurosystem.
1 Measured by the HICP excluding food and energy.
2 In % of the labour force.
3 In % of GDP.

2. Activity and demand

The Belgian economy grew by 1.4 % in 2018, clearly below the pace recorded in 2017. While the euro area economy slowed down further in the second half of last year, Belgian quarterly growth remained quite stable and in line with the short-term estimate of our autumn 2018 projections. Growth edged down marginally at the start of 2019 to 0.3 % on a quarterly basis, according to the revised NAI statistics. This is at odds with what was observed in the euro area, where GDP growth rebounded in the first quarter of this year, but is in line with confidence indicators for Belgium. The latter had initially remained relatively resilient but have recently worsened. Consumer confidence, for example, took a clear dive as of December and is currently close to its long-term average. Producer confidence, on the other hand, though gradually deteriorating, still remains above average. At the cut-off date of the projections, there were no clear indications of a strong pickup of activity in the near term, which is consistent with the nowcasting models used by the Bank that show stable growth of 0.3 % in the second quarter.

Chart 2

GDP and confidence indicators



Sources: NAI, NBB.

1 Data adjusted for seasonal and calendar effects.

2 Data normalised on the basis of the long-term average and the standard deviation.

The current projections point to a broadly constant growth rate of about 0.3 % until the end of the projection horizon. In annual terms, activity is set to expand by 1.2 % in 2019. Growth edges down marginally in 2020 but rises to 1.2 % again in 2021. The broadly constant growth rate can be traced back to an acceleration in private consumption that is, however, largely offset by lower investment growth and a more negative growth contribution from net exports. Compared to the Bank's autumn projections, the current growth outlook implies a limited downward revision of 0.4 pp in cumulative terms over the 2019-2021 period, which is largely concentrated in 2019 and which can be traced back to the sharp downward adjustment of export market growth.

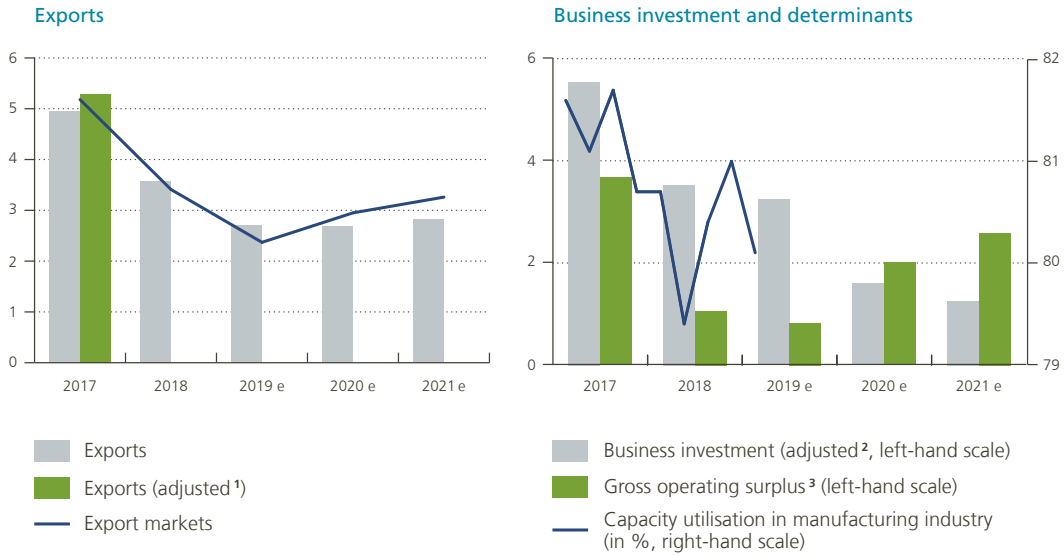
Turning to demand components, growth in the years ahead will continue to be driven mainly by domestic demand. Net exports supported growth in 2018 and continued to do so at the start of 2019 due to a marked decline in imports, but their growth contribution will gradually turn negative. While the expansion of Belgium's export markets gains traction as of the second half of this year, export growth remains broadly constant in annual terms over the projection period, as market share losses reappear. Against the backdrop of strong gains in cost competitiveness, Belgian exports had grown more or less in line with the expansion in export markets over the past couple of years, while export market shares had previously displayed a downward trend. As labour costs have accelerated and will continue to increase at a more sustained rate, export firms' cost competitiveness will evolve less favourably than in recent years and their market shares are projected to decline gradually over the projection period. As import growth is expected to edge up, in line with accelerating domestic demand, net exports would reduce growth again in the outer years of the projection period.

As usual, according to the technical assumption adopted for all the quarters covered by the projection period, the growth contribution of changes in inventories is set at zero, particularly in view of the great statistical uncertainty surrounding this concept.

Chart 3

Exports and business investment

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



Sources: NAI, NBB.

1 Export growth adjusted for the reorganisation in 2016 of the commercial activities of a large pharmaceutical company in favour of its subsidiaries based in Belgium so that, from the second quarter of 2016, the statistics show more trade flows to and from Belgium. However, since the upward impact is fairly similar for both imports and exports, there is no net effect on GDP. An adjustment should be made to take account of this statistical effect when considering the movement in market shares.

2 Adjusted to take account of major transactions in specific investment goods with other countries.

3 In nominal terms.

The declining support from net exports is offset by a rising contribution from domestic demand and, in particular, private consumption. The latter is the most important component of final demand and has been relatively lacklustre for several years already.[1] In the last quarter of 2018, private consumption growth again came in significantly below what was expected in the Bank's autumn projections, partly as a result of a severe drop in household spending on durables. The latter is likely to have been of a mostly temporary nature, as a consequence of anticipation effects in car registrations following the stricter emission testing procedures (WLTP) introduced in September. Private consumption did in fact recover somewhat in the first quarter of this year due to a rebound in purchases of durables.

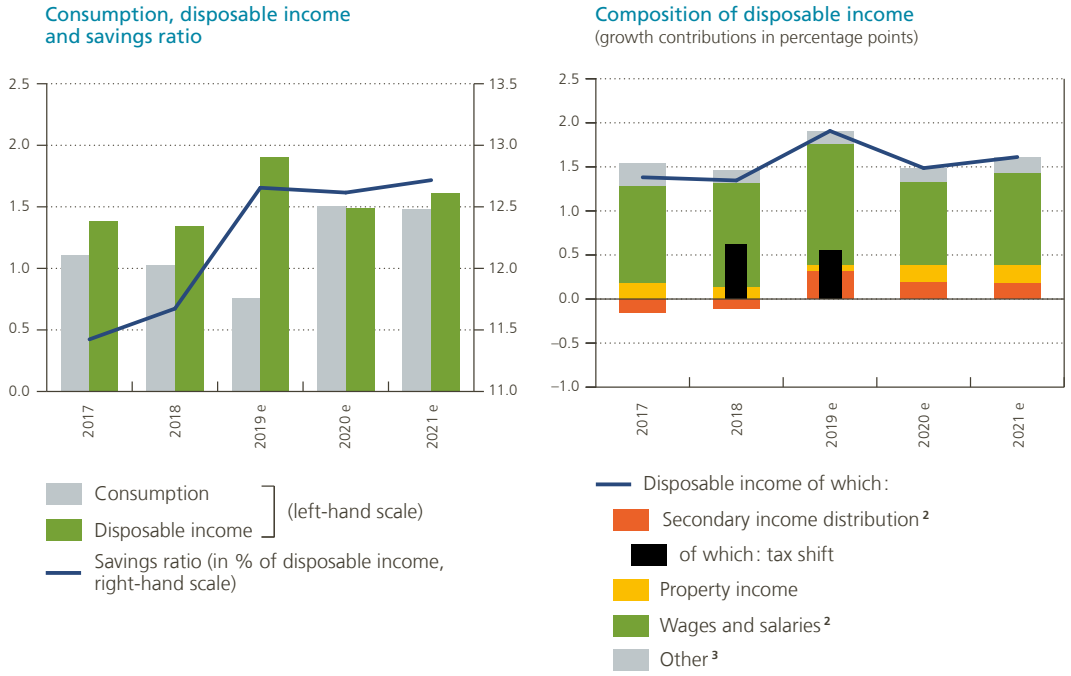
While consumer confidence has weakened to around its long-term average, the fundamentals remain relatively strong and point to a further pick-up in private consumption growth. Over the next three years, the cumulative increase in real household disposable income will amount to slightly more than 5 %. Taking the expected population growth into account, this corresponds to an increase in purchasing power of 3.5 % per person by 2021. A large part of this real income growth can be traced back to labour income. On the one hand, job creation will remain robust in the years ahead, although the expansion of employment will ultimately moderate. On the other hand, and more importantly, real wages are set to rise more strongly in the coming years. In addition, the third phase of the tax shift that came into force in January 2019 has further increased take-home pay. Finally, property incomes, that are however saved to a larger extent, will also continue to contribute positively to the growth of household incomes, mainly as a result of rising interest rates.

1 Please refer to the article on "Why has Belgian private consumption growth been so moderate in recent years?" in this Economic Review for a more detailed discussion on this topic.

Chart 4

Household consumption and disposable income [1]

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



Sources: NAI, NBB.

1 Data deflated by the household consumption expenditure deflator.

2 Excluding social contributions payable by employers.

3 "Other" comprises the gross operating surplus and gross mixed income (of self-employed persons).

As usual, households only gradually adjust their spending to rising incomes and typically aim to smooth out volatility in income growth. In this connection, real household incomes will receive a strong boost, particularly in 2019, not only from the aforementioned cut in personal income taxes but also from a marked indexation effect, as wages and replacement incomes are increased on the basis of the past hike in inflation, while current inflation is already declining. As of 2020, disposable income growth edges down to about 1.5 % per year.

Against this backdrop the current projections point to a slight further increase in consumption growth in the first half of the projection period, after which growth moderates marginally in the final year. In annual terms, private consumption outpaces GDP in both 2020 and 2021. While the savings ratio shoots up to 12.7 % this year, partly due to the carry-over of weak consumption growth at the end of 2018, it remains broadly constant thereafter.

Business investment has decelerated somewhat in 2018 following an exceptionally strong performance in the two previous years and is expected to gradually continue losing momentum. This further moderation of the business investment cycle is consistent with the underlying fundamentals: costs are on the rise and, as usual in Belgium, are expected to be only partially passed on in (selling) prices, causing firms' profit margins to shrink, as explained in chapter 4. Additionally, interest rates are gradually picking up and final demand is no longer accelerating. Moreover, the capacity utilisation indicator in manufacturing seems to have passed its peak, which indicates that investment in additional production capacity is becoming less urgent.

In contrast, household investment in new dwellings or renovation projects has recorded only meagre growth in recent years. The current projections point to a further expansion of that investment averaging about 0.3 % per quarter, driven by an increase in household income that could offset the dampening effect of the expected rise in mortgage interest rates.

Finally, as regards public expenditure, the growth of public consumption will remain relatively moderate throughout the projection period, on the basis of the current medium-term outlook for the budget. Public investment on the other hand will, as usual, be determined by the electoral cycle : following the sharp acceleration in 2018, local investment growth will be considerably lower in 2019. For 2020, and especially for 2021, account is taken of more substantial spending on a number of major public investment projects, e.g. in connection with the Oosterweel link.

Table 4

GDP and main expenditure categories

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

	2018	2019 e	2020 e	2021 e
Household and NPI final consumption expenditure	1.0	0.8	1.5	1.5
General government final consumption expenditure	0.9	1.1	1.0	1.0
Gross fixed capital formation	2.9	3.4	1.4	1.7
General government	6.8	–2.7	–0.2	6.8
Housing	1.8	4.3	1.5	1.0
Businesses	2.7	4.1	1.6	1.3
p.m. Domestic expenditure excluding the change in inventories[1]	*1.4*	*1.5*	*1.4*	*1.4*
Change in inventories[1]	–0.3	–0.3	0.0	0.0
Net exports of goods and services[1]	0.3	0.1	–0.2	–0.3
Exports of goods and services	3.6	2.7	2.7	2.8
Imports of goods and services	3.3	2.6	2.9	3.1
Gross domestic product	1.4	1.2	1.1	1.2

Sources : NAI, NBB.

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

3. Labour market

After five consecutive years of strong job creation, the employment intensity of growth would increase even further this year, to just above 1, and the number of persons in work is expected to rise further by about 60 000. Employment growth is then predicted to moderate in the next two years as activity growth will gradually be supported more by increases in hourly labour productivity. The latter has been particularly weak recently and even negative in 2018 but is projected to recover, also in view of the recent strong investment growth.

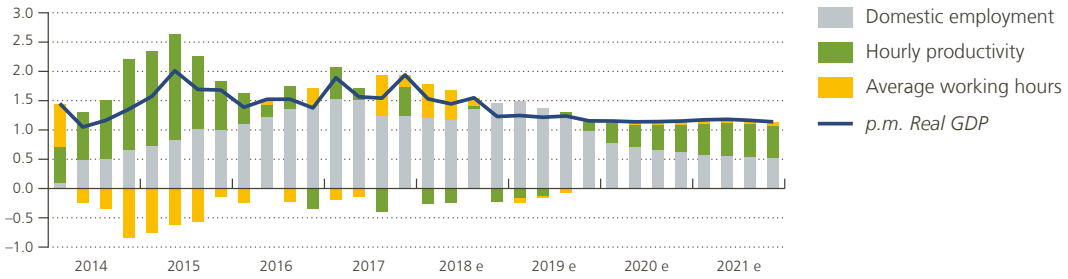
The deceleration of employment during the projection period reflects both the slower pace of activity growth and the fact that the job intensity of growth gradually returns to normal as a result of accelerating wage costs and the declining impact of policies implemented to shore up the effective labour supply, e.g. by curbing early retirement schemes. In addition, at this stage of the cycle, after years of strong job creation combined with a steep fall in unemployment, labour shortages affecting certain occupations and some segments of the labour

market are increasingly holding back the further expansion of employment. Labour market tensions are also expected to affect the average working time: the long-term trend of a decline in working hours has been interrupted recently due to greater pressure to work overtime or to curb part-time working arrangements. Similarly, supply-side pressures lead to a slight increase in average hours worked over the projection period, albeit to a lesser extent than in 2018.

Chart 5

Domestic employment, working time and productivity

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



Sources: NAI, NBB.

All in all, an additional 121 000 jobs are projected to be created over the 2019-2021 period. This amounts to an upward revision compared to the Bank's autumn 2018 projections, despite somewhat lower GDP growth. This is due to the incorporation of the most recent statistics which suggest that employment remained surprisingly buoyant and grew at a relatively constant quarterly rate of 0.4 % over the last two quarters. Most jobs were created in the branches sensitive to the business cycle. Naturally, employment growth in those industries will also slow down the most, while job creation in other services will hold up better and employment in administration and education will continue to grow at a broadly constant pace. The number of self-employed is also projected to decelerate, although to a lesser extent than the number of employees. Rising wage growth does not depress the increase in the number of self-employed; also, self-employed status has become somewhat more attractive by the improvements made to the social security scheme for self-employed persons and by the opportunities for retired persons to combine their pension with a self-employed occupation.

Strong job creation coupled with a limited increase in the working age population, mainly due to ageing, increased the harmonised employment rate to just under 70 % in 2018, up from 67.2 % in 2015. The employment rate is expected to continue rising to more than 71 % in 2021. This still falls short of the Belgian EU2020-objective of a 73.2 % employment rate by next year.

The number of unemployed job-seekers is expected to decline by a further 42 000 persons over the projection period, driven mainly by the gradual departure from the labour force of a large cohort of unemployed persons aged 63 and over, entering retirement. While the ongoing decline in unemployed job seekers causes the registered unemployment rate to drop further over the projection horizon, the harmonised unemployment rate – which measures the number of people actually seeking work on the basis of a survey – is assumed to be much less affected as a large part of those older people currently disappearing from the unemployment figures were not actively looking for a job in the past either. The harmonised unemployment rate, which reached a historically low level of 6 % last year, is therefore expected to decline only slightly and bottom out at 5.7 % during the projection period.

Table 5

Labour supply and demand

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

	2014	2015	2016	2017	2018	2019 e	2020 e	2021 e
Total population	55	59	57	54	53	52	53	51
Working age population [1]	9	16	16	12	11	10	11	9
Labour force	33	21	33	37	31	41	21	17
Domestic employment	20	41	59	65	62	61	34	27
Employees	14	30	46	52	51	49	25	19
Branches sensitive to the business cycle [2]	0	18	29	38	37	34	13	7
Administration and education	7	3	3	2	2	1	2	2
Other services [3]	7	9	14	13	12	13	10	10
Self-employed	6	10	13	12	11	12	9	8
Unemployed job-seekers	14	–19	–26	–28	–30	–19	–13	–10
p.m. Harmonised unemployment rate [4, 5]	*8.6*	*8.6*	*7.9*	*7.1*	*6.0*	*5.7*	*5.7*	*5.7*
Harmonised employment rate [4, 6]	*67.3*	*67.2*	*67.7*	*68.5*	*69.7*	*70.5*	*70.9*	*71.2*

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).

4. Costs and prices

4.1 Labour costs

Hourly labour costs are expected to accelerate significantly over the projection horizon and increase by some 2.3 % on average every year. The projections take into account the maximum margin of 1.1 % for negotiated wage increases in the 2019-2020 period. While not all social partners agreed to sign the interprofessional agreement, this wage norm was translated into law via a Royal Decree of 19 April 2019. We assume that the full extent of the margin will be used. In line with the stylised facts concerning the time needed to implement the wage norm at industry and company level, a somewhat bigger rise in negotiated wages is expected in the second year. This is slightly lower than the technical assumption included in the Bank's autumn 2018 projections, when the wage norm for the 2019-2020 period was not yet known. The current projections assume constant growth in negotiated wages in 2021.

Annual wage growth is also affected by changes in indexation. As indicated, wage indexation is quite large in 2019 in particular, as the spike in the health index towards the end of 2018 is passed on to wages via the existing indexation mechanisms with the usual delay. The indexation effect is somewhat lower in the outer years of the projection horizon.

Table 6

Price and cost indicators

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

	2017	2018	2019 e	2020 e	2021 e
Private sector labour costs[1]:					
Labour costs per hour worked	1.5	1.2	2.5	2.0	2.4
of which:					
Negotiated wages	0.2	0.4	0.4	0.7	0.7
Indexation	1.6	1.7	2.0	1.4	1.7
Social contributions[1]	–0.3	–0.7	0.0	–0.2	0.0
Wage drift and other factors	–0.1	–0.2	0.1	0.1	0.1
p.m. Labour costs per hour worked according to the national accounts[2]	1.4	1.2	2.4	1.9	2.4
Labour productivity[3]	0.0	–0.3	–0.1	0.4	0.6
Unit labour costs[1]	1.5	1.5	2.6	1.6	1.8
Total inflation (HICP)	2.2	2.3	1.5	1.6	1.5
Core inflation[4]	1.5	1.3	1.6	1.8	1.9
of which:					
Services	1.9	1.6	1.9	2.2	2.4
Non-energy industrial goods	0.8	0.8	1.0	1.1	1.2
Energy	9.9	8.9	1.1	–0.2	–2.1
Food	1.4	2.7	1.2	1.8	1.9
p.m. Inflation according to the national index (NCPI)	*2.1*	*2.1*	*1.7*	*1.6*	*1.5*
Health index[5]	1.8	1.8	1.6	1.6	1.6

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

1 Not shown according to the national accounts concept but according to a broader, macroeconomically more relevant concept that includes reductions in contributions for target groups and wage subsidies.

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

3 Value added in volume per hour worked by employees and self-employed persons.

4 Measured by the HICP excluding food and energy.

5 Measured by the national consumer price index excluding tobacco, alcohol and fuel.

Wage drift and other factors reduced the growth in wage costs quite significantly in 2018, possibly because new jobs were mostly created for workers with lower productivity and, hence, lower wages. Against this backdrop, the projections for wage drift were revised down, also because the decelerating labour demand could reduce wage pressures. Overall, wage drift is still expected to have a slight upward effect on wage costs, as the share of older workers is increasing and because of the trend towards a more educated workforce.

Finally, the increase in labour costs is moderated somewhat by the additional cuts in social security contributions implemented in 2019 and 2020, in order to gradually bring down the base rate in employers' social contributions to 25 %, as decided under the tax shift programme. However, the impact of these reductions is much smaller than in 2018.

All in all, unit labour costs rise sharply this year but decelerate somewhat thereafter. This is due to the projected recovery in productivity as of 2020, implying that growth in unit labour costs is somewhat more moderate than the rise in hourly wage costs in the outer years of the projection period. However, even in the 2020-2021 period, unit labour costs still increase more rapidly than in the recent past.

4.2 Prices

Accelerating unit labour costs exert upward pressure on inflation. However, as can be observed from past correlations, changes in the rate of increase in unit labour costs tend to be partially absorbed by firms' profit margins in Belgium. Profit margins had expanded markedly up to early 2017, notably because the deceleration in unit labour costs was only partially passed on to prices. Likewise, over the projection period, rising unit labour costs will not entirely translate into higher prices, as profit margins will continue to decline towards their long-run average in 2021 according to macroeconomic indicators.

Hence, core inflation would rise clearly less than the growth rate of unit labour costs but still edges up to almost 2 % by the end of 2021. In absolute terms, services inflation – which is more sensitive to domestic wage cost pressures – increases more than inflation for non-energy industrial goods. There has already been a clear rise in services inflation since the start of 2019, although that is partly due to specific factors, including the disappearance from the inflation data of the abolition, as of January 2018, of the radio and television licence fee in the Walloon Region and the bigger than usual holiday-related price increases in April. The strong growth in unit labour costs, particularly in 2019, is projected to gradually push up services inflation further, to 2.4 % at the end of the projection horizon. The pick-up in core inflation is not apparent in the figures for total inflation due to the slowdown of energy prices, in particular.

In 2019, energy price increases are dropping sharply due to a significant fall in gas prices, as well as a slowdown in the increase in prices of petroleum products and – to a lesser extent – electricity prices. The fall in gas prices seems to be mostly related to increased supplies of (shale) gas. Oil prices have recently recovered, but this follows a significant decline since the fourth quarter of last year and, overall, the rate of increase is clearly below the average pace observed in 2018. Moreover, since July 2018, excise duties on motor fuels have remained stable, whereas in past years they had increased, on average, owing to the ratchet system and the periodic indexations. No additional increases in excise duties were taken into account in the projection period and, in line with the oil price assumptions, energy inflation should become negative as of 2020.

Food inflation is also expected to drop in 2019, after which it would edge up slowly. This drop is partly related to government measures. In January 2018, food inflation was boosted by an increase in the so-called sugar tax on soft drinks introduced in 2016. This impact disappears in the 2019 inflation figures, while excise duties on tobacco have also been increased less strongly in 2019 than last year.

All in all, total inflation will slow down to 1.5 % on average in 2019, and will only rise marginally thereafter. The above analysis pertains to the HICP, which permits comparison of inflation rates across the EU member countries. Inflation measured according to the Belgian national consumer price index (NCPI) may deviate slightly from that figure owing to methodological differences. The NCPI is used to calculate the health index, which excludes tobacco, alcoholic beverages and motor fuels, and serves as a reference for price indexation of wages and replacement incomes. Notwithstanding some volatility in the monthly data, the health index is set to grow at a relatively constant rate in annual terms throughout the projection period. It is expected that the threshold index for certain indexation mechanisms, including those for government wages and replacement incomes, will next be exceeded in January 2020.

Chart 6

Inflation and determinants

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

Sources: EC, NAI, NBB.

1 Difference between the year-on-year rise in unit selling prices and unit production costs.

2 Including wage subsidies and reductions for target groups. Unit labour costs in the private sector.

5. Public finances

5.1 Budget balance

According to the data published by the NAI in April 2019, the Belgian government recorded a budget deficit of 0.7 % of GDP in 2018, representing a small improvement over 2017. Against the macroeconomic background described above, the general government budget deficit is expected to increase substantially in 2019 and the following years.

Table 7

General government accounts

(in % of GDP)

	2018	2019 e	2020 e	2021 e
General government				
Revenue	51.7	50.8	50.6	50.6
Primary expenditure	50.1	50.1	50.4	50.8
Primary balance	1.6	0.7	0.2	–0.2
Interest charges	2.3	2.1	2.0	1.9
Financing requirement (–) or capacity	–0.7	–1.3	–1.7	–2.1
Overall balance per subsector				
Federal government [1]	–0.1	–1.2	–1.6	–1.7
Social security	0.0	0.0	0.0	0.0
Communities and Regions [1]	–0.5	–0.2	–0.3	–0.4
Local authorities	0.0	0.1	0.1	0.0

Sources: NAI, NBB.

1 These figures include the advances on the regional additional percentages on personal income tax although, according to the methodology of the ESA 2010, those advances are regarded as purely financial transactions and the regional additional percentages are only taken into account at the time of collection.

The expected deterioration of the budget balance in 2019 is due to the decline in revenue. The main reason for this is the reduction in corporate income tax receipts resulting from lower assessments, which are the corollary to the shift in favour of advance payments in preceding years. The tax burden on labour is further reduced via the so-called tax shift, the final phase of which is scheduled for 2020. Primary expenditure is projected to edge upwards over the projection horizon and interest charges will continue to decline, although at a slower pace than in recent years.

The deficits are expected to occur mainly at the level of the federal government, although the Communities and Regions sub-sector will also continue to record a small deficit during the projection period. In contrast, the local government and social security accounts should remain broadly in balance.

As usual, the projections are based on the assumption of no change in policy. Hence, they only take account of budget measures that have already been announced and specified in sufficient detail.

5.2 Revenues

Table 8

Public revenues

(in % of GDP)

	2018	2019 e	2020 e	2021 e
Fiscal and parafiscal revenues	44.6	43.8	43.5	43.6
Levies applicable mainly to labour incomes	24.9	24.9	24.9	25.0
Personal income tax	11.1	11.0	11.0	11.1
Social contributions	13.8	13.9	13.9	13.9
Taxes on corporate profits	4.4	3.6	3.4	3.4
Levies on other incomes and on assets	4.0	4.0	4.0	4.0
Taxes on goods and services	11.3	11.3	11.2	11.2
of which:				
VAT	6.9	6.9	6.9	6.9
Excise duty	2.2	2.2	2.2	2.1
Non-fiscal and non-parafiscal revenues	7.1	7.0	7.0	7.0
Total revenues	51.7	50.8	50.6	50.6

Sources: NAI, NBB.

In 2019, government revenue is expected to decrease by 0.9 percentage point of GDP. In 2020, a further decline of 0.2 percentage point of GDP is projected and in 2021 the revenue ratio will remain stable.

The decline in government revenue in 2019 and 2020 is mainly due to the decrease in corporate income tax receipts, resulting from the offsetting impact of the temporary rise in 2017 and 2018. The increase in the basic rate of tax surcharge applied to inadequate advance corporate income tax payments induced firms to step up their advance payments, generating a temporary revenue boost in 2017 and 2018. This is expected to lead to a drop in revenue collected via the assessments in 2019 and 2020. In 2020, corporate income tax receipts should return to their structural level, which is almost the same in relation to GDP as that prevailing before the increase in the tax surcharge rate.

In addition, measures relating to the tax shift result in a further reduction in the tax burden on labour incomes. In 2019, the main cuts concern personal income tax, with revenue expected to decrease by 0.2 percentage point of GDP. Moreover, measures intended to activate savings by granting tax exemption for a first tranche of income from dividends will reduce personal tax assessments in 2019. In 2020, there is a further cut in employer's social contributions, but its effect on revenue will be broadly compensated by favourable private sector employment growth.

5.3 Primary expenditure

The primary expenditure ratio is expected to stabilise at 50.1 % of GDP in 2019. In nominal terms, spending would therefore expand at much the same rate as economic activity. The increase in expenditure will be tempered by a decline in public investment, which had been boosted in the run-up to the municipal and provincial elections

in October 2018. In addition, no indexation of social benefits and public sector wages is planned until next year, and that will have a moderating effect on the expected expenditure trend in 2019.

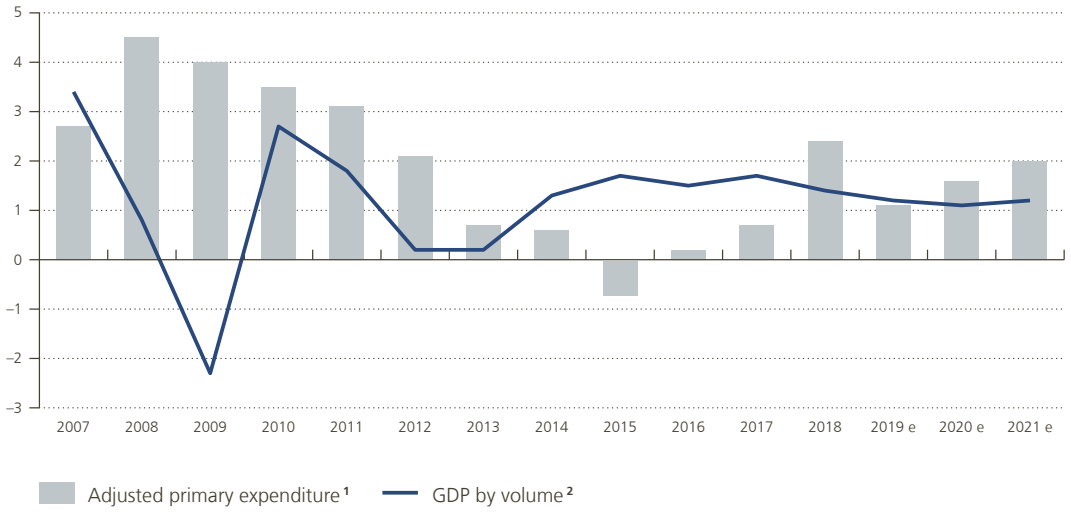
Adjusted for the impact of temporary factors, the economic cycle and the gap between inflation and actual indexation, real primary expenditure is forecast to increase by 1 % in 2019.

Under unchanged policy conditions, the spontaneous expansion of primary expenditure is expected to exceed the GDP growth rate in 2020 and 2021, leading to an increase in the expenditure ratio. This situation is due mainly to the drift in social benefits resulting from population ageing. The natural increase in pensions and health care expenditure, combined with the welfare adjustments, will place a heavy burden on public finances. In recent years, it has been possible to neutralise the demographic pressure on social security expenditure by strict control of spending on health care, the 2015 index jump and the fall in unemployment.

Chart 7

Primary expenditure of general government and GDP

(percentage changes compared to the previous year)



Sources: NAI, NBB.

1 Primary expenditure deflated by the GDP deflator and adjusted for cyclical, one-off and fiscally neutral factors, and for the effect of indexation. The latter is due to the difference between the actual indexation (or the theoretical figure for 2015 and 2016, as a result of the approved index jump) of civil service pay and social benefits and the increase in the GDP deflator.

2 Calendar adjusted data.

5.4 Debt

In 2018, the public debt ratio declined to 102 % of GDP. The debt ratio is expected to decline further during the projection period, but the reduction will be modest.

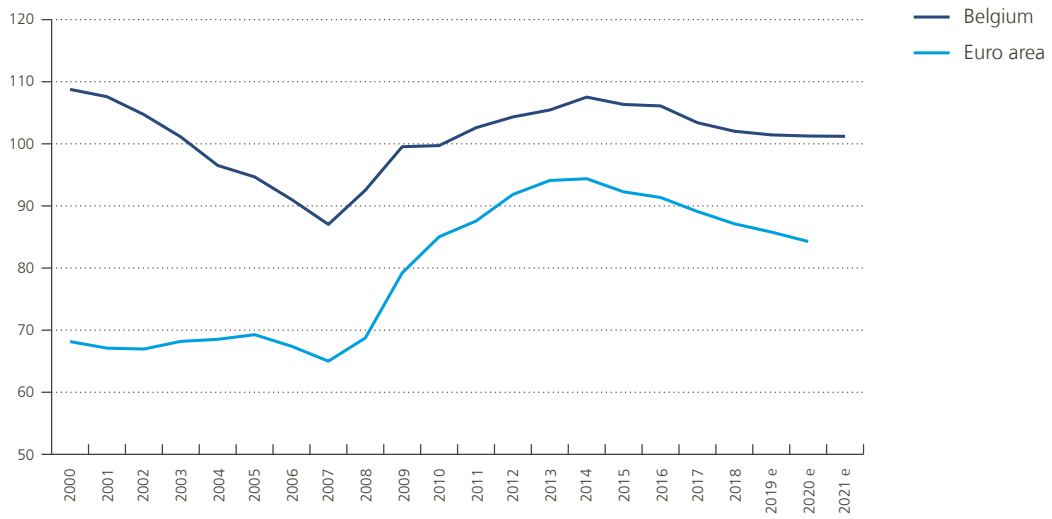
In 2019, debt expressed as percentage of GDP will fall to 101.4 %. After that the debt ratio should continue falling but very slowly, to 101.2 % in 2021. The favourable impact of the primary balance will gradually fade over the projection period, as the surplus will become much smaller and revert to a deficit in 2021.

This picture contrasts with the latest EC forecasts for the euro area, whose debt ratio is expected to decline faster. Hence, the gap with Belgium will widen.

Chart 8

Consolidated gross debt of general government

(in % of GDP)



Sources: EC, NBB.

6. Conclusion and risk assessment

The Eurosystem's spring 2019 projections generally point to a less upbeat growth outlook. The Bank's projections for Belgian growth have been revised down as well, albeit to a clearly lesser extent than those for other euro area countries. Recent statistics and our short-term estimate for the second quarter of 2019 are still in line with the previous projections, but the strong downward revision in trade and export markets translates into slightly lower annual growth for both 2019 and 2020. The Belgian economy is now expected to grow at a rate comparable to that in the euro area this year but, contrary to Belgian growth, the latter would edge up in the outer years of the projection horizon.

In the coming years, Belgian growth will be supported by domestic demand. Household consumption will pick up due to increases in purchasing power, which should compensate for the gradual normalisation of the corporate investment cycle and the more negative growth contribution of net exports. In the euro area, domestic demand is similarly driving economic activity. The growth rate of business investment declines further from 2020 onwards, but household consumption growth remains stable over the projection period. Net exports weigh most heavily on growth in 2019 but improve thereafter.

The Bank's growth estimates are towards the lower end of the range of the most recent forecasts of the other institutions, especially for 2020. They already incorporate the first vintage of statistics (GDP, labour market) pertaining to the first quarter of 2019 and, compared to the projections by the other institutions, were also informed by more recent high-frequency indicators (partly up to May) that continued to point to a broadly unchanged economic environment. The Bank's projection for economic growth in 2020 is in particular more

Table 9

Comparison with the estimates of other institutions

(in %)

Institution	Publication date	GDP growth (in volume)			Inflation (HICP, unless otherwise mentioned)		
		2019	2020	2021	2019	2020	2021
Belgian Prime News	March 2019	1.3	1.2		1.8	1.6	
IMF	April 2019	1.3	1.4	1.5	1.9	1.6	1.9
OECD	May 2019	1.2	1.3		1.6	1.5	
EC	May 2019	1.2	1.2		1.8	1.6	
Consensus Economics	May 2019	1.2	1.3	1.2	1.7	1.6	1.6
Federal Planning Bureau [1]	June 2019	1.3	1.3	1.4	1.7	1.5	1.6
NBB	June 2019	1.2	1.1	1.2	1.5	1.6	1.5

1 Economic budget (June 2019) for 2019-2020 and Economic Outlook (February 2019) for 2021. The inflation rates are the NCPI figures.

pessimistic than that by the Federal Planning Bureau. The difference can be largely traced back to a different assumption about government investment growth.

Once again, risks to the current projections pertain primarily to the international environment and are clearly tilted to the downside. The global trade momentum is one of the main uncertainties for this exercise, also given the fact that the assumed recovery in trade is not yet visible in forward-looking indicators, such as those concerning export orders in manufacturing. In this context, additional trade restrictions would intensify the headwinds for the recovery of euro area growth, in particular if they are directly connected to euro area exports. However, even if tariffs do not specifically target EU products, increasing trade tensions typically have a broader impact via indirect channels (including through uncertainty, global value chains and financial markets) that could weigh on the euro area and the Belgian growth outlook. Similarly, a supply-driven hike in oil prices would also lower growth projections.

At the domestic level, risks may be more balanced or slightly tilted to the downside. First, private consumption has come in lower than expected in recent quarters. While this was partly due to temporary factors and fundamentals, including the outlook for income growth, remain strong, household consumption may continue to be lower than expected. This is clearly connected to the outlook for wages: we assume, for instance, that wage negotiations at the industry and company level will lead to a full use of the available margin of 1.1 % for the 2019-2020 period, and that wage drift will turn slightly positive. Lower wage growth would curb consumption and, most likely, activity growth. Second, as employment growth loses steam, productivity should in fact pick up somewhat to keep activity growth broadly constant over the projection period. At the same time, business investment may slow down less than in the current projections. Finally, in view of the projected large structural deficit in 2021, it is clear that future governments will need to restore balance to public finances. The size and nature of those measures will determine to what extent the Belgian growth outlook will be affected.

Annex

Projections for the Belgian economy: summary of the main results

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

	2017	2018	2019 e	2020 e	2021 e
Growth (calendar adjusted data)					
Real GDP	1.7	1.4	1.2	1.1	1.2
Contributions to growth:					
Domestic expenditure, excluding change in inventories	1.1	1.4	1.5	1.4	1.4
Net exports of goods and services	0.6	0.3	0.1	–0.2	–0.3
Change in inventories	0.0	–0.3	–0.3	0.0	0.0
Prices and costs					
Harmonised index of consumer prices	2.2	2.3	1.5	1.6	1.5
Health index	1.8	1.8	1.6	1.6	1.6
GDP deflator	1.7	1.1	1.4	1.5	1.6
Terms of trade	–0.9	–1.4	–0.2	–0.3	0.0
Unit labour costs in the private sector [1]	1.5	1.5	2.6	1.6	1.8
Hourly labour costs in the private sector [1]	1.5	1.2	2.5	2.0	2.4
Hourly productivity in the private sector	0.0	–0.3	–0.1	0.4	0.6
Labour market					
Domestic employment (annual average change in thousands of persons)	64.5	61.7	60.8	33.7	26.9
Total volume of labour [2]	1.5	1.6	1.2	0.7	0.6
Harmonised unemployment rate (in % of the labour force aged 15 years and over)	7.1	6.0	5.7	5.7	5.7
Incomes					
Real disposable income of individuals	1.4	1.3	1.9	1.5	1.6
Savings ratio of individuals (in % of disposable income)	11.4	11.7	12.7	12.6	12.7
Public finances					
Primary balance (in % of GDP)	1.6	1.6	0.7	0.2	–0.2
Budget balance (in % of GDP)	–0.8	–0.7	–1.3	–1.7	–2.1
Public debt (in % of GDP)	103.4	102.0	101.4	101.3	101.2
Current account (according to the balance of payments, in % of GDP)	0.7	–1.3	–1.6	–2.0	–2.2

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.

Inclusive growth : a new societal paradigm ?

N. Cordemans *

Introduction

As illustrated by the Brexit vote in the UK, the election of Donald Trump in the US or the yellow vest movement in France, populism and popular discontent have been on the rise in advanced economies over recent years. Amongst the various factors regularly put forward to explain these developments is the worsening of income and wealth distribution. While inequality at global level has tended to decline over the last few decades, inequality within countries has actually widened overall, with the well-off seeing their income rising much faster than the rest of the population. Higher inequality has fuelled renewed debate about the pace, the pattern and the distribution of economic growth. Against this background, the late 2000s saw the emergence of the concept of "inclusive growth", which broadly refers to the ideal that everyone should be given the opportunity to contribute to and benefit from increased prosperity. This is precisely the focus of this article.

The first part is dedicated to economic growth and its relationship with inequality. It addresses the relevance of GDP as an indicator of social progress and introduces the concept of inclusive growth. The second part describes and explains some major findings and trends for advanced economies. The conclusion summarises the main results and highlights future challenges.

1. From "going for growth" to "inclusive growth"

Economic growth typically refers to real Gross Domestic Product growth (GDP), which features high amongst the most closely watched economic indicators. This has been the case since the 1950s, when systems of national accounts were gradually being established[1]. Yet, in recent years, economic growth has come under increasing criticism as a policy goal. There have been calls for a shift in emphasis from "economic production" to "people's wellbeing" (Stiglitz *et al.*, 2009) and for growth to be made more inclusive (OECD, 2019).

1.1 The rise and the fall of economic growth

In a historical perspective, economic growth kicked off with the First Industrial Revolution (1750-1830) that ushered in steam engines, cotton-spinning and railroads, and by the general acceptance by institutions of

* The author would like to thank Paul Butzen and Kristel Buysse for their valuable comments and contribution.

1 The American economist Simon Kuznets developed national accounting and the concept of GDP in the 1930s in the United States. The objective was to accurately measure aggregate economic activity in order to identify appropriate stimulus policies to stem the Great Depression. The metric was refined after World War II and the first formal national accounts were published in 1947 by the US Department of Commerce. Many European countries developed their own systems in the 1950s and 1960s.

the principles of free market and private property (as defended by Adam Smith and David Ricardo). It picked up gradually with the Second Industrial Revolution (1870-1900) – which brought in electricity, the internal combustion engine and running water with indoor plumbing – and literally took off in the decades after the Second World War, with mass consumption of electric household appliances and consumer goods. At that time, economic growth also became a major policy objective.

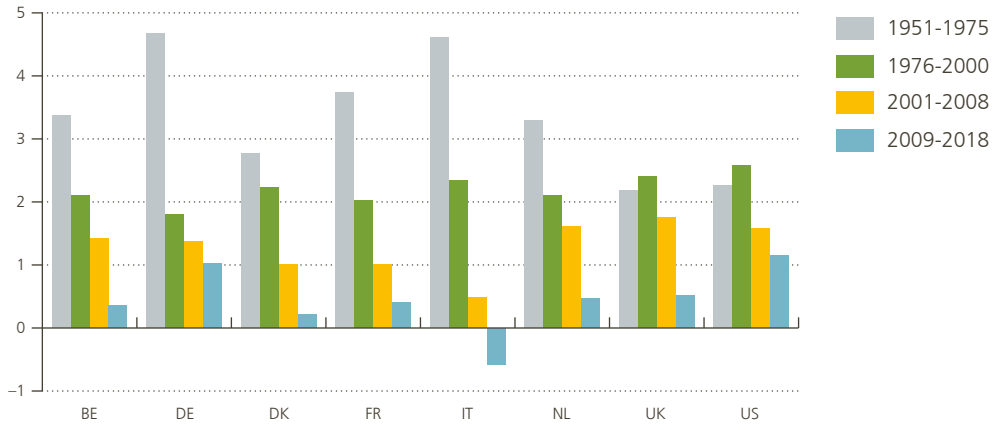
In many industrialised countries, the Great Depression of the 1930s and the Second World War had inflicted severe damage to the economy and caused massive unemployment. The post-war era was then characterised by a strong desire for reconstruction, job creation and material wellbeing. In this context, and following the work carried out by J. M. Keynes, the role of the State in the economy was substantially strengthened. National accounting was then designed as a tool for macroeconomic policy, whose primary goals included fostering economic growth (Cassiers and Thiry, 2014). The latter was designed as the cornerstone of the social pact forged at the time, according to which, workers and employers would share the benefits of higher productivity (*ibid*.).

GDP growth came to be seen as vital to raising living standards, avoiding social unrest and supporting the expansion of the welfare state. It also developed as a symbol of power for nation states and, together with technological progress, was regarded as an essential factor of national security in times of the Cold War (Schwarzer, 2014).

Chart 1

Real GDP per capita

(average annual growth, percentages)



Source: Conference Board.

During the "Glorious Thirty" [1], the post-war boom period running broadly between 1946 and 1975 [2], economic growth was unprecedented. In Europe, as well as in other regions like Japan, labour productivity caught up with US levels. Gains were very substantial and led to a considerable rise in people's standard of living. In parallel, inequality receded, overall. In a context of limited or inexistent ecological concerns, GDP growth became closely associated with greater wellbeing and permanent income growth was widely considered as both possible and desirable.

1 The name was coined in 1979 by the French demographer Jean Fourastié, with the publication of his book "Les Trente Glorieuses".
2 In reality, the "golden age" of economic growth in Europe ran from 1950 to 1973, when the first oil shock struck.

But the 1970s sounded the death knell of the post-war economic miracle and economic growth declined steadily after the first oil shock of 1973. Moreover, from the 1980s onwards, inequality started increasing in most advanced economies and, especially, in the Anglo-Saxon countries. Over the last few decades, GDP growth as an indicator of societal progress has been increasingly called into question, notably due to environmental concerns. At the same time, the unequal distribution of economic growth has also gradually weakened the legitimacy of the process.

1.2 Questioning Gross Domestic Product

The first report that is known for pointing up the limits to material growth was published in 1972 by the Club of Rome[1]: "The Limits to Growth" (Meadows *et al*., 1972). The authors claimed that infinite growth in a finite world was not possible and recommended establishing "a condition of ecological and economic stability that is sustainable far into the future". While the report received considerable attention, the value of its findings was questioned because its predictions about natural resources did not seem to materialise (Kjellén and Wallensteen, 2012). Recent research however confirmed that the global environment is vulnerable to economic growth (IPCC, 2014), notably through climate change, and vice versa (Koubi *et al*., 2011).

Despite its shortcomings and the fact that it was never intended for this role, GDP per capita is still nowadays widely used by economists, policy-makers, institutions and the media as the primary gauge of a nation's wellbeing. After addressing the relevance of GDP, this section briefly discusses some recent initiatives aimed at measuring societal progress and/or people's wellbeing, in order to better inform policy decisions.

What is GDP?

GDP is the sum of the monetary value of all final goods and services that are produced and traded for money within a given period of time, typically a year. Since the value of production in an (closed) economy corresponds to the remuneration of factors of production, GDP also measures the sum of incomes distributed by an economy. And because everything produced must be bought by someone, the value of production must be equal to people's total expenditure.

GDP is a valuable measure of economic activity…

GDP sums up the economic activity of a country and GDP growth tells us about the position of the economy in its cycle. Together with other economic indicators such as inflation and employment statistics, and considering structural parameters such as demography, GDP growth sends signals to policy-makers about the need for cooling down or supporting economic activity.

… but it is not an appropriate gauge of societal progress

At global level, there is correlation between the level of economic development of a country and the average living standard of its population. For instance, countries with higher GDP per capita typically have higher levels of education and longer life expectancy[2]. These two variables are part of the Human Development Index (HDI) and contribute to enhancing people capabilities – i.e. what people are effectively able to do and to be[3]. Undoubtedly, education and health are two important and mutually-reinforcing dimensions of wellbeing. More generally,

1 The Club of Rome was founded in 1968 in Rome. It consists of scientists, economists, businessmen and businesswomen, high level civil servants and former Heads of State from around the globe. Its mission is "*to promote understanding of the global challenges facing humanity and to propose solutions through scientific analysis, communication and advocacy*" (Club of Rome, 2019).

2 Correlation is not causality and the latter could go both ways: higher incomes allow people to invest in education, but a higher level of education also may bring higher income. Higher income allows people to invest more in their health, but better health also contributes to productive capacities. It should also be noted that longer life expectancy may lower average per capita income when population ageing is advanced.

3 Over the last three decades, the capabilities approach to welfare has been developed by Amartya Sen. See Sen (1985).

although "money does not buy happiness", some recent studies have pointed to a robust positive relationship between subjective wellbeing and income across countries and over time, dismissing the idea of a satiation point[1] (Stevenson and Wolfers, 2013).

This rather positive assessment of economic development should nevertheless be qualified. Focusing on health, it appears for instance that the relationship between per capita GDP and life expectancy weakens beyond a certain income level. Looking solely at advanced economies, the relationship becomes non-significant and, at country level, research has shown that rising incomes and personal wellbeing may actually be linked negatively. Ruhm (2000) thus pointed out that, when the US economy is booming, people tend to suffer more medical problems and die sooner, while people tend to live longer when the economy falters. More generally, GDP growth should not be conflated with improved wellbeing or social progress, for several reasons.

(1) Firstly, everything that is included in GDP does not contribute to wellbeing: GDP actually registers as a positive achievement some economic activities that are detrimental to wellbeing and does not account for negative externalities. Typically, exploiting natural resources raises GDP, while it may have a detrimental impact on the environment.

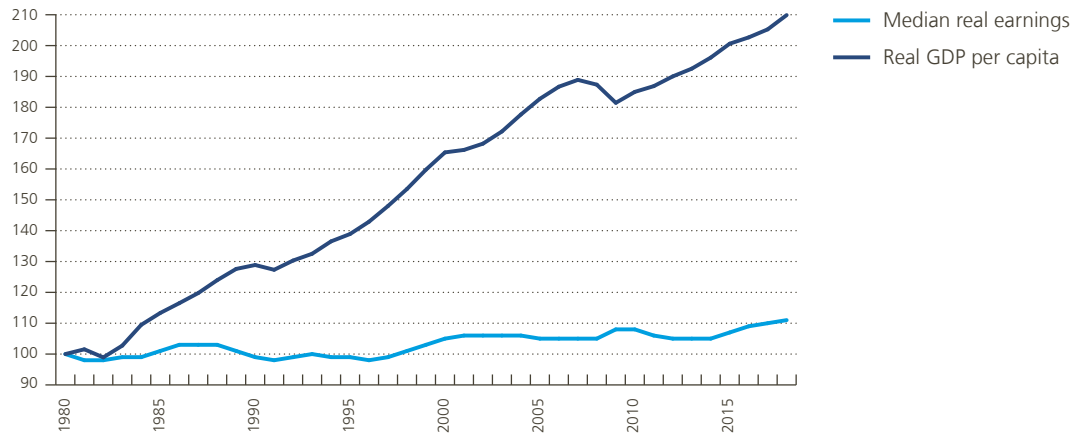
(2) Secondly, GDP does not include many things that contribute to wellbeing: it does not account for leisure time, air quality, levels of health and education, activities conducted outside the market like housework or volunteer work, etc. Increasing working hours contributes to economic growth, but not necessarily to citizens' wellbeing.

(3) Thirdly, GDP does not account for inequalities: GDP per capita corresponds to the average income of the population but income may be very unevenly distributed amongst citizens. Interestingly, real GDP per capita more than doubled in the US between 1980 and 2018. Over the same period, however, median real earnings remained largely stable, meaning economic growth only benefited the better off.

Chart 2

Median real earnings and GDP per capita in the US

(index: 1980 = 100)



Source: Federal Reserve Bank of St Louis.

1 In 1974, American economist Richard Easterlin claimed that increasing average income did not raise average wellbeing. He found that, although subjective wellbeing is positively associated with income within any country at a given point in time, the average level of declared wellbeing for a country changes little when average incomes growth. This is now widely known as the "Easterlin Paradox". More recent research work has argued that this was true only beyond a certain income threshold (Kahneman and Deaton, 2010).

GDP (per capita) may be a relevant economic indicator, but GDP growth cannot be assimilated to societal progress and be the primary goal of policy actions. This is particularly true in rich countries, where material living standards are high and where the emphasis can thus be put on improving non-material dimensions of wellbeing, such as social capital, health, education, environmental quality, public safety, etc.

Measuring wellbeing better

Over the last two decades, a wide range of indicators aimed at (partially) addressing the failure of GDP have been produced. Some indicators are scoreboards, including raw measures of social phenomena like homicide rates or obesity, while other indicators aggregate various welfare dimensions, including inequality, income, health, education, employment, environment, etc[1].

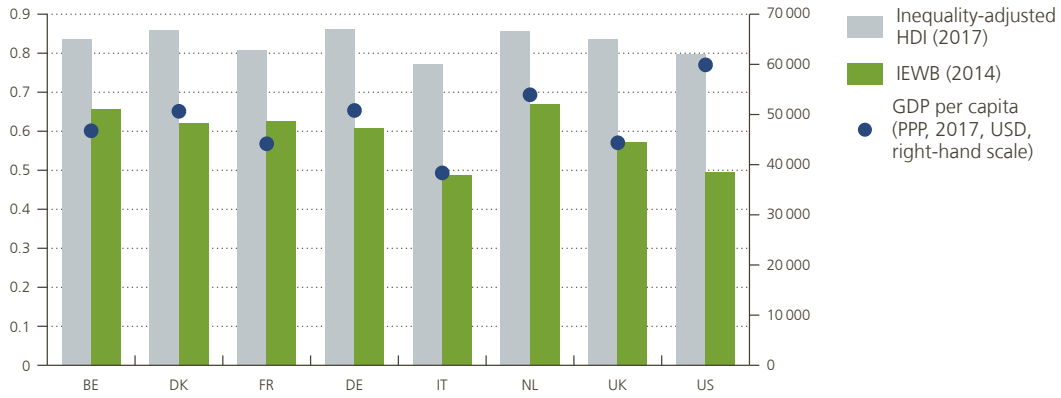
Amongst the most emblematic indicators is the Human Development Index (HDI). The latter was developed in the 1990 by Pakistani economist Mahbub ul Haq for the United Nations Development Programme (UNDP). The HDI is a simple statistic composite index of life expectancy, education and per capita income indicators. It was supplemented in 2010 by an inequality-adjusted HDI[2].

Another prominent indicator developed in 1998 by the Centre for the Study of Living Standards (CSLS) is the Index of Economic Wellbeing (IEWB)[3]. It is based on the premise that wellbeing is multidimensional and depends on various monetary as well as non-monetary factors. It measures consumption, accumulation of productive resources, income distribution and economic security.

Chart 3

HDI, IEWB and GDP per capita

(index unless otherwise stated)



Sources: CSLS, IMF, UNDP.

Looking at these two indicators together with GDP per capita and comparing the relative performance of selected OECD countries illustrates the gap that may emerge between measures of wellbeing and GDP per capita.

1 Each of the indicators recently developed highlights in its own way factors that contribute to prosperity but none of them is aimed at replacing GDP. Most indicators have their own limits and may not be fit for policy purposes.

2 For a more detailed description of the HDI, see UNDP (2016).

3 For a more detailed description of the Index of Economic Wellbeing (IEWB), see Osberg and Sharp (2011).

It is noticeable, for instance, that the US, while having the highest level of GDP per capita, performs relatively badly in terms of the inequality-adjusted HDI and, even more so, when it comes to the IEWB. This is largely due to high inequality and low economic security, comparatively long working hours and a low life expectancy. On the contrary, Belgium performs better in terms of human development and economic wellbeing than in terms of GDP per capita. This relates to low levels of inequality and extensive leisure time, with relatively low average hours worked per employed person.

In 2008, the then French President Nicolas Sarkozy set up a commission tasked with rethinking the measurement of economic performance and social progress. It was chaired by Amartya Sen, Joseph Stiglitz and Jean-Paul Fitoussi and gathered contributions from leading socio-economic thinkers.

The commission's final report was published in 2009 and received considerable attention and a wide stamp of approval. Its main recommendations included: (1) shifting emphasis from measuring economic production to measuring people's wellbeing; (2) using alternatives to GDP such as net national income and household disposable income; (3) taking distribution and inequality into account; (4) complementing GDP with use of objective measures of wellbeing from categories such as employment, health, education, social networks, the environment, insecurity and governance; and (5) taking account of sustainability by calculating stocks of human and physical capital and natural resources (Cordemans *et al.*, 2013).

Initiatives to develop new, alternate or complementary, indicators to GDP received a significant boost after the publication of this report, both at national and international level[1]. Numerous academics, policy-makers, non-profit organisations as well as international institutions have taken up on the challenges. The OECD, the World Bank and the EU have all followed up on the report's recommendations.

At Belgian level, a Law adopted in 2014 made provision for the publication of an annual report on Complementary Indicators to GDP (NAI, 2019). These indicators provide information on social, environmental and economic issues. They are aimed at describing trends in people's wellbeing and the development of Belgian society. The 67 indicators are prepared by the Federal Planning Bureau within the framework of the National Accounts Institute. The annual report has been published since 2016. The Belgian Federal Planning Bureau moreover developed a set of 31 indicators to assess the progress made by Belgium towards the 17 Sustainable Development Goals by 2030, adopted by the UN. It regularly publishes research on wellbeing measurement of the population (see, for instance, Joskin, 2019).

1.3 Making economic growth inclusive

Amongst initiatives and statistical developments aimed at better measuring people's wellbeing, inequality has received particular attention over the most recent years. This renewed interest in one of the oldest economic issues has given rise to the new concept of "inclusive growth".

Several factors have contributed to this development. Firstly, income inequality has widened considerably in many parts of the world since the 1980s and inequality has recently reached unprecedented levels in the post-war period. Secondly, the global economic and financial crisis of 2008-2009 did not weigh equally on all shoulders and affected the less well-off segments of the population more severely. Moreover, in the subsequent years, the bottom of the income distribution suffered most from the removal of anti-crisis measures and fiscal retrenchment (OECD, 2017). As illustrated by the rising discontent in recent years, uncertainty and fears of social decline and exclusion have reached the middle classes in several societies. Thirdly, income and wealth inequality has been better documented lately, notably due to the works of Thomas Piketty, Emmanuel Saez and Gabriel Zucman (see for instance Piketty and Saez, 2003 and Piketty *et al.*, 2018), as well as Branco Milanovic

1 For a review of the main initiatives at national level, see OECD (2008). For a broader review of initiatives and indicators, see, for instance, Cassiers and Thiry (2014).

(see for instance Milanovic, 2016). Fourthly, research work has shed new light on the relationship between inequality and economic growth, with a tentative consensus that it is negative (see below).

For all these reasons, there has been growing recognition that economic growth should be more equally distributed – not only in terms of income, but in the various dimensions that matter for people. Stopping the trend of rising inequality and its adverse economic, social and political consequences has been put high on governments' and institutions' policy agendas.

Why is there cause for concern about inequality?

Some form of inequality provides for incentives: income disparities for instance may induce people to study and/or work harder and/or longer. Rewards for innovation, entrepreneurial activity and job creation in competitive markets may exacerbate inequality, but they tend to have a positive effect on growth. Allowing for a certain level of inequality appears optimal from an efficiency point of view. It contributes to a better allocation of talent across occupations and to higher productivity levels, making everyone in society better off. At the same time, rent-seeking, abuse of market power, and inequality of opportunity can be detrimental to overall welfare. Several arguments can be put forward for containing inequalities and ensuring they are not disproportionately exacerbated.

(1) A first argument simply has to do with social justice. People do not choose many facts about themselves: their fortune in the distribution of assets and abilities, their intelligence, their strength and the like. Caring for social justice would require a fair distribution of social and economic advantages across society.

    This idea has been theorised by John Rawls in "A Theory of Justice" (Rawls, 1971). He argues that people should decide principles of justice behind a "veil of ignorance", without taking account of the bare facts about themselves, including personal characteristics, class position, social status, etc. Ignorance of these details would then lead to principles that are fair to all. Going further, Rawls argues that such a theoretical decision-making process would lead to a strategy that would maximise prospects for the least well-off.

(2) A second, more prosaic, argument relates precisely to the opposite relationship between inequality and economic growth[1]: while the topic is hotly disputed in the literature, there is growing evidence that inequality has a negative impact on growth, at least beyond a certain threshold and, more specifically, in rich countries (Aghion *et. al.*, 1999, Ostry *et al.*, 2014, Cingano, 2014, Brueckner and Lederman, 2018, Aiyar and Ebeke 2019). According to Cingano (2014), what matters most for growth is the gap between low-income households and the rest of the population. On the contrary, no evidence is found that those with high incomes pulling away from the rest of the population harms economic growth.

    On the one hand, poverty and inequality reduce opportunities, with negative consequences for individuals as well as for society at large. As illustrated by the Great Gatsby curve, which links intergenerational earnings elasticity to income inequality, there is clear evidence that higher income inequality is associated with lower social mobility in OECD countries. Inequality of outcomes and inequality of opportunities are therefore intertwined (Durlauf and Seshadri, 2017).

    On the other hand, inequality may lead to social unrest and political instability that can weigh on economic activity. Amongst other factors like anti-immigrant attitudes or the attachment to conservative values, greater inequality and economic insecurity are regularly related to rising populism, popular discontent or demand for protection.

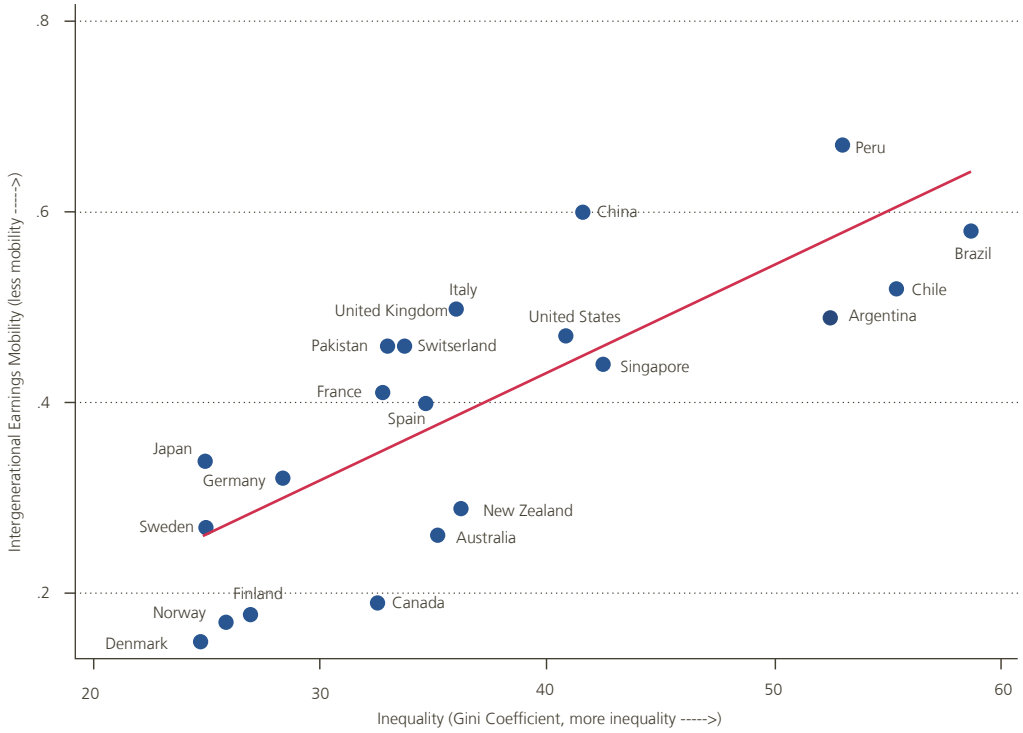
As noted by Ostry *et al.* (2014) a tentative consensus has emerged in the literature on growth, according to which "inequality can undermine progress in health and education, cause investment-reducing political and

1 See, for instance, Arestis (2018) or Darvas and Wolff (2016) for a review of the literature.

economic instability, and undercut the social consensus required to adjust in the face of major shocks, and thus that it tends to reduce the pace and durability of growth". As put by the OECD (2014), "addressing the multidimensional nature of inequality and its impact on different segment of the population matters for sustainable economic growth" [1].

Chart 4

The Great Gatsby curve



Source: Corak (2016). Reproduced with permission.

How to define the concept of inclusive growth?

Given the range of actors who use the term, there is no single definition of "inclusive growth". It may also vary through space and time, depending on the needs and the preferences of the population. The concept broadly refers to the ideal that everyone should be given the opportunity to contribute to and to benefit from increased prosperity.

The notion of inclusiveness encompasses equality of opportunity - in access to education, jobs, finance or the judicial system - and equity in terms of outcome - including income and wealth, but also educational attainment, health status and employment conditions. It covers environmental issues as well as intergenerational fairness.

1 Interestingly, the responsibility of distributional issue in the last global crisis is regularly pointed out, with credit expansion used to paper over poverty or a stagnating purchasing power (see for instance White, 2012 or Darvas and Wolff, 2016). Countries with higher inequality tended to register higher household debt levels, which weighed on economic activity during the crisis, pushing both unemployment and poverty rate higher.

Aspects of inequality are closely intertwined and tend to feed off each other. Unequal outcomes moreover tend to accumulate across the life span, making it harder for disadvantaged people to climb the social ladder.

The concept of "inclusive growth" thus goes beyond income and "material" wellbeing, by including its non-monetary dimensions. Inevitably, a trade-off may appear between inclusiveness and economic growth. The sustainable nature of the latter typically depends on the definition of the former and, for instance, on the extent to which future generations are accounted for.

Initiatives to foster inclusive growth

Over recent years, inclusive growth has been put at the heart of the policy debate in several parts of the world. Prominent institutions have promoted "inclusive growth" to a new policy objective and adopted various initiatives to foster it.

Amongst the pioneers is the World Bank, who established in 2008 a Commission on Growth and Development. The latter published in June 2008 The Growth Report: Strategies for Sustained Growth and Inclusive Development, which "identifies some of the key insights and policy levers to help countries achieve high, sustainable, and inclusive growth" (Commission on Growth and Development, 2008).

In its 2020 strategy, adopted in 2010, the European Commission put forward three mutually-reinforcing priorities, including "inclusive growth", which it regards as "fostering a high-employment economy delivering social and territorial cohesion". The two other priorities are "smart growth: developing an economy based on knowledge and innovation", and "sustainable growth: promoting a more resource efficient, greener and more competitive economy". The European commission also launched in 2016 the Annual Convention for Inclusive Growth (replacing the Convention of the European Platform against Poverty), which brings together civil society organisations and policymakers to discuss how to achieve inclusive growth.

In 2012, the OECD launched its "Inclusive Growth Initiative", in response to the ministerial mandate for a New Approaches to Economic Challenges. It is aimed at developing a strategic policy agenda in line with a new vision of economic growth which puts people's wellbeing centre stage. Extensive work has been done to document wider inequalities and a multidimensional approach to assess, promote and monitor inclusive growth has been adopted. At the OECD Ministerial Council Meeting in June 2016, Ministers adopted a Declaration on Enhancing Productivity for Inclusive Growth.

The IMF has conducted numerous research on the topic and, since 2013, it has offered a course that discusses analytical and operational tools to promote inclusive growth. Finally, the World Economic Forum (WEF) released its "Inclusive Growth and Development Report" in 2017, as part of its Initiative on Economic Growth and Social Inclusion (WEF, 2017).

2. Inclusiveness in advanced economies: state of play

Measurement of inclusive growth ranges across a large spectrum of indicators which reflect the multi-dimension character of wellbeing. Although it does not claim to be exhaustive, this section highlights some major findings and trends for advanced economies. It is based on selected monetary and non-monetary dimensions for which comparable data are available at international level.

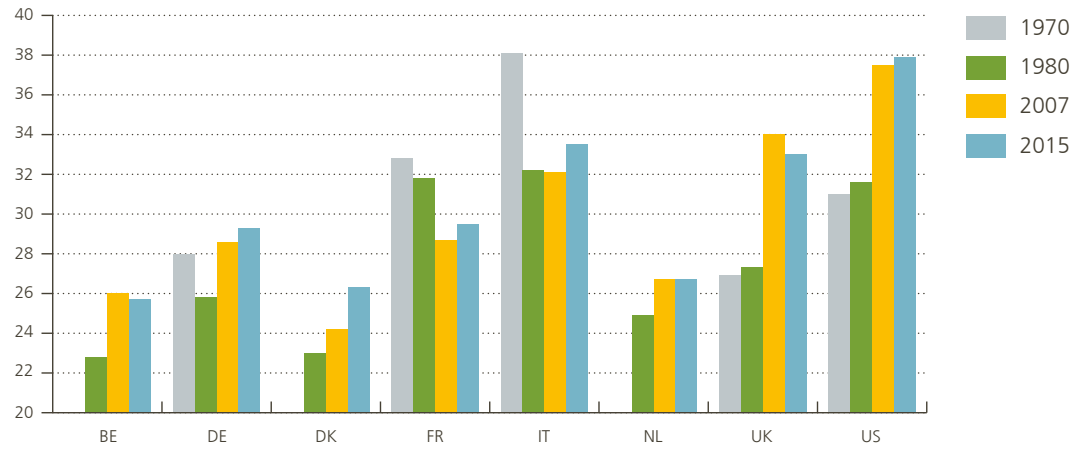
Widening income inequalities

In contrast with the immediate post-war period, income inequality, as measured by the Gini coefficient[1, 2], has widened in most advanced economies over the last couple of decades [3]. However, with varying patterns across countries in terms of both magnitude and timing. For instance, inequalities have risen much more significantly in the UK and the US than in most other rich nations. In France, by contrast, inequalities have tended to decline in comparison to the 1970s while, in Germany, they widened mainly in the 2000s. In Belgium, inequalities rose between 1980 and 1995, but have remained largely stable and comparatively low since then.

Chart 5

Gini index

(disposable income per adult equivalent, 0 = perfect equality & 100 = perfect inequality)



Source: Standardized World Income Inequality Database.

An important element that can be put forward to explain rising income inequality is the decline in the labour income share compared to the share allocated to capital. The median labour share came down from 66.1 % to 61.7 % between the early 1990s and the late 2000s in OECD countries.

Two major developments may have contributed to this trend: firstly, a structural evolution in favour of a more capital-intensive economy and secondly, a decrease in workers' bargaining power (OECD, 2012). The latter decline can be attributed to various factors, including: (1) globalisation, which has boosted competition amongst workers at international level, (2) technological development and the replacement of the workforce by machines, (3) labour market policies that have increased flexibility but lowered worker protection or minimum wage, (4) privatisations in network industries since the 1990, and (5) the decline in both union membership and collective bargaining coverage (*Ibid.*).

1 The Gini coefficient is a broad measure of inequality based on the comparison of cumulative proportions of the population against cumulative proportions of income they receive. It ranges between 0 in the case of perfect equality and 100 in the case of perfect inequality. The Gini coefficient is based here on household disposable income (after taxes and transfers) per adult equivalent.

2 Although they are harmonised, these statistics should be interpreted with caution. The measurement of income (of both labour and capital) is particularly complicated and always imperfect. These data result from surveys and may not reflect the exact situation of individuals. In particular, it is common knowledge that rich people tend to understate their financial situation.

3 It can be underlined that disposable income inequality are significantly lower than market inequality. This is particularly the case in the EU, where social redistribution systems are extensively developed compared to other parts of the world like, for instance, the United States.

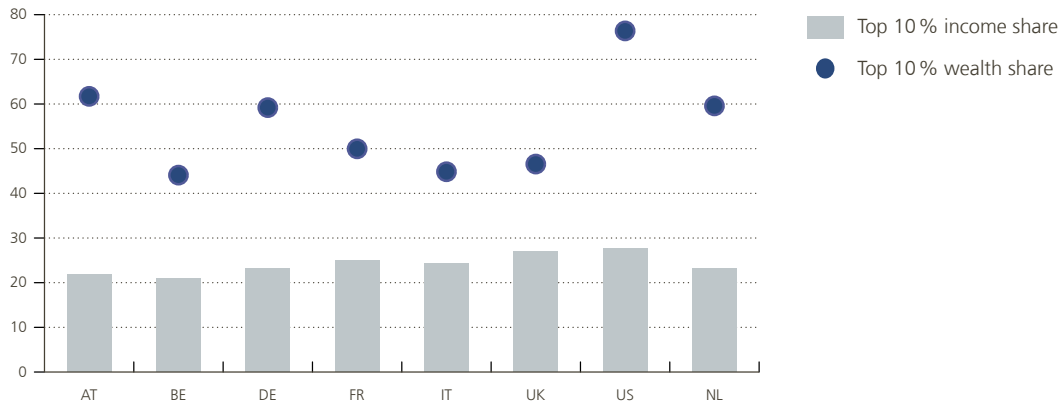
Wealth inequalities are more pronounced

In theory, the relationship between the labour income share and inequality is not obvious, as it depends on various factors, including the distribution of labour and capital endowments across the population, as well as on the effect of taxation and social transfers. For example, a decline in the labour income share may not be accompanied by an increase in income inequality if it goes hand in hand with a lower unemployment rate and/or is offset by income redistribution. In practice, however, evidence points to a close relationship between the decline in the labour income share and income inequality in many advanced economies. This is due notably to highly unequal wealth distribution and thus to the fact that capital incomes tend to be much more concentrated than labour incomes. Because wealth is significantly more unequally distributed than income, unequal outcomes tend to be passed on from generation to generation.

Chart 6

Income share and wealth share of top 10 % [1]

(2012 or latest available year, percentages)



Source: OECD.

1 Income refers to disposable household income and wealth refers to net private household wealth (corrected for household size).

As an illustration of the relatively large wealth disparities, in European countries the 10 % at the top of the wealth distribution usually own around between 40 and 60 % of total country assets. Disparities are even wider in the US, where the richest 10 % own about 80 % of national wealth. Just as in the case of income inequality, wealth inequality is comparatively low in Belgium.

Increased job polarisation

Another significant element to explain rising income inequality is a faster rise in labour compensation at the top than at the bottom of the distribution scale.

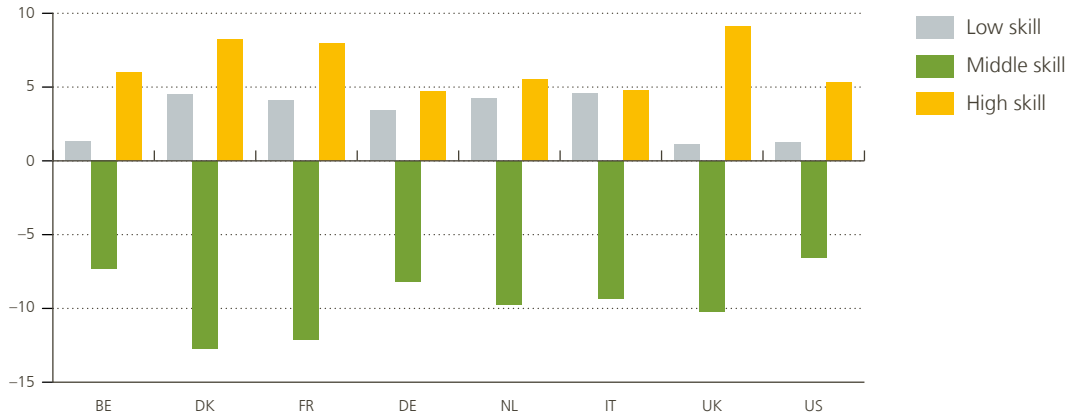
The decline in the labour income share has indeed gone hand in hand with a more polarised distribution of labour incomes, with a bigger share attributed to higher incomes and a decline in the share attributed to lower incomes. Such wage polarisation in advanced economies reflects a shift in labour demand towards more educated and highly-skilled workers. Over the last two decades, demand for highly-skilled workers has increased significantly. At the same time, demand for middle-skilled profile has declined, while demand for low-skilled workers has risen only moderately.

These developments can partly be attributed to both technological developments and globalisation. Technological progress has fostered demand for highly-qualified profiles, while middle-skilled "routine" tasks that were typically performed by workers with moderate education have been automated or offshored to lower-wage countries (Breemersch *et al.*, 2019). Fiercer competition from the latter in the low-tech and middle-tech industries has aggravated pressure on middle-wage jobs, especially after China joined the WTO in 2001. Employment growth in advanced economies has thus tended to polarise into relatively high-skilled, high-wage jobs and low-skilled, low-wage jobs (*Ibid.*).

Chart 7

Change in employment shares by skill content of occupation

(1995-2015, percentage points)



Source: OECD.

Besides, technological progress and, more specifically, the development of information and communication technology (ICT), have given rise to growing productivity and wage dispersion between firms. Since the beginning of the 2000s, firms at the global technology frontier have posted significant productivity gains, comparable to those observed in the past, while laggard firms have generally seen their productivity stagnating.

This diverging trend can be partially attributable to a weakening competitive environment and growing winner-takes-all dynamics (Oulton, 2018). Such dynamics are a particular hallmark of the digital technology sector, where dominant players often grab the lion's share of the market, leading to dominant positions and profits. They may also reflect the obstacles standing in the way of the diffusion of new technologies, notably related to the complexity of these technologies and the outlay and organisational changes that they require.

So, differences in terms of productivity gains have translated into growing divergences in terms of compensation per employee across firms. Highly-productive firms at the technological frontier have notably been able to raise their key employees' salaries to "superstar" levels (Schwellnus *et al.*, 2017).

Concentration at the top

The decline in the labour income share, together with rising labour income disparities have translated into a concentration of income at the top of the distribution. Thus, while the total income share of the top 1 % had declined between 1960 and 1980, it has since then risen. This is particularly the case in the UK and the US, where it has more than doubled, reaching almost 15 % in the former and exceeding 20 % in the latter. On average, at the OECD level, the income of the top 10 % of earners is now around ten times that of the

bottom 10 %, up from seven times three decades ago (OECD, 2016). An increase in the top income share has been observed in almost all rich countries.

It should be noted that financial deregulation and globalisation have contributed to an increase in financial wealth and higher wages in the finance industry, thereby contributing to higher inequality (Dabla-Norris, 2015). Besides globalisation and technological change, competition failures and a decline in the redistributive power of the State, have also been cited as likely factors underlying the increase in inequality in advanced economies (OECD, 2017).

Poverty risk amongst workers has increased

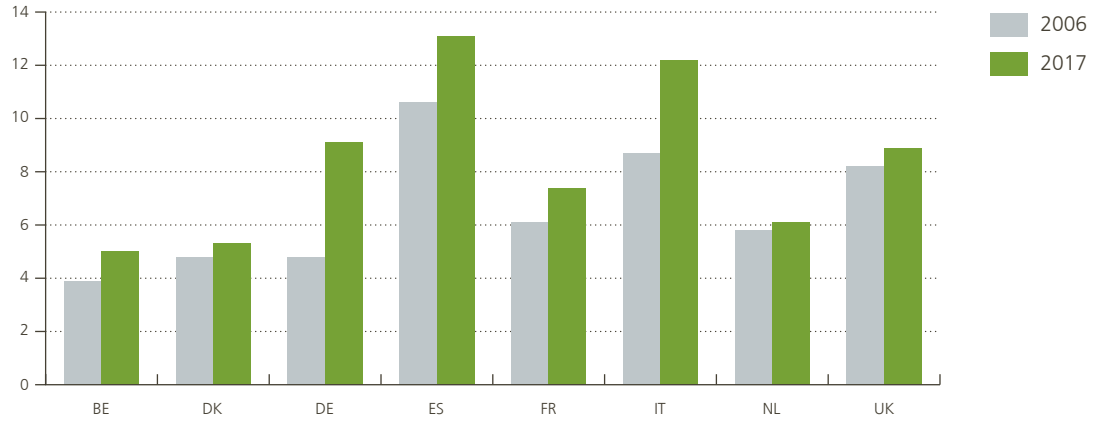
Another striking development over the last few years is the rise in the share of workers at risk of poverty[1]. Most of the rise has taken place after the global and financial crisis of 2008-09. In 2017, nearly one-tenth (9.5 %) of employed people aged between 18 and 64 in the EU27 were at risk of poverty after social transfers, compared to one in twelve (8 %) in 2006. The risk was significantly higher for those working part-time (15.6 %) and for employees with temporary jobs (16.2 %). Is was also slightly higher for men (9.8 %) than for women (9.1 %). Although the pattern is broad-based, magnitude and timing vary widely at country level.

Among the factors that have contributed to the inability of workers to achieve a decent income are labour market reforms, including a reduction in the minimum wage and tighter access to unemployment benefits. The case of Germany is emblematic: greater flexibility of the German labour market supported by the Hartz reforms of the 2000s has accompanied rising rates of low-wage employment. The reforms were made with the objective of boosting employment, legalising forms of informal work and improving incomes of low-paid workers (EC, 2016). At the same time, it appears that they have resulted in many employees working in low-paid, precarious jobs, with few prospects of career development.

Chart 8

Workers at risk of poverty

(share of working people living with less than 60 % of the median income, percentages)



Source: Eurostat.

1 The poverty rate corresponds to the share of working people living with less than 60 % of the household disposable income per adult equivalent.

By contrast, in-work poverty has remained relatively stable and contained in countries like Denmark and Belgium. In Belgium, however, the employment rate is also low compared to most other EU Member States. At the end of 2018, the employment rate was only around 65 %, compared to 69 % at EU28 level and 76.3 % in Germany.

An ever-greater intergenerational divide

The global financial crisis of 2008-09 and the ensuing euro area crisis have weighed more significantly on the young generations, reinforcing an already existing intergenerational divide in terms of both poverty and inequality.

In several EU countries, the economic difficulties of the last decade have reinforced relatively high youth unemployment and the trend towards lower job stability. At the same time, involuntary part-time employment and temporary work contracts have risen the most among young people. These unfavourable labour market developments have led to a higher poverty risk and higher prevalence of in-work poverty. Since 2015, the situation has nevertheless tended to improve.

Chart 9

Poverty risk has increased for the youth and decreased for the elderly

(share of the population living with less than 60 % of the median income, percentages)

Source: Eurostat.

In 2017, the poverty risk for 16-24-year-olds in the EU27 worked out at 22.7 %, up from 19.9 % in 2008. This is a larger increase than for the total population. By contrast, the poverty risk for the elderly has declined substantially, to 14.9 % in 2017, down from 18.9 % in 2008. In Belgium, the decline in the poverty risk for the elderly can be related to several factors, including the increase in the lowest pension benefits, the introduction of guaranteed income for the elderly and higher pension rights for women, due to the higher labour force participation rate of the generation now retiring (Frère, 2016). As for the noticeable increase in the risk of poverty for the younger generations, it is likely related in part to the recent reform of the unemployment benefit scheme and, more specifically, to the cutbacks in integration benefits. The divergent trend as regards the poverty risk for the young and the elderly is expected to continue in future (Dekkers *et al.*, 2019).

More broadly, diverging trends in poverty rates reflect a rise in income inequality across generations in the EU since the mid-2000s (Chen *et al.*, 2018). While the median disposable income of the working-age population – after tax and social transfers – has largely stagnated since the crisis, it has risen by around 10 % for the elderly. More specifically, in most EU countries, the ratio of median net income of the elderly to the youth has risen. As pointed out by Bussolo et al.(2019), beyond disparities across generations, disparities within age cohorts have also widened, with younger cohorts facing higher income inequality at every point of the life cycle than older ones.

Higher joblessness and poverty risk among the young are of particular concern as they not only have adverse and potentially long-lasting consequences for today's youth, but they are also likely to weigh on human capital and productivity gains, and therefore on tomorrow's economic prospects. Moreover, greater inequality across generations erodes social cohesion and polarises political preferences, potentially undermining confidence in political institutions (Chen *et al.*, 2018).

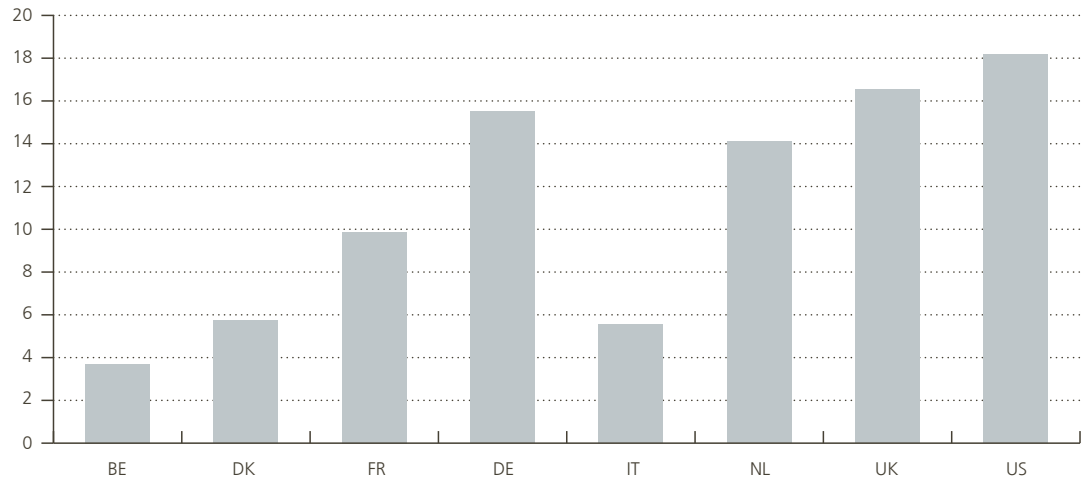
The gender income gap has remained significant

The gender pay gap has tended to decline over the last decade, but it has remained significant in some countries. In 2017, women's gross hourly earnings were on average 16 % below those of men in the EU27. At individual country level, the gender pay gap was relatively high in Germany and in the UK, exceeding 15 %. By contrast, it was low in Belgium, Denmark and in Italy, where it stood at around 5 % or below. In most countries, the gender pay gap is lower for new labour market entrants and tends to widen with age. This is very evident in Belgium where, in 2017, the wage gap was negative for the under-25-year-olds, while it exceeded 15 % for the 55-64-year-olds.

Chart 10

The gender gap in labour income

(difference between median earnings of men and women relative to median earnings of men, full-time employees, 2017 or latest available year, percentages)



Source : OECD.

Foreign-born citizens and their children have fewer opportunities

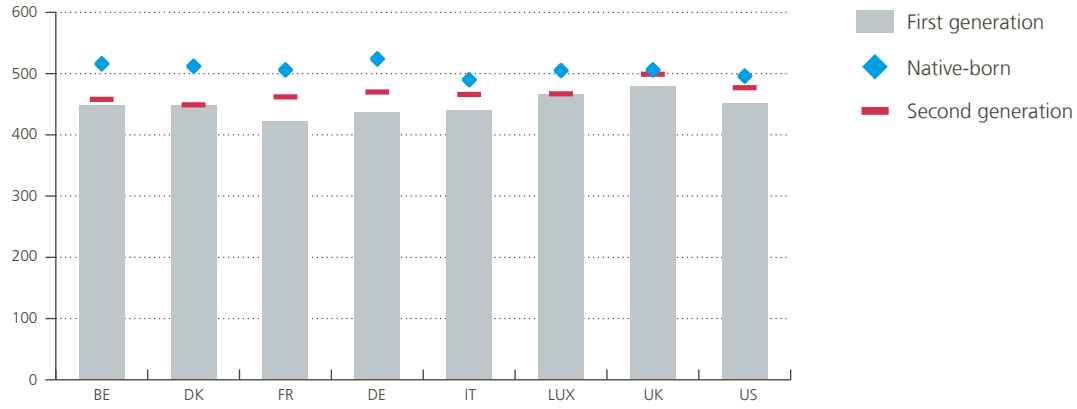
In most OECD countries, immigrants and foreign-born workers are at a disadvantage in education and in the labour market. This is particularly the case in countries with a long migration tradition and a heterogeneous immigrant population.

As far as education is concerned, the OECD PISA study reveals that performance of the first-generation foreign-born is well below those of native-born students. In many countries, performance of second-generation immigrants is also comparatively low. This is particularly the case in Belgium, where the disadvantage of the second generation is larger than in most other OECD countries. This is notably attributable to the unfavourable socio-economic background of the children of immigrants and to the fact that the impact of parental background is greater in Belgium than elsewhere (OECD, 2008).

Chart 11

Students' performance in science, reading and mathematics, by migrant status

(mean combined PISA scores, students aged 15, 2015)



Source: OECD.

Large gaps are also observed on the labour market, where the employment rate among immigrants compared to the native-born is low, while the unemployment rate amongst immigrants is relatively high. Again, gaps here are significantly larger (and more persistent) in Belgium than in other OECD countries, especially for non-EU15 immigrants, and for women in particular. Amongst the explanatory factors is the over-representation of immigrants among those with a very low education level, the existence of discrimination, less developed personal networks as well as information asymmetry (OECD, 2008).

Health gains have been remarkable but unequally shared

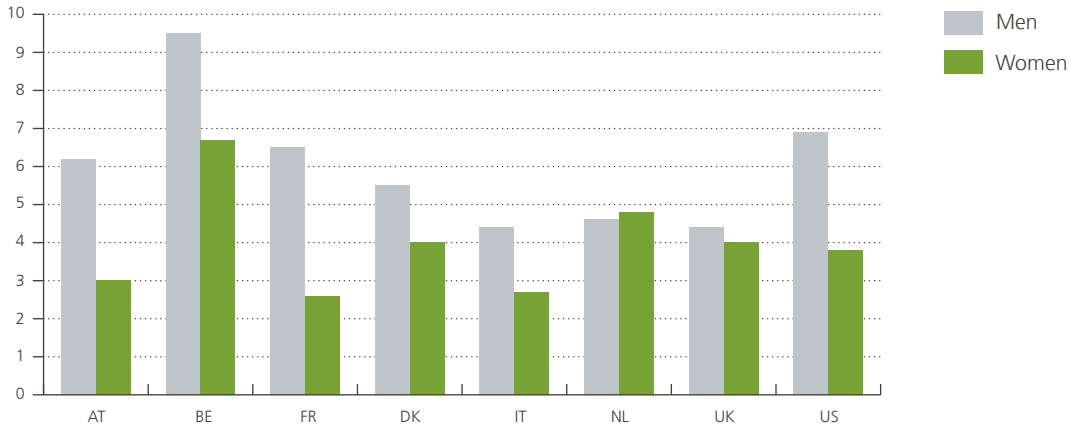
There have been substantial health gains over time, with life expectancy at birth in rich countries on average ten years higher today than it was in 1970. This results notably from improvements in education and living conditions, from a reduction in risk factors like smoking, better quality and accessibility of healthcare systems (OECD, 2017). Thus, in 2016, life expectancy at birth was 80.8 years, on average, across OECD countries, compared to 69.9 years in 1970. This performance nevertheless masks substantial differences across countries, genders as well as socio-economic status.

Focussing on the latter, the gap between people with the highest level of education and those with the lowest level is elevated. In 2015, the former could expect to live around six years longer than people with the lowest level of education at age 30 (53.4 versus 47.8 years) across the OECD. These differences in life expectancy by education level are particularly pronounced for men, with an average gap of seven years. Belgium stands out as a country where the difference in life expectancy on the basis of education is particularly high.

Chart 12

Gap in life expectancy at age 30 between highest and lowest education level

(in years, 2015 or nearest year)



Source: OECD.

Air pollution improved but remained at dangerous level

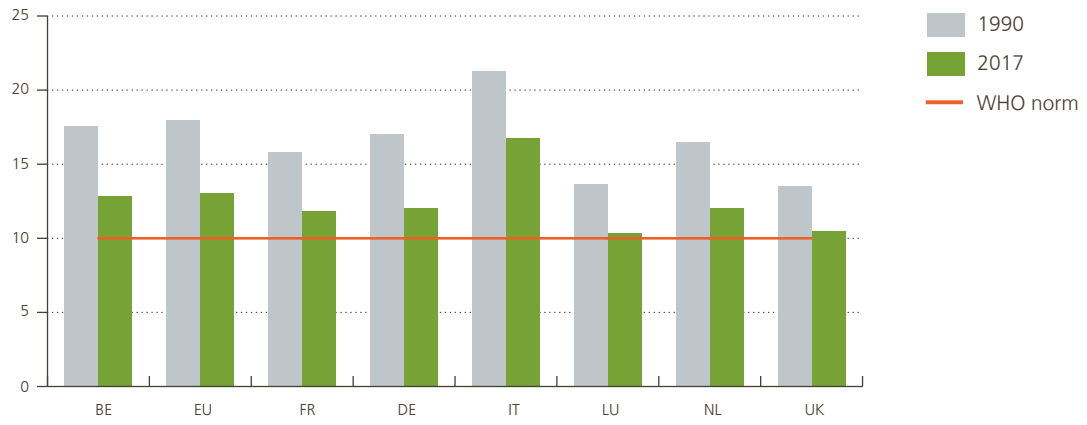
According to the World Health Organisation (WHO), air pollution is a major health problem (WHO, 2019). In particular, exposure to small particulate matter of 2.5 microns or less in diameter, which are capable of penetrating deep into the respiratory tract, is responsible for cardiovascular and respiratory disease, as well as cancers. Because some population are more sensitive (children) or more exposed (urban area), and because of inequality in access to healthcare, not everyone is exposed to the same risk.

The good news is that, over the last three decades, concentrations of suspended particles have dropped in most countries of the world. In rich countries, they have declined about 13.8 % between 1990 and 2017. They have nevertheless remained above the WHO annual norm of 10 micrograms for PM2.5 in many EU countries. This is the case in particular in Belgium, where the share of diesel vehicles in total car population is prominent, although it has declined lately.

Chart 13

Exposure to air pollution

(urban and rural exposure to ambient PM2.5 pollution[1])



Source: World Bank.

1 Population-weighted exposure to ambient PM2.5 pollution is defined as the average level of exposure of a nation's population to concentrations of suspended particles measuring less than 2.5 microns in aerodynamic diameter. Exposure is calculated by weighting mean annual concentrations of PM2.5 by population in both urban and rural areas.

Increased disparities across EU regions

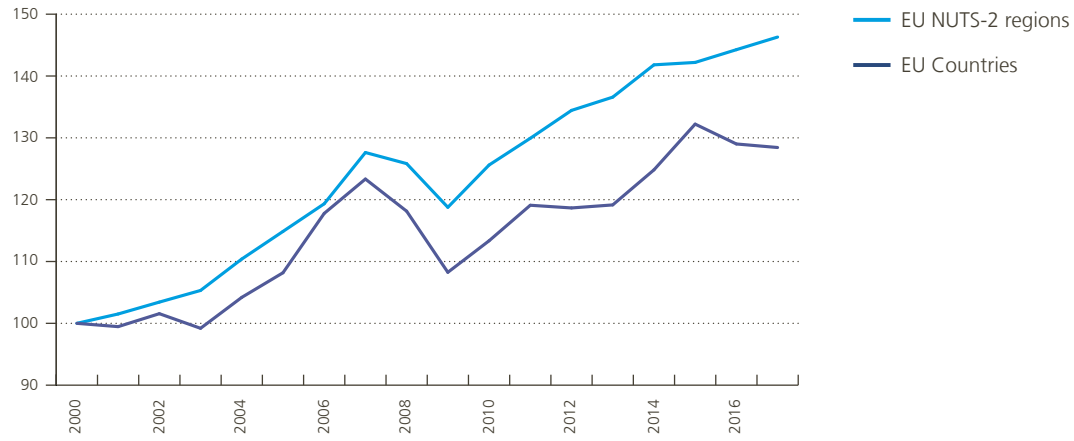
Finally, looking at spatial inequalities at EU level, purchasing power disparities between countries have increased since the beginning of the 2000s. Disparities across EU regions have risen even more, however.

Globally, well-connected metropolitan areas have registered faster economic development than rural or peripheral areas. But urban zones also face higher levels of inequality, especially large cities, which tend to

Chart 14

Purchasing power standard (PPS) per inhabitant

(standard deviation, 2000 = 100)



Source: Eurostat.

attract the most skilled workers and the most productive firms. Obviously, regional disparities are not limited to incomes or purchasing power but include multiple wellbeing dimensions. For instance, in 2018, unemployment rates ranged from 1.3 % in the Prague Region in Czech Republic to over 25 % in the Greek region of Western Macedonia.

Conclusion

Polarisation has tended to increase in advanced economies over the last few years. The decline in the labour income share, together with rising labour income disparities have translated into a concentration of income at the top of the distribution range. At the same time, the share of workers at risk of poverty has risen, especially amongst the young, who paid the highest price for the recent economic and financial crises. On the contrary, the poverty risk among the elderly has declined substantially in most countries. Large gaps persist across populations when it comes to non-monetary dimensions of wellbeing, including education, employment and health. At EU level, regional and, to a lesser extent, cross-country income disparities have also widened over the last two decades.

The main factors behind those developments include globalisation and technological progress, which have fostered competition between workers at global level and shifted labour demand in favour of highly-skilled people in advanced economies. A decline in the redistributive power of the State has also been cited as a driver of the increase in inequality.

Belgium ranks amongst the countries with the lowest level of inequality and the narrowest gender gap in labour income. Poverty risk amongst working people is also low, but employment rate is comparatively weak. By contrast, Belgium stands out as a country where immigrants and their children tend to lack opportunities, where the level of education is a significant determinant of life-expectancy and where air pollution is pretty high.

The multiple dimensions of inequality are closely intertwined and tend to feed off each other. Addressing inequality of opportunity really matters, as it does not just have adverse and potentially long-lasting consequences for people today, but is also likely to weigh on tomorrow's economic prospects. Accessibility and quality of education is key in this regard.

Looking ahead, promoting more inclusive growth faces key challenges. Firstly, innovation and technological change are expected to accelerate with the development of artificial intelligence, digitalisation and automation. While technological advances are key to raising productivity and improving living standards, they can also leave people behind. Secondly, population ageing is a global phenomenon, but is most pronounced in advanced economies. This trend is putting pressure on the working-age population and pushing up the dependency ratio. It is thus expected to weigh on future income growth per capita and may possibly reinforce distributive tensions. Thirdly, while a temporary slowdown cannot be ruled out, global economic integration is not expected to decline structurally. The rapid development of large emerging economies in particular offers many opportunities for advanced economies, but it may also continue to generate costs for various segments of the population. Fourthly, climate change and other environmental concerns require major shifts in production and consumption practices. Appropriate adjustments are generating both opportunities and costs. Ensuring that those are equitably shared across the population is crucial to making the ecological transition successful.

These challenges are very significant and addressing them requires both the approval and cooperation of the whole population. Today's social frustration about the distribution of the benefits of economic growth should be taken seriously to restore public confidence in the capacity of democratic institutions, technological progress and international economic integration to support further social progress and wellbeing for all.

Bibliography

Aghion P., E. Caroli and C. García-Peñalosa (1999), "Inequality and Economic Growth : The Perspective of the New Growth Theories", *Journal of Economic Literature*, 37 (4), 1615–1660, December.

Aiyar S. and C. Ebeke (2019), *Inequality of Opportunity, Inequality of Income and Economic Growth*, IMF Working Paper 19/34, February.

Breemersch K., J. P. Damijan and J. Konings (2019), "What drives labor market polarization in advanced countries ? The role of China and technology", *Industrial and Corporate Change*, 28(1), 51–77, February.

Brueckner M. and D. Lederman (2018), *Inequality and economic growth : the role of initial income*, World Bank Group, Policy Research Working Paper 8467.

Cassiers I. and G. Thiry (2014), "A High-Stakes Shift : Turning the Tide from GDP to New Prosperity Indicators", in *Redefining Prosperity*, edited by Cassiers I., London and New York, Routledge, coll. "Routledge Studies in Ecological Economics", 22-40.

Chen T., J-J. Hallaert, A. Pitt, H. Qu, M. Queyranne, Al. Rhee, A. Shabunina, J. Vandenbussche and I. Yackovlev (2018), *Inequality and Poverty Across Generations in the European Union*, IMF Staff Papers, January.

Club of Rome (2019), https://www.clubofrome.org/

Commission on Growth and Development (2008), *The Growth Report : Strategies for Sustained Growth and Inclusive Development,* Washington, DC : World Bank.
https://openknowledge.worldbank.org/handle/10986/6507License: CC BY 3.0IGO.

Corak M. (2016), *Inequality from Generation to Generation : The United States in Comparison*, IZA Discussion Paper 9929.

Cordemans N., B. Decerf and F. De Ville (2013), *Beyond GDP: towards a country where life is really good,* A report to the King Baudouin Foundation.

Dabla-Norris E., K. Kochhar, N. Suphaphiphat, F. Ricka and E. Tsounta (2015), *Causes and Consequences of Income Inequality : A Global Perspective*, IMF Staff Discussion Note 15/13, June.

Darvas A. and G. Wolff (2016), *An anatomy of inclusive growth in Europe*, Bruegel blueprint series 26.

Dekkers G., E. Tarantchenko and K. Van den Bosch (2019), *Medium-term projection for Belgium of the* at-risk-of-poverty *and social exclusion indicators based on EU-SILC*, Bureau du Plan, Working Paper 3-19, February.

Durlauf S. and A. Seshadri (2017), "Understanding the Great Gatsby Curve", *NBER Macroeconomics Annual 32*, 333-393.

EC (2016), *Evidence review – Low pay and in-work poverty : preventative measures and preventative approaches,* Directorate-General for Employment Social Affairs and Inclusion, May.

Frère J-M. (2016), *La population à risque de pauvreté ou d'exclusion sociale en Belgique – Projection jusqu'en 2030*, Bureau du Plan, Working Paper 12-16, November.

Gordon R. J. (2012), *Is US economic growth over? Faltering innovation confronts the six headwinds*, CEPR, Policy Insight 63, September.

NAI (2019), *Indicateurs complémentaires au PIB,* Institut des Comptes nationaux, February.

IPCC (2014), *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, IPCC, Geneva, Switzerland.

IWEPS (2011), *Développement d'indicateurs complémentaires au PIB. Partie 1: revue harmonisée d'indicateurs composites/synthétiques*, Working Paper 4.

Joskin A. (2019), *Inégalités de bien-être en Belgique. Construction de onze indicateurs composites pour mesurer le bien-être de différentes catégories de la population*, Bureau fédéral du Plan, Working Paper 2-19, February.

Kahneman D. and A. Deaton (2010), "High Income Improves Evaluation of Life But Not Emotional Well-Being", PNAS, 107(38), 16489-16493, September.

Kjellén B. and P. Wallensteen (2012), "Climate Change, Peacekeeping, and Perspectives for UN Reform", in *Climate Change, Human Security and Violent Conflict*, edited by Jürgen Scheffran, Michael Brzoska, Hans Günter Brauch, Peter Michael Link, and Janpeter Schilling, 685-694. Berlin: Springer-Verlag.

Koubi V., T. Bernauer, A. Kalbhenn and G. Spilker (2011), *Climate Variability, Economic Growth, and Civil Conflict*, APSA 2011 Annual Meeting Paper.

Milanovic B. (2016), *Global Inequality. A New Approach for the Age of Globalization,* Cambridge, Harvard University Press.

OECD (2008), *Policy use of wellbeing metrics: Describing countries' experiences*, Statistical and data directorate working paper 94.

OECD (2008), *Jobs for Immigrants (Vol. 2): Labour Market Integration in Belgium, France, the Netherlands and Portugal,* https://doi.org/10.1787/9789264055605-en.

OECD (2012), "Labour Losing to Capital: What Explains the Declining Labour Share?", *in OECD Employment Outlook.*

OECD (2014), *All on Board – Making Inclusive Growth Happen.*

OECD (2016), *The Governance of Inclusive Growth.*

OECD (2017), *Bridging the Gap: Inclusive Growth 2017 update report.*

OECD (2019), *Inclusive Growth,* https://www.oecd.org/inclusive-growth/about.htm

Osberg L. and A. Sharp (2011), *Moving from a GDP-based to a wellbeing-based metric of economic performance and social progress: results from the index of economic wellbeing for OECD countries, 1980-2009,* Center for the Study of Living Standard (CSLS), Research Report 2011-12.

Ostry J., A. Berg and C. Tsangarid (2014), *Redistribution, inequality, and growth*, IMF Staff Discussion Note 114/02, International Monetary Fund.

Oulton N. (2018), *The UK Productivity Puzzle : Does Arthur Lewis Hold the Key ?*, Centre for Macroeconomics, LSE, 25 March.

Piketty T., E. Saez and G. Zucman (2018), *Distributional national accounts : method and estimates for the Unites States, The Quarterly Journal of Economics*, 133(2), May.

Piketty T. and E. Saez (2003), *Income Inequality in the United States, 1913-1998, The Quarterly Journal of Economics*, 118(1), February.

Rawls J. (1971), *A Theory of Justice,* Revised Edition, Cambridge, Harvard University Press.

Schwarzer J. (2014), "Growth as an objective of economic policy in the early 1960s : the role of aggregate demand", *Cahiers d'économie Politique / Papers in Political Economy,* 67(2), 175-206.

Schwellnus C., A. Kappeler and P. Pionnier (2017), *Decoupling of wages from productivity : Macro-level facts,* OECD Economics Department Working Papers, 1373, https://doi.org/10.1787/d4764493-en.

Sen A. K. (1985), *Commodities and capabilities,* North-Holland, Amsterdam.

SPF sécurité sociale (2016), *Evolution de la situation sociale et de la Protection sociale en Belgique 2016 :* Augmentation des divergences, synthèse.

Stevenson B. and J. Wolfers (2013), "Subjective Wellbeing and Income : Is There Any Evidence of Satiation ?", *American Economic Review,* 103(3), 598-604.

UNDP (2016), *Human Development Report 2016 : Human Developments for Everyone.*

WEF (2017), *The Inclusive Growth and Development Report 2017.*

White W. (2012), "Policy debate : how do you make growth more inclusive ?", in de Mello, L. and M. A. Dutz (eds.) (2012), *Promoting Inclusive Growth : Challenges and Policies,* OECD.

WHO (2019),
https://www.who.int/news-room/fact-sheets/detail/ambient-%28outdoor%29-air-quality-and-health

Why has Belgian private consumption growth been so moderate in recent years?

G. Minne
R. Basselier
G. Langenus

Introduction [1]

While Belgium had weathered the great recession relatively well compared to the euro area as a whole and most of the neighbouring countries, its growth performance has been more moderate since. Over the past five years, the Belgian economy has shown a steady expansion of, on average, 1.5 % in annual terms, which is nearly half a percentage point below the euro area's annual average.

As regards the demand components, private consumption – that accounts for the largest part of final demand in most advanced economies – has been particularly lacklustre in Belgium in recent years, with the exception of 2016. Remarkably, the annual average growth rate of private consumption during the past five years did not even exceed that recorded during the 2008-2013 period, which includes the crisis years. This contrasts with the situation in many other euro area countries where household spending has often been a key driver of the post-crisis recovery.

In this article, we look at the reasons behind the slow growth of Belgian households' consumption spending in recent years. The first chapter reviews the long-term trends and provides a comparison with household consumption growth in the euro area and in the largest neighbouring countries. In the second chapter, we take a look at the product categories that account for the overall slow consumption growth. The third chapter focuses on the role of disposable income growth and, more specifically, income from labour, which is considered to be the main determinant of private consumption. The last chapter looks into other possible explanations for the path of private consumption, such as wealth and composition effects, as well as the rising level of indebtedness of Belgian households.

1. Belgian private consumption in a longer-term and international perspective

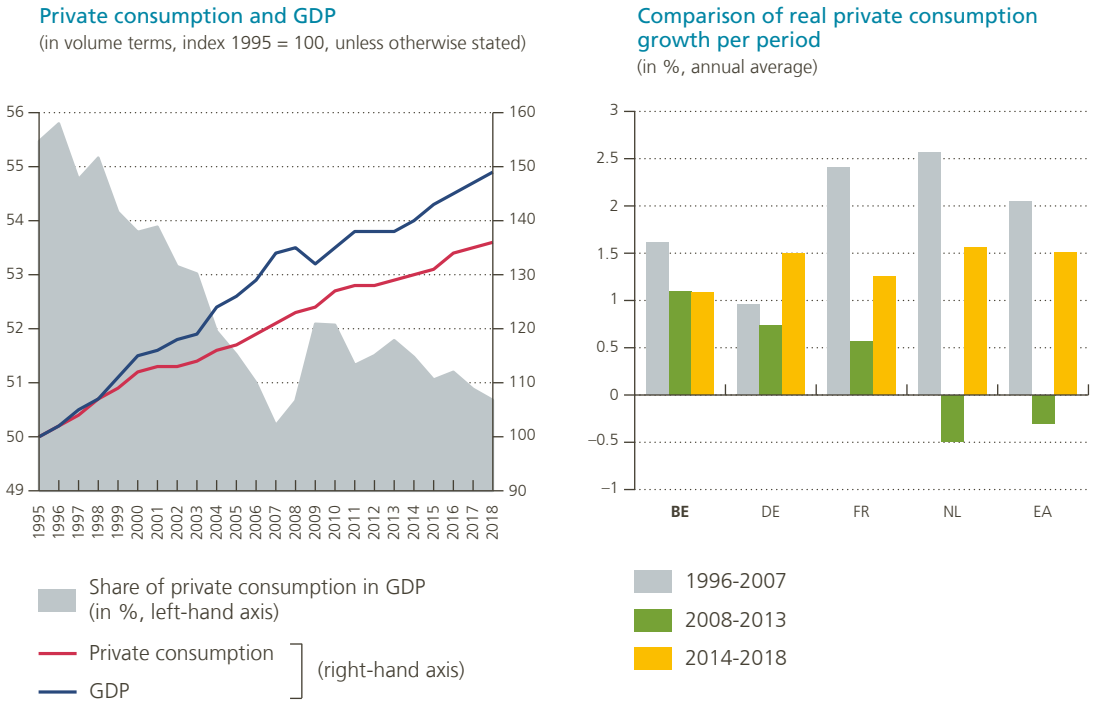
An analysis of the data for Belgium since 1995 indicates that the cumulative growth rate of private consumption has failed to keep up with that of economic activity. The share of private consumption in GDP has been on a long-term declining path: between 1995 and 2018, activity has grown by a cumulative 50 %, whereas private consumption has only expanded by some 36 %.

1 This article is based on national accounts dating from mid-May 2019. The next set of annual national accounts will be published in October 2019 and will be subject to a five-yearly occasional methodological revision. The latter may also affect the series for private consumption.

The share of private consumption in GDP reached a trough in 2007, at just over 50 %, but the downward trend was temporarily interrupted as of 2008 as private consumption held up relatively well compared to GDP during the crisis years, despite heavy macroeconomic uncertainty and tighter financial conditions. This was due to a number of idiosyncratic factors that helped to cushion the blow of the great recession. First of all, the Belgian labour market is relatively rigid, which led to important labour hoarding during the early crisis years. This was reinforced by an extension of the system of temporary unemployment, that keeps workers in the firm even when there is insufficient demand (De Mulder and Druant, 2011). Moreover, in 2009, at the height of the financial crisis, households' purchasing power was shored up by the usual lags in the indexation mechanisms. Due to the surge of inflation in 2008, price indexation of wages and social benefits was substantial in 2009. As inflation had actually moderated considerably by that time and was close to zero, the indexation was well in excess of the then rise in consumer prices and provided temporary support for real disposable income growth. All in all, these elements have helped Belgian households to protect their labour income, which is an important determinant of private consumption, as will be discussed in chapter 3.

Chart 1

Private consumption in a historical and international perspective



Sources: Eurostat, NAI, NBB.

From 2008 to 2013, Belgian private consumption still recorded an average annual growth rate of about 1 %, well above the average pace that was observed in the three main neighbouring countries. In the euro area as a whole, the average growth rate even turned slightly negative during this period, on account of severe drops in consumer spending in certain countries such as Italy and Spain. All in all, Belgian consumers have on average felt the crisis less than those in other euro area countries.

On the other hand, when euro area private consumption started to rebound in 2014, it clearly outpaced that of Belgium. Similarly, Germany, France and the Netherlands have seen a clear recovery in the growth rate of private consumption in the past five years. Belgium has recorded only a moderate rise in consumer spending, no higher than the average observed during the crisis years. The share of private consumption in economic activity continued

its downward trend and was back to just over 50 % in 2018. Both from a historical perspective as compared to the euro area as a whole, the expansion in Belgian private consumption has been relatively weak in the last few years.

Before looking into the drivers of weak household consumption growth, the next chapter assesses which product categories have been consumed relatively less in recent years.

2. Which products have been consumed relatively less recently?

Following the work by Matute and Urtasun (2017), household consumption can be broken down into four main categories taken from the two-digit COICOP classification[1], as listed in table 1.

Table 1

Four main types of household consumption

Categories of goods and services	COICOP code	COICOP class
Basic goods and services	1	Food and non-alcoholic beverages
	6.1	Medical products, appliances and equipment
	7.2	Operation of personal transport equipment
	7.3	Transport services
	10	Education
Non-essentials	2	Alcoholic beverages, tobacco and narcotics
	6.2	Outpatient services
	6.3	Hospital services
	8.1	Postal services
	8.3	Telephone and telefax services
	9.4	Recreational and cultural services
	9.5	Newspapers, books and stationery
	9.6	Package holidays
	11	Restaurants and hotels
	12	Miscellaneous goods and services
Durables and semi-durables	3	Clothing and footwear
	5	Furnishings, household equipment and routine household maintenance
	7.1	Purchase of vehicles
	8.2	Telephone and telefax equipment
	9.1	Audiovisual, photographic and information processing equipment
	9.2	Other major durables for recreation and culture
	9.3	Other recreational items and equipment, gardens and pets
Quasi-fixed expenditure	4	Housing, water, electricity, gas and other fuels

Source: NBB.

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. It should be noted that 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 the consumption expenditure by households, 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 within Belgian territory, 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 very similar, but a detailed decomposition per product type only exists for the domestic concept (currently until 2017).

The economic rationale behind such a decomposition is that consumption of the various types of products is likely to change in different ways during different points of the business cycle.

Spending on durable goods, for example, can reasonably be assumed to be most sensitive to changes in economic conditions. First of all, the purchase of durable goods tends to require a larger part of the household budget and cannot easily be reversed. During a crisis period, job and income prospects become more uncertain and postponing the purchase of such goods until more information can be obtained is a reasonable thing to do (Gudmundsson and Natvik, 2012). Second, durables are also more likely to be purchased via a loan (Pistaferri, 2016). Financial conditions had been tightened up during the initial phase of the great recession and this may have prevented certain households from going ahead with their desired purchase. Third, taking into account the longer lifetime of durable goods, Dossche *et al.* (2018) state that households derive utility from the flow of services provided by the good during its lifespan, but not from the purchase itself. Hence, when households decide to postpone the purchase of durable goods, they would lose only little utility at that specific time. From a practical point of view, it makes sense that the purchase of vehicles or furniture can more easily be postponed than that of indispensable items like food or medicine.

Items such as food, medicine, public transport and education are considered basic products and take up almost one-quarter of consumer spending. Typically, these items have a low income elasticity, which implies that even when households are faced with a negative income shock, they will nonetheless continue to buy them. The category of quasi-fixed expenditure on housing and related energy expenses can also be considered as a necessity and represents about another quarter of consumer spending.

The largest category of Belgian consumer spending consists of non-essentials and non-durables and includes a broad range of items, which are typically bought for leisure. Given the non-essential nature of these goods and

Chart 2

Consumer spending by category of expenditure

(in % of total, volume data for 2017, data for 1995 between brackets)

Source: Eurostat.

services, these purchases are also considered to be quite sensitive to swings in the business cycle as they can be easily cut back.

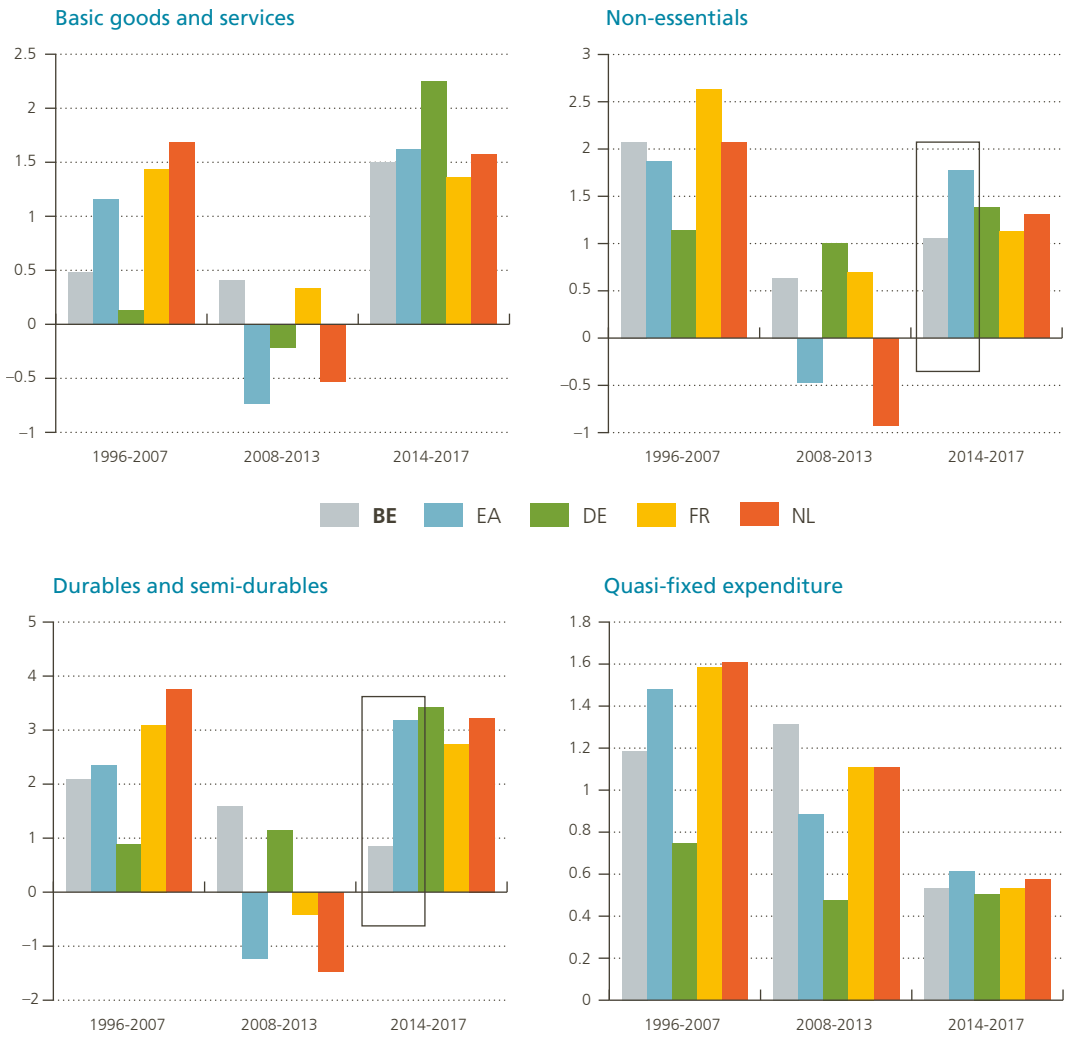
Generally speaking, purchases of durable goods and non-essential products are more likely to be postponed during economic downturns (Mínguez and Urtasun, 2015). During upturns, on the other hand, pent-up demand for these products could then boost consumer spending.

The phenomenon of pent-up demand following the crisis years cannot be observed from the data for Belgium. In fact, the average growth rate of the category of (semi-)durable goods has been lower since 2014 than the average recorded from 2008 to 2013. Moreover, it was clearly below the average rate observed in the euro area as a whole and the main neighbouring countries during the recent period. A likely explanation is that pent-up demand for durables may simply have been weaker or even absent in Belgium, because these purchases had previously not been postponed to the same extent as in other countries. In fact, when comparing the average

Chart 3

Consumer spending on different categories of goods and services

(average annual percentage changes, volume data)



Source: Eurostat.

growth rates across countries during the years between 2008 and 2013, Belgian purchases of durable and semi-durable goods continued to expand at a pace comparable to the pre-crisis period, whereas those purchases had been clearly cut back in the euro area and the neighbouring countries.

The category of non-essentials and non-durables, which is also expected to be quite sensitive to the business cycle, exhibited the expected pattern during the crisis period. Purchases of these goods and services by Belgian households grew considerably slower than before 2007. However, this category did not rebound after 2013, as it did in the euro area. As these non-essentials account for an important part of consumers' purchases, their sluggish expansion compared to that of the euro area and the neighbouring countries is an important explanation for the relatively weaker growth of overall private consumption.

For the other two categories, basic goods and quasi-fixed expenditure, the pace of growth recorded in Belgium during the past five years is very similar to that in the euro area.

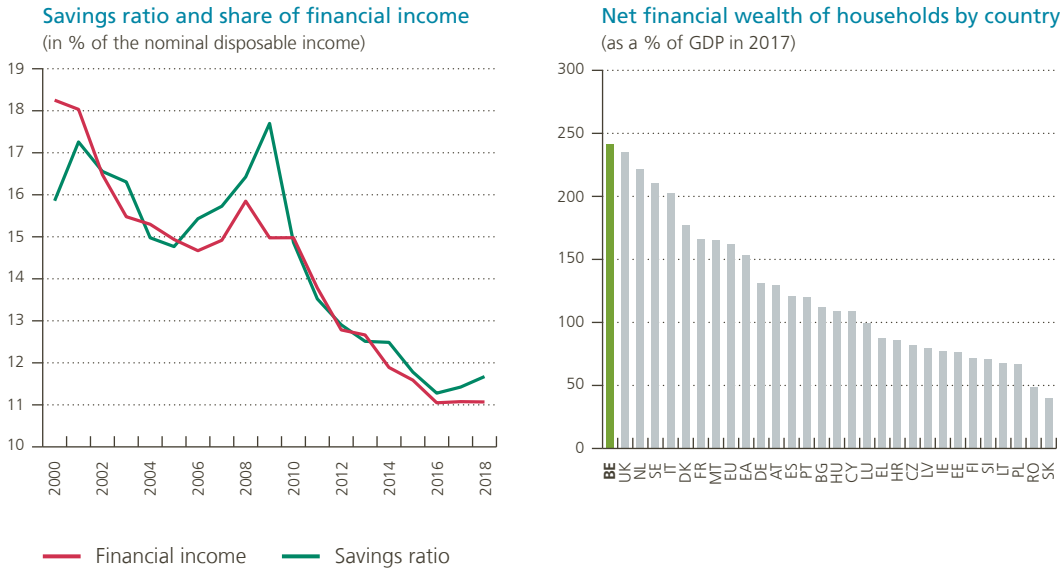
3. Slow labour income growth is the key driver of moderate household consumption growth

3.1 The declining savings ratio reflects the slowdown of net financial income, not strong consumption growth

At the start of the century, Belgian households were still saving about 16 % to 17 % of their disposable income. This was considerably more than the euro area average. Since then, their savings ratio has gradually declined. This trend was only temporarily interrupted around the great recession, when the heightened uncertainty led to more precautionary saving and households mostly saved their extra real income.

Chart 4

Household savings, net financial assets and property income



Sources: Eurostat, NAI, NBB.

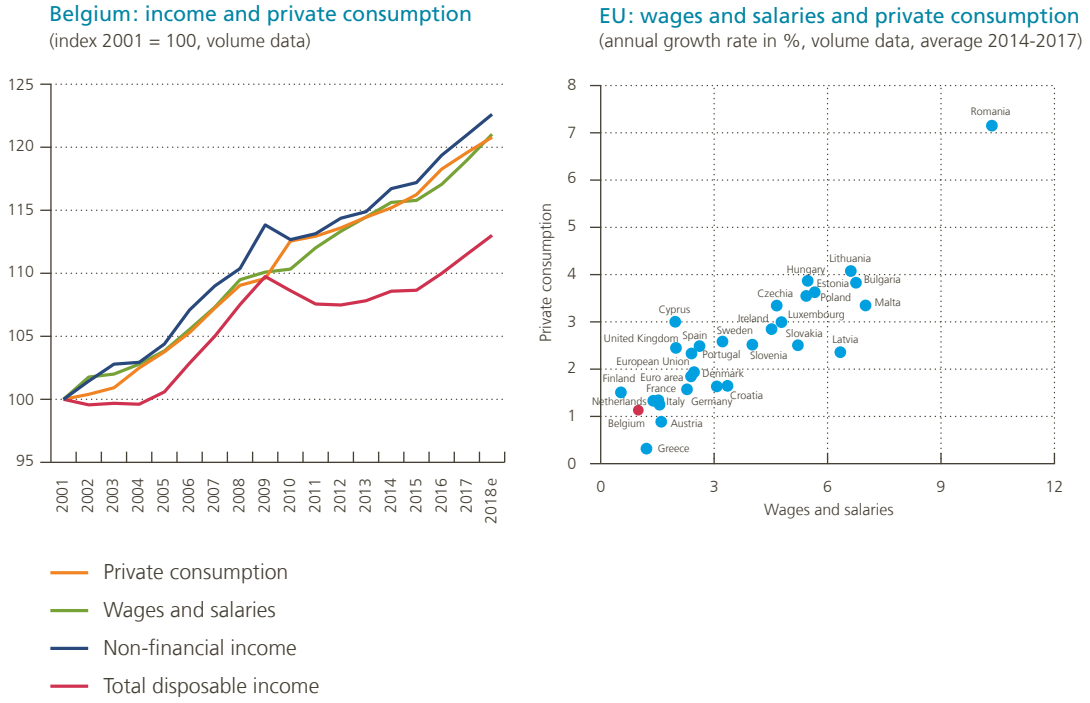
While a declining savings ratio mechanically implies that private consumption rises more than households' purchasing power, the observed decline in average savings as a proportion of income mostly reflects a composition effect. Belgian households have large net financial assets, but mainly as a result of the declining return on capital and historically low interest rates, the share of financial income in total household income has dropped considerably, coming down from 17.5 % of disposable income in 2008 to only 10.6 % in 2018. As financial income[1] is typically saved more (Basselier and Langenus, 2014), this puts downward pressure on the overall savings ratio (Baugnet *et al.,* 2017).

3.2 Private consumption mostly tracks current labour income

While the changing composition of household income, with a larger share of non-financial income, explains why household consumption has risen more than disposable income in recent years, consumption growth has remained very close to changes in non-financial income and its largest component, wages and salaries. Between 2001 and 2018, private consumption in volume terms increased by 20.8 % while real wages and salaries rose by 21 % in Belgium. Remarkably, private consumption seems to have moved in line with labour income in that period. The two indicators are not systematically moving at the same pace every year, but their respective paths do not diverge greatly over time. Also, in other countries, growth in private consumption shows a strong positive correlation with current labour income.

Chart 5

Strong correlation between private consumption and labour income



Sources: Eurostat, NAI, NBB.

1 Financial income (also named "property incomes") includes interest, dividends, and benefits related to insurance assets and other financial investment as well as rent on natural assets (mostly fields rented out to farming companies). The latter category does not include the rental of a real estate asset and constitutes a small share of the financial income.

According to the "permanent income hypothesis" (Friedman, 1957, Hall, 1978, Hall and Mishkin, 1982), the average household would have a certain preference for keeping its consumption expenditure stable irrespective of the business cycle and the life-cycle.[1] A rational household then uses its capacity to save and borrow to keep a broadly stable consumption pattern and makes its expenditure decisions not only on the basis of current disposable income but rather on some permanent income or total wealth concept. The latter may be defined as the present value of lifetime wealth, current income and the present discounted value of the income that households expect to receive in the future. However, in reality, household consumption often seems to track current income quite closely.

The reasons why private consumption could be more reactive to changes in current labour income and not as smoothed as predicted by the permanent income hypothesis are well-documented in the literature (e.g. Jappelli and Pistaferri, 2010). In general, the marginal propensity to consume out of an income shock depends on the sign of the shock and whether the shock is anticipated or not. However, credit constraints and the presence of myopic consumers could generally increase the correlation between consumption and current income.

First, households may find themselves constrained to tailor their consumption expenditure to their current income and spend the entire income at their disposal in every period. Among the so-called "hand-to-mouth consumers", two categories can be distinguished: the poor and the wealthy ones. The poor hand-to-mouth consumers hold little or no liquid assets and no illiquid assets such that they are unable to smooth their consumption intertemporally. The wealthy hand-to-mouth consumers have a lot of illiquid assets such as housing or retirement accounts but only little or no liquid assets. Because illiquid assets cannot be instantly converted into consumption goods at reasonable cost, households may opt for spending their entire income every period (Kaplan *et al.,* 2014). In advanced countries, wealthy hand-to-mouth consumers are generally a much larger fraction of the population than poor ones. The sensitivity of household consumption to labour income changes may also be specifically related to more difficult access to the credit market (Deaton, 1991) or the existence of precautionary savings (Carroll and Kimball, 2001). The assumption that households can smooth consumption by saving and borrowing under similar conditions does not always hold: while they can always save, borrowing may be limited or could involve high transaction costs. Credit constraints typically affect households whose future incomes are perceived as being uncertain and are more prevalent in a recessionary period when the default risk rises.

Second, a household intending to smooth out its consumption over time needs to estimate its income growth and getting a reliable estimate of the path of future income may be relatively difficult and time-consuming. In that case, households may decide to opt for a less sophisticated consumption pattern and act as myopic consumers, tailoring their consumption expenditure to their current income (Weil, 1992, Campbell and Mankiw, 1989).

3.3 Despite strong job creation, labour income growth was fairly moderate between 2014 and 2018

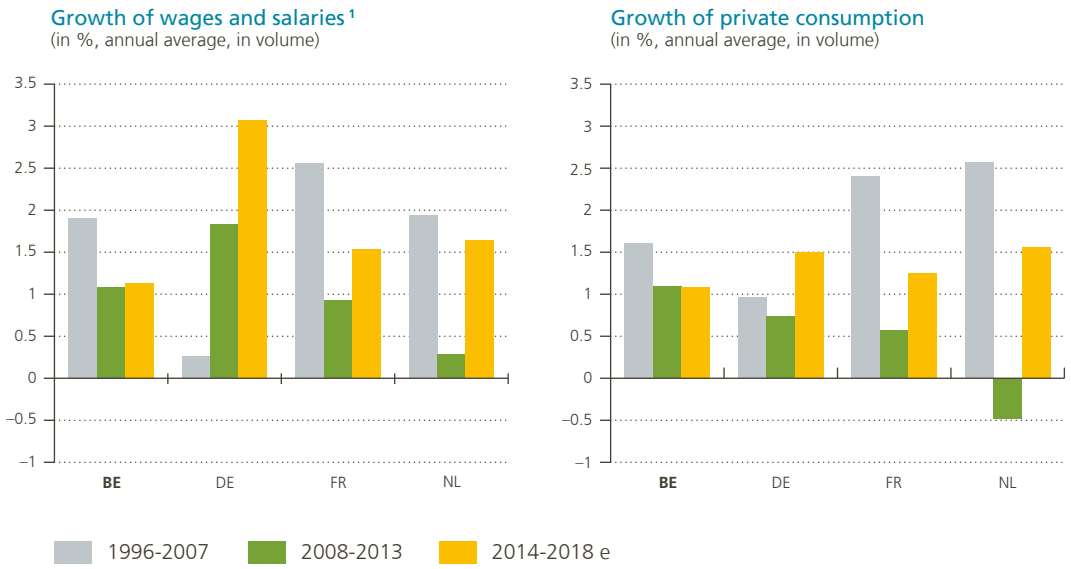
As private consumption seems to be mostly determined by non-financial or labour income, we now focus on trends in this income. Labour income growth has been relatively weak in recent years. On average, between 2014 and 2018, real wages and salaries grew less in Belgium than in the major neighbouring countries, contrary to previous periods. Average annual growth of this income component was close to 1 % in Belgium against 3.1 % in Germany, 1.5 % in France and 1.6 % in the Netherlands. While labour income growth strongly rebounded in the recovery phase from 2014 onwards in the neighbouring countries, it remained broadly stable in Belgium. This different pattern is mostly visible in average private consumption growth too (except for Germany[2]).

1 Households may find it more advantageous to pay an extra premium to cover the risk of a sudden and large fall in their income and expenditure, as is the case for supplementary pensions and health insurance.

2 Germany's major labour market reforms in the first half of the 2000s have radically changed labour market conditions and affected wage growth negatively. Between 2002 and 2005, growth of total real wages and salaries was negative every year.

Chart 6

Private consumption and labour income: comparison with the neighbouring countries



Sources: Eurostat, NAI, NBB.

1 Excluding employers' social security contributions. Due to the unavailability of sufficiently detailed figures for 2018, the growth rate of wages and salaries received by households is approximated by using the growth rate already observed for wages and salaries received by the total economy in that year.

The comparatively slow growth of labour income is not specifically caused by weak employment growth. Even though economic activity growth has recently been weaker in Belgium than in the euro area and in the major neighbouring countries, it has been more labour-intensive. All in all, Belgian employment growth is broadly in line with figures from the neighbouring countries, reaching an average annual growth rate of 1.1 % against 0.7 % in France, 1.2 % in Germany and 1.3 % in the Netherlands between 2014 and 2018.

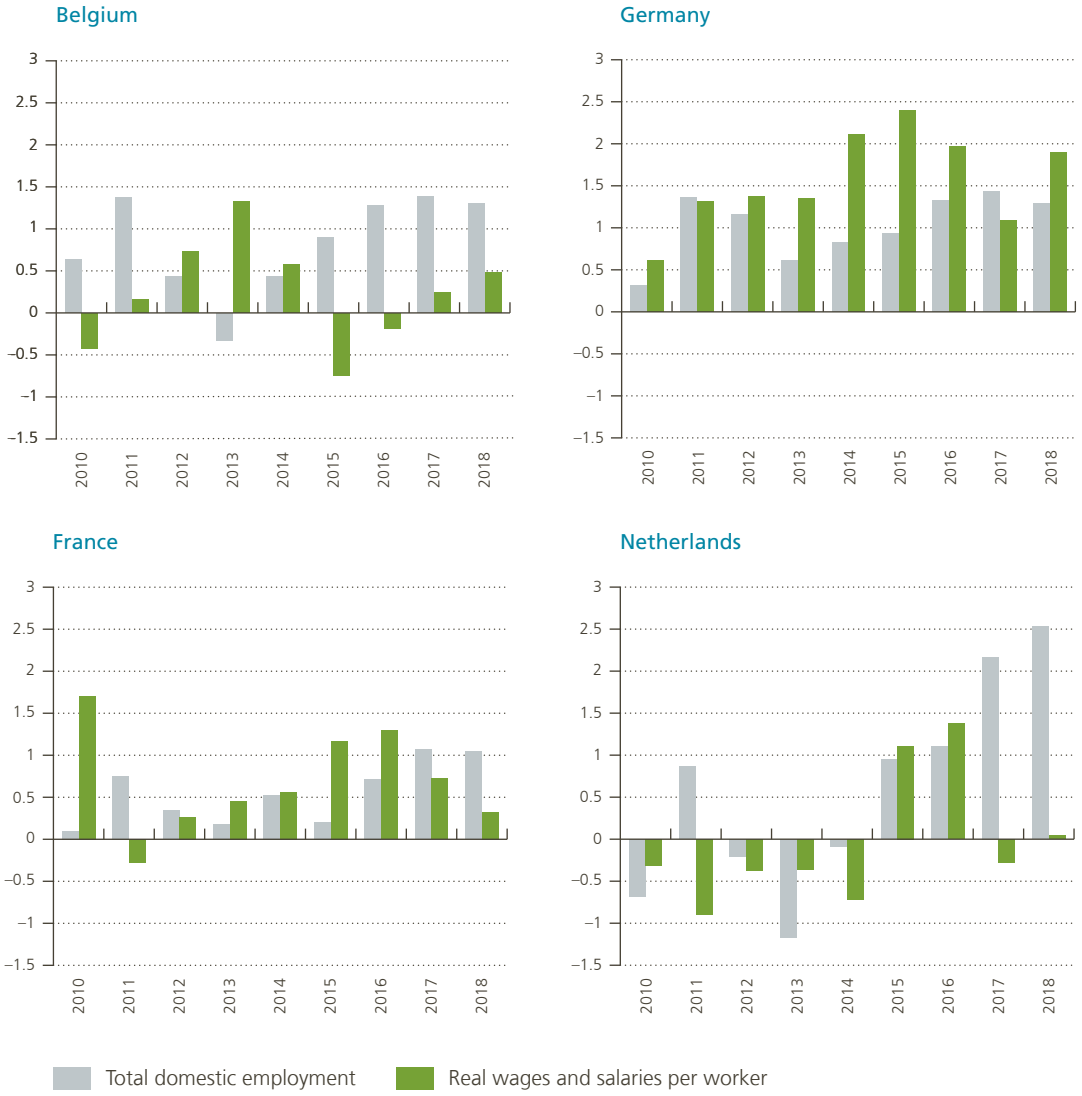
However, real unit wage growth was significantly lower than in other countries. Real wages per worker actually remained more or less flat in Belgium from 2014 to 2018 (and even declined in 2015 and 2016), compared with an average increase of 1.9 % in Germany, 0.8 % in France and 0.3 % in the Netherlands. This is mostly a policy choice as wages were curbed by the various measures to restore cost competitiveness. While the cuts in employer-paid social security contributions obviously did not weigh on households' purchasing power, wages were reduced by the temporary suspension of the indexation mechanisms in 2015 and the different constraints on the conventional wage settlements (for which zero growth was imposed in some recent years).[1] In addition, the temporary suspension of the indexation mechanisms affected pensions, unemployment benefits and other replacement incomes as well, which also weighed on purchasing power and, hence, household consumption.

1 The macroeconomic effects that were likely to result from the temporary suspension of the indexation mechanism in the course of 2015 were discussed in Box 1 in the article on the economic projections for Belgium that was published by the NBB in December 2014. This simulation already mentioned, among other effects, a negative household income shock with a dampening impact on private consumption growth.

Chart 7

Labour income growth was weak due to low real wage growth

(annual % changes)



Sources: Eurostat, NAI, NBB.

3.4 Measures to curb wage growth were not fully offset by tax reductions

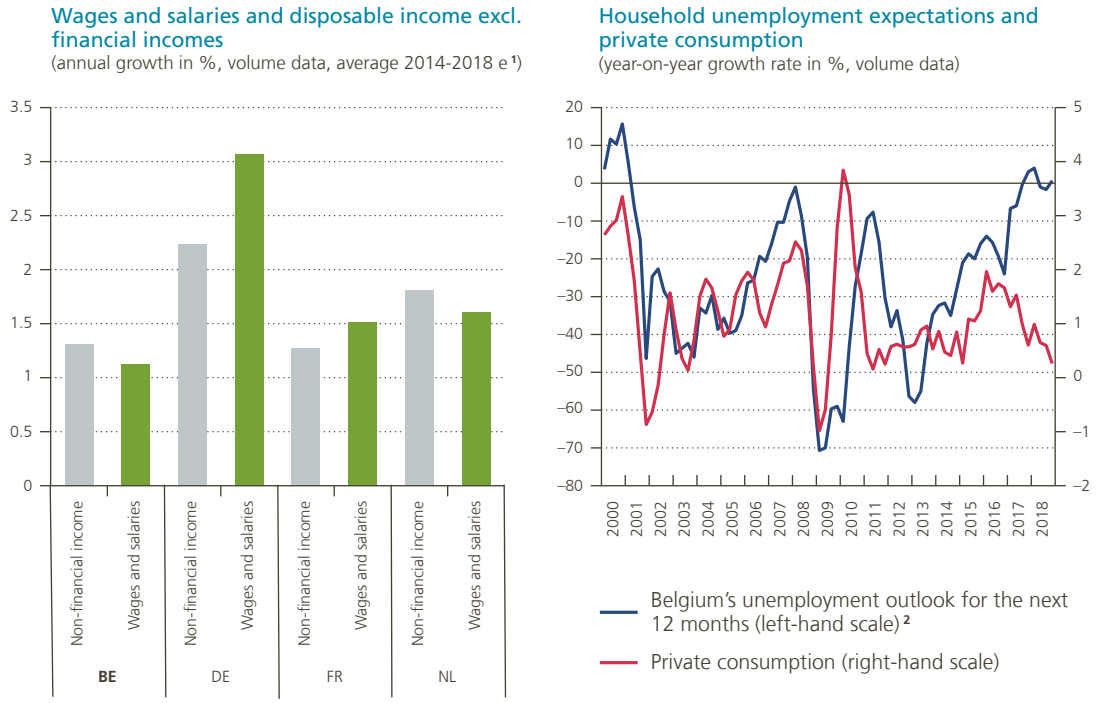
In parallel with the aforementioned measures aimed at curbing wage growth, there have been offsetting measures intended to support household purchasing power, notably the tax shift package. The tax shift is a multi-year policy adopted in 2015 that was gradually implemented from January 2016 to January 2019 to lower the tax pressure on labour income. Those measures have limited growth of net transfers from the households to the government and therefore have supported their disposable income (particularly for low-income households). Concurrently, a number of financing measures were included in the tax shift package to reduce the increase in the budget deficit, such as an increase in value added tax on several categories of consumption (electricity, tobacco, or alcohol) or a hike in the withholding tax on dividends and interest on bonds. Overall, when looking at non-financial income growth rather than growth in wages and salaries, the negative gap between Belgium

and its neighbours turns out smaller, but does not entirely disappear in the period under review (2014-2018).[1] More specifically, Belgian non-financial income grew by an annual average of 1.3 % over the last five years, which was about half a percentage point below the growth rate observed for that category of income in the neighbouring countries, on average.

In this context, employment growth in itself seems to have become a less important driver of private consumption. The low growth of labour income per worker has weighed on wages paid for existing jobs but also, by extension, for the jobs being created, meaning that the extra consumption associated with new jobs tends to be lower than previously. The indicator from the NBB consumer survey for the unemployment outlook over the next 12 months, which has turned out to be a leading indicator of private consumption in Belgium, has recently displayed a considerably lower correlation with the latter variable.[2]

Chart 8

Tax reductions reduced the negative gap with neighbouring countries while the link between employment and consumption has become weaker recently



Sources: Eurostat, NAI, NBB.

1 Due to the unavailability of sufficiently detailed figures for 2018, the growth rate of wages and salaries received by households is approximated by using the growth rate already observed for wages and salaries received by the total economy in that year.

2 Balance of replies to monthly survey, aggregate quarterly data. Calendar adjusted data. Reverse of the indicator released by the NBB.

More generally, the fiscal stance can also have an impact on private consumption (also beyond the secondary income distribution). In this connection, it should be noted that in the 2014-2018 period considered, the Belgian government has, overall, slightly tightened the fiscal stance: according to the most recent EC estimates,

1 Please note that the most recent phase of the Belgian tax shift package (that came into force at the start of 2019) could not yet be included in this analysis. However, the same is true for the additional fiscal measures in the other countries considered, including tax cuts that have supported purchasing power there as well.

2 A similar trend has been observed between private consumption growth and the growth of the number of worked hours by employee.

the structural primary surplus has been increased by about 0.5 % of GDP. This is slightly more restrictive than in Germany and France but less so than in the Netherlands. However, given the uncertainty about the fiscal multipliers and e.g. the large differences in the public finance situation between those countries, it seems unlikely that the slight divergences in the fiscal stances can account for the relatively lower private consumption growth in Belgium.

4. Other factors do not seem to explain slow household consumption growth

In this section, we consider a number of other factors that could explain why Belgian household consumption has been so moderate in recent years. We generally find, however, that the actual impact of these factors is likely to be very limited.

4.1 Wealth effects and impact of household indebtedness ?

One potential determinant of private consumption is household net wealth. Increases in wealth, originating for instance from stock or real estate prices, could lead households to adjust their consumption expenditure upwards. Looking at the empirical literature on the wealth effect on private consumption, most authors identify a positive but limited aggregate wealth effect at the macro level (Davis and Palumbo, 2001, Sousa, 2009, Carroll *et al.,* 2011). Regarding Belgium, while the estimated effect of net financial wealth is relatively high compared to the other countries, the estimated effect of house prices is particularly low according to Reusens and Warisse (2018).

In terms of net wealth, Belgian households rank among the richest in the euro area. Their net wealth rose from 571 % to 573 % of nominal GDP between 2014 and 2017. As a matter of comparison, in 2017, households' net wealth reached 378 % of nominal GDP in Germany, 492 % in France and 451 % in the Netherlands. At the aggregate level, Belgian households have notably benefited from the growing value of land held by private individuals.

Using Reusens and Warisse's (2018) estimates, we find that changes in net wealth cannot explain a large part of the difference in consumption growth between Belgium and Germany or France between 2014 and 2018 (despite the relatively high sensitivity of consumption to financial net wealth). Only in the Netherlands has the wealth effect on private consumption been somewhat larger in recent years, as household consumption has been buoyed up by a surge in house prices. However, all in all, total wealth effects do not seem to be the main explanation for the relatively slower private consumption growth in Belgium compared to the three main neighbouring countries.

One striking feature regarding the developments in net wealth is that Belgian household debts has grown significantly in recent years and more than in other countries. In fact, whereas a certain deleveraging has been observed for households on average in the euro area, Belgian households have continued to increase their indebtedness, as expressed in percentage of GDP. The Belgian households' debt to GDP ratio even outstripped recently the euro area average. This mainly represents a strong increase in mortgage debt. While overall net wealth has increased, rising debt levels could still weigh on consumption to the extent that they may increase the monthly debt service and, hence, reduce the part of income that can actually be consumed. Highly leveraged households may find themselves compelled to reduce their spending (Dynan, 2012) while a high debt service puts direct constraints on their consumption spending and makes them more reactive to income changes than average households (Mian *et al.,* 2013, Nakajima, 2018).

In that connection and based on microdata on households' debt and food consumption in Belgium between 2010 and 2014 (HFCS), Perilleux *et al.* (2019) argue that the debt service is influencing the spending of a household

whereas its outstanding amount is less relevant. They found that households with a debt service to income larger than 30 % tend to reduce their consumption more than the average household. However, the impact of the debt increase on the monthly debt service was largely offset by a strong decline in mortgage rates. According to Bank for International Settlements (BIS) data, between the end of 2013 and the latest available data (Q3 2018), the debt service ratio of households rose from 7.4 % to 7.6 % of gross disposable income and this trend appears quite low in relation to previous episodes (in particular the period running from 2006 to 2013). This relatively small increase in the debt service ratio is unlikely to have exerted any strong pressure on private consumption in the recent period.

Chart 9

The wealth effect is unlikely to have had a strong impact on consumption

Sources : Eurostat, NBB, Reusens and Warisse (2018).
1 Liabilities are shown with negative values.

4.2 Role of inequality ?

Rising inequality could be another explanation for slow consumption growth. As propensities to consume are typically higher for lower-income households, all things being equal, a less equal income distribution could be associated with lower consumption.

While societal questions regarding purchasing power and income distribution have come to the fore recently, macro indicators tend to suggest that income inequality has actually declined. The Gini coefficient (published by Eurostat) assesses the extent to which the distribution of income among households deviates from an equal distribution, with low levels indicating a more equal distribution of income. In the recent period, the coefficient has remained stable in Belgium, at a lower level than the neighbouring countries and the euro area average. Lower income categories enjoyed a stronger increase in their net earnings than the higher income categories

on average between 2014 and 2018. From a wider perspective, the Gini coefficient has seemed to follow a downward trend since the beginning of the century.

All in all, declining inequality should in principle have supported private consumption growth, rather than dented it.

4.3 Impact of population ageing ?

As in other countries, population ageing is a key demographic trend in Belgium. Elderly people account for a growing share of the population in Belgium : the share of the population above 65-years-old went from 17.9 % at the start of 2014 to 18.7 % by January 2018. Empirical studies generally show that households tend to decrease their spending upon retirement (see for example Aguiar and Hurst, 2005). Older consumers are also less forward-looking and are investing less in durable consumption goods. Hence, population ageing would in principle reduce private consumption growth.

At the same time, labour market participation and employment rates have clearly increased for older age groups in recent years, partly as a result of a long-term trend and cohort effects in female participation, but also due to the measures to curb early retirement. This is likely to have boosted their current income and, therefore, their consumption. In addition, population is also ageing in other countries, where private consumption has been more buoyant in recent years. Against this background, it does not seem plausible that population ageing has significantly contributed to the relatively lower consumption growth in Belgium.

Conclusion

According to the current national accounts data, consumption of Belgian households has grown only moderately in recent years. This is quite remarkable as consumer confidence had reached a 17-year high by the end of 2017 and a surge in private consumption has been a key driver of the post-crisis recovery in many other euro area countries. In this article, we try to explain why Belgian households have not raised their consumption as much.

First, we note that during the crisis years and the aftermath of the great recession, private consumption had held up much better than in other countries. This is due to a number of idiosyncratic factors that helped to cushion the blow of the recession for Belgian households. The fall in employment was moderated by more labour hoarding and specific government measures to extend the temporary unemployment system. In addition, the lags in the existing indexation mechanisms initially boosted household income as wages and benefits were index-linked on the basis of the relatively high pre-crisis inflation. A detailed breakdown of private consumption shows that purchases of income-elastic goods, which are typically prone to business cycle swings, such as durables and non-essentials, slowed down less during the crisis years in Belgium than in neighbouring countries. While in other countries, the phenomenon of pent-up demand led to strong increases in purchases of those goods in the recovery phase, this was much less the case in Belgium.

Second, we show that slow private consumption growth can essentially be traced back to the moderate growth in purchasing power. Especially over a longer period, private consumption clearly tracks income growth. Even if the sharp deceleration in disposable income of Belgian households was partly due to net financial incomes that are mostly saved, growth in non-property income has also been quite weak in recent years. This is primarily due to the main component, labour income. While activity growth has been particularly employment-intensive, government measures to restore cost competitiveness, including the legal constraints on real wage settlements and the temporary suspension of the indexation mechanisms in 2015, have significantly reduced real income growth. Up to now, this has not been fully offset by the tax shift measures: real disposable income excluding financial income also grew less for Belgian households than for those in the neighbouring countries. However, the last phase of the tax shift package could not yet be included in this analysis, considering that it has only been implemented early 2019.

We also look at other potential explanations for the lacklustre consumption growth in recent years. These include the impact of household wealth and indebtedness as well as population ageing and changes in inequality. However, we find that none of these elements are likely to have been a key driver of the moderate increase in household consumption.

All in all, our analysis suggests that the policies to curb household income growth, with a view to restoring cost competitiveness, have come at a cost in terms of household consumption between 2014 and 2018, even if the relatively slow private consumption growth should also be seen against a backdrop of greater resilience during and after the crisis years. Finally, we should recall that this analysis is based on the current series of national accounts statistics. In October 2019, the NAI will undertake an occasional revision of those statistics that may also affect household consumption data.

Bibliography

Aguiar M. and E. Hurst (2005), "Consumption versus Expenditure", *Journal of Political Economy*, 113(51), 919-948, October.

Basselier R. and G. Langenus (2014), "Recent changes in saving behaviour by Belgian households: the impact of uncertainty", NBB, *Economic Review*, December, 53-62.

Baugnet V., Ph. Du Caju and M.-D. Zachary (2017), "Low interest rates and their impact on Belgium's households", NBB, *Economic Review*, June, 43-59.

Campbell John Y. and N. G. Mankiw (1989), "Consumption, Income, and Interest Rates: Reinterpreting the Time Series Evidence", NBER, *Macroeconomics Annual*, 4, 185-216.

Carroll C.D. and M.S. Kimball (2001), *Liquidity constraints and Precautionary Saving*, NBER, Working Paper 8496, October.

Carroll C.D., J. Slacalek and M. Otsuka (2011), "How large are housing and financial wealth effects? A new approach", *Journal of Money, Credit, and Banking*, 43(1), 55-79.

Davis M.A. and M.G. Palumbo (2001), *A primer on the economics and time series econometrics of wealth effects*, Finance and Economics Discussion Series, Working Paper 2001-09, Board of Governors of the Federal Reserve System (US).

Deaton A.S. (1991), "Saving and Liquidity Constraints", *Econometrica*, 59, 1221-1248.

De Mulder J. and M. Druant (2011), "The Belgian labour market during and after the crisis", NBB, *Economic Review*, June

Dossche, M., M. Forsells, L. Rossi and G. Stoevsky (2018), "Private consumption and its drivers in the current economic expansion", *ECB Economic Bulletin*, Issue 5.

Dynan K. (2012), "Is a Household Debt Overhang Holding Back Consumption", Brookings Papers on Economic Activity, *Economic Studies Program, The Brookings Institution*, 43(1), 299-362.

Friedman M. (1957), *A Theory of the Consumption Function*, Princeton, NJ: Princeton Univ. Press

Gudmundsson J. and G. J. Natvik (2012), *That Uncertain Feeling – How consumption responds to economic uncertainty in Norway*, Norges Bank Staff Memo, 23.

Hall R.E. (1978), "Stochastic implications of the life-cycle permanent income hypothesis: theory and evidence", *The Journal of Political Economy*, 86, 971-87.

Hall R.E. and F.S. Mishkin (1982), "The Sensitivity of Consumption to Transitory Income: Estimates from Panel Data on Households", *Econometrica*, 50(2), 461-81.

Jappelli T. and L. Pistaferri (2010), "The Response of Consumption to Income Changes", *Annual Review of Economics*, 2, 479-506.

Kaplan G., G. L. Violante and J. Weidner (2014), "The Wealthy Hand-to-Mouth", *Brookings Papers on Economic Activity*, 45(1), 77-153.

Matute M.M. and A. Urtasun (2017), The recovery of private consumption in Spain by product type and household, Banco de España, *Economic Bulletin*, 2.

Mian A., K. Rao and A. Sufi (2013), "Household balance sheets, consumption, and the economic slump", *Quarterly Journal of Economics*, 128(4), 1687-726.

Mínguez J.G. and A. Urtasun (2015), "Consumption dynamics in Spain by product type", Banco de España, *Economic Bulletin*, September.

Nakajima J., (2018), "The role of household debt heterogeneity on consumption: Evidence from Japanese household data", BIS, *Working Paper*, 736, July.

Pistaferri L. (2016), *Why Has Consumption Remained Moderate after the Great Recession?*, Mimeo, https://web.stanford.edu/~pista/slow_cons_oct23.pdf

Périlleux G., F. Rycx, I. Tojerow and Ph. Du Caju (2019), *A bigger house at the cost of an empty fridge? Effect of households' indebtedness on their consumption: micro-evidence using Belgian HFCS data*, Mimeo.

Reusens P. and C. Warisse (2018), "House prices and economic growth in Belgium", NBB, *Economic Review*, December, 81-106.

Sousa R. (2009), *Wealth effects on consumption: evidence from the euro area*, ECB, Working paper 1050

Weil P. (1992), "Hand-to-Mouth Consumers and Asset Prices", *European Economic Review*, 36(2-3), April, 575-583.

Is a recession imminent? The signal of the yield curve

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Ch. Van Nieuwenhuyze *

Introduction

Few stylised facts are currently receiving more attention in the media than the predictive power of the yield curve regarding future economic activity: the yield curve inverted about one year before all nine US recessions identified since 1955. As the US yield curve has recently flattened and occasionally inverted, the question resurfaces: is a recession imminent?

Experience shows that commentators tend to downplay the signals given by the yield curve. In fact, when asked the question in 2007, 2000, 1990 and on earlier occasions, most economists indicated that "this time is different", meaning that "this time", the yield curve inversion will not be followed by a recession. Yet, a recession occurred every time.

Central banks also often contribute to downplaying the signals of the yield curve. Regarding the forecasts made by central banks and the yield curve, we note an interesting analogy. While central banks are sometimes compared to the Delphic oracle – for instance, when communication related to monetary policy "reveals expectations of future events" (Praet, 2013) –, the yield curve can be compared to Cassandra, the princess who was given the gift to see into the future but was cursed to never be believed.

However, given that the yield curve is influenced by numerous factors, this article shows that there are good reasons to be cautious when interpreting the signal of the yield curve. Some of these factors are related to the economic cycle and thus give the yield curve predictive power, while others are not and may therefore blur the signal. As the relative importance of these factors in driving yield curve dynamics may vary over time, the predictive power of the yield curve may not be constant.

The article focuses on the US since the debate about how to interpret the signal of the yield curve is most prominent there: the US yield curve is currently suggesting that the country is quite likely to enter a recession in about a year (probability of up to 45 % according to some models).

* The authors are grateful to J. Boeckx, H. Dewachter and P. Ilbas for their valuable comments.

The remainder of the article is structured as follows. Section 1 presents the relationship between the yield curve and recessions. Based on theoretical foundations for this relationship (section 2) and empirical regularities observed in the past (section 3), we aim to determine whether the forecasting power of the yield curve is still relevant (section 4).

1. A modern Cassandra

1.1 First look at the data

Chart 1 illustrates the good track record of the yield curve in predicting recessions. In the US (left-hand panel), the slope of the sovereign yield curve – measured as the difference between the ten-year and the one-year yields – turned negative about one year before the latest nine recessions identified by the National Bureau of Economic Research (NBER). Using other yield maturities results in highly correlated slope measures, although the slope might not turn negative before every recession. Besides, in over sixty years, the US yield curve gave only one false alarm[1]. Regarding the current context, with the slope of the US yield curve close to zero, a simple rule of thumb would imply that the risk of a US recession is relatively high.

In the euro area, the performance of the yield curve in forecasting recessions is similar (right-hand panel in chart 1). The curve drawn by overnight indexed swap (OIS) rates was flat before the latest financial crisis, and German data before 1999 corroborate the stylised fact. However, the yield curve did not invert before the sovereign debt crisis (a recession started in 2011 according to the Centre for Economic Policy Research, CEPR). Currently, the slope of the yield curve is still significantly positive in the euro area – indicating that the recession probability derived from that slope remains low – which is why the article focuses on the United States.

A decomposition of the changes in the slope of the yield curve into contributions from changes in the short- and long-term yields displayed in chart 2 allows us to make two observations that will be investigated further in the rest of the article. First, each yield curve flattening preceding American or European recessions was accompanied by significant increases

Like Cassandra, the princess of Troy who predicted the fall of her city, the yield curve has always been right but never taken seriously.

Source: The De Morgan Foundation ("Cassandra", 1898).

1 It inverted in 1966 but the NBER did not identify any recession at that time. Nevertheless, the US economy slowed down significantly in 1967 and could arguably have entered a recession had the Fed not decided to change the course of its monetary policy stance by resuming money supply expansion (Friedman, 1968, 1970).

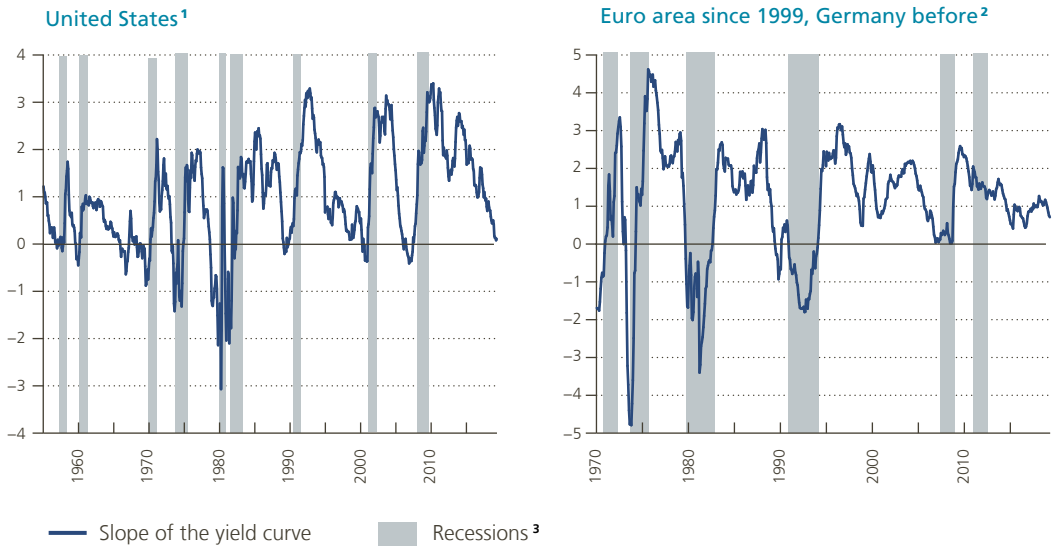
in the short-term yield, whereas the change in long-term yields was smaller. This observation is often used as grounds to emphasise the role of monetary policy.

Second, it appears that the behaviour of long-term yields has changed since the mid-1980s. Before that time, long-term yields tended to increase along with short-term yields ahead of recessions, hence dampening the flattening of the yield curve. Thereafter, long-term yields have tended to decrease slightly ahead of recessions, thus reinforcing the flattening of the yield curve. In this respect, some researchers have found a structural break in the mid-1980s in the relationship between the yield curve and economic activity, which could be due to the greater focus of central banks on the control of inflation.

Chart 1

In the US and euro area, the yield curve inverted before recessions

(slope of the yield curve in %)



Sources: CEPR, Board of Governors of the Federal Reserve System (H15), NBER, OECD, Thomson Reuters.

1 Market spread between US Treasury securities at 10-year and 1-year, constant maturity.

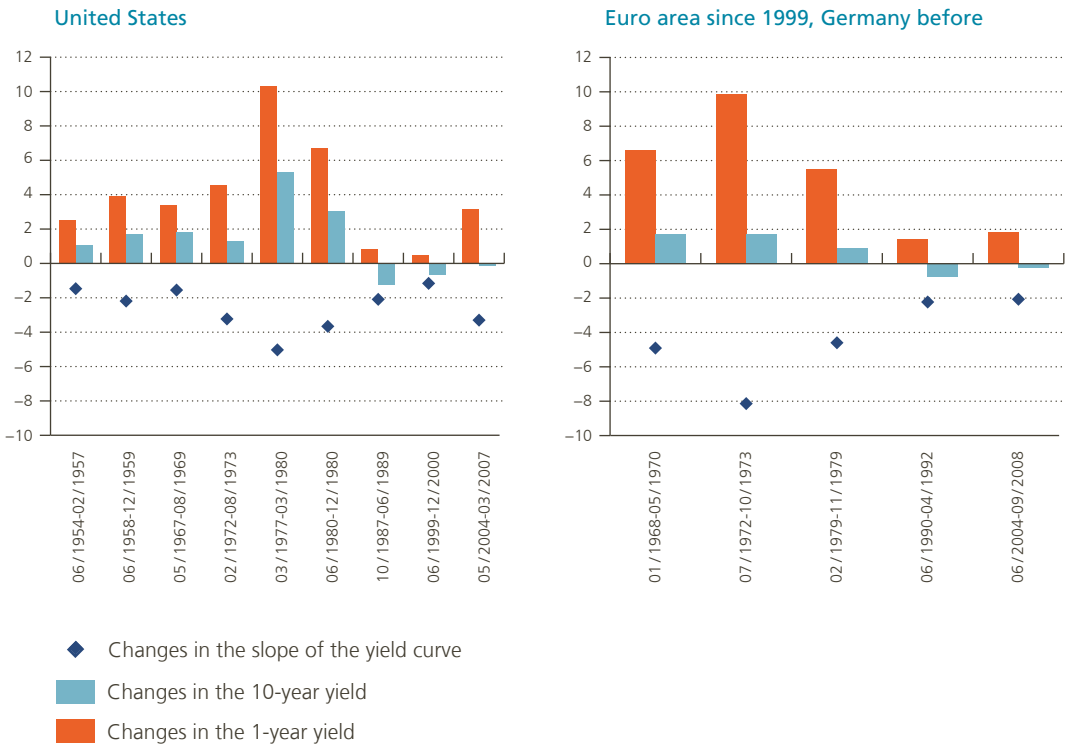
2 Spread between 10-year and 1-year OIS yields since 2005. The 10-year OIS yield is retroplated back to 1999 using the 10-year swap rate on Euribor 6-month. The spread is retropolated back to 1970 with German data. German data on long-term yields refer to the yield on outstanding listed federal securities with residual maturities of over 9 to 10 years traded on the secondary market. German data on short-term yields are usually either the three-month interbank offered rate applicable to loans between banks, or the rate associated with Treasury bills, Certificates of Deposit or comparable instruments of three-month maturity in each case. German data refer to unified Germany from July 1990 and West Germany prior to this date.

3 US, euro area and German recessions were identified respectively by the NBER, CEPR and Economic Cycle Research Institute (ECRI), with the exception of the German recession at the beginning of the 1970s which is identified by the OECD composite leading indicators. German recession dates determined by ECRI are similar to those determined by the CEPR for the euro area since 1970.

Chart 2

Short- and long-term yield movements during flattening of the curve ahead of recessions [1]

(percentage points)



Sources: Board of Governors of the Federal Reserve System (H15), OECD, Thomson Reuters.
1 See footnotes in chart 1 for details.

1.2 The "this time is different" state of mind

The yield curve did not only earn its reputation as Cassandra from its remarkable past performance at forecasting recessions. It also owes it to the many reassuring statements made by most commentators who hinted that the signals given by the yield curve were not reliable anymore.

Examples of reassuring statements are so numerous that it would be impossible to list them all. However, these statements were also made by the most prominent and influential economists. Focusing on the ones made shortly before the most recent financial crisis, Alan Greenspan notoriously declared in 2005 before the US Senate Banking Committee that "the evidence very clearly indicates that [the yield curve's] efficacy as a forecasting tool has diminished very dramatically […]" (as reported in the Financial Times, 4 April 2019). In 2006, Ben Bernanke declared "[…] I would not interpret the currently very flat yield curve as indicating a significant economic slowdown to come […]". In 2007, Charles Goodhart wrote that the yield curve has appeared to have good predictive power for future output growth at times in the past, but that "this may now have largely disappeared".

The situation was best summarised by Rudebusch and Williams (2009) who wrote: "[…] it is interesting to note that many times during the past 20 years forecasters have acknowledged the formidable past performance of the yield curve in predicting expansions and recessions but argued that this past performance did not apply in the current situation".

Also, in the current environment, "this time is different" arguments are put forward. Most members of the Fed's Federal Open Market Committee (FOMC) made clear that they would agree with the vice chairman John Williams who recently stated that "There's a lot of reasons to think that it has been a recession predictor for reasons in the past that kind of don't apply today" (Bloomberg, 29 March 2019).

However, two members of the FOMC voiced different points of view. Neel Kashkari, president of the Fed of Minneapolis, wrote in mid-2018: "This time is different. I consider those the four most dangerous words in economics. […] there is little reason to raise rates much further, invert the yield curve, put the brakes on the economy and risk that it does, in fact, trigger a recession". At the same time, James Bullard, president of the Fed of St. Louis, wrote: "Some argue that this time is different when it comes to the yield curve. I recall similar comments relative to the yield curve inversions in the early 2000s and the mid-2000s – both of which were followed by recessions".

In summing up the FOMC's position, Federal Reserve Chairman Jerome Powell showed some consideration for the yield curve by declaring in mid-2018 that "If you raise short-term rates higher than long-term rates, then maybe your policy is tighter than you think. Or it's tight, anyway" (Bloomberg, 17 July 2018).

To be sure, the arguments made by economists who have tended to discard the yield curve as a reliable predictor of recessions were often convincing and some of them might actually play a role in the present case, as will be shown later in the article. But the repeated act of discarding the yield curve calls for other explanations. An alternative interpretation could be that the yield curve model was deemed "too simple" for forecasting recessions: one single index beat the most sophisticated macroeconomic models and the most extensive surveys of professional forecasters.

Whether or not the yield curve is still a reliable indicator, it has been the best predictor of recessions so far, and this stylised fact calls for explanations. The next section briefly presents theories that could explain the link between the yield curve and recessions.

2. Why does the yield curve predict recessions?

While many empirical studies establish the ability of the yield curve to predict recessions (see section 3 for an overview), theoretical foundations for this relation are relatively scarce and no theory has been generally accepted. As Benati and Goodhart (2008) put it, the predictive content of the yield curve remains "a stylised fact in search of a theory".

Theoretical investigations largely rely on consumption-based asset-pricing models (Harvey, 1988; Roma and Torous, 1997; Rendu de Lint and Stolin, 2003) or more general macrofinancial models with rational expectations (Estrella, 2005). Most explanations are based on the notion that the yield curve captures changes in monetary policy and the views of the market regarding future economic conditions. According to these theories, the yield curve can *reflect* a future recession, but it is not the *cause* of recessions. Other explanations point to a more active role of the yield curve, either via a negative impact on banks' profitability or a self-fulfilling prophecy. In this section, we describe these mechanisms and link them with the different building blocks of the slope of the yield curve.

2.1 Monetary policy (short-term rate) and the slope of the yield curve

Monetary policy can influence the slope of the yield curve since it almost entirely determines short-term yields. A tightening of monetary policy usually results in a rise in the short-term rate and thus has a dampening effect on the slope if the increase in long-term yields is smaller. Estrella (2005) and Estrella and Mishkin (1997)

show that this is usually the case and that monetary policy is an important determinant of the slope of the yield curve, particularly when the tightening is credible. A restrictive monetary policy is likely to slow down the economy and inflation, which dampens expectations regarding the real rate of return and future inflation, the two factors driving long-term yields.

The importance of monetary policy for the flattening of the yield curve ahead of recessions seems corroborated by the empirical observation that these episodes in the US were predominantly due to an increase in the short-term rates (as illustrated in chart 2). Note that in this case the yield curve could be seen as an indicator of the monetary stance, either expansionary, neutral or contractionary in case of a steep, flat or negative yield curve. In fact, the findings of Adrian and Estrella (2008) suggest that the monetary policy stance is better captured by the slope of the yield curve than by the level of interest rates.

2.2 Recession expectations affect the slope of the yield curve

Another reason why the yield curve might flatten is the expectation of a recession. The theory put forward by Harvey (1988) can explain an increased demand for assets that mature when a recession is expected. The central assumption in Harvey's model is that consumers prefer a stable level of income rather than high income during expansions and low income during slowdowns. In his simple model where a default-free bond is the only financial instrument available, if investors expect a reduction in their consumption – a recession – they prefer to save by buying long-term bonds in order to get pay-outs in the slowdown. By doing so, they increase the demand for long-term bonds, which decreases the corresponding yield. In addition, to finance the purchase of the long-term bonds, investors may sell short-term bonds whose yields will increase. As a result, when a recession is expected, the yield curve flattens or inverts.

Besides Harvey's general intuition, more recent theories which focus on the decomposition of long-term yields into an expectations component and a term premium help to explain why the slope of the yield curve tends to fall in the case of recession expectations.

Recession expectations dampen the expectations component

When market participants expect a downturn, they likely also anticipate that the central bank will cut the policy rate at some time in the future to provide monetary accommodation. According to the expectations hypothesis of the term structure of interest rates, the expected lower short-term yields imply a decline in the long-term yield.

As a reminder, the expectations hypothesis states that long-term yields are equal to the average of expected short-term yields over a given investment horizon, or that these two quantities differ by a constant term premium. However, abundant empirical evidence shows that the term premium varied widely over time (Fama, 1986 ; Dai and Singleton, 2002 ; Joslin *et al.*, 2014). Consequently, the expectations hypothesis is in itself not sufficient to explain yield curve dynamics : the role of the (time-varying) term premium should also be considered.

… and possibly also compress the term premium

To understand the time variation in the term premium, we first need to understand exactly what the term premium is. As formulated by Cohen *et al.* (2018), the term premium represents "the compensation or risk premium that risk-averse investors demand for holding long-term bonds. This compensation arises because the return earned over the short term from holding a long-term bond is risky, whereas it is certain in the short term for a bond that matures over the same short investment horizon". The term premium can thus be seen as the compensation required by investors who buy long-term bonds to bear the risk that short-term yields do not move as they expect over their investment horizon. Hence, time variation in the term

premium might be due to changes in risk aversion and/or perceptions of potential changes in short-term interest rates.

Being influenced by many factors, the term premium might also contain information regarding future recessions, as suggested by some empirical studies (Hamilton and Kim, 2002; Favero *et al.*, 2005; Wright, 2006; Estrella and Wu, 2008; Dewachter *et al.*, 2014; Bauer and Mertens, 2018a,b). This could be true, for instance, in the event of a "flight-to-safety" (towards government bonds), combined with a preference for long maturities (i.e. 'preferred habitat' as explained in Modigliani and Sutch, 1966, and Vayanos and Vila, 2009).

Section 4 discusses other factors (such as asset purchases by central banks) that could disturb the link between the term premium (and thus the slope of the yield curve) and recessions.

2.3 Can the yield curve cause a recession? Bank profits and self-fulfilling prophecy

Up until now, both the explanations zooming in on the effect of monetary policy and recession expectations imply a passive role for the yield curve. The following theories see a more active role.

The yield curve and bank profits

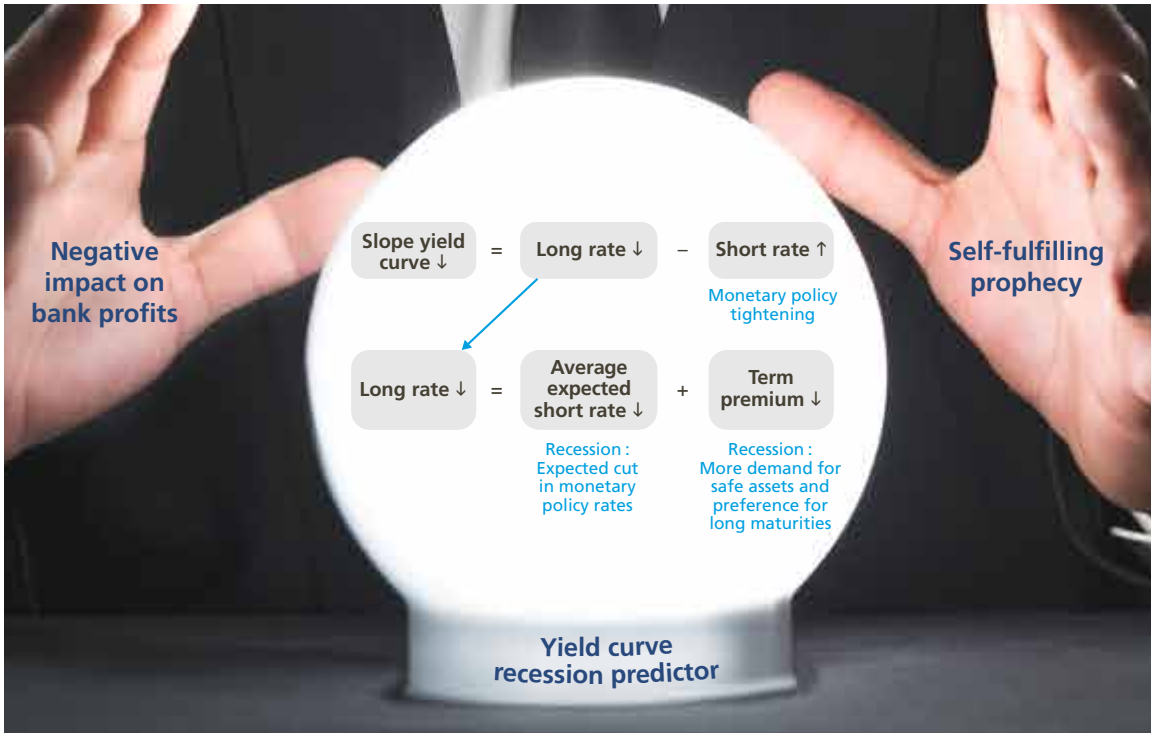
A flatter or negative curve tends to hurt banks' profitability. Banks are engaged in maturity transformation and thus benefit from the gap between the yield they receive on their long-term assets (mostly loans) and the rate they pay on their short-term liabilities (mostly deposits). *Ceteris paribus*, their net interest margin falls (rises) when the yield curve flattens (steepens). When banks' margins are squeezed, banks might become involved in a "search for yield" (i.e. invest in riskier assets promising a higher return), making the banking sector and the economy more prone to macrofinancial shocks. If the margin turns negative, and lending is no longer profitable, banks might even stop lending or tighten their credit conditions to compensate for the loss. This in turn reduces the pace of credit growth and economic activity.

The literature on this channel (Alessandri and Nelson, 2015; Borio *et al.*, 2017; Claessens *et al.*, 2018; English *et al.*, 2018; Kapinos and Musatov, 2018; Ampudia and Van den Heuvel, 2018) shows a strong heterogeneity in the findings, depending on the balance sheet characteristics of the banks and the rest of the economy. The profitability explanation for the relationship between the yield curve and economic activity depends on i) the degree to which interest rate risk is hedged by banks, ii) the importance of non-interest-bearing assets, iii) the interest rate pass-through of the different financial instruments, and iv) the effect of bank capital on lending. Furthermore, Borio *et al.* (2017) and Claessens *et al.* (2018) find that the effects of the slope of the yield curve on bank profits tend to be greater at lower levels of interest rates.

Self-fulfilling prophecy

Finally, there might be self-fulfilling mechanisms at play. To the extent that an inverted yield curve is perceived by financial markets as an early warning indicator, this might give rise to greater risk aversion which negatively affects the economy. In the quarterly survey of senior loan officers (FED, October 2018), some banks said they would tighten lending standards if the yield curve were to invert, as it would signal "a less favourable or more uncertain economic outlook". This combines self-fulfilling elements with an active bank channel, illustrating the potential of the yield curve to cause a recession when its inversion is not disregarded (in contrast with the still predominant "this time is different" state of mind).

Why does the yield curve predict recessions?



Source : NBB.

3. Empirical evidence

3.1 Review of the empirical literature

Early studies such as Kessel (1965) and Fama (1986) already reported the phenomenon of the flattening of the US yield curve before a recession or a slowdown. But the empirical literature really started to develop at the end of the 1980s when the US yield curve flattened again. Harvey (1988, 1989) and Laurent (1988, 1989) showed that the yield curve was a better predictor of recessions than other indicators. In the same vein, Stock and Watson (1989) suggested adding a measure of the slope of the yield curve to the list of leading indicators of the US Department of Commerce. Eventually, the seminal works of Estrella and Hardouvelis (1991) and Chen (1991) considered the link between a flatter yield curve and lower future economic growth as a stylised fact.

Studies carried out in subsequent decades focused on three main questions to which we now turn.

Is the yield curve a better predictor of economic activity than other indicators?

Many studies conclude that the yield curve is the best leading indicator in the US (or one of the best) and that it generally obtains better results than surveys of professional forecasters or indices of leading indicators (Estrella and Mishkin, 1996, 1998; Stock and Watson, 2003b; Rudebusch and Williams, 2009; Berge, 2015). Some studies emphasise that the yield curve is not systematically the best predictor for very short horizons (up to three or six months) but that it performs better than other indicators for medium horizons. Berge and Jordà (2011) estimate at precisely 18 months the horizon at which the yield curve gives the most reliable signals regarding a possible turning point in the business cycle.

Is the relation between the yield curve and economic activity also observed elsewhere than in the United States?

The relation between the yield curve and economic activity has been established in many countries (Harvey, 1991, 1997; Plosser and Rouwenhorst, 1994; Bonser-Neal and Morley, 1997; Estrella and Mishkin, 1997; Bernard and Gerlach, 1998; Ivanova *et al.*, 2000; Moneta, 2005). However, the forecasting power of the yield curve varies across countries. The most convincing results were found in the United States, Germany and Canada, whereas the relation is less pronounced in Belgium, Ireland, Italy, the Netherlands and Spain, for instance.

Without detailing (possibly numerous) country-specific explanations, it appears that the three countries in which the relation is the strongest (the United States, Germany and Canada) are large economies – which implies that they are less subject to idiosyncratic shocks – and that their public debt has been considered risk-free over the past few decades – hence, no credit risk premium on sovereign bond yields can blur the signals of the yield curve.

Has the relation been stable through time?

Empirical results are almost unanimous regarding the existence of a structural break in the mid-1980s resulting in a decrease in the sensitivity of GDP growth to the slope of the yield curve (Chauvet and Potter, 2002; Peel and Ioannidis, 2003; Venetis *et al.*, 2003; Feroli, 2004; Duarte *et al.*, 2005; Galvão, 2006; Schrimpf and Wang, 2010; Aguiar-Conraria *et al.*, 2012). Some studies even suggested that the forecasting ability of the yield curve had vanished (Haubrich and Dombrosky, 1996; Dotsey, 1998; Jardet, 2004), before recent recessions following yield curve flattening questioned that result. Indeed, despite the consensus on the diminished ability of the yield curve to forecast *GDP growth*, models show that it has retained its ability to forecast *recessions* (Dueker, 1997; Ahrens, 2002; Estrella *et al.*, 2003; Rudebusch and Williams, 2009).

The reason underlying the structural break between the yield curve and GDP growth in the mid-1980s is still being investigated. This point will be further discussed in the next sub-section in light of new empirical evidence.

3.2 New empirical evidence

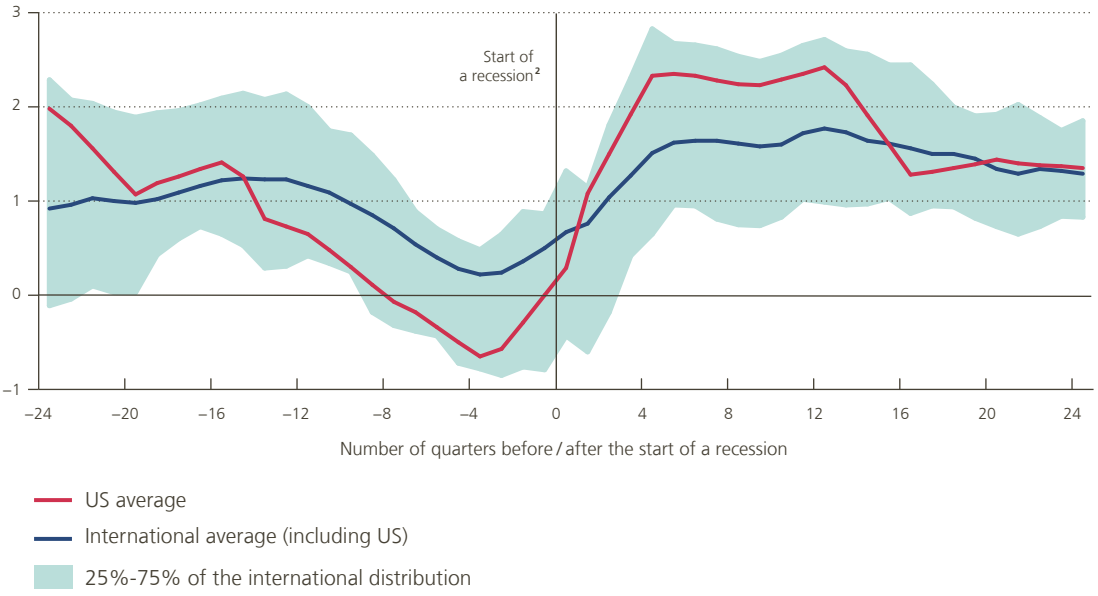
We use the "macrohistory" database of Jordà *et al.* (2017) to provide new evidence of the forecasting power of the yield curve. There are three main advantages in using this database: (1) data go back to 1870 and so cover various historical periods characterised by different macroeconomic regimes; (2) it covers 17 advanced economies (AU, BE, CA, CH, DE, DK, ES, FI, FR, IT, JP, NL, NO, PT, SE, UK, US); (3) it contains several macrofinancial variables that can be used as alternatives for the yield curve to forecast economic activity. To the best of our knowledge, this is the first time that this database has been used to investigate the relation between the yield curve and economic activity.

Chart 3 shows that the database clearly captures the stylised fact of a flattening of the yield curve before recessions since WWII (the most studied period). The slope of the yield curve is computed as the difference between the long-term yield made available in the dataset (usually five-year tenor) and the short-term yield (usually three-month). Recession years are defined as years associated with a fall in real GDP. More specifically, the chart shows that the flattening is clear not only in the United States but also in other countries. It also shows that the yield curve tends to invert in the US before recessions, but that seems to be less the case internationally (note however that the distribution around the international average also goes into negative territory).

Chart 3

The slope of the yield curve around recessions: international evidence [1]

(in %, 1953-2016 averages)



Sources: Jordà *et al.* (2017), NBB.

1 All annual series are transformed into quarterly observations through linear interpolation.

2 The start of a recession corresponds to the quarter in which the year-on-year growth of real GDP turns negative.

In addition to reproducing the stylised fact of the yield curve flattening before recessions, the database of Jordà *et al.* (2017) permits an econometric analysis of the relation between the yield curve and real GDP growth. We estimate the following simple regression:

$$real\ GDP\ growth_t = c + \alpha\ X_{t-1} + \beta\ real\ GDP\ growth_{t-1} + \epsilon_t,$$

where X_{t-1} is any potential leading indicator of economic activity lagged by one year, c is a constant, and ϵ_t is an error term[1].

Table 1 displays the results of the estimations with different variables used in X_{t-1}, including the slope of the yield curve. Columns in the table show results for the United States, Germany, a panel composed of the United States, Germany and Canada, and a panel composed of the rest of the countries. The sample is split into four sub-periods: the Classical Gold Standard (1880-1913), the interwar period (1919-1938), the "pre-Volcker" period (1953-1978) and the "post-Volcker" period (1985-2016)[2]. The latter two periods are defined so as to account for the change in macroeconomic dynamics, especially regarding inflation, that could relate to the forecasting ability of the yield curve.

The results displayed help to answer the three questions asked in the previous sub-section.

1 We assume that X_{t-1} is predetermined. Post-estimation checks show that residuals are largely free of any serial correlation.

2 The Classical Gold Standard period is defined as starting in 1880 since the convertibility of the greenback paper money was restored in 1879. The pre-Volcker period starts in 1953 to account for the Federal Reserve-Treasury Accord of 1951 which resulted in the formal abandonment of the policy of pegging government bond prices in 1953 (Friedman, 1968).

First, the yield curve is one of the best predictors of economic activity. This is assessed by the relatively high R^2 of the regressions on the slope of the yield curve and the significance of the α estimates[1].

Second, the yield curve helps to forecast real GDP growth not only for the panel of "risk-free" countries but also for the panel of "other countries" (significant α estimates). For those other countries, we note however that α estimates are smaller, which indicates that real GDP growth is less sensitive to changes in the slope of the yield curve which could be affected by changes in the credit risk premium (confirming earlier findings in the empirical literature).

Third, and most importantly, the sensitivity of real GDP growth to the slope of the yield curve declined between the pre- and post-Volcker periods. Focusing on the panel US-DE-CA, estimates show that real GDP growth would fall by 0.95 percentage point if the slope of the yield curve dropped by 1 percentage point in the pre-Volcker period (*ceteris paribus*), whereas it would fall by only 0.50 percentage point in the post-Volcker period[2].

It is important to understand the underlying reasons for this decrease in sensitivity as it contributes to the "this time is different" state of mind. The increased focus of central banks on the control of inflation is often cited as the main explanation. In the US, since the early 1980s when the Fed – then chaired by Paul Volcker – tightened monetary policy to rein in soaring prices, inflation has been relatively stable at lower levels. Bordo and Haubrich (2004) put forward a theoretical argument that is often used in this context. According to them, an increase in inflation in a credible monetary policy regime could blur the picture concerning the yield curve and economic activity. The argument assumes that a positive inflation shock would be deemed to have temporary effects in a credible monetary policy regime (low inflation persistence) and hence would only raise short- but not long-term yields. This could result in a yield curve inversion but no recession if the underlying shock is purely nominal.

However, empirical research does not favour this theory. It is best tested by studying the Classical Gold Standard period, i.e. the text-book example of a period of price stability (zero expected inflation). Whereas the argument (assuming that it would prevail over other theories) suggests that the coefficient of the slope of the yield curve would not be significant during that period, our estimates displayed in the table show that it is. As such, our results corroborate those of Bordo and Haubrich (2008a,b), Benati and Goodhart (2008) and Gerlach and Stuart (2018). Note that our results are particularly interesting in the case of the US since the country did not have a formal central bank at the time, which suggests that monetary policy is not the only factor explaining the forecasting power of the yield curve.

Overall, Bordo and Haubrich's (2004) theory could partly explain the diminished forecasting ability of the yield curve since the mid-1980s, as there is empirical evidence of a decrease in inflation persistence (Benati and Goodhart, 2008), but the evidence of the yield curve's forecasting power during the Classical Gold Standard period makes it a less attractive explanation. The next section presents an alternative explanation – related to the term premium – and shows its implications when assessing current recession probabilities.

1 The good forecasting accuracy of real stock returns in the US during the pre- and post-Volcker periods is also remarkable. However, focusing on the panel of large economies with "risk-free" sovereign yields (US-DE-CA), the coefficient of real stock returns loses its significance for the post-Volcker period whereas the one for the slope of the yield curve remains significant. Therefore, our results corroborate Stock and Watson's (2003a) conclusion: "[…] no single asset price is a reliable predictor of output growth across countries over multiple decades. The term spread perhaps comes closest to achieving this goal […]".

2 Some of these results are corroborated by additional evidence and robustness tests presented in the annex.

Table 1

Forecasting performance for real GDP growth (one-year ahead)[1]

X_{t-1}	$real\ GDP\ growth_t = c + \alpha X_{t-1} + \beta\ real\ GDP\ growth_{t-1} + \varepsilon_t$							
	US[2]		DE[2,3]		Panel US-DE-CA[2,4]		Panel other countries[5]	
	R^2 (%)	α	R^2 (%)	α	R^2 (%)	α	R^2 (%)	α
Slope of the yield curve								
Classical Gold Standard	20	1.00**	15	0.95*	16	0.99***	1	0.19***
Interwar period	23	1.08	20	1.46**	23	1.25**	4	0.55**
Pre-Volcker	40	1.23***	40	0.93***	22	0.95***	10	0.15*
Post-Volcker	30	0.43**	2	0.52	6	0.50**	25	0.11*
Short-term yield								
Classical Gold Standard	26	–1.28***	17	–0.95*	21	–1.20**	1	–0.55**
Interwar period	22	–0.75	37	–1.45**	27	–1.08	1	–0.11
Pre-Volcker	18	–0.45***	57	–0.80***	19	–0.44**	11	–0.28***
Post-Volcker	20	–0.33	9	0.60	3	0.09	24	0.00
Inflation								
Classical Gold Standard	14	–0.44	16	–0.45**	13	–0.37**	2	0.03
Interwar period	21	–0.27*	23	0.01**	21	0.01**	7	–0.12**
Pre-Volcker	8	–0.25*	48	–0.86***	12	–0.29**	14	–0.21***
Post-Volcker	33	–0.53**	1	0.03	4	–0.31*	24	–0.13*
Credit-to-GDP gap								
Classical Gold Standard	13	–0.18	7	0.11	8	0.05	3	–0.07**
Interwar period	16	–0.03	–	–	17	0.02	1	0.00
Pre-Volcker	2	0.10	25	0.19*	3	0.01	15	0.03*
Post-Volcker	23	–0.04	3	0.08*	3	0.00	27	–0.03***
Real broad money growth								
Classical Gold Standard	33	0.71***	15	0.24**	24	0.46	4	0.05**
Interwar period	22	0.54	30	0.07*	24	0.08*	2	0.06*
Pre-Volcker	48	0.68***	47	0.42***	23	0.29*	26	0.16***
Post-Volcker	22	0.08	6	0.38	3	0.05	24	0.03
Real stock returns								
Classical Gold Standard	57	0.21***	8	0.05	41	0.17	4	0.03**
Interwar period	66	0.19***	47	–0.01***	33	–0.01**	9	0.05*
Pre-Volcker	49	0.09***	70	0.07***	44	0.08***	17	0.03***
Post-Volcker	56	0.06***	1	0.00	4	0.02	34	0.03***
ΔPublic debt / GDP								
Classical Gold Standard	11	–0.44	4	0.05	8	–0.10	3	–0.03
Interwar period	19	0.28	–	–	38	0.46	2	0.04**
Pre-Volcker	32	0.88***	33	0.53**	10	0.26*	15	0.03
Post-Volcker	25	0.13	5	0.32**	3	0.06	24	0.03
ΔCurrent account / GDP								
Classical Gold Standard	10	0.27	7	–0.54*	8	–0.18	2	–0.01
Interwar period	16	–0.52	–	–	32	–0.44	1	0.05
Pre-Volcker	5	–1.04	25	–0.44	4	0.05	17	0.23**
Post-Volcker	22	0.50	6	–0.97	5	–0.51	25	0.10**
All variables together (α = coefficient of the slope of the yield curve)								
Classical Gold Standard	74	–3.36	38	–0.45	51	–2.85*	7	–0.10
Interwar period	81	2.90	–	–	65	–0.71*	10	0.94**
Pre-Volcker	77	1.71***	81	–0.49	61	–0.07	29	–0.06
Post-Volcker	75	0.95***	27	1.95	19	1.27*	39	0.25**

Sources: Jordà *et al.* (2017), NBB.

1 The standard errors for all regressions are robust to heteroskedasticity and cluster-robust for panel regressions. Panel regressions include fixed effects. Asterisks *, ** and *** indicate significance at the 1, 5 and 10 %-level (unilateral tests in function of the sign of the coefficients).

2 As credit-to-GDP gaps series are available only since 1888 according to our computational methodology, the series are excluded from the regressions with all variables over the period of the Classical Gold Standard. Credit-to-GDP gaps are computed as the deviation of the credit-to-GDP ratios from their long-term trends. The latter are estimated by applying Hamilton's (2017) method, i.e. five-year direct forecasts based on an AR(4) model.

3 Some estimations regarding Germany during the interwar period could not be carried out due to a lack of data.

4 No data for Canada for the first two periods (Classical Gold Standard and interwar period).

5 Some data are missing for some countries and periods (mainly around the two world wars).

4. Is the yield curve still a reliable indicator?

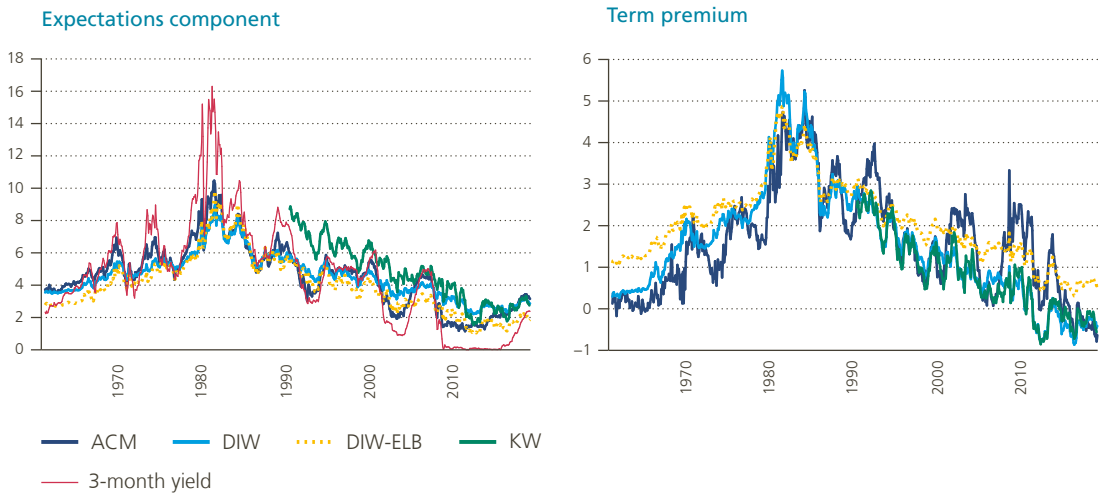
While the previous section showed that the forecasting power of the yield curve has decreased since the mid-1980s, this section further investigates the reasons for that decline and, using more detailed US data, attempts to determine whether the yield curve is still a reliable indicator. In particular, the section draws attention to the prominent role played by structural and policy factors in shaping the long end of the yield curve.

Decomposing long-term US sovereign yields into short-term rate expectations and a term premium helps to shed light on the structural and policy forces that have been influencing the yield curve. Since these two components are unobservable, they have to be estimated, which can be done using various models. Chart 4 displays estimates of these components for the ten-year US sovereign yield derived from four different models: one proposed by Adrian *et al.* (2013, henceforth ACM), one proposed by Kim and Wright (2005, KW) and two proposed by Dewachter *et al.* (2016)[1]. The latter two models differ, as one accounts for the effective lower bound (DIW-ELB) whereas the other does not (DIW). The goal is not to discuss all the model specificities, but rather to highlight two observations. First, model uncertainty (in addition to estimation uncertainty) seems sufficiently important to conclude that it is impossible to precisely pin down the value of the two components. However, and this is the second observation, the low-frequency dynamics of the two components are similar across models. Specifically, all models show that the two components maintained an upward trend between the mid-1960s and the beginning of the 1980s, and subsequently followed a downward trend. In the past couple of years, short-term yield expectations have edged upwards, mainly reflecting better economic prospects and consequently (expectations of) monetary policy normalisation, while term premium estimates have remained at low levels.

Chart 4

Decomposition of 10-year US sovereign yields according to different models

(in %)



Sources: Board of Governors of the Federal Reserve System (H15), NBB.

1 Both specifications proposed by Dewachter *et al.* (2016) are similar to the model of Christensen and Rudebusch (2012), with the level factor of the yield curve restricted to follow a random walk.

These low-frequency dynamics are important as they can help us to understand the changing relation between the yield curve and economic activity. In that respect, note that the trend decline in average expected short-term yields observed since the mid-1980s has not fundamentally altered the slope of the yield curve, since a similar decline can be observed in short-term yields (represented by the three-month sovereign yield on the chart). However, the trend decline in term premiums has altered the slope (considering that the term premium in the three-month yield is negligible). Therefore, the next sub-section takes a closer look at the factors behind the structural and continued decline in the term premium. In contrast to the factors mentioned in section 2, these drivers are unrelated to market expectations of looming recession risks.

4.1 Structural and policy factors behind the fall in the term premium

First of all, note that the nominal term premium can be further decomposed into a real interest rate premium and an inflation risk premium. The trend decline in the term premium over the last decades reflects declines in both of its components.

The trend decline can in part be explained by a shift in the monetary policy regime (Wright, 2011 ; Vlieghe, 2018). Since the mid-1980s, central banks in advanced economies have focused on bringing inflation down, stabilising it at a low level of about 2 % and anchoring inflation expectations at a similar level. In parallel with the inflation conquest, term premiums, and in particular the inflation risk premiums, have come down. With inflation low and rather predictable, the risk of inflation surprises has been reduced, with investors accepting lower compensation for bearing this risk. In addition, the inflation risk premium also dropped as the correlation between inflation and consumption growth became more positive : when consumption growth is weak, inflation tends to surprise on the downside, making bonds, due to their fixed nominal returns, more attractive. Since the global financial crisis in 2008, safe long-term bonds have become more attractive and, with inflation falling short of its target, the inflation risk premium fell even lower. It may currently be close to zero or even negative in the Unites States (Hördahl and Tristani, 2014 ; Camba-Mendez and Werner, 2017 ; Cohen *et al.*, 2018).

Besides the inflation risk premium, the real interest rate premium has also declined steadily in the US. An important factor exerting downward pressure on the latter has been the imbalance between the reduced supply of safe assets and the increased demand for them at global level over the past decades (Caballero *et al.*, 2017 ; Del Negro *et al.*, 2017). Before the crisis, higher demand for safe, longer US Treasuries can be explained by emerging economies turning to safe US assets to invest their savings, which were expanding as a result of population ageing and central banks building international reserves for precautionary reasons after the Asian financial crisis of the late 1990s (Bernanke, 2005). The global financial crisis exacerbated the supply-demand imbalance in safe assets. The global supply of safe assets fell as government bonds in certain jurisdictions were no longer characterised as safe, while worldwide demand for safe assets was boosted, e.g. by regulatory requirements for pension funds (De Backer and Wauters, 2017). This higher demand for safe longer-term US Treasuries further compressed term premiums, and, in particular, the real interest rate premiums. In addition, the Fed's asset purchases under its quantitative easing programme also lowered term premia on longer-term Treasuries. D'Amico and King (2013) and Bonis *et al.* (2017) find that the large stock of assets on the Fed's balance sheet might still be holding down term premiums. This could explain why, despite the Fed no longer buying long-term assets, term premiums remain depressed today.

In today's situation, to the extent that the low level of term premiums mainly reflects forces unrelated to recession expectations, a flat or inverted yield curve need not necessarily signal that a recession is imminent.

Given that the term premium may distort the signal given by the yield curve, would it not be better to exclude it from the slope altogether to improve its predictive power ? The following sub-section investigates this question.

4.2 Should the slope of the yield curve be adjusted for the term premium?

While section 3 assesses the yield curve's ability to predict future GDP growth, this section focuses on analysing the yield curve's ability to predict future recessions.

In order to relate the yield curve to the probability of a recession, probit models of the following form are estimated:

$$P\left(recession_{t+12,\ t+18} = 1|X_t\right) = \Phi(\beta_0 + \beta_1 X_t),$$

where $recession_{t+12,\ t+18}$ is a 0/1 indicator that equals 1 if there is an NBER-dated recession at some point between 12 and 18 months ahead, $\Phi(\ldots)$ denotes the standard normal cumulative distribution function and X_t is one of the following three explanatory variables:

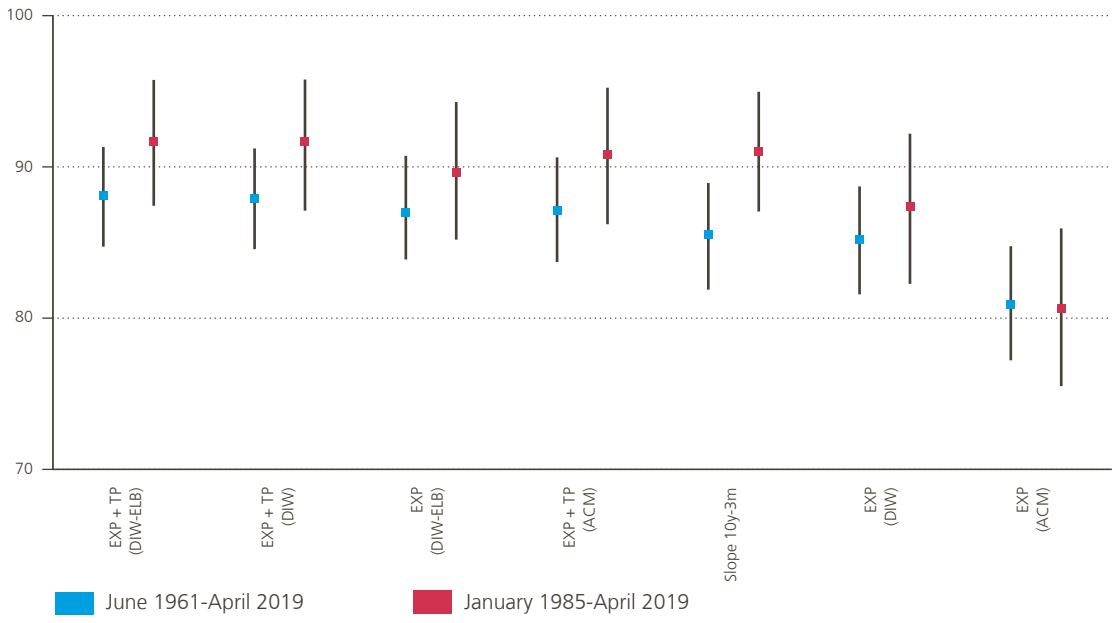
- the slope of the yield curve, defined as the difference between ten-year and three-month US sovereign yields;
- the expectations (EXP) component of the slope of the yield curve (i.e. excluding the term premium);
- the expectations component and the term premium included separately (EXP + TP);

To compare the forecasting accuracy of the three measures, we calculate the "area under the curve" (AUC) for each of them. This measure roughly captures the probability of correct prediction, with 100 % corresponding to perfect prediction and 50 % to no predictive power (equivalent to tossing a coin). We use three different models to decompose the slope of the yield curve since 1961: ACM, DIW-ELB and DIW. We also compute AUCs for an estimation period starting in 1985 to test the stability of the results (taking into account a potential structural break in the mid-1980s).

Chart 5

Predictive power of the slope of the US yield curve and its components

(AUC in %, confidence intervals of 95 %)



Sources: Board of Governors of the Federal Reserve System (H15), NBB.

Note: The predictive power of the expectations and term premium component derived from the KW model are not shown in the chart as they are not comparable with the AUCs depicted. For one thing, KW data are only available as of 1991. Second, KW uses different data for the ten-year yield on US Treasuries. However, AUCs based on KW data lead to similar conclusions to AUCs based on ACM and DIW data.

Chart 5 reports the AUCs obtained for the different models over the two estimation periods. AUCs are rather similar across the two periods (even if the predictive power in the shorter sample is slightly higher overall), confirming the finding in the empirical literature on the stability of the relationship between the yield curve and recessions (as opposed to GDP growth). The slope and its components all seem to have good, and rather similar, predictive power. Explicitly including the term premium component seems to slightly improve the predictive accuracy, suggesting that the term premium does contain some useful information about future recessions. However, the relatively high predictive power of the expectations component suggests that the recession signal embedded in the slope of the yield curve stems mostly from this component[1].

With the confidence intervals of the predictive abilities overlapping, we cannot, at first sight, conclude that the differences between AUCs are statistically significant. However, if we perform a Wald test, we reject the hypothesis that all AUCs are equal (at the 1 % significance level). More specifically, in the full sample, we cannot reject the hypothesis that AUCs are equal only for the first three specifications in the chart, i.e. we can think of these three models as performing equally well. This implies that the predictive power of the expectations component based on DIW-ELB estimates is similar to that of the two components included separately according to DIW-ELB and DIW estimates. Consequently, empirical evidence remains inconclusive on whether the term premium generally has additional explanatory power for predicting recessions, and thus whether the slope generally needs to be adjusted for it. In the smaller sample, we cannot reject the hypothesis that AUCs are equal only for the simple slope specification and the DIW and DIW-ELB specifications which include an expectations component and a term premium separately. This further shows that empirical evidence is inconclusive about the additional explanatory power of the term premium compared to a simple slope measure.

In addition to computing the slope of the yield curve as before, we also look at the predictive power of a "short-term slope". Given the relatively small size of term premia in short yields, a short-term slope should be a purer measure of market expectations for the trajectory of conventional near-term monetary policy. Like the expectations component, it thus tries to filter out the impact of the term premium from the recession signal in the slope of the yield curve. In this respect, Engstrom and Sharpe (2018) propose to look at a "near-term forward spread", which is the difference between the implied three-month forward yield on US Treasury bills six quarters from now and the yield on a three-month Treasury bill. The AUCs for this near-term forward spread calculated over the full sample and the sub-sample are respectively 82 % and 86 %. The near-term forward spread thus also has high predictive power but it doesn't outperform the measures reported in chart 7. Rather, it is in line with the results of the models that use the expectations component only.

4.3 What does the current slope of the yield curve tell us about recession risks?

Since empirical results are rather inconclusive on the relevance of the term premium for forecasting recessions, chart 6 shows estimated recession probabilities according to each of the four specifications mentioned above. More specifically, the chart shows recession probabilities between 12 and 18 months ahead for the ACM, DIW-ELB, DIW, and the near-term forward spread models using data back to 1961. Results obtained with a sample period starting in 1985 send a similar message as those estimated over the full sample.

Overall, the recession probabilities derived from the different specifications tend to behave rather similarly, clearly peaking before the start of a US recession (grey bars). However, at specific points in time, like in the past few years, probabilities derived from the yield curve slope differ from measures excluding the term premium.

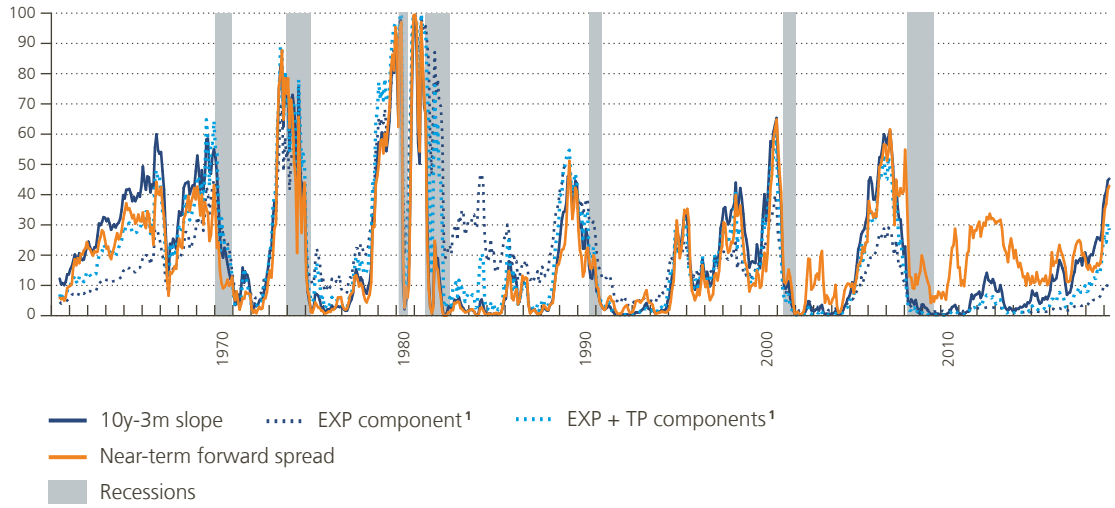
The recession probability derived from the slope of the yield curve has recently risen substantially, standing at around 45 % by April 2019, which is significantly above the unconditional probability of around 20 % (historical probability at any point in time of being in a recession between 12 and 18 months ahead). The recession

1 This is line with the findings of Ang *et al.* (2006) and De Graeve *et al.* (2009).

Chart 6

US recession probabilities between 12 and 18 months ahead

(derived from the slope of the yield curve, in %)



Sources: Board of Governors of the Federal Reserve System (H15), Thomson Reuters, NBER, NBB.
1 Average of the recession probabilities obtained from the estimates of ACM, DIW and DIW-ELB models.

probability inferred from the decomposed slope (expectations component and term premium separately) has also displayed a clear upward trend. However, to the extent that structural and policy forces are depressing the term premium, these probabilities could be overestimating the recession risk.

Indeed, the recession probability based upon the slope adjusted for the term premium indicates a much lower, even insignificant, recession probability at the moment. The expectations component of the slope of the US yield curve is currently still positive, reflecting expectations of further increases in the short-term yield. In contrast, recession probabilities inferred from the near-term forward spread have risen sharply since late 2018, after being flat for years. Also, note that the Fed has recently become more cautious: in January 2019, it announced that further interest rate rises would be put on hold given tepid inflation, rising risks to global growth and tighter financial conditions. Later on, in March, the Fed stated that it would slow down the policy of scaling down its balance sheet and terminate the policy altogether by the end of September 2019, earlier than the markets expected. This change in tone and policy points to a less optimistic outlook and may have led markets to reassess the expected path of short-term rates.

Which slope measure one ultimately prefers will depend a lot on one's view about what forces are dominant drivers of yield curve dynamics at a certain point in time. Today, this debate is far from settled. Bauer and Mertens (2018a,b) appear to be rather sceptical about the this-time-is-different argument. They favour the traditional rate spread between ten-year and three-month Treasuries (without any adjustment for the term premium) as their research shows it to be the best measure for predicting recessions. On the other hand, Engstrom and Sharpe (2018) want to exclude factors that may degrade the predictive power of the yield curve (e.g. the trend decline in the term premium) and thus propose looking at the near-term forward spread to get a purer measure of market interest rate expectations. Johansson and Meldrum (2018) downplay somewhat the heightened recession risk predicted by the ten-year minus three-month spread, by also looking at slope measures adjusted for the term premium.

Conclusion

The stylised fact concerning the yield curve is most apparent in the United States: the yield curve inverted before all nine recessions identified since 1955. Yet, as the US yield curve essentially became flat at the beginning of 2019, most commentators argue that recession risks remain low. In other words, they argue that "this time is different".

The most frequently cited arguments explaining why "this time is different" are asset purchases by central banks and reduced fears of inflation. These factors explain why the term premium – i.e. the part of the long-term yield which compensates the bond-holder for uncertainty regarding future interest rate movements – is currently low and, hence, yield curve inversions are more likely and do not necessarily signal upcoming recessions. Indeed, estimates show a significant drop in the term premium since the mid-1980s without any accompanying increase in recession occurrences. As a result, it is argued that the slope of the yield curve should be adjusted for the term premium in order to obtain a better indication of future recessions.

However, there is no decisive empirical evidence showing that the slope of the yield curve should be adjusted for the term premium. In fact, models including the term premium tend to obtain better results at forecasting recessions (in terms of "area under the curve"), although the difference compared to models excluding the term premium is not statistically significant. Hence, it remains possible that cyclical fluctuations in the term premium might contain information regarding future recessions, as for instance in the case of greater demand for long-term safe assets in a context of depressed economic prospects.

Given the indecisive empirical evidence, various estimates of current recession probabilities should be considered. According to the estimations carried out in the article, a model based on the slope of the yield curve gives a risk of about 45 % as of April 2019 that a recession will occur in the United States in between 12 and 18 months. Adjusting the slope of the yield curve for the term premium gives lower recession probabilities that depend on the specific model considered to estimate the term premium. Disregarding model uncertainty, the average probability of the models excluding the term premium is about 10 %, which suggests that recession risks are particularly low given the unconditional probability of 20 %. In general, forecasters will lean towards one of these estimates depending on which factors they believe are driving the term premium.

Overall, there are numerous reasons to assume that the yield curve is no longer as reliable as it has been in the past. However, if this leads one to conclude that recession risks remain negligible in the current context, this actually implies that one believes that "this time is different". Realising this helps to put things in perspective and probably encourages some analysts to question the reasons put forward to claim that recession risks remain low. The resulting debate has at least the advantage of ensuring that the signal given by the yield curve is not discarded too quickly (and that Cassandra's prediction would be taken more seriously).

Annex

Additional regression results on the forecasting ability of the slope of the yield curve [1]

X_{t-1}	US		DE		Panel US-DE-CA [2]		Panel other countries	
	R^2 (%)	α	R^2 (%)	α	R^2 (%)	α	R^2 (%)	α
1-year ahead forecasts of real consumption growth								
Classical Gold Standard	20	0.58*	18	1.80*	12	0.85	0	0.23**
Interwar period	23	0.78	1	0.26	7	0.53	1	0.15
Pre-Volcker	29	0.74***	35	0.46	19	0.60**	14	0.15*
Post-Volcker	39	0.34**	4	0.01	6	0.27*	24	0.01
1-year ahead forecasts of real investment growth								
Classical Gold Standard	1	–0.03	23	9.36***	3	1.86	0	2.24**
Interwar period	7	3.68	39	4.62**	11	4.08**	6	1.80***
Pre-Volcker	57	3.12***	24	1.83*	20	2.29**	8	0.31
Post-Volcker	34	1.79***	6	1.16	17	1.70***	24	0.81***
2-year ahead forecasts of real GDP growth								
Classical Gold Standard	3	–0.36	17	1.73**	0	0.09	0	0.28**
Interwar period	11	1.34*	11	1.54	12	1.44**	1	0.32*
Pre-Volcker	3	0.23	6	0.44	4	0.35*	5	–0.32
Post-Volcker	25	0.64**	2	–0.44	2	0.35	3	0.08
3-year ahead forecasts of real GDP growth								
Classical Gold Standard	2	0.04	7	0.98*	1	0.24	0	0.08
Interwar period	28	1.99**	16	2.20**	19	2.10**	0	0.11
Pre-Volcker	6	–0.40*	13	–0.12	2	–0.31*	7	0.00
Post-Volcker	6	0.33	5	1.18	4	0.55*	1	0.04
1-year ahead forecasts of real GDP growth: robustness tests on alternative sub-periods								
1953-1964 (before rise in US inflation)	20	1.28	21	–0.54	11	0.32	0	0.16
1953-1971 (Bretton Woods period)	21	1.22**	27	0.60**	15	0.72**	7	0.05
1953-2016 (post-WWII period)	16	0.27***	15	0.87***	17	0.73***	29	0.10*

Sources: Jordà *et al.* (2017), NBB.

1 The standard errors for all regressions are robust to heteroskedasticity and cluster-robust for panel regressions. Panel regressions include fixed effects. Asterisks *, ** and *** indicate significance at the 1, 5 and 10 %-level (unilateral tests in function of the sign of the coefficients).

2 No data for Canada for the first two periods (Classical Gold Standard and interwar period).

Bibliography

Adrian T., R. Crump and E. Moench (2013), "Pricing the term structure with linear regressions", *Journal of Financial Economics*, 110(1), 110-138.

Aguiar-Conraria L., M. M. F. Martins and M. J. Soares (2012), "The yield curve and the macro-economy across time and frequencies", *Journal of Economic Dynamics & Control*, 36, 1950-1970.

Alessandri P. and B. D. Nelson (2015), "Simple banking: profitability and the yield curve", *Journal of Money, Credit and Banking*, 47(1), 143-175.

Ampudia M. and S. Van den Heuvel (2018), *Monetary policy and bank equity values in a time of low interest rates*, ECB, Working Paper 2199.

Ang A., M. Piazessi and M. Wei (2006), "What does the slope of the yield curve tell us about GDP growth?", *Journal of Econometrics*, 131(1-2), 539-403.

Arhens R. (2002), "Predicting recessions with interest rate spreads: a multicountry regime-switching analysis," *Journal of International Money and Finance*, 21, 519-537.

Bauer M. D. and T. M. Mertens (2018a), *Economic forecasts with the yield curve*, Federal Reserve Bank of San Francisco, Economic Letter 2018-07.

Bauer M. D. and T. M. Mertens (2018b), *Information in the yield curve about future recessions*, Federal Reserve Bank of San Francisco, Economic Letter 2018-20.

Benati L. and C. Goodhart (2008), "Investigating time-variation in the marginal predictive power of the yield spread," *Journal of Economic Dynamics & Control*, 32, 1236-1272.

Bernanke B. S. (2005), *The Global Saving Glut and the U.S. Current Account Deficit*, Remarks at the Sandridge Lecture, Virginia Association of Economics, Richmond, Virginia, Federal Reserve Board, 10 March.

Bernanke B. S. (2006), *Reflections on the yield curve and monetary policy*, Speech before the Economic Club of New York, New York, 20 March.

Bernard H. and S. Gerlach (1998), "Does the term structure predict recessions? The international evidence", *International Journal of Finance and Economics*, 3, 195-215.

Berge T. J. (2015), "Predicting recessions with leading indicators: model averaging and selection over the business cycle", *Journal of Forecasting*, 34, 455-471.

Berge T. J. and Ò. Jordà (2011), "Evaluating the classification of economic activity into recessions and expansions," *American Economic Journal: Macroeconomics*, 3(2), 246-277.

Bonis B., J. Ihrig and M. Wei (2017), *The effect of the Federal Reserve's securities holdings on longer-term interest rates*, Federal Reserve Board of Governors, FEDS Notes, April 20.

Bordo M. D. and J. G. Haubrich (2004), *The yield curve, recessions and the credibility of the monetary regime: long-run evidence 1875-1997*, NBER, Working Paper 10431.

Bordo M. D. and J. G. Haubrich (2008a), "Forecasting with the yield curve; level, slope, and output 1875-1997", *Economics Letters*, 99, 48-50.

Bordo M. D. and J. G. Haubrich (2008a), "The yield curve as predictor of growth: long-run evidence, 1875-1997", *The Review of Economics and Statistics*, 90(1), 182-185.

Borio C., L. Gambacorta and B. Hofmann (2017), "The influence of monetary policy on bank profitability", *International Finance*, 20, 48-63.

Bloomberg (17 July 2018), "Jerome Powell hints at a little trouble with the curve".

Bloomberg (29 March 2019), "John Williams downplays recession fears, stresses flexible Fed policy".

Bonser-Neal C. and T. R. Morley (1997), *Does the yield spread predict real economic activity? A multicountry analysis*, Federal Reserve Bank of Kansas City, Economic Review, Third Quarter, 37-53.

Bry G. and C. Boschan (1971), *Cyclical analysis of time series: selected procedures and computer programs*, NBER, New York.

Bullard J. (2018), "The risk of yield curve inversion – and how to avoid it", Federal Reserve Bank of St. Louis, Regional Economist, Third Quarter.

Caballero R. J., E. Farhi, and P.-O. Gourinchas (2017), "The safe assets shortage conundrum", *Journal of Economic Perspectives*, 31(3), 29-46.

Camba-Mendez G. and T. Werner (2017), *The inflation risk premium in the post-Lehman period*, ECB, Working Paper 2033.

Chauvet M. and S. Potter (2002), "Predicting a recession: evidence from the yield curve in the presence of structural breaks", *Economics Letters*, 77, 245-253.

Chen N.-F. (1991), "Financial investment opportunities and the macroeconomy", *The Journal of Finance*, 46(2), 529-554.

Christensen J. H. E. and G. D. Rudebusch (2012), "The response of interest rates to US and UK quantitative easing", *The Economic Journal*, 122, F385-F414.

Claessens S., N. Coleman and M. Donnelly (2018), "Low-for-long interest rates and banks' interest margins and profitability: cross-country evidence", *Journal of Financial Intermediation*, 35, 1-16.

Cohen B. H., P. Hördahl and D. Xia (2018), "Term premia: models and some stylised facts", BIS Quarterly Review, September.

Dai Q. and K. J. Singleton (2002), "Expectations puzzles, time-varying risk premia, and affine models of the term structure", *Journal of Financial Economics*, 63, 415-441.

D'Amico S. and T. B. King (2013), "Flow and stock effects of large-scale treasury purchases: evidence on the importance of local supply", *Journal of Financial Economics*, 108(2), 425-448.

De Backer B. and J. Wauters (2017), "The cyclical and structural determinants of the low interest rate environment", National Bank of Belgium, Economic Review, September, 69-86.

De Graeve F., M. Emiris and R. Wouters (2009), "A structural decomposition of the US yield curve", *Journal of Monetary Economics*, 56(4), 545-559.

Del Negro M., M. P. Giannoni, D. Giannone and A. Tambalotti (2017), "Safety, liquidity, and the natural rate of interest", *Brookings Papers on Economic Activity*, Washington DC, 235-294.

Dewachter H., L. Iania and M. Lyrio (2014), "Information in the yield curve: a macro-finance approach", *Journal of Applied Econometrics*, 29, 42-64.

Dewachter H., L. Iania and J.-C. Wijnandts (2016), "The response of euro area sovereign spreads to the ECB unconventional monetary policies", NBB, Working Paper 309.

Dotsey M. (1998), "The predictive content of the interest rate term spread for future economic growth", Federal Reserve Bank of Richmond, Economic Quarterly, 84(3), 31-51.

Duarte A., I. A. Venetis and I. Paya (2005), "Predicting real growth and the probability of recession in the euro area using the yield spread", *International Journal of Forecasting*, 21, 261-277.

Dueker M. J. (1997), "Strengthening the case for the yield curve as a predictor of U.S. recessions", Federal Reserve Bank of St. Louis, Review, March/April, 41-51.

English W. B., S. Van den Heuvel and E. Zakrajšek (2018), "Interest rate risk and bank equity valuations", *Journal of Monetary Economics*, 98, 80-97.

Engstrom E. and S. Sharpe (2018), "The near-term forward yield spread as a leading indicator: A less distorted mirror", Board of Governors of the Federal Reserve System, Finance and Economics Discussion Paper 2018-055.

Estrella A. and G. A. Hardouvelis (1991), "The term structure as a predictor of real economic activity", *The Journal of Finance*, 46(2), 555-576.

Estrella A. and F. S. Mishkin (1996), "The yield curve as a predictor of U.S. recessions", Federal Reserve Bank of New York, Current Issues in Economics and Finance, 2(7).

Estrella A. and F. S. Mishkin (1997), "The predictive power of the term structure of interest rates in Europe and the United States: implications for the European Central Bank", *European Economic Review*, 41, 1375-1401.

Estrella A. and F. S. Mishkin (1998), "Predicting U.S. recessions: financial variables as leading indicators", *The Review of Economics and Statistics*, 80(1), 45-61.

Estrella A., A. R. Rodrigues and S. Schich (2003), "How stable is the predictive power of the yield curve? Evidence from Germany and the United States", *The Review of Economics and Statistics*, 85(3), 629-644.

Estrella A. and H. Wu (2008), "Term premiums and the predictability of recessions", mimeo.

Fama E. F. (1986), "Term premiums and default premiums in money markets", *Journal of Financial Economics*, 17(1), 175-196.

Favero C. A., I. Kaminska and U. Söderström (2005), *The predictive power of the yield spread: further evidence and a structural interpretation*, CEPR, Discussion Paper 4910.

FED, October 2018 Senior loan officer opinion survey on bank lending practices. https://www.federalreserve.gov/data/sloos/sloos-201810.htm.

Feroli M. (2004), "Monetary policy and the information content of the yield spread", *The B.E. Journal of Macroeconomics*, 4(1), 1-17.

Financial Times (4 April 2019), "Has the yield curve predicted the next US downturn?"

Friedman M. (1968), "The role of monetary policy", *The American Economic Review*, 58(1), 1-17.

Friedman M. (1970), "Controls on interest rates paid by banks", *Journal of Money, Credit and Banking*, 2(1), 15-32.

Galvão A. B. C. (2006), "Structural break threshold VARs for predicting US recessions using the spread", *Journal of Applied Econometrics*, 21, 463-487.

Gerlach S. and R. Stuart (2018), "The slope of the term structure and recessions: the pre-Fed evidence, 1857-1913", CEPR, Discussion Paper 13013.

Goodhart C. (2007), "Does a downward-sloping yield curve predict a recession?", VoxEU.org on 24 September.

Hamilton J. D. and D. H. Kim (2002), "A reexamination of the predictability of economic activity using the yield spread", *Journal of Money, Credit and Banking*, 34(2), 340-360.

Harvey C. R. (1988), "The real term structure and consumption growth", *Journal of Financial Economics*, 22(2), 305-333.

Harvey C. R. (1989), "Forecasts of economic growth from the bond and stock markets", *Financial Analysts Journal*, September/October, 38-45.

Harvey C. R. (1991), "The term structure and world economic growth", *The Journal of Fixed Income*, 1, 4-17.

Harvey C. R. (1997), "The relation between the term structure of interest rates and Canadian economic growth", *The Canadian Journal of Economics*, 30(1), 169-193.

Haubrich J. G. and A. M. Dombrosky (1996), "Predicting real growth using the yield curve", Federal Reserve Bank of Cleveland, Economic Review, First Quarter, 26-35.

Hördahl P. and O. Tristani (2014), "Inflation Risk Premia in the Euro Area and the United States", *International Journal of Central Banking*, 10(3), 1-47.

Ivanova D., K. Lahiri and F. Seitz (2000), "Interest rate spreads as predictors of German inflation and business cycles", *International Journal of Forecasting*, 16, 39-58.

Jardet C. (2004), "Why did the term structure of interest rates lose its predictive power?", *Economic Modelling*, 21, 509-524.

Johansson P. and A. Meldrum (2018), "Predicting recession probabilities using the slope of the yield curve", Board of Governors of the Federal Reserve System, *FEDS Notes*.

Jordà Ò., M. Schularick and A. M. Taylor (2017), *Macrofinancial history and the new business cycle facts*, NBER Macroeconomics Annual 2016, volume 31, edited by M. Eichenbaum and J. A. Parker. Chicago: University of Chicago Press.

Joslin S., M. Priebsch and K. J. Singleton (2014), "Risk premiums in dynamic term structure models with unspanned macro risks", *The Journal of Finance*, 69(3), 1197-1233.

Kapinos P. and A. Musatov (2018), "Smaller banks less able to withstand flattening yield curve", Federal Reserve Bank of Dallas, Economic Letter, 13(8).

Kashkari N. (2018), "The flattening yield curve", Federal Reserve Bank of Minneapolis, Message on 16 July.

Kessel R. A. (1965), "The cyclical behavior of the term structure of interest rates", NBER, Occasional Paper 91.

Kim W. and J. Wright (2005), "An arbitrage-free-three-factor term structure model and the recent behaviour of long-term yields and distant-horizon forward rates", Board of Governors of the Federal Reserve System, Finance and Economics Discussion Paper 2005-33.

Laurent R. D. (1988), "An interest rate-based indicator of monetary policy", Federal Reserve Bank of Chicago, Economic Perspectives, January/February, 3-14.

Laurent R. D. (1989), "Testing the 'spread'", Federal Reserve Bank of Chicago, Economic Perspectives, July, 22-34.

Modigliani F. and R. Sutch (1966), "Innovations in interest rate policy", *The American Economic Review*, 56 (1/2), 178-197.

Moneta F. (2005), "Does the yield spread predict recessions in the euro area?" *International Finance*, 8(2), 263-301.

Peel D. A. and Ch. Ioannidis (2003), "Empirical evidence on the relationship between the term structure of interest rates and future real output changes when there are changes in policy regimes", *Economics Letters*, 78, 147-152.

Plosser C. I. and K. G. Rouwenhorst (1994), "International term structures and real economic growth", *Journal of Monetary Economics*, 33, 133-155.

Praet P. (2013), *Forward guidance and the ECB*, column published in VoxEU.org on 6 August.

Rendu de Lint C. and D. Stolin (2003), "The predictive power of the yield curve: a theoretical assessment", *Journal of Monetary Economics*, 50(7), 1603-1622.

Roma A. and W. Torous (1997), "The cyclical behavior of interest rates", *The Journal of Finance*, 52(4), 1519-1542.

Rudebusch G. D. and J. C. Williams (2009), "Forecasting recessions: the puzzle of the enduring power of the yield curve", *Journal of Business & Economic Statistics*, 27(4), 492-503.

Schrimpf A. and Q. Wang (2010), "A reappraisal of the leading indicator properties of the yield curve under structural instability", *International Journal of Forecasting*, 26, 836-857.

Stock J.H. and M. W. Watson (1989), "New indexes of coincident and leading economic indicators," *in NBER Macroeconomics Annual. O. J. Blanchard and S. Fischer*, eds., 351-394.

Stock J.H. and M. W. Watson (2003a), "Forecasting output and inflation : the role of asset prices", *Journal of Economic Literature*, 41, 788-829.

Stock J.H. and M. W. Watson (2003b), "How did leading indicator forecasts perform during the 2001 recession ?", Federal Reserve Bank of Richmond, Economic Quarterly, 89(3), 71-90.

Vayanos D. and J.-L. Vila (2009), *A preferred habitat model of the term structure of interest rates*, NBER, Working Papers 15487.

Venetis I. A., I. Paya and D. A. Peel (2003), "Re-examination of the predictability of economic activity using the yield spread : a nonlinear approach", *International Review of Economics and Finance*, 12, 187-206.

Vlieghe G. (2018), "The yield curve and QE", speech given at the Imperial College Business School, Bank of England, 25 September.

Wright J. (2006), "The yield curve and predicting recessions", Federal Reserve Board, Finance and Economics Discussion Paper No. 2006-07.

Wright J. (2011), "Term Premia and Inflation Uncertainty : Empirical Evidence from an International Panel Dataset", *American Economic Review*, 101(4), 1514-1534.

An analysis of non-standard forms of employment in Belgium

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Introduction

This article reports on non-standard forms of employment in Belgium. The terms "non-standard" – sometimes also called "atypical" or "unconventional" – refer to all forms of employment that differ from the traditional employment arrangement, i.e. a permanent contract for full-time salaried work.

There is a rising trend towards non-standard forms of employment in most industrialised countries. The OECD, the European Commission, the ILO and Eurofound have all shown that these forms of employment are associated with greater insecurity for the worker and/or linked to a lower degree of social protection.

The developments seen on the labour market – one of the features being the rise in non-standard forms of employment – are in large part linked to the profound changes taking place in society and the economy, including globalisation; the expansion of the tertiary sector; the growing number of women entering the labour market; the ageing of the workforce; technological advances and digitalisation; together with the growing demand – on the part of both the employers and the employees – for more flexible work arrangements. Such upheavals in society, and change in the labour market, are nothing new: these changes have been taking place over the last few decades. For instance, the rise of the tertiary sector can be seen quite clearly in the employment figures for the 2005-2017 period. The majority of the 388,000 jobs created in Belgium during that time have basically been in market-related services plus administration, healthcare and education. Although most of these have been salaried jobs with permanent contracts, there has also been a non-negligible rise in the number of people on temporary work contracts and self-employed workers. Not least, more than half of all the jobs created over that period were part-time positions.

These developments are also partly underpinned by changes to labour regulation. Taking only the most recent ones, we can list for example the new law on "feasible and manageable" work, which provides flexibility in, inter alia, calculating working hours; the introduction of flexi-jobs in the "accommodation and food services" sector, plus the extension of this approach in the trade sector and to people drawing retirement pensions; changes to the rules on student work; the application of a more progressive method for calculating the notice period; the extension of temporary work contracts to the entire private sector and, under certain conditions, to the public sector; the expansion of night work in the e-commerce sector; the improvements made to the social security status of self-employed people; and the creation of a status for "student entrepreneurs".

In a situation where traditional employment contracts are gradually giving way to non-standard forms of employment, it is advisable to remain attentive to working conditions and job quality, whatever the status, contract type and working hours.

There is a wide variety of non-standard forms of employment. In this article we concentrate on the three main types: self-employment, temporary contracts and part-time work. We will sketch out the scope and trends of each of the non-standard forms of employment analysed and compare Belgium's situation with the European average. We will describe the characteristics of these forms of employment in relation to "traditional" jobs. Lastly, we will identify the people who are most likely to be working in non-standard jobs. In order to determine the main factors for this phenomenon, an econometric analysis has been carried out, taking as explanatory variables gender, age, region of residence, level of education, fields of study, marital status, number of children, country of birth and branch of activity.

Unlike descriptive statistics, this type of analysis has the advantage of being able to neutralise the incidence of the other variables on the one under examination, or to study the interaction between two specific variables, independently of the other characteristics. For example, the impact of a person's age on the probability that s/he will be working under a temporary contract is estimated by assessing the incidence of the other variables which might also influence the result, such as his/her sector of activity, origins, gender etc. The data used are drawn from the labour force surveys (LFS) published by Eurostat. Given that survey data are by nature non-exhaustive, the results are presented within a 95 % confidence interval. A detailed explanation of the model, plus all the results, can be found in appendix.

1. Self-employed workers

1.1 Ever-greater heterogeneity

On an international comparison, Belgium is exceptional due to the increase – albeit a slight one – in the proportion of self-employed workers in the country's total employment figure. Based on the national accounts data, the proportion of self-employed people rose from 16 % to 17 % between 2005 and 2018, while for the EU as a whole the proportion slipped from 17 % to 15 %. The number of self-employed people in Belgium has been buoyed by a number of factors, including inter alia the popularity of the liberal professions, the successive improvements made to the social security regime for the self-employed, the opportunity to combine a retirement pension with an occupational income under self-employed status and the increasingly marked attraction of flexibility.

While the overall proportion of the self-employed in Belgium has not changed very much, what has changed in particular is the diversity of the occupations involved and the form in which they are carried out. Most noteworthy here are secondary occupations (which account for a quarter of all self-employed people registered with the national institute for social security of the self-employed (NISSE); people combining retirement and self-employment (10 %); freelance workers[1] (estimated by UNIZO at 158 000 in Flanders and Brussels in 2018), digital workers (a poorly estimated, but still limited, phenomenon), and students entrepreneurs (1 %).

Among the various branches of activity, it is in the agriculture sector that we see by far the greatest probability of a person being self-employed, with seven out of ten agricultural workers having self-employed status – a significantly higher probability than all other sectors. Other branches of activity showing the highest probabilities after agriculture are "other service activities" and "accommodation and food services" (both with 36 %) and "technical, professional and scientific activities" (33 %).

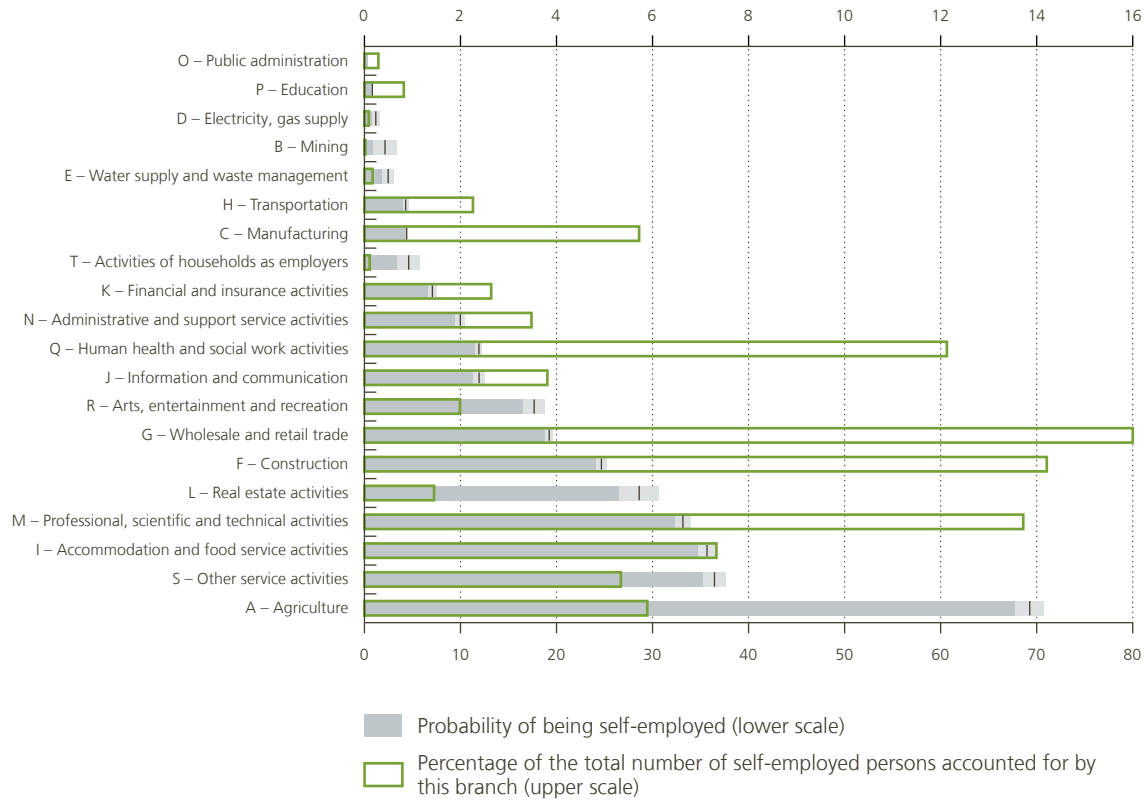
1 A self-employed worker without saleable business assets, who is not a member of a regulated profession such as the medical or legal profession. Such people choose to work with client companies via an external, non-hierarchical relationship. According to a survey conducted by French freelance work liaison platform MALT, 90 % of the freelancers polled had chosen this status voluntarily, while Eurofound gives a figure of 60 % for this. Freelancers are frequently to be found in the IT, design and graphics professions, but the trend is spreading to other sectors such as accounting, communication and marketing services to companies. Meanwhile, initiatives have been taken by a number of online platforms or workers' groups to improve working conditions for freelancers.

The weight of these sectors is however rather limited in relation to the overall number of self-employed persons. The NISSE database shows that the largest number of self-employed persons are to be found in the health sector (14 % of all self-employed persons), which includes a number of liberal professions; manufacturing industry (14 %); and "wholesale and retail trade" (13 %), though this latter sector is now shrinking. These findings are reflected in the probability that a person will be self-employed based on his/her chosen field of study. Those who have pursued studies in the veterinary medicine or medical and healthcare fields are most likely to opt for self-employed status. The upward trend in the number of self-employed workers in industry, especially in the construction sector, is partly due to the growing number of foreign workers, especially from the newer EU member states, who opt for self-employed status in order to be able to carry out a remunerated occupation in Belgium. The number of non-Belgians working with self-employed status in industry in Belgium has more than tripled between 2005 and 2017, rising from 14 000 to 45 000.

Chart 1

Self-employed workers by branch of activity [1]

(probability that a worker will have self-employed status based on the Probit model with time-fixed effects [2,3] and proportion of the total number of self-employed persons, 2008-2017 [4], working population aged 15 and over)



Sources: LFS (microdata), NBB estimation.

1 Based on the NACE-2008 classification code.

2 All the results can be found in appendix.

3 Controlling for gender, region of residence, age, level of education, marital status, number of children and country of birth. The results are presented within a 95 % confidence interval.

4 As a break in the series of NACE classification codes occurred in 2008, the data used here are restricted to the 2008-2017 period.

Taking into account workers' personal characteristics[1] and also their branches of activity, persons living in the Brussels Region show the highest probability of being self-employed (14 %), with a slightly lesser probability in Flanders and Wallonia, around 13 % and 12 % respectively. The breakdown by region masks a number of specific province-related features. Indeed, West Flanders and Walloon Brabant show probabilities that are equivalent to Brussels. All other provinces show lower probabilities than the capital region, with differences ranging from 1 (East Flanders) to 3 percentage points (Luxembourg).

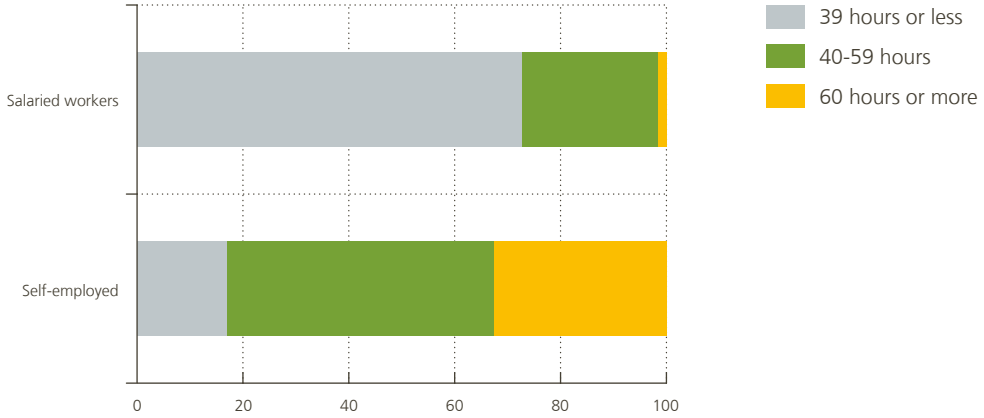
1.2 A choice in spite of the more arduous working hours

Self-employed work is characterised by much longer working hours than salaried occupations. While only three salaried employees out of ten report putting in over 40 hours per week, this is the case for eight out of ten self-employed workers. If we take workers who claim to put in more than 60 hours per week, we find very few salaried workers, but one third of all self-employed persons.

Chart 2

Weekly working hours, by employment status

(hours worked per week, as a percentage of the total, excluding variable working hours, 2017)



Source: EC.

In spite of the more demanding work timetable, self-employed persons run a noticeably higher risk of poverty[2]: 14 % of them earn an income that is below the poverty line, compared with 4 % among salaried workers. However, that proportion is markedly lower than among job-seekers, where it stands at 49 %. Irrespective of one's employment status, having a remunerated occupation appears to be an effective bulwark against poverty.

It should be stressed that the social security status of self-employed workers differs considerably from that of employees. The rate of social security contributions paid by self-employed persons is lower than the rate deducted from employees' income (employee and employer contributions combined), but this also confers

1 In terms of age, level of education, field of studies, marital status, number of children, country of birth.

2 The poverty risk rate is based on the percentage of households whose total net income is lower than the poverty line, i.e. 60 % of the median net income equivalent. In Belgium, the poverty threshold is calculated from the data compiled for the EU Statistics on Income and Living Conditions (SILC). It corresponds to net annual income of € 13 670, equivalent to € 1 139 net per month for a single person, and € 28 708 net per annum or € 2 392 net per month for a household composed of two adults and two children under the age of 14.

a lesser degree of entitlements. Unlike employees in the private or public sector, self-employed workers must also sign up separately with social insurance funds and mutuality insurance. Aside from these obligations, they enjoy certain rights as regards family allowance, sickness and invalidity insurance, maternity cover, pension rights and "bridging" benefits in case of involuntary interruption or cessation of activities. However, the self-employed do not have the right to draw unemployment benefit and they are not covered in the event of a work accident. Measures have been taken to improve both their social security status and their work-life balance, including extending maternity leave and raising the minimum pension. In order to make up for their lower level of social security protection, the self-employed also have the option of supplementing their rights through voluntary insurances.

In spite of these disadvantages, the proportion of self-employed persons who report that they are very satisfied with their work situation (55 %) is higher than among employees (49 %). Practically all (nine out of ten) self-employed people say they do not wish to change their employment status. In Belgium, in 80 % of cases, people who are self-employed have opted voluntarily for this employment status, versus 60 % on average in the EU.

The vast majority (70 %) of self-employed people work alone, without any staff. While 40 % say this is their own preference, 16 % do not think that they have enough work to justify hiring staff and 14 % believe that it is too expensive to do so.

According to a survey carried out by Eurostat in 2017, 1.5 % of all self-employed workers in Belgium are "economically dependent". This definition is based on a set of three criteria: 1) they have no staff, 2) 75 % of their income depends on a client in a dominant position, and 3) they have no control over their work timetable. In other words, these workers have self-employed status but do not share the basic characteristics of self-employment, in terms of autonomy and freedom from hierarchical relationships. According to the ILO, the average figure for the EU as a whole is 4 %. The relatively small proportion of economically dependent self-employed workers in Belgium is due to the fact that this is one of the very few countries to have laid down formal criteria for deciding who does and does not qualify for self-employed status, so as to reduce any ambiguities regarding this status. The criteria are: absence of a hierarchical link and autonomy in performing their work.

1.3 Age and level of education: two decisive factors

There are a number of personal characteristics that affect the probability that a person will have self-employed status. In Belgium, contrary to what one may observe on average across the European Union, the probability that a person will have self-employed status rises in line with his/her level of education. The probability increases from around 10 % for a person with a low level of education to 14 % for someone with a high level of education. While in some other places, the self-employment status is adopted more often by relatively low-educated people in order to get access to the labour market, in our country it is mostly higher education graduates that adopt it. This outcome is largely underpinned by the high proportion of liberal professions among the self-employed.

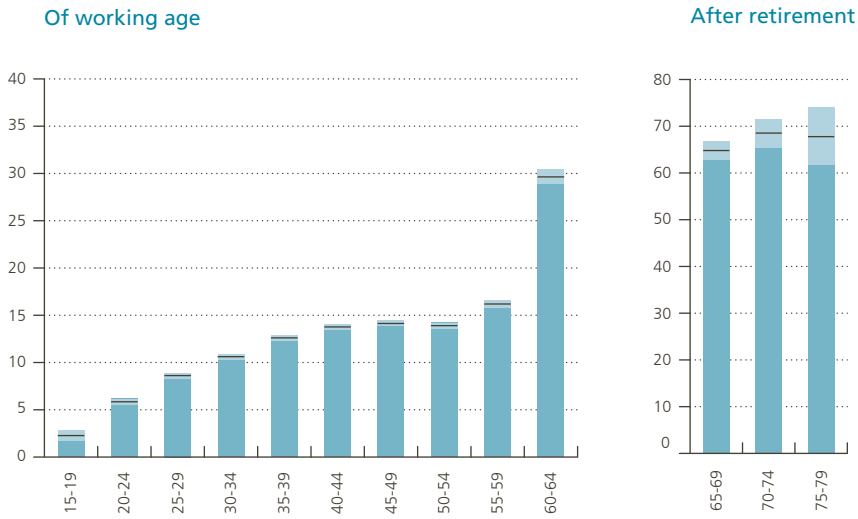
Age also has a significant influence on the probability that a person will be self-employed. The probability rises progressively from 2 % among the 15-19 age group to 11 % for the 30-34 year-olds, subsequently stabilises at around 13-16 % up to 60 years of age, and then doubles among the 60-64 age group. Beyond retirement age, it actually reaches over 60 %. Most people who decide to continue in a remunerated occupation after they begin drawing their retirement pension do so under self-employed status. The fact that people who are in receipt of a retirement pension are entitled to combine this income with revenue from self-employed work is certainly a contributory factor underpinning this phenomenon.

As regards the other personal characteristics, it is worth noting that, all else being equal, a woman is around 8 percentage points less likely to be self-employed than a man. This gap shrinks to 6 % if we control for the

Chart 3

Probability of being self-employed, by age [1]

(based on the Probit model with time-fixed effects [2], 2005-2017, working population aged 15 and over, 95 % confidence interval)



Sources: LFS (microdata), NBB estimate.

1 All the results can be found in appendix.

2 Controlling for gender, region of residence, level of education, marital status, number of children and country of birth.

branch of activity. Marital status also has an effect on the probability of being self-employed. Married people are more likely to be self-employed than single people (a 14 % versus a 10 % probability). However, the fact of having children or not has no significant influence.

People born in another EU member state are most likely to be working self-employed (a 15 % probability). This is higher than the probability for a person born in Belgium (13 %) and also higher than for those born outside the EU (11 %).

In absolute numbers, after those of Belgian nationality – who account for almost nine out of every ten self-employed workers – Romanian nationals are the most numerous among the self-employed (21 % of all non-Belgian self-employed), followed by the Dutch (14 %) and the French (11 %). Brussels hosts the greatest number of foreign-nationality workers: 41 % of all self-employed people are non-Belgian, compared with 7 % in Flanders and Wallonia.

2. Temporary contracts

2.1 An increasingly common phenomenon

The term "temporary contracts" comprises fixed-term contracts, contracts from a temporary employment agency, replacement staff contracts, specific assignment contracts and student work.

Up until 2014, the proportion of this type of employment contract within total salaried employment in Belgium hardly changed at all, oscillating around 8 %. Since then however, it has been rising, reaching 10 % in 2017. Permanent contracts nevertheless remain the norm, with nine out of every ten employees working under a permanent employment contract. This is a higher proportion than the EU average (86 %).

The start of this increase coincided with the abolition of the "trial period" clause, which came about as part of the legislative move to unify the legal status of blue-collar and white-collar workers in Belgium. At the same time, the financial conditions for terminating a permanent contract were eased as regards terminating white-collar employment but rendered more stringent for the dismissal of blue-collar workers. From that moment, many employers came to prefer to hire new employees on temporary contracts, in order to assess whether they match the required profile.

The NBB 2018 Annual Report indeed shows a steady increase in the proportion of temporary contracts among new hires. In 2018, 46 % of all new recruitment was carried out under temporary contracts, a rise of 12 percentage points versus 2008.

In order to encourage the use of permanent contracts, the notice periods applicable at the start of the period of employment have been further reduced: since May 2018, the notice period for new employees who have been in the job for three months or less has been reduced to just one week.

In addition to temporary contracts, there exist other mechanisms designed to increase flexibility. These include the flexi-job scheme, whose initial purpose was to increase flexibility and at the same time reduce undeclared work in the hotels, restaurants and catering sector. At that time, this approach was only available to people who were already in a job and working at least 4/5 of full time. It was subsequently extended to the retail sector and to those drawing a retirement pension. This system enables workers to take a side-job with more advantageous financial conditions for both them and their employers (salary exempted from personal social security contributions and from withholding tax on professional income).

Temporary contracts are more common in those sectors that have a particular need for flexibility. Thus, the likelihood that a person will be working on a temporary contract is higher in the education (17 %), "activities of households as employers of domestic personnel" (17 %) and "arts, entertainment and recreation" (14 %) sectors. In absolute figures as well, proportionally the greatest number of people working on temporary contracts are to be found in education (largely due to the current process of appointing teachers and the system for replacing absent teachers), in wholesale and retail trade and the "accommodation and food services" sector (both sectors that experience sharp peaks in their business), plus also the "administrative and support service activities" sector (which includes temporary agency work). By contrast, temporary contracts are proportionally less common in the "public administration", construction, transportation and 'human health and social work' sectors.

2.2 Frequently a springboard to a permanent contract

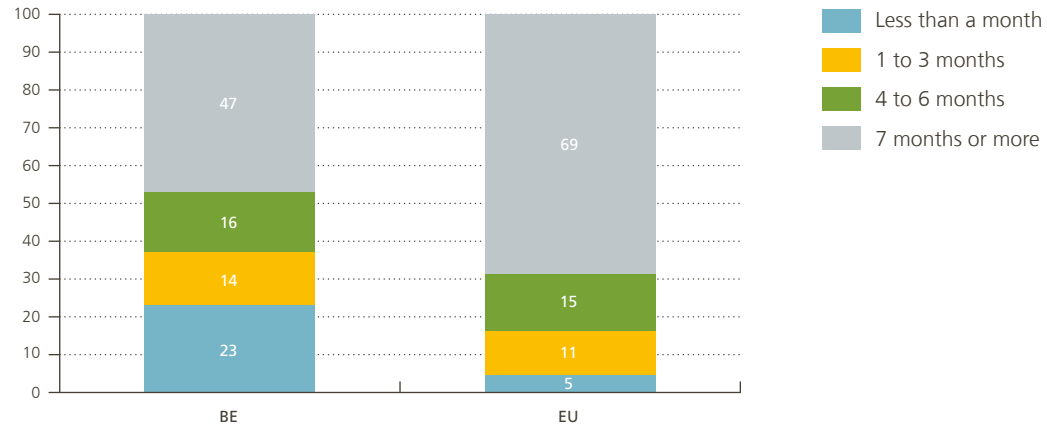
Belgium stands out from the EU average with its frequent use of very short-term temporary contracts. Close to one in four contracts are for less than a month, while in the EU such contracts are used only between a fifth and a quarter as often. As already stated, the abolition of the trial period has resulted in an increase in the use of temporary contracts so that employers can obtain a clearer understanding of an employee's abilities before hiring him/her on a permanent contract. We would also point out that this type of contract covers not only fixed-term contracts but also contracts from temporary agencies, which employers are increasingly using as a way of delegating recruitment of their personnel. The popularity of student jobs has also contributed to the increase in short-term temporary contracts, particularly since the reform of the calculation method for the number of hours that may be worked[1].

1 In January 2017, the limit on working hours for student jobs was increased to 475 hours per year, up from the previous 50 days – i.e. maximum 400 hours or 50 eight-hour days. This resulted in greater flexibility and potentially increased the number of jobs a student could take on. Since 2018 some sectors (retail) benefit from an exception to the ban on Sunday working for young people under 18 working under the student worker scheme.

Chart 4

Temporary contracts, by duration

(as a percentage of the total of temporary contracts, 2017)



Source: EC.

Although it is advantageous for an employer to have the option of using a range of employment contracts – whether affording greater flexibility, ending automatically on the stated date, allowing a means of testing out an employee, etc – this may be a disadvantage for the worker as regards his/her career prospects and lack of employment and earnings stability. Workers on temporary contracts are often the first to suffer the impact when business activity slows down, as their contracts are simply not renewed. The degree to which a worker is penalised will depend on his/her age – this kind of flexibility may be an advantage for young people – and, more generally, on his/her socioeconomic position – whether student, head of a household, etc. At the start of a career, flexibility can help employees to gather a wide range of professional experience. However, most workers on temporary contracts have not chosen this route; they simply have not managed to find a job with a permanent contract. This holds true for seven out of ten people on temporary contracts. For those under 25, the percentage is lower, however, at six out of ten. Some of these people voluntarily opt for a temporary contract as the flexibility helps them combine work and study more easily.

Given the instability of employment and thus earnings associated with this type of contract, especially as regards very short-term contracts, people working on temporary contracts are far more likely to have an income that is below the poverty line than those working on fixed-term contracts (13 % compared to 3 %). The probability is however lower than that for registered job-seekers; it is noteworthy that this figure is one in two.

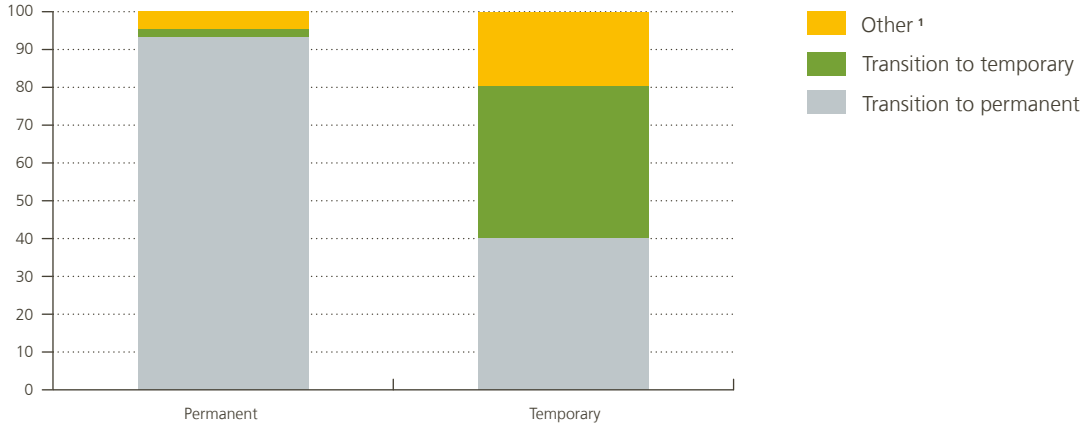
An ILO report published in 2016 stated that temporary contracts tend to have a negative impact on earnings. This means that a worker on a temporary contract earns a lower salary than one on a permanent contract doing the same work, despite the fact that there are legal provisions both at EU and national levels designed to ensure that workers should be treated equally, whatever employment contract they are working under. This negative impact is distributed unevenly across the earnings range: it is very marked at low salary levels and almost non-existent at the upper end of the scale. The report reveals that when the data is controlled for worker and employment characteristics – age, education, occupation and sector of activity – the earnings penalty works out at a little over 10 % in Belgium.

However, this situation is generally transitory. Close to 40 % of those employed on temporary contracts obtain permanent contract the following year, a slightly higher figure than ten years ago (+4 pp). A Federgon report on temporary agency workers published in 2018 revealed that two thirds obtained a fixed contract after two years and that their rate of access to training was significantly higher than the national average (16 % compared with 9 %).

Chart 5

Mobility by type of contract

(as a percentage of the total of the corresponding employment, transition between 2016 and 2017)



Sources: EC, Statbel.

1 Other: inactive, unemployed or self-employed.

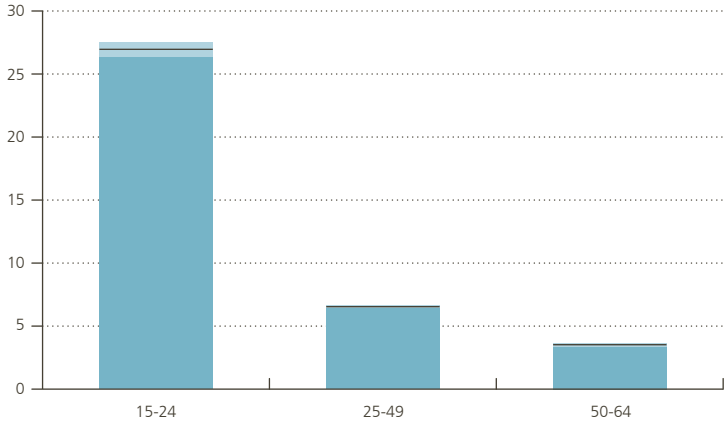
2.3 Over-represented at-risk groups

As we have seen, people working under a temporary contract rarely do so out of personal choice, in contrast to those who take on self-employed status (or part-time work, see below). It is therefore not surprising that we find a greater number of vulnerable workers – women, young people, those coming from outside the EU and those with a low level of education – on this type of contract. Other personal characteristics such as marital status and number of children have however little or no impact on the probability that a person will be working on a temporary contract.

Chart 6

Probability of working under a temporary contract, by age [1]

(based on the Probit model with time-fixed effects [2], 2005-2017, salaried population aged 15 and over, 95 % confidence interval)



Sources: LFS (microdata), NBB estimate.

1 All the results can be found in appendix.

2 Controlling for gender, region of residence, level of education, marital status, number of children and country of birth.

The most significant determining factor is the worker's age. Young people are far more likely than other age groups to find themselves working on a temporary contract. This probability decreases very rapidly as the age of the worker increases. It falls from 60 % for people under 20, to 13 % for those aged 25-29, and then fluctuates around 4-7 % up to pensionable age. For young workers, temporary contracts are becoming ever more frequently a inevitable step before obtaining a permanent contract.

Low-educated workers, who have less negotiating power than the more educated, are also more often obliged to take work under temporary contracts, but the education gap is less marked in Belgium than in other EU countries. One worker in ten who has not been educated beyond lower secondary level is hired on a temporary contract, while this is the case for only 6 % of those with medium or high levels of education.

Temporary contracts are more common among those who have studied "sciences, mathematics & statistics", "arts and humanities subjects" and "education". This over-representation of the science subjects is due to the relatively higher number of researchers who are often hired on temporary contracts. This also holds true for many people working in the arts fields. In the field of education people usually begin their careers on temporary contracts as this is the obligatory route to obtaining an appointment. Temporary contracts are also widely used in cases where absent teachers have to be replaced.

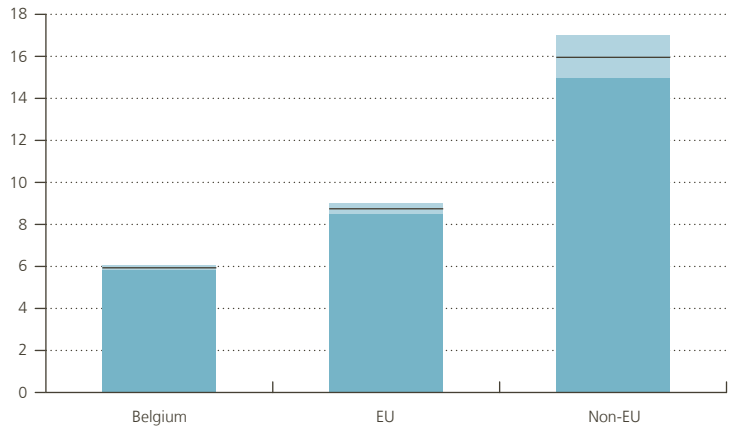
The specific nature of the education sector has an impact on the probability of women being hired on a temporary contract. Seven out of ten people working in education are women. When all other personal characteristics are equal, a woman is around 3 % more likely to be working on a temporary contract than a man. When we control for the branch of activity – and therefore for the fact that women are more numerous in the education workforce than men – the women's probability of working under a temporary contract is only marginally higher (+1 percentage point) than for men.

The over-representation of certain groups among temporary contracts also underlines their difficulty in obtaining a permanent employment contract. Non-EU workers are around three times more likely to be hired on temporary contracts than Belgians. The problems these people encounter regarding recognition

Chart 7

Probability of working under a temporary contract, by country of birth [1]

(based on the Probit model with time-fixed effects [2], 2005-2017, salaried population aged 15 and over, 95 % confidence interval)



Sources: LFS (microdata), NBB estimate.

1 All the results can be found in appendix.

2 Controlling for gender, age, region of residence, level of education, marital status and number of children.

of their diplomas and/or skills acquired abroad may explain this phenomenon. Rather than hire the person immediately on a permanent contract, an employer would prefer to initially assess the skillset of the worker by offering a temporary contract. This may be positive for the non-EU worker if it subsequently leads to a permanent contract. On the other hand, if one temporary contract follows another in succession without leading to a permanent contract, this creates greater instability and poverty risk for the person concerned.

3. Part-time work

3.1 Applies to a quarter of all workers

The proportion of part-time workers in total employment in Belgium, which had been on the rise since the 1990s, has stabilised at around one in four during the last few years. This is higher than the EU average of one worker in five. The existence in Belgium of various mechanisms such as the time credit scheme, career break option and special-purpose leave, which enable workers to reduce their working time, has undoubtedly contributed to the popularity of part-time work. These schemes were successful, especially among workers coming to the end of their career who wish to gradually reduce their working time before taking retirement.

The sectors in which part-time work is most common are "activities of households as employers of domestic personnel" (51 %), 'human health and social work' (34 %) and "administrative and support service activities" (30 %). These are all sectors in which women – who, as we shall see later in this article, form a majority among part-time workers – are strongly represented.

Part-time work is slightly more common in Flanders and Wallonia than Brussels. This holds true for all the provinces, with the exception of Hainaut, where the probability of part-time work is the same as for Brussels. These are the conclusions that emerge from the descriptive statistics but econometric analysis reveals that the outcomes are not due to the composition of the population in each of the regions. An initial explanation might in fact have been that the phenomenon of population ageing is less marked in the Brussels Region. However, the differences in probabilities are not neutralised if we control for workers' ages. On the other hand, there are two factors which partly explain the regional discrepancies: level of education and marital status. Brussels hosts a higher proportion of highly educated people and – as we shall see later on in this article – the higher a person's level of education, the less likely it is that s/he will opt for part-time work. Meanwhile the Flanders Region has a larger proportion of married people, who are more inclined to reduce their working time than the unmarried.

The number of hours put in by those working part-time is an important factor in assessing the quality of the jobs in question. As low working hours tend to result in inadequate income, we may conclude that, below a certain number of hours per week, the job is likely to be precarious in nature. In concrete terms, we refer to jobs totalling less than 20 hours as "short part-time" or "underemployment". Knowing whether this kind of situation is voluntary or constrained is of course vital information for assessing just how critical it is.

In an attempt to combat underemployment, a recent legislative measure [1] requires employers planning to recruit new personnel to offer, as a priority, their existing employees who are forced to work part-time an increase in their working hours. The law also sets minimum working hours equivalent to one third of full-time employment, while also allowing exceptions, especially in the trade sector, which is subject to fluctuations in demand, including contracts for as little as eight hours per week.

1 Law promulgated on 25 December 2017.

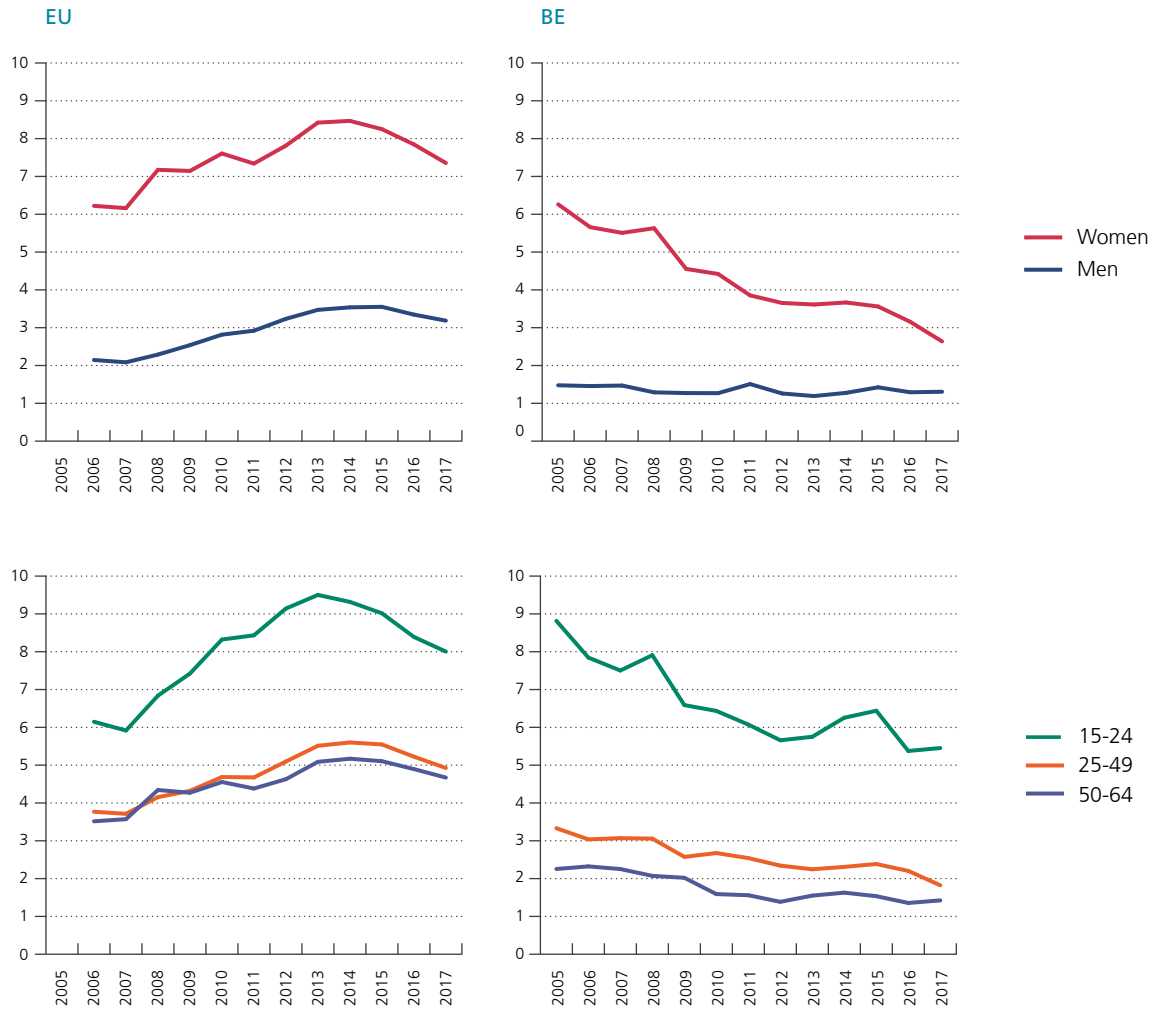
The average number of hours put in by part-time workers in Belgium has been increasing steadily since the early 2000s, rising from around 22 hours per week at that time to 26 in 2017 (partly due to the introduction of the 4/5 time formula). This is higher than the EU average, which has risen merely from 20 to 21 hours over the same period.

In addition to the positive impact which it has on the overall employment rate, part-time work can also help to improve the work-life balance of the workers concerned. Nevertheless, we must not fail to point out the negative effects. Working part-time creates a wage gap, as the hourly wages tend to be lower than what a full-time employee can expect to earn. Moreover, there are fewer opportunities for training and promotion in part-time employment and it carries a higher risk of falling below the poverty line, especially in the case of single parents. This is reflected in a higher poverty risk than among full-time workers, though this risk is still quite modest – 6.5 % versus 4.3 % among full-time workers.

Chart 8

Involuntary part-time work by gender and age

(as a percentage of the corresponding total employment figure)



Source : EC.

The fact of whether working part-time is a voluntary choice or an involuntary imposition is a key factor in assessing how precarious this kind of occupation actually is. In fact, involuntary part-time employment in Belgium – in the order of 2 % – is noticeably less common than the EU average (5 %). In our country, people working part-time have usually made a voluntary choice to do so, for a variety of reasons such as wishing to look after their children or care for others in need of assistance, for health reasons, in order to pursue studies, etc. People involuntarily working part-time are more often women and, especially, young people. The proportion of people involuntarily working part-time in Belgium has been falling since the turn of the century, although it was still rising in the EU up until the economic recovery that began in 2014.

To prevent those who can only find part-time jobs falling into an unemployment trap or dropping out of the workforce altogether, Belgium provides a benefit known as the "income guarantee allowance", which enables people working part-time involuntarily to draw a supplementary allowance on top of their wages for a temporary period. This benefit ensures that these workers do not suffer any loss of income when they move out of unemployment into employment.

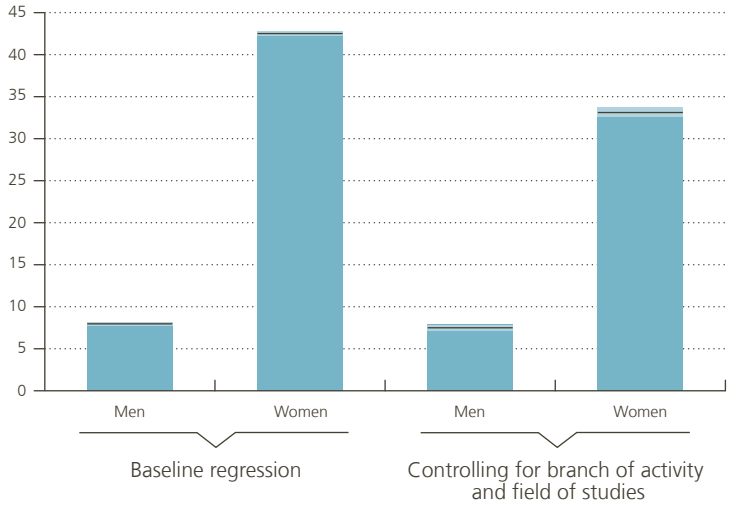
3.2 Women and end-of-career workers form a large majority

Among the various personal characteristics taken into account, it is women who are the most likely to be working part-time. All else being equal, a woman has a four times greater probability of reducing her working time than a man. There are a number of factors that explain the predominance of women among part-time workers. Firstly, women are still taking on a greater role in the upbringing of children and domestic tasks than men. Secondly, it is very often more financially advantageous for the woman in a family household to reduce her working time, and therefore her salary, as men earn on average more than women. Last but not least, part-time jobs are more common to certain branches, such as "activities of households as employers of domestic personnel", "human health and social work" and "administrative and support service activities". These are all sectors in which women are strongly represented.

Chart 9

Probability of working part-time, by gender [1]

(based on the Probit model with time-fixed effects [2], 2005-2017, population in work aged 15 and over, 95 % confidence interval)



Sources: LFS (microdata), NBB estimate.

1 All the results can be found in appendix.

2 Controlling for region of residence, age, level of education, marital status, number of children and country of birth.

Econometric analysis reveals however that neither the fact of having children or not nor her marital status influences the likelihood that a woman will be working part-time but rather her field of study and the branch of activity in which she works. If we control for these two factors, the difference between men and women is reduced but a marked difference still remains. In fact, women have a greater tendency to go into fields of study or economic sectors where part-time work is more common. Still today, eight out of ten part-time workers in Belgium are women. However, we should underline that there has been a strong movement in recent years towards part-time work among men.

The likelihood that a person will be working part-time depends strongly on his/her age. There is a 24 % probability that workers under 25 will be working part-time. The part-time formula enables people to combine paid employment with studies but it is also the case that people in this age group are more likely to be working part-time involuntarily. The probability that a person will be working reduced hours then falls to 14 % between the ages of 25 and 29 and thereafter gradually rises throughout workers' careers, reaching slightly over 30 % towards the end of their career (60-64). It is extremely rare to find involuntary part-time work among this age-group. This situation has some connection with the existence of a number of schemes that enable people to reduce their working time towards the end of their careers. However, the greatest probability that a person will be working part-time is highest after s/he reaches pensionable age. Seven out of ten of those who decide to continue in a remunerated occupation after 65 years of age do so on a part-time basis.

Having a higher level of education reduces the likelihood that a person will be working part-time. Those with a lower level of education have a 29 % probability, versus 22 % among those with a medium level of education and 14 % for the highly educated. This may be due to a number of factors. First of all, a more highly-educated person is likely to suffer a greater loss in earnings in moving to part-time work. If a person receives benefits from the national employment office, the reduction in income due to going part-time is covered to a greater extent for workers on low wages. Moreover, it is difficult to work reduced hours if one has a position of responsibility within one's employer's organisation.

Conclusions

The changes that have been taking place in the society and the economy (including globalisation, the expansion of the tertiary sector, digitalisation, etc) for a number of years now are leading to a gradual transformation of the labour market, in particular bringing in ever-greater flexibility in labour relations. Thus, the model of full-time salaried work under a permanent contract, which has hitherto been the norm, is giving way to non-standard forms of employment. In this situation, it is important to remain attentive to the working conditions of the people involved in these forms of employment so as to ensure job quality, whatever the status, contract type and working hours arrangement.

In this article, we have analysed three types of non-standard employment, namely self-employment, temporary contracts and part-time work. In Belgium, the growth of these forms of employment has not generally been accompanied by a worsening of working conditions, though this basic finding needs to be qualified somewhat. In fact, the findings differ according to the particular non-standard form of employment being examined and also according to whether the adoption of that status by the workers in question is voluntary or not.

Self-employment is more widespread in Belgium than on average in the EU (17 % of total employment versus 15 % for the EU). Moreover, while self-employment is proportionally in retreat across the EU, it is showing a slight increase in Belgium. The number of self-employed people in Belgium has been buoyed by number of factors, including inter alia the popularity of the liberal professions, the successive improvements made to the social security regime for the self-employed, the opportunity to combine a retirement pension with an occupational income under self-employed status and the increasingly marked attraction of flexibility. The self-employed typically have a heavier work timetable than salaried employees. Self-employed people are also more likely to have an income below the poverty line than are salaried workers, they have a lower level of social security cover (which also means paying lower contributions) and are not entitled to draw unemployment benefits. In spite of these disadvantages, self-employed workers report having a high degree of job satisfaction and the majority of them say they do not wish to change their employment status. People who adopt self-employed status generally do so out of personal choice because it is worth noting that the professions traditionally operate under this status or in order to grasp an opportunity. A very low proportion (1.5 %) of self-employed persons in Belgium are deemed to be "economically dependent". This is largely due to the fact that Belgium is one of the few countries to have taken steps to avoid any ambiguities as to what "self-employed" means, introducing two formal criteria for determining self-employed status, namely the absence of a hierarchical link and autonomy in carrying out the work.

The proportion of people working under temporary contracts remains low in Belgium, where nine out of ten employees are working under a permanent contract (compared with the EU average of 86 %). Looking at the last 15 years, the incidence of temporary contracts as a proportion of total salaried employment hardly changed at all until the economic recovery began in 2014 but has seen an increasingly sustained rise since then. This shift coincided with the abolition of the "trial period" clause that came about when the employment status of blue-collar and white-collar workers was harmonised. Since that time, many employers appear to prefer not to commit to offering new personnel a permanent contract but in the first instance tend to offer a temporary contract, in order to assess whether the new employee matches the required profile. Unlike the case with self-employed status and part-time work, it is rare that a worker makes a voluntary personal choice to sign a temporary contract. Moreover, this type of employment contract is linked with greater job and income insecurity. For young people, a temporary contract is becoming ever more frequently a inevitable first step before obtaining a permanent contract. Given that people do not generally enter into temporary contracts willingly, the sharp increase in temporary work, especially those of very short-term, concentrated among young workers, deserves special attention. In particular, if people are forced to work under successive temporary contracts, which do not lead over time to the offer of a permanent contract, this is bound to lead to greater instability and a higher risk of poverty.

Part-time work is more common in Belgium than on average in the EU (25 % against 19 % respectively). However, unlike the other EU countries, working part-time is in most cases the result of a voluntary decision by the workers in question : just 2 % of workers in Belgium do so involuntarily, compared with 5 % in the EU. While the proportion of people working part-time involuntarily is quite small, it would nevertheless be advisable to remain attentive to the issue of underemployment (where the employee is working less than 20 hours per week), especially as regards the risk of precarious income and particularly among people living alone. Nevertheless, given the low percentage of people working part-time involuntarily, we may deduce that most "under-employed" people have made a personal choice to work fewer hours. Working part-time, which is the case for four times as many women as men in Belgium, helps to ensure a good work-life balance. The predominance of women among part-time workers is due to a number of factors, especially the fact that women still today take on a greater share than men in the upbringing of children and the performance of household tasks. Part-time work is also widely used by people approaching the end of their careers in order to reduce their working hours before finally taking retirement. The high proportion of part-time work in total employment in Belgium is partly due to the existence of various mechanisms such as the time-credit scheme, career-break option and special-purpose leave, which have proved to be enormously popular, especially among workers coming to the end of their career.

Annex

The database used for the econometric estimates comprises all the microdata available in the Labour Force Surveys conducted in Belgium between 2005 and 2017. For each analysis the population sample is made up of everyone aged 15 and over who is in work. Regarding temporary contracts, the sample is taken only from salaried workers. Please also note that the analysis of self-employed workers does not include carers.

As the data used comes from just a sample of the population, we have used Eurostat's weighting coefficients so that the results provide an estimate of the percentages for the entire population. For each of the variables analysed, we have verified the representativeness thresholds so as to ensure that the results are representative.

For each of the three aspects dealt with in this article, we have used an estimation based on a Probit model defined in the following way:

$$\Pr(Y_{it} = 1 \mid X_{it}) = \Phi(\beta X_{it} + \mu_t + \varepsilon_{it})$$

where Φ is the distribution function of the standard normal random variable $\Phi(z) = \int_{-\infty}^{z} \frac{1}{\sqrt{2\pi}} e^{-u^2/2} du \quad z, u \in \mathbb{R}$

Y_{it} is the dependent binary variable which takes the value 1 if the person is independent (or on a temporary contract, or working part-time, depending on which category is being studied) and 0 if not; X_{it} represents all the explanatory variables – gender, region or province of residence, age, level of education, field of study, marital status, number of children, country of birth and branch of activity; μ_t is the time-fixed effect; and ε_{it} is the error term.

However, the model estimated using this approach cannot be directly interpreted, except for the meaning of the relationship between the variables: if the coefficient is positive (or negative respectively), then, all else being equal, the probability will increase (or decrease) if the variable increases. With discrete variables, if the coefficient is positive (or negative respectively) this means that the variable in question has a positive (or negative) effect on the probability vis-à-vis the reference category. For example, regarding the regression on part-time work, if the coefficient of the "female" variable is positive, this means that, all else being equal, a woman is more likely than a man (the reference group) to work part time.

In order to understand the exact effect of a variable on the probability of a person's employment status, i.e. the size of the variation, we need to calculate the marginal effects. These effects are the partial derivative of the probability for the variable j, for which we wish to know the effect size. This derivative depends on the value of the other variables. So that we have to choose how to set the other variables. In our case we use the average level, so that each coefficient can be interpreted for all the other variables remaining constant and equal to the average. For example, based on the table below, we could say that for two people who show average characteristics in terms of age, region of residence, level of education, marital status, number of children and country of birth, a woman is 35 % more likely to be working part-time than a man.

Based on our estimate, we could also estimate the predicted probability for all the variables included in the regression. These are the data presented in the tables shown in this article. A 95 % confidence interval has been calculated for each of the predicted probabilities.

The following tables show the marginal effects derived from the model. For each category the table shows four regressions: the first takes the personal characteristics of workers excluding their field of studies, the second includes their field of studies, the third excludes their field of studies but includes their branch of activity and the last is an estimate including all the variables. We have broken down the information in this way because of the loss of information when the "field of studies" and "branch of activity" variables are included in the regression. Information on "field of studies" is only available for those with at least a higher secondary school

diploma. Including them in the analysis therefore implies excluding all those with lower levels of education. As regards information on the "branch of activity", there is a break in the data series in 2008 as the EU Statistical Classification of Economic Activities (NACE-code) was then revised. Including "branch of activity" in the regression therefore means that we lose three years of estimates.

The second table shows the predicted probabilities. Data for gender, region of residence, age, level of education, marital status, number of children and country of birth are calculated based on the first regression (excluding field of studies and branch of activity). The data supplied for "field of studies" are based on the results of the second regression and those for "branch of activity" on the third regression.

Annex 1

Marginal effects of the probability of being self-employed

(coefficients multiplied by 100, on the basis of the Probit model with time-fixed effects, population at work aged 15 and over, 2005-2017 [1])

	Personal characteristics		Personal characteristics and field of studies		Personal characteristics and branch of activity		Personal characteristics, field of studies and branch of activity	
Gender								
Male	Ref.		Ref.		Ref.		Ref.	
Female	–7.9***	(0.1)	–8.0***	(0.1)	–5.9***	(0.1)	–6.1***	(0.1)
Region								
Brussels	Ref.		Ref.		Ref.		Ref.	
Flanders	–1.8***	(0.2)	–1.7***	(0.2)	–1.9***	(0.2)	–1.6***	(0.2)
Wallonia	–2.6***	(0.2)	–2.5***	(0.2)	–2.1***	(0.2)	–2.0***	(0.2)
Age								
Under 30	Ref.		Ref.		Ref.		Ref.	
From 30 to 59	5.4***	(0.1)	5.3***	(0.2)	4.9***	(0.1)	4.7***	(0.1)
60 and over	28.6***	(0.4)	26.7***	(0.6)	21.9***	(0.4)	21.7***	(0.7)
Level of education								
Low	Ref.				Ref.			
Medium	2.8***	(0.1)	Ref.		2.3***	(0.1)	Ref.	
High	4.6***	(0.1)	3.2***	(0.1)	6.1***	(0.1)	3.2***	(0.1)
Field of studies								
General programmes			Ref.				Ref.	
Education			–9.1***	(0.3)			–3.2***	(0.4)
Arts and humanities			–0.4	(0.3)			–0.2	(0.3)
Social sciences, business and law			–0.3	(0.3)			–1.3***	(0.2)
Sciences, maths, stats			–6.9***	(0.3)			–5.4***	(0.3)
ICT			–5.4***	(0.4)			–4.5***	(0.3)
Engineering, manufacturing, construction			–0.8***	(0.2)			–1.8***	(0.2)
Agriculture, veterinary			19.0***	(0.7)			5.1***	(0.6)
Health, welfare			5.2***	(0.3)			5.4***	(0.3)
Services			6.5***	(0.4)			0.9***	(0.3)
Marital status								
Separated, divorced, widowed	Ref.		Ref.		Ref.		Ref.	
Single	–2.3***	(0.2)	–2.7***	(0.2)	–2.5***	(0.2)	–2.6***	(0.2)
Married	1.6***	(0.2)	1.2***	(0.2)	1.2***	(0.2)	0.9***	(0.2)
Number of children	**0.1****	**(0.1)**	**0.1**	**(0.1)**	**0.0**	**(0.1)**	**0.1**	**(0.1)**

Sources: LFS (microdata), NBB estimate.
Note: (standard errors), * significant at 90 %, ** significant at 95 %, *** significant at 99 %.
1 Regressions including data relating to branch of activity only cover the period 2008-2017.

Annex 1 (continued)

Marginal effects of the probability of being self-employed

(coefficients multiplied by 100, on the basis of the Probit model with time-fixed effects, population at work aged 15 and over, 2005-2017 [1])

	Personal characteristics		Personal characteristics and field of studies		Personal characteristics and branch of activity		Personal characteristics, field of studies and branch of activity	
Country of birth								
Belgium	Ref.		Ref.		Ref.		Ref.	
EU	2.2***	(0.2)	1.6***	(0.3)	1.2***	(0.2)	1.1***	(0.2)
Non-EU	–1.9***	(0.2)	–1.5***	(0.3)	–2.7***	(0.2)	–2.3***	(0.2)
Branch of activity								
A. Agriculture					Ref.		Ref.	
B. Mining					–67.1***	(1.0)	–60.8***	(1.5)
C. Manufacturing					–64.9***	(0.8)	–59.0***	(1.2)
D. Electricity and gas supply					–68.1***	(0.8)	–62.0***	(1.2)
E. Water supply and waste management					–66.8***	(0.8)	–61.1***	(1.3)
F. Construction					–44.6***	(0.8)	–38.5***	(1.3)
G. Wholesale and retail trade					–50.0***	(0.8)	–45.6***	(1.2)
H. Transportation					–65.0***	(0.8)	–59.3***	(1.2)
I. Accommodation and food service activitie					–33.6***	(0.9)	–31.8***	(1.4)
J. Information and communication					–57.3***	(0.8)	–49.5***	(1.3)
K. Financial and insurance activities					–62.2***	(0.8)	–56.0***	(1.2)
L. Real estate activities					–40.7***	(1.3)	–31.7***	(1.8)
M. Professional, scientific and technical activities					–36.1***	(0.9)	–29.5***	(1.3)
N. Administrative and support service activities					–59.3***	(0.8)	–52.7***	(1.3)
O. Public administration					–69.0***	(0.8)	–63.1***	(1.2)
P. Education					–68.4***	(0.8)	–62.5***	(1.2)
Q. Human health and social work activities					–57.4***	(0.8)	–53.9***	(1.2)
R. Arts, entertainment and recreation					–51.6***	(0.9)	–46.3***	(1.4)
S. Other service activities					–32.8***	(1.0)	–29.7***	(1.4)
T. Activities of households as employers of domestic personnel					–64.7***	(1.0)	–58.8***	(1.4)
Sample size	534 847		337 837		395 972		246 316	

Sources: LFS (microdata), NBB estimate.

Note: (standard errors), * significant at 90 %, ** significant at 95 %, *** significant at 99 %.

1 Regressions including data relating to branch of activity only cover the period 2008-2017.

Annex 2

Marginal effects of the probability of being employed on a temporary contract

(coefficients multiplied by 100, based on the Probit model with time-fixed effects, salaried population aged 15 and over, 2005-2017 [1])

	Personal characteristics		Personal characteristics and field of studies		Personal characteristics and branch of activity		Personal characteristics, field of studies and branch of activity	
Gender								
Male	Ref.		Ref.		Ref.		Ref.	
Female	3.1***	(0.1)	2.2***	(0.1)	1.1***	(0.1)	1.1***	(0.1)
Region								
Brussels	Ref.		Ref.		Ref.		Ref.	
Flanders	–2.2***	(0.1)	–3.2***	(0.2)	–1.9***	(0.2)	–2.7***	(0.2)
Wallonia	0.3*	(0.2)	–0.6***	(0.2)	0.4**	(0.2)	–0.3	(0.2)
Age								
Under 30	Ref.		Ref.		Ref.		Ref.	
From 30 to 59	–13.2***	(0.2)	–11.4***	(0.2)	–13.2***	(0.2)	–11.5***	(0.2)
60 and over	–11.2***	(0.3)	–9.9***	(0.5)	–11.8***	(0.3)	–10.8***	(0.5)
Level of education								
Low	Ref.				Ref.			
Medium	–4.2***	(0.1)	Ref.		–4.0***	(0.2)	Ref.	
High	–4.5***	(0.1)	–1.5***	(0.1)	–5.7***	(0.2)	–2.2***	(0.1)
Field of studies								
General programmes			Ref.				Ref.	
Education			6.5***	(0.3)			–0.8***	(0.3)
Arts and humanities			4.5***	(0.3)			2.2***	(0.3)
Social sciences, business and law			–0.4*	(0.2)			0.2	(0.2)
Sciences, maths, stats			3.9***	(0.4)			2.7***	(0.4)
ICT			–1.8***	(0.3)			–1.6***	(0.4)
Engineering, manufacturing, construction			–1.2***	(0.2)			–0.7***	(0.2)
Agriculture, veterinary			1.5***	(0.5)			0.9	(0.5)
Health, welfare			–0.1	(0.2)			–0.2	(0.3)
Services			0.3	(0.2)			–0.2	(0.3)
Marital status								
Separated, divorced, widowed	Ref.		Ref.		Ref.		Ref.	
Single	2.9***	(0.2)	2.8***	(0.2)	3.0***	(0.2)	3.0***	(0.2)
Married	–1.7***	(0.1)	–1.3***	(0.2)	–1.5***	(0.1)	–1.1***	(0.2)
Number of children	**0.3*** **	**(0.0)**	**–0.1**	**(0.1)**	**0.2*** **	**(0.1)**	**–0.2*** **	**(0.1)**

Sources: LFS (microdata), NBB estimate.

Note: (standard errors), * significant at 90 %, ** significant at 95 %, *** significant at 99 %.

1 Regressions including data relating to branch of activity only cover the period 2008-2017.

Annex 2 (continued)

Marginal effects of the probability of being employed on a temporary contract

(coefficients multiplied by 100, based on the Probit model with time-fixed effects, salaried population aged 15 and over, 2005-2017 [1])

	Personal characteristics		Personal characteristics and field of studies		Personal characteristics and branch of activity		Personal characteristics, field of studies and branch of activity	
Country of birth								
Belgium	Ref.		Ref.		Ref.		Ref.	
EU	3.7***	(0.2)	4.6***	(0.3)	3.5***	(0.2)	4.1***	(0.3)
Non-EU	9.2***	(0.3)	10.1***	(0.4)	9.0***	(0.3)	10.4***	(0.4)
Branch of activity								
A. Agriculture					Ref.		Ref.	
B. Mining					–4.5***	(1.4)	–0.6	(2.0)
C. Manufacturing					–4.5***	(0.9)	–2.0*	(1.0)
D. Electricity and gas supply					–6.5***	(0.9)	–3.5***	(1.2)
E. Water supply and waste management					–5.6***	(0.9)	–2.6**	(1.2)
F. Construction					–7.0***	(0.9)	–4.6***	(1.0)
G. Wholesale and retail trade					–4.5***	(0.9)	–2.1**	(1.0)
H. Transportation					–5.7***	(0.9)	–3.2***	(1.1)
I. Accommodation and food service activitie					–2.3***	(0.9)	0.6	(1.1)
J. Information and communication					–5.3***	(0.9)	–2.7**	(1.1)
K. Financial and insurance activities					–7.7***	(0.9)	–5.2***	(1.0)
L. Real estate activities					–4.9***	(1.0)	–1.8	(1.3)
M. Professional, scientific and technical activities					–3.7***	(0.9)	–1.5	(1.1)
N. Administrative and support service activities					–1.7*	(0.9)	–0.5	(1.1)
O. Public administration					–4.7***	(0.9)	–2.4***	(1.0)
P. Education					7.8***	(0.9)	12.2***	(1.1)
Q. Human health and social work activities					–4.2***	(0.9)	–1.3	(1.1)
R. Arts, entertainment and recreation					4.6***	(1.0)	7.5***	(1.2)
S. Other service activities					–4.2***	(0.9)	–2.8**	(1.1)
T. Activities of households as employers of domestic personnel					7.0***	(1.3)	10.2***	(1.8)
Sample size	459 467		290 889		340 013		212 640	

Sources: LFS (microdata), NBB estimate.

Note: (standard errors), * significant at 90 %, ** significant at 95 %, *** significant at 99 %.

1 Regressions including data relating to branch of activity only cover the period 2008-2017.

Annex 3

Marginal effects of the probability of being a part-time worker

(coefficients multiplied by 100, based on the Probit model with time-fixed effects, population at work aged 15 and over, 2005-2017 [1])

	Personal characteristics		Personal characteristics and field of studies		Personal characteristics and branch of activity		Personal characteristics, field of studies and branch of activity	
Gender								
Male	Ref.		Ref.		Ref.		Ref.	
Female	34.6***	(0.1)	27.7***	(0.2)	28.9***	(0.2)	24.9***	(0.2)
Region								
Brussels	Ref.		Ref.		Ref.		Ref.	
Flanders	2.7***	(0.2)	2.3***	(0.3)	3.0***	(0.2)	2.5***	(0.3)
Wallonia	1.8***	(0.2)	2.0***	(0.3)	1.9***	(0.3)	1.9***	(0.3)
Age								
Under 30	Ref.		Ref.		Ref.		Ref.	
From 30 to 59	1.9***	(0.2)	2.8***	(0.2)	2.3***	(0.2)	2.7***	(0.2)
60 and over	20.8***	(0.5)	23.0***	(0.7)	20.6***	(0.5)	21.5***	(0.8)
Level of education								
Low	Ref.				Ref.			
Medium	–6.7***	(0.2)	Réf		–7.0***	(0.2)	Réf	
High	–14.3***	(0.2)	–9.7***	(0.2)	–15.8***	(0.2)	–9.8***	(0.2)
Field of studies								
General programmes			Ref.				Ref.	
Education			0.5	(0.4)			–2.1***	(0.5)
Arts and humanities			6.8***	(0.4)			7.3***	(0.5)
Social sciences, business and law			0.0	(0.3)			0.6*	(0.3)
Sciences, maths, stats			0.2	(0.5)			0.4	(0.6)
ICT			–1.5***	(0.6)			0.1	(0.7)
Engineering, manufacturing, construction			–4.2***	(0.3)			–2.3***	(0.3)
Agriculture, veterinary			–3.4***	(0.6)			–1.3*	(0.7)
Health, welfare			9.3***	(0.3)			1.9***	(0.4)
Services			3.5***	(0.4)			1.3***	(0.4)
Marital status								
Separated, divorced, widowed	Ref.		Ref.		Ref.		Ref.	
Single	–1.6***	(0.2)	–1.6***	(0.3)	–1.4***	(0.2)	–1.6***	(0.3)
Married	3.8***	(0.2)	3.8***	(0.2)	4.4***	(0.2)	3.8***	(0.3)
Number of children	**1.3*** **	**(0.1)**	**2.0*** **	**(0.1)**	**1.2*** **	**(0.1)**	**2.0*** **	**(0.1)**

Sources: LFS (microdata), NBB estimate.
Note: (standard errors), * significant at 90 %, ** significant at 95 %, *** significant at 99 %.
1 Regressions including data relating to branch of activity only cover the period 2008-2017.

Annex 3 (continued)

Marginal effects of the probability of being a part-time worker

(coefficients multiplied by 100, based on the Probit model with time-fixed effects, population at work aged 15 and over, 2005-2017 [1])

	Personal characteristics		Personal characteristics and field of studies		Personal characteristics and branch of activity		Personal characteristics, field of studies and branch of activity	
Country of birth								
Belgium	Ref.		Ref.		Ref.		Ref.	
EU	–0.6**	(0.3)	0.5	(0.3)	0.1	(0.3)	1.6***	(0.4)
Non-EU	1.4***	(0.3)	2.1***	(0.4)	–0.8***	(0.3)	0.5	(0.4)
Branch of activity								
A. Agriculture					Ref.		Ref.	
B. Mining					1.7	(1.8)	3.4	(2.5)
C. Manufacturing					2.1***	(0.5)	1.6**	(0.7)
D. Electricity and gas supply					0.4	(0.9)	–0.2	(1.0)
E. Water supply and waste management					1.7*	(0.9)	2.2*	(1.2)
F. Construction					–1.0*	(0.5)	–0.3	(0.7)
G. Wholesale and retail trade					9.9***	(0.5)	9.5***	(0.7)
H. Transportation					5.4***	(0.6)	4.8***	(0.7)
I. Accommodation and food service activitie					18.5***	(0.7)	20.2***	(0.9)
J. Information and communication					6.8***	(0.7)	4.9***	(0.8)
K. Financial and insurance activities					10.0***	(0.6)	7.3***	(0.8)
L. Real estate activities					9.4***	(1.1)	6.7***	(1.3)
M. Professional, scientific and technical activities					6.5***	(0.6)	4.9***	(0.7)
N. Administrative and support service activities					19.9***	(0.6)	15.5***	(0.8)
O. Public administration					6.9***	(0.5)	5.7***	(0.7)
P. Education					14.1***	(0.5)	13.3***	(0.7)
Q. Human health and social work activities					23.2***	(0.5)	20.4***	(0.7)
R. Arts, entertainment and recreation					19.1***	(0.8)	18.2***	(1.1)
S. Other service activities					10.6***	(0.7)	9.4***	(0.9)
T. Activities of households as employers of domestic personnel					40.8***	(1.4)	37.9***	(1.9)
Sample size	541 239		341 110		400 213		248 500	

Sources: LFS (microdata), NBB estimate.

Note: (standard errors), * significant at 90 %, ** significant at 95 %, *** significant at 99 %.

1 Regressions including data relating to branch of activity only cover the period 2008-2017.

Annex 4

Marginal effects for the provinces and more detailed age-groups

(coefficients multiplied by 100, based on the Probit model with time-fixed effects, population at work aged 15 and over, 2005-2017; controlling for gender, level of education, marital status, number of children and country of birth)

	Self-employed		Temporary contracts		Part-time work	
Province						
Brussels	Ref.		Ref.		Ref.	
Antwerp	–2.6***	(0.2)	–3.1***	(0.2)	3.4***	(0.3)
Limbourg	–2.6***	(0.2)	–0.4**	(0.2)	5.4***	(0.3)
East Flanders	–1.4***	(0.2)	–2.6***	(0.2)	1.2***	(0.3)
Flemish Brabant	–2.6***	(0.2)	–2.9***	(0.2)	1.9***	(0.3)
West Flanders	0.9***	(0.2)	–2.3***	(0.2)	0.9***	(0.3)
Walloon Brabant	0.9***	(0.3)	–1.3***	(0.2)	0.5	(0.3)
Hainaut	–4.0***	(0.2)	–0.0	(0.2)	–0.9***	(0.3)
Liege	–2.7***	(0.2)	1.3***	(0.2)	3.4***	(0.3)
Luxembourg	–2.2***	(0.3)	–0.3	(0.2)	4.0***	(0.3)
Namur	–2.3***	(0.3)	0.1	(0.2)	2.4***	(0.3)
Age breakdown						
15-19	Ref.		Ref.		Ref.	
20-24	3.6***	(0.3)	–33.6***	(0.8)	–28.1***	(0.9)
25-29	6.3***	(0.3)	–47.4***	(0.8)	–34.5***	(0.9)
30-34	8.3***	(0.3)	–52.9***	(0.8)	–33.3***	(0.9)
35-39	10.3***	(0.3)	–54.8***	(0.8)	–32.0***	(0.9)
40-44	11.5***	(0.3)	–55.7***	(0.8)	–30.7***	(0.9)
45-49	11.9***	(0.3)	–56.4***	(0.8)	–29.0***	(0.9)
50-54	11.6***	(0.3)	–56.9***	(0.8)	–23.2***	(0.9)
55-59	13.9***	(0.4)	–57.3***	(0.8)	–17.1***	(0.9)
60-64	27.4***	(0.5)	–56.3***	(0.8)	–16.4***	(1.0)
65-69	62.5***	(1.1)	–38.1***	(1.8)	19.6***	(1.4)
70-74	66.2***	(1.6)	–34.7***	(3.0)	26.4***	(1.7)
75-79	65.5***	(3.2)	–44.2***	(4.4)	27.5***	(3.1)

Sources: LFS (microdata), NBB estimate.
Note: (standard errors), * significant at 90 %, ** significant at 95 %, *** significant at 99 %.

Annex 5

Predicted probabilities for each dependent variable

(in %, based on the Probit model with time-fixed effects, 95 % confidence interval)

	Self-employed			Temporary contracts			Part-time work		
Gender									
Male	16.5	**16.6**	16.8	5.2	**5.3**	5.4	7.9	**8.1**	8.2
Female	8.6	**8.7**	8.8	8.2	**8.3**	8.5	42.4	**42.6**	42.8
Region									
Brussels	14.2	**14.5**	14.8	7.7	**7.9**	8.2	17.2	**17.6**	17.9
Flanders	12.6	**12.7**	12.9	5.6	**5.7**	5,8	20.1	**20.3**	20.5
Wallonia	11.7	**11.9**	12.0	8.1	**8.2**	8.4	19.2	**19.4**	19.6
Province									
Brussels	14.0	**14.3**	14.6	7.6	**7.9**	8.1	17.0	**17.4**	17.8
Antwerp	11.5	**11.7**	12.0	4.6	**4.8**	5.0	20.5	**20.8**	21.2
Limbourg	11.4	**11.7**	12.0	7.2	**7.5**	7.7	22.4	**22.8**	23.2
East Flanders	12.6	**12.9**	13.2	5.1	**5.3**	5.5	18.2	**18.6**	18.9
Flemish Brabant	11.5	**11.8**	12.0	4.7	**4.9**	5.1	18.9	**19.3**	19.6
West Flanders	14.9	**15.2**	15.5	5.4	**5.6**	5.8	18.0	**18.3**	18.7
Walloon Brabant	14.8	**15.2**	15.7	6.2	**6.6**	6.9	17.4	**17.9**	18.4
Hainaut	10.1	**10.4**	10.7	7.5	**7.8**	8.1	16.1	**16.5**	16.9
Liege	11.4	**11.7**	12.0	8.9	**9.2**	9.5	20.4	**20.8**	21.3
Luxembourg	11.8	**12.1**	12.5	7.3	**7.6**	7.9	20.9	**21.4**	21.8
Namur	11.6	**12.0**	12.4	7.6	**8.0**	8.4	19.3	**19.8**	20.3
Age breakdown									
15-19	1.7	**2.2**	2.8	58.6	**60.2**	61.8	46.0	**47.8**	49.5
20-24	5.5	**5.8**	6.1	26.0	**26.6**	27.2	19.1	**19.6**	20.2
25-29	8.3	**8.6**	8.8	12.5	**12.8**	13.1	12.9	**13.2**	13.6
30-34	10.3	**10.6**	10.8	7.0	**7.3**	7.5	14.2	**14.5**	14.8
35-39	12.3	**12.6**	12.8	5.2	**5.4**	5.6	15.5	**15.8**	16.1
40-44	13.5	**13.7**	14.0	4.4	**4.5**	4.7	16.8	**17.1**	17.4
45-49	13.8	**14.1**	14.4	3.7	**3.8**	4.0	18.5	**18.8**	19.1
50-54	13.6	**13.9**	14.2	3.1	**3.2**	3.4	24.2	**24.6**	25.0
55-59	15.8	**16.2**	16.5	2.7	**2.9**	3.1	30.1	**30.7**	31.2
60-64	28.8	**29.6**	30.4	3.5	**3.9**	4.3	30.5	**31.4**	32.3
65-69	62.7	**64.7**	66.7	19.0	**22.1**	25.1	65.3	**67.4**	69.4
70-74	65.4	**68.5**	71.5	19.9	**25.5**	31.1	71.2	**74.1**	77.1
75-79	61.6	**67.8**	73.9	7.5	**16.0**	24.5	69.5	**75.3**	81.1
Level of education									
Low	9.5	**9.7**	9.9	10.0	**10.2**	10.4	28.3	**28.6**	28.9
Medium	12.4	**12.5**	12.7	5.9	**6.0**	6.1	21.7	**21.9**	22.2
High	14.2	**14.3**	14.5	5.6	**5.7**	5.8	14.2	**14.3**	14.5
Marital Status									
Separated, divorced, widowed	12.4	**12.7**	13.0	6.4	**6.6**	6.9	18.1	**18.4**	18.8
Single	10.2	**10.4**	10.5	9.4	**9.6**	9.7	16.6	**16.8**	17.0
Married	14.1	**14.3**	14.4	4.8	**4.9**	5.0	22.0	**22.2**	22.4
Number of children									
No children	12.4	**12.5**	12.7	6.3	**6.4**	6.5	18.8	**18.9**	19.1
By additional child	+0.0	**+0.1**	+0.2	+0.2	**+0.3**	+0.4	+1.4	**+1.5**	+1.6

Sources: LFS (microdata), NBB estimate.

Annex 5 (continued)

Predicted probabilities for each dependent variable

(in %, based on the Probit model with time-fixed effects, 95 % confidence interval)

	Self-employed			Temporary contracts			Part-time work		
Country of birth									
Belgium	12.5	**12.6**	12.7	5.8	**5.9**	6.0	19.6	**19.7**	19.8
EU	14.4	**14.8**	15.2	9.2	**9.6**	10.0	18.6	**19.1**	19.5
Non-EU	10.3	**10.7**	11.1	14.6	**15.1**	15.6	20.6	**21.1**	21.6
Field of studies									
General programmes	11.9	**12.3**	12.7	6.0	**6.3**	6.6	16.4	**16.8**	17.3
Education	3.0	**3.2**	3.4	12.3	**12.8**	13.3	16.8	**17.3**	17.9
Arts and Humanities	11.4	**11.9**	12.4	10.3	**10.8**	11.3	22.9	**23.6**	24.3
Social sciences, business and law	11.8	**12.0**	12.3	5.7	**5.9**	6.1	16.5	**16.8**	17.1
Sciences, maths, stats	5.0	**5.4**	5.8	9.5	**10.2**	10.8	16.3	**17.1**	17.8
ICT	6.4	**6.9**	7.5	4.0	**4.5**	5.0	14.3	**15.3**	16.3
Engineering, manufacturing, construction	11.3	**11.5**	11.8	4.9	**5.1**	5.3	12.3	**12.6**	12.9
Agriculture, veterinary	30.0	**31.3**	32.5	6.9	**7.8**	8.7	12.4	**13.5**	14.5
Health, welfare	17.1	**17.5**	17.9	5.9	**6.2**	6.4	25.6	**26.1**	26.6
Services	18.2	**18.8**	19.4	6.2	**6.6**	7.0	19.8	**20.4**	21.0
Branch of activity									
A. Agriculture	67.8	**69.3**	70.8	8.0	**9.7**	11.3	9.5	**10.4**	11.3
B. Mining	1.0	**2.1**	3.3	3.0	**5.2**	7.3	8.6	**12.1**	15.5
C. Manufacturing	4.2	**4.4**	4.6	5.0	**5.2**	5.4	12.2	**12.6**	12.9
D. Electricity and gas supply	0.8	**1.2**	1.5	2.3	**3.1**	3.9	9.2	**10.8**	12.3
E. Water supply and waste management	1.9	**2.5**	3.1	3.3	**4.1**	4.9	10.7	**12.1**	13.5
F. Construction	24.1	**24.7**	25.3	2.4	**2.7**	2.9	9.0	**9.4**	9.9
G. Wholesale and retail trade	18.9	**19.2**	19.6	5.0	**5.2**	5.4	19.9	**20.3**	20.7
H. Transportation	4.0	**4.3**	4.6	3.7	**4.0**	4.3	15.3	**15.9**	16.4
I. Accommodation and food service activities	34.8	**35.7**	36.7	6.8	**7.3**	7.9	27.9	**28.9**	29.8
J. Information and communication	11.3	**11.9**	12.5	3.9	**4.3**	4.8	16.3	**17.2**	18.1
K. Financial and insurance activities	6.7	**7.1**	7.6	1.7	**2.0**	2.2	19.6	**20.4**	21.1
L. Real estate activities	26.6	**28.6**	30.6	3.7	**4.8**	5.9	17.9	**19.8**	21.7
M. Professional, scientific and technical activities	32.4	**33.2**	34.0	5.4	**5.9**	6.4	16.3	**16.9**	17.6
N. Administrative and support service activities	9.5	**10.0**	10.4	7.5	**8.0**	8.4	29.6	**30.3**	31.1
O. Public Administration	0.2	**0.3**	0.3	4.7	**5.0**	5.2	16.9	**17.3**	17.7
P. Education	0.7	**0.8**	0.9	16.9	**17.4**	17.9	23.9	**24.5**	25.0
Q. Human health and social work activities	11.6	**11.9**	12.2	5.2	**5.4**	5.7	33.1	**33.6**	34.0
R. Arts, entertainment and recreation	16.6	**17.7**	18.8	13.1	**14.2**	15.3	28.1	**29.5**	30.9
S. Other service activities	35.2	**36.5**	37.7	4.9	**5.5**	6.1	20.1	**21.1**	22.0
T. Activities of households as employers of domestic personnel	3.4	**4.6**	5.8	14.7	**16.6**	18.5	48.6	**51.2**	53.8

Sources: LFS (microdata), NBB estimate.

Bibliography

CSE (2015), *Rapport 2015 – La modulation du temps de travail, une réponse aux souhaits des entreprises et des Travailleurs.*

EC (2017), *Access to social protection for people working on non-standard contracts and as self-employed in Europe – A study of national policies.*

EC (2017), *Access to social protection of people working as self-employed or on non-standard contracts – Belgium? ESPN Thematic Report.*

Euractiv (2018), *Le travail indépendant en pleine mutation en Europe*, (https://www.euractiv.fr).

Eurofound (2017), *Exploring Self-Employment in the European Union*, Publications Office of the European Union.

Eurofound (2017), *The many faces of self-employment in Europe*, Blog, (https://www.eurofound.europa.eu/publications/blog/the-many-faces-of-self-employment-in-europe)

Federgon (2018), www.interimaire2018.be.

France Stratégie (2016), *Nouvelles formes du travail et de la protection des actifs – Enjeux,* mars.

ILO (2016), *Non-standard employment around the world – Understanding challenges, shaping prospects*, International Labour Office.

ILO (2017), *Dependent self-employment: Trends, challenges and policy responses in the EU*, Employment Working Paper 228.

ILO (2018), *Informality and non-standard forms of employment*, Prepared for the G20 Employment Working Group Meeting.

ILO/OECD (2018), *Promoting adequate social protection and social security coverage for all workers, including those in non-standard forms of employment*, Paper presented at the 1st Meeting of the G20 Employment Working Group.

ILO (2018), *Statistical definition and measurement of dependent "self-employed" workers – Rationale for the proposal for a statistical category of dependent contractors*, 20th International Conference of Labour Statisticians.

ILO (2019), *Digital labour platforms and the futur of work: Toward decent work in the online world*, Executive summary.

ILO (2019), *Non-standard forms of employment*, (https://www.ilo.org/global/topics/non-standard-employment/lang--en/index.htm).

OECD (2019), *Chapter 2: The future of work: What do we know?*, Working Party on Employment.

Pesole, A. et al (2018), *Platform Workers in Europe*, Publications Office of the European Union.

SPF Sécurité sociale (2019), *La lutte contre la pauvreté en Belgique en 6 questions* (https://socialsecurity.belgium.be/fr/octroi-des-droits-sociaux/la-lutte-contre-la-pauvrete-en-belgique-en-6-questions).

Statbel (2018), *Les indépendants plus satisfaits de leur travail que les salariés*, Nouvelles, (https://statbel.fgov.be).

Abstracts from the Working Papers series

360. A macro-financial analysis of the corporate bond market, by H. Dewachter, L. Iania, L. Wolfgang, M. Lyrio, December 2018

The authors assess the contribution of economic and financial factors in the determination of euro area corporate bond spreads over the period 2001-2015. The proposed multi-market, no-arbitrage affine term structure model is based on the methodology proposed by Dewachter, Iania, Lyrio, and Perea (2015). They model jointly the 'risk-free curve', measured by overnight index swap (OIS) rates, and the corporate yield curves for two rating classes (A and BBB). The model includes four spanned and six unspanned factors. They find that, in general, both economic (real activity and inflation) and financial factors (proxying risk aversion, flight to liquidity and general financial market stress) play a significant role in the determination of the spanned factors and hence in the dynamics of the risk-free yield curve and corporate bond spreads. Across the risk-free OIS curve, macroeconomic and financial factors are each responsible on average for explaining 30 and 65 percent of yield variation, respectively. For A- and BBB-rated corporate debt, the selected financial variables explain on average 50 percent of the variation in corporate spreads over the last decade.

361. Some borrowers are more equal than others: Bank funding shocks and credit reallocation, by O. De Jonghe, H. Dewachter, K. Mulier, S. Ongena, G. Schepens, December 2018

The paper provides evidence on the strategic lending decisions made by banks facing a negative funding shock. Using bank-firm-level credit data, the authors show that banks reallocate credit within their loan portfolio in at least three different ways. First, they reallocate to sectors where they have a high market share. Second, they also reallocate to sectors in which they are more specialised. Third, they reallocate credit towards low-risk firms. These reallocation effects are economically large. A bigger standard deviation in sector market share, sector specialisation or firm soundness reduces the transmission of the funding shock to credit supply by 22, 8 and 10 %, respectively.

362. The origins of firm heterogeneity: A production network approach, by A. B. Bernard, E. Dhyne, G. Magerman, K. Manova, A. Moxnes, January 2019

The paper quantifies the origins of firm size heterogeneity when firms are interconnected in a production network. Using the universe of buyer-supplier relationships in Belgium, the paper develops a set of stylised facts that motivate a model in which firms buy inputs from upstream suppliers and sell to downstream buyers and final demand. Larger firm size can come from high production capability, more or better buyers and suppliers, and/or better matches between buyers and suppliers. Downstream factors explain the vast majority of firm size heterogeneity. Firms with higher production capability have greater market shares among their customers, but also higher input costs and fewer customers. As a result, high production capability firms have lower sales unconditionally and higher sales conditional on their input prices. Counterfactual analysis suggests that the production network accounts for more than half of firm size dispersion. Taken together, our results suggest that multiple firm attributes underpin their success or failure, and that models with only one source of firm heterogeneity fail to capture the majority of firm size dispersion.

363. *Imperfect competition in firm-to-firm trade, by K. A. Kikkawa, G. Magerman, E. Dhyne, January 2019*

The paper studies the implications of imperfect competition in firm-to-firm trade. Using a dataset on all transactions between Belgian firms, the authors find that firms charge higher markups if they have higher input shares among their buyers. They interpret this as firms competing as oligopolies to supply inputs to each buyer and build a model in which they charge different markups to different buyers. They use the estimated model to quantify how distortionary firm-to-firm markups are. Reducing all markups in firm-to-firm trade by 20 percent increases welfare by around 7 percent, suggesting large distortions due to double marginalisation. The authors then investigate how endogenous markups in firm-to-firm trade alter predictions of the transmission of shocks. In the counterfactual where they take a fall in import prices as the shock, they show that allowing for oligopolistic competition generates larger cost reductions for some firms and attenuates these for others relative to a case with constant markups. They demonstrate that a measure capturing firms' positions in the production chain is a key metric in explaining this heterogeneity.

364. *Forward guidance with preferences over safe assets, by A. Rannenberg, January 2019*

The author develops a New Keynesian model with preferences over safe assets (POSA) calibrated using evidence on the wedge between household discount rates and market interest rates. POSA attenuate intertemporal consumption smoothing and thus the household's responsiveness to future interest rates, the more so the more distant in time they are, and imply a consumption wealth effect. Therefore, POSA substantially lower the macroeconomic effect of forward guidance policies. By contrast, POSA does not substantially change the effect of the standard shocks of Smets/Wouters- type DSGE models. The results carry over to a model with Iacoviello-type collateral constraints. Such constraints in themselves tend to strongly amplify the effect of forward guidance.

365. *The distinct effects of information technologies and communication technologies on the age-skill composition of labour demand, by S. Blanas, January 2019*

This paper is the first to study the distinct effects of information technologies (IT) and communication technologies (CT) on the skill, age, and age-skill composition of labour demand. The analysis is conducted on a sample comprising 10 developed countries, 30 industries covering the largest part of the economy, and the period 1982-2005. I find that IT intensity increases the relative demands for the high-skilled, low-skilled and oldest workers, while it decreases the relative demands for the medium-skilled and younger workers. Also, IT intensity increases the relative demands for the high-skilled and low-skilled from all age profiles, while it decreases the relative demands for the medium-skilled from all age profiles. CT intensity exerts opposite effects. Consistent with knowledge-based hierarchy theories highlighting the organisational aspect of the adoption of IT and CT by firms, the empowerment of agents at lower and higher levels of the hierarchy induced by IT and CT, respectively, rationalise these findings. I also find that the aforementioned effects operate mostly as of 1990, when the IT and CT advancement rates were even higher than in the 1980s. Although a clear pattern of disproportionate effects across sectors is not identified, such a pattern across countries does exist: the inequalities generated by the two types of technologies are mitigated by higher union density.

366. *A survey of the long-term impact of Brexit on the UK and the EU27 economies, by P. Bisciari, January 2019*

The paper reviews a sample of studies on the long-term impact of Brexit on GDP and welfare for both the UK and EU economies. It considers only official and academic studies published before the end of November 2018. The paper highlights the very wide range of findings, especially for the UK, reflecting great uncertainty. The negative economic impact is more limited for the EU27 and for most Member States. Small open economies closely related to the UK are hit harder than others. This is the case for Ireland due to geographical proximity, for Luxembourg with its economy specialising in financial services, and for Cyprus and Malta as they are Commonwealth countries. When the Brexit trade channel is estimated on its own, GDP (or welfare) losses

come to around 1 percentage point of GDP in the Netherlands and in Belgium, while they average 0.6 percentage point of GDP in the EU27. For the same Brexit scenario, the results depend on the model specifications, on the channels considered and on some key assumptions. For the UK, higher GDP/welfare losses are found for reduced-form approaches, when a productivity shock is added and, also for the EU, for global value chain approaches. Higher GDP/welfare losses are also associated with higher non-tariff trade barriers. Results are sensitive to some parameters such as the reaction of trade volumes to changes in tariffs and non-tariff trade barriers (trade elasticities). Reaching a Free Trade Agreement could limit the GDP/welfare losses both for the UK and the EU Member States compared to an orderly no deal (WTO scenario). If the UK remains in the Single Market or the Customs Union, the GDP/welfare losses induced by Brexit could be even more contained. This justifies the economic interest for both the UK and the EU Member States to reach an agreement on their future relationship.

367. A macroeconomic model with heterogeneous and financially-constrained intermediaries, by T. Lejeune, R. Wouters, February 2019

The paper analyses the risk amplification inherent in a macroeconomic model with a heterogeneous financial sector. It extends a model with an equity-constrained intermediary by adding a shadow banking intermediary with procyclical leverage. It is shown that the inclusion of this intermediary significantly amplifies financial frictions and adds to financial instability. Quantitative effects on asset prices are magnified, and the amplification propagates to the real side of the macro economy. Reducing the size of the shadow banking sector involves a trade-off between stabilising the economy and the expected growth of economic activity. Ignoring the heterogeneity of the financial sector may lead to an underestimation of the excess risk-taking due to the anticipation of expansionary policies and of financial and macroeconomic responses to shocks.

368. The economic importance of the Belgian ports: Flemish maritime ports, Liège port complex and the port of Brussels – Report 2017, by E. Gueli, P. Ringoot, M. Van Kerckhoven, March 2019

The paper analyses the economic importance of the Belgian ports based largely on annual accounts data for the year 2017. After the stagnation in 2016, direct value added at the Belgian ports rose by 7.3 % or roughly 4.4 % of Belgium's GDP. All ports except the Liège port complex contributed to value added growth. The ports of Antwerp and Ghent were the most important players. In the case of value added growth, the biggest contributing sectors were the chemicals industry and, to a lesser extent, cargo handling and the metalworking industry.

After falling between 2012 and 2015, direct employment at Belgian ports was up for the second year in a row. The pattern of investment is closely linked to projects and is therefore highly volatile: after the decline between 2012 and 2014, direct investment at the Belgian ports was up for the third year in a row, increasing in 2017 by 2.4 %. The sectors making the biggest contribution to investment growth were the port construction and dredging sector and, to a lesser extent, cargo handling, and the energy and chemicals industries.

Based on the traffic figures, the Flemish ports can be considered as real bridgeheads for trade with the UK. Developments regarding the Brexit arrangements and their consequences should therefore be followed very closely. Given the existing import and export volumes in terms of tonnage, it seems that Brexit will mostly be a challenge for Zeebrugge and, to some extent, for Antwerp too. As a supplier of both China and the United States, Belgium is indirectly involved in trade between the two countries. If protectionism were to close the United States off to exports from abroad, the Belgian economy might be hit among the hardest in Europe.

369. Does banks' systemic importance affect their capital structure and balance sheet adjustment processes?, by Y. Bakkar, O. De Jonghe, A. Tarazi, March 2019

Frictions prevent banks from immediately adjusting their capital ratio towards their desired and/or imposed level. This paper analyses (i) whether or not these frictions are larger for regulatory capital ratios vis-à-vis a plain leverage ratio; (ii) which adjustment channels banks use to adjust their capital ratio; and (iii) how the speed of adjustment and adjustment channels differ between large, systemic and complex banks versus small

banks. Our results, obtained using a sample of listed banks across OECD countries for the 2001-2012 period, bear critical policy implications for the implementation of new (systemic-risk-based) capital requirements and their impact on banks' balance sheets, specifically lending, and hence the real economy.

370. A model for international spillovers to emerging markets, R. Houssa, J. Mohimont, Ch. Otrok

The paper develops a small open economy (SOE) dynamic stochastic general equilibrium (DSGE) model that helps to explain business cycle synchronisation between an emerging market and advanced economies. The model captures the specificities of both economies (e.g. primary commodity, manufacturing, intermediate inputs, and credit) that are most relevant for understanding the importance as well as the transmission mechanisms of a wide range of domestic and foreign (supply, demand, monetary policy, credit, primary commodity) shocks facing an emerging economy. The authors estimate the model with Bayesian methods using quarterly data from South Africa, the US and G7 countries. In contrast to the predictions of standard SOE models, they are able to replicate two stylised facts. First, our model predicts a high degree of business cycle synchronisation between South Africa and advanced economies. Second, the model is able to account for the influence of foreign shocks in South Africa. The authors are also able to demonstrate the specific roles these shocks played during key historical episodes such as the global financial crisis in 2008 and the commodity price slump in 2015. The ability of our framework to capture endogenous responses of commodity and financial sectors to structural shocks is crucial to identifying the importance of these shocks in South Africa.

371. Estimation methods for computing a branch's total value added from incomplete annual accounting data, S. Vansteelandt, F. Coppens, D. Reynders, M. Vackier, L. Van Belle

Timely monitoring of the economic performance of a particular sector is generally hindered by the fact that not all companies have filed their annual accounts by the time that an evaluation is made. In view of this, the authors develop several imputation strategies that each enable a company's value added to be predicted on the basis of available information from past and current years for those companies whose value added was not reported in time.

For each proposed strategy, they discuss the assumptions which must be fulfilled for unbiased estimation and calculate the estimation uncertainty. In particular, the proposed imputation procedures all rely on an assumption of missing at random, namely that the value added figures for companies that have not yet filed their annual accounts are similar (in some way) to those for companies with the same characteristics (e.g. the same historical data) that did file their accounts by the evaluation date. The authors show how to retrospectively assess the validity of this assumption, and how to adjust the imputation procedure if the assumption fails.

The importance of the availability of the uncertainty margins should not be underestimated because they will result in faster and higher-quality publications.

Finally, they retrospectively apply each strategy to data from the Belgian port sector and compare their performance at several evaluation dates. All the proposed methods show good results on these data. The method using (ordinary least squares) regression is preferred because it is very flexible in the use of auxiliary variables, requires weaker assumptions, has less estimation uncertainty and is easily automatable.

Conventional signs

%	percent
e	estimate
e.g.	*exempli gratia* (for example)
i.e.	*id est* (that is)
p.m.	*pro memoria*

EUR	euro
USD	US dollar

List of abbreviations

Countries or regions

BE	Belgium
DE	Germany
EE	Estonia
IE	Ireland
EL	Greece
ES	Spain
FR	France
IT	Italy
CY	Cyprus
LT	Lithuania
LU	Luxembourg
LV	Latvia
NL	Netherlands
AT	Austria
PT	Portugal
SI	Slovenia
SK	Slovakia
FI	Finland
EA	Euro area
BG	Bulgaria
CZ	Czech Republic
DK	Denmark
HR	Croatia
HU	Hungary
PL	Poland
RO	Romania
SE	Sweden
UK	United Kingdom
EU	European Union
EU15	European Union of 15 countries, before the 2004 enlargement
EU27	European Union, excluding Croatia
EU28	European Union, including Croatia
AU	Australia
CA	Canada
JP	Japan

CH	Switzerland
NO	Norway
US	United States

Other abbreviations

AUC	Area under the curve
BIS	Bank for International Settlements
CEPR	Centre for Economic Policy Research
CSLS	Centre for the Study of Living Standards
COICOP	Classification of Individual Consumption by Purpose
CSE	*Conseil supérieur de l'emploi* – High Council for Employment
DGS	Directorate General Statistics
EC	European Commission
ECB	European Central Bank
ECRI	Economic Cycle Research Institute
ELB	Effective lower bound
EME	Emerging market economy
ESA	European System of Accounts
ICT	Information and communication technology
IEWB	Index of Economic Wellbeing
ILO	International Labour Organisation
IMF	International Monetary Fund
IT	Information technology
Fed	Federal Reserve
FOMC	Federal Open Market Committee
FPB	Federal Planning Bureau
FPS	Federal Public Service
GDP	Gross domestic product
HDI	Human Development Index
HFCS	Household Finance and Consumption Survey
HICP	Harmonised index of consumer prices
ICT	Information and communication technology
IMF	International Monetary Fund
IPCC	Intergovernmental Panel on Climate Change
LFS	Labour force survey
NACE	Nomenclature of economic activities in the European Community
NAI	National Accounts Institute

NBB National Bank of Belgium
NBER National Bureau of Economic Research
NCPI National consumer price index
NEO National Employment Office
NISSE National Institute for Social Security of the Self-employed
NPI Non-profit institution
NUTS Nomenclature of territorial units for statistics – *Nomenclature des unités territoriales statistiques*

OECD Organisation for Economic Cooperation and Development
OIS Overnight indexed swap
OPEC Organisation of the Petroleum Exporting Countries

PISA Programme for International Student Assessment
PPS Purchasing power standard

SILC Statistics on Income and Living Conditions
S&P Standard and Poor's
Statbel Belgian statistical office

UNDP United Nations Development Programme
UNIZO *De Unie van Zelfstandige Ondernemers*

VAT Value added tax

WEF World Economic Forum
WHO World Health Organisation
WLTP Worldwide harmonised Light vehicles Test Procedures
WTO World Trade Organisation
WWII World War II

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