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Country Report Germany 2019
Including an In-Depth Review on the prevention and correction of macroeconomic imbalances

Accompanying the document

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE EUROPEAN COUNCIL, THE COUNCIL, THE EUROPEAN CENTRAL BANK AND THE EUROGROUP

2019 European Semester: Assessment of progress on structural reforms, prevention and correction of macroeconomic imbalances, and results of in-depth reviews under Regulation (EU) No 1176/2011

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EXECUTIVE SUMMARY

Sizeable investment efforts and innovation combined with structural reforms, would make the German economy more resilient to unfavourable external and domestic developments and ensure a sustainable and inclusive growth model. The German economy is facing challenges in a number of sectors, which have traditionally performed well internationally. Stronger investment and innovation efforts are needed to boost productivity and help diversify Germany's growth model, keeping up with technological change and demand shift and dynamics. Boosting both private and public investment would be a way to address challenges related to sustainable transport, decentralised renewable energy production, digitalisation and demographic change. Higher investment in and expenditure on education and skills, very high-capacity broadband and research and development are key to raising long-term growth potential. Structural reforms promoting better use of the labour market potential of groups that have so far been inactive or under-represented could help address the already noticeable shortages of skilled labour and support income, especially for low-income earners. **([1])**

The German economy continues to grow, driven by domestic demand in an increasingly challenging external environment. After a 2.2 % rise in 2017, GDP grew by only 1.5 % in 2018. The contribution of net exports turned negative, as solid domestic demand pushed up the import-to-GDP ratio and export growth was weaker than in previous years. The current account surplus declined from 8.5 % in 2016 to 8.0 % in 2017 and 7.4 % in 2018. Underpinned by the continued economic expansion, unemployment fell to a record low of 3.2 % by the end of 2018, despite the increase in the labour force. Despite very low unemployment and high job vacancy rates, real wage growth has edged up only moderately, to around 1 %. Core inflation was at 1.5 % in 2018 and is expected to edge up to 1.6 % by 2020, in the context of moderate domestic demand.

The government budget surplus increased during the reporting period, and public debt continues to fall, providing ample space to boost public investment. In 2017, the government surplus reached 1.0 % of GDP, rising further to a record high of 1.7 % of GDP in 2018.([2]) The budget is expected to remain in surplus in 2019 as well, but at a lower level. The gross debt-to-GDP ratio is expected to decrease from 63.9 % in 2017 to 60.1 % in 2018 and to fall further below the Treaty reference value over the next couple of years.

Given its economic importance and strong integration in EU value chains, structural reforms in Germany could both raise its potential for growth and trigger positive spillovers in other EU countries. Structural reforms in Germany, such as lowering the heavy tax burden on labour, would increase its GDP and, to some extent, that of other EU countries as well, as higher demand for foreign products in Germany is expected to outweigh the increase in competitiveness. Germany also plays an important role in further developing the Single Market. However, some obstacles remain, such as the lack of competition in business services and the underinvestment in network industries.

Focusing private and public investment on network industries and services such as digital, energy and transport infrastructure, as well as on education and innovation, could improve Germany's growth potential. Despite some acceleration in public investment, the country's investment ratio in 2017 was still below the average of the rest of the euro area. It is lagging behind in deploying very high-capacity broadband, which could improve productivity growth and boost convergence in regional living conditions if more were invested. Stronger public and private investment in sustainable transport and electricity infrastructure is crucial to meet climate, energy and environmental targets. Higher investment in

([1]) This report assesses Germany's economy in light of the European Commission's Annual Growth Survey published on 21 November 2018. In the survey, the Commission calls on EU Member States to implement reforms to make the European economy more productive, resilient and inclusive. In so doing, Member States should focus their efforts on the three elements of the virtuous triangle of economic policy — delivering high-quality investment, focusing reforms efforts on productivity growth, inclusiveness and institutional quality and ensuring macroeconomic stability and sound public finance. At the same time, the Commission published the Alert Mechanism Report (AMR) that initiated the eighth round of the macroeconomic imbalance procedure. The AMR found that Germany warranted an in-depth review, which is presented in this report.

[2] Based on preliminary national data.

research and innovation, especially among small and medium-sized enterprises, could increase total factor productivity. Higher expenditure on education and skills could help to tackle short-term labour shortages and demographic ageing, while ensuring growth that is inclusive.. Annex D identifies key priorities for EU cohesion policy funding over 2021-2027 in Germany, building on the analysis of investment needs and challenges outlined in this report.

Overall, Germany has made limited ([3]) progress in addressing the 2018 country-specific recommendations.

There has been some progress in the following areas:

- Public and private investment, including R&D expenditure has increased, partly as a result of the increase in resources allocated to infrastructure programmes.
- Disincentives to work more hours are being reduced as changes in social security contributions and certain benefits are increasing net wages.
- Wage increases reflect improved conditions, but the increase remained limited in real terms.

There has been limited progress in the following areas:

- The availability of very high-capacity broadband infrastructure nationwide has improved only slowly, despite promising announcements.
- Only a few measures have been taken to make the tax system more efficient and investment-friendly.
- Only a few, skills related measures have been taken, e.g., to promote longer working lives.

([3]) Information on the level of progress and measures taken in response to the policy advice in each subpart of a country-specific recommendation is presented in the overview table in the Annex.

Regarding progress in reaching the national targets under the Europe 2020 strategy, Germany is performing well on:

- the employment rate
- reducing early school leaving and poverty
- investment in research and development (R&D)
- increasing the share of renewable energy.

However, it is unlikely to reach its national indicative energy efficiency and climate targets by 2020.

Germany performs well on the indicators of the Social Scoreboard supporting the European Pillar of Social Rights. It has low unemployment, including youth unemployment. However, it scores only averagely on the Social Scoreboard as regards the gender employment gap. The social dialogue functions well, and the social partners are overall closely involved in policy-making.

The main findings of the in-depth review contained in this report and the related policy challenges are as follows:

- **The current account surplus has declined for the last three years, but is expected to remain high, contributing 2.3 pps. to the euro area surplus of 3.3 % of euro area GDP.** Strong domestic demand is expected to keep import growth above export growth, further easing the current account surplus. The domestic saving-investment imbalance, which has been growing since 2008, reached a turning point in 2016. Since then, private sector net lending has been coming down, but partially offset by the public surplus which has continued to rise. Despite the efforts made, the factors which keep investment low relative to savings remain largely in place.
- **Private investment has increased noticeably, but not across all asset types.** Equipment investment has grown robustly in response to record-high capacity utilisation. Housing investment continues to boom, even if the construction sector reports capacity constraints

and price increases. However, significant challenges loom. The manufacturing sector faces a slowdown in foreign demand dynamics, in tandem with a need to adapt to new consumer preferences and technological change (e.g. low-emission cars). Non-residential construction has been increasing sluggishly in real terms, suggesting that essential infrastructure may not have kept up with the economy's needs.

- **Real public investment is increasing after a period of reduction, but more efforts are still needed to clear the large investment gap, particularly as regards investment in infrastructure and education.** Public investment in 2018 grew by 7.7 % nominally and 3.8 % in real terms. Real public investment growth has been positive for the last three years, after showing negative growth rates before that. This reflects government efforts to boost investment. However, as in the years before, net investment at municipal level remained negative in 2018 and the investment backlog accumulated by 2018 rose to 5 % of GDP. The biggest shortfalls are in education and infrastructure. Investment in public infrastructure is still held back by capacity and planning constraints at municipal level. Measures initiated to overcome these have yet to show tangible results. Moreover, there is scope to improve digital public services and public procurement.

- **Labour productivity growth in Germany has slowed and turned negative in the second half of 2018..** Given the reduction in labour force potential caused by demographic change, productivity growth will increasingly depend on investment in productive capital and innovation, including in digitalisation. Firm-level data show that the gap between the most and the least productive companies has widened, suggesting that there are obstacles to the spread of technology.

- **Germany's electricity networks are still slow to adapt to higher shares of renewables, and there has not been enough investment in transmission and distribution grids.** The lack of appropriate grid infrastructure is causing financial losses to Germany and other EU countries in terms of congestion management. Efforts are being made to improve internal networks, but the need for investment in additional transmission capacity is likely to grow even further. The inadequate transmission capacity of Germany's north-south electricity lines strains the grid capacity of neighbouring countries.

- **More investment in sustainable transport is needed to tackle air quality challenges, support climate change mitigation and adaptation and improve productivity.** Low emissions cuts mean Germany is likely to miss its Effort Sharing Decision target. The transport sector has done particularly badly at cutting emissions of both greenhouse gases and local air pollutants.

- **Germany's tax system is not particularly efficient and favourable to growth and investment.** More distortive direct taxes, notably on labour income, as a share of GDP are higher than the EU average, while revenues from consumption and environmental taxes are lower. Employment incentives are dampened by the heavy tax burden on labour including that on low-income and second earners, also impacting household income and consumption. The statutory corporate tax rate and effective average tax rates are high. The tax system remains complex and compliance costs are relatively high. The effective tax rate on inheritance and gifts is low, at about 2 %, thereby maintaining Germany's high wealth inequality.

- **Even though labour shortages are increasing, there has been little real wage growth and some labour market potential remains underused.** The German labour market is performing well, with strong employment growth and record-low unemployment. With a high job vacancy rate, skilled labour shortages are increasingly limiting economic development. At the same time, real wage growth has been modest. Weaker coverage of collective agreements may have contained wage growth. Despite growing skilled labour shortages, the labour market potential of under-represented groups such as women and people with a migrant background,

including refugees, remains under-used. Although some measures have been taken to reduce the heavy tax burden on low-income earners, disincentives to work persist for this group.

Other key structural issues analysed in this report, which point to particular challenges for Germany's economy, are the following:

- **Risks to the financial sector seem to be contained** but cost structures need to be tackled**.** Although the banking sector has relatively good capital and liquidity levels, it needs to tackle its cost structure. A fragmented market structure weighs on profits, but capitalisation ratios are satisfactory, and the ratio of non-performing loans is half the euro area average. House price increases are not yet causing macro or financial stability risks. Squeezed revenues from the low interest rate environment, costs incurred through digitalisation, regulatory requirements and the emergence of new competitors are intensifying the challenges faced by banks.

- **Germany's social protection system works well overall, but there are some concerns about the future, also because of demographic change.** The number of people at risk of poverty or social exclusion is falling, but the children of low-skilled people continue to fare much worse than average, pointing to challenges in equality of opportunity and a long term persistence of disadvantage across generations. Recent government measures are associated with commitments to guarantee adequate social protection. However, ensuring this in the long run may require structural measures. Demographic change will strain public finances and challenge both the sustainability and the adequacy of pensions. In addition to adequacy and sustainability, the fairness and the regressive nature of the pension system need to be considered. Healthcare efficiency could be improved, especially in hospital and pharmaceutical care, by providing the same price signal across different patient groups to suppliers for the same treatment, and by making better use of eHealth.

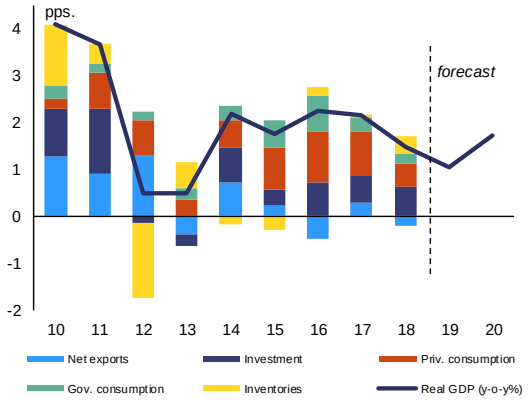
- **The education system is slow to respond to rapid changes in the labour market and society**. While Germany has addressed relatively well some recent challenges, such as integrating refugees into the education system, others, such as digital skills, school infrastructure and teacher shortages, are mounting. In view of technological transformation and increasing shortages of skilled labour, this is of concern.

1. ECONOMIC SITUATION AND OUTLOOK

GDP growth

The German economy is expected to maintain solid growth for the foreseeable future, driven by domestic demand in an increasingly challenging external environment. Germany's GDP growth came out at 1.5 % in 2018 preceded by 2.2 % in the two preceding years. The slowdown was driven by weaker export growth amid rising protectionism. Private consumption declined in the second half of the year despite solid employment and income growth. Investment in both equipment and construction stayed robust, however economic sentiment, especially in manufacturing, has cooled down and latest survey data suggest a downward revision of orders and the export outlook. High capacity utilisation and order books may help the economy rebound and sustain growth in the short run. However, the external environment is becoming less favourable. The strong labour market and ample fiscal space are expected to support the domestic demand this year and next. Overall, real GDP growth is expected to cool down to 1.1 % in 2019 and rebound mildly to 1.7 % in 2020, helped not least by a higher number of working days, according to the 2019 winter interim forecast.

Graph 1.1: **Demand components of GDP growth**



(1) Note: GDP growth and contributions to annual growth
Source: European Commission

Steady growth in domestic demand is expected to help reduce the high external surplus. The export outlook has worsened over the past year. At the same time, the solid domestic demand could keep import growth high and result in a further easing of the current account surplus.

Investment

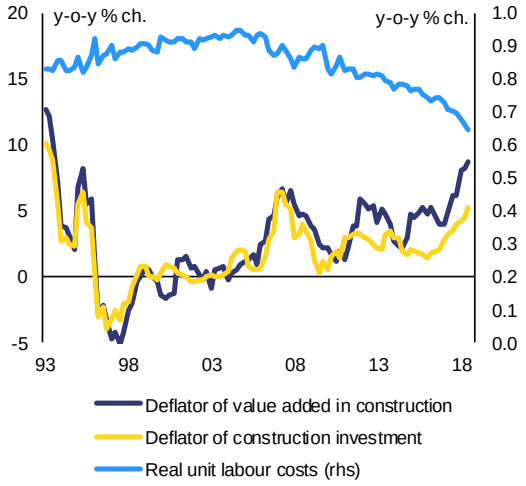
Public investment effort is increasing against a backdrop of a significant investment backlog. Overall public investment rose by around 6 % in 2015 and 2016 and by close to 8 % in 2017 and 2018 in nominal terms. In real terms, the increase for the last four years was around 4.5 % on average. In 2017 and 2018, overall government net investment has turned positive for the first time since 2012. Since 2018, public investment growth has been driven by the municipal sector, where however investment remains much lower than depreciation.

Private investment is expected to expand as a result of high capacity utilisation and replacement needs, but uncertainty has increased considerably. Above-average capacity utilisation and changing consumer preferences should spur the effort to renew and expand the capital stock, though economic sentiment in the manufacturing sector has cooled markedly during 2018. Housing investment posted strong growth in 2018 and is expected to continue increasing, although at a slower rate, given ample order book backlogs and a still-high level of new building permits.

House prices are set to rise further, owing to the inadequacy of the housing supply in large cities. This has implications for rent levels. Despite a pick-up in residential investment, the housing supply still lags behind demographic change, especially in conurbations and big cities. As a result, a housing shortage has built up over the past decade. This is probably one of the main factors pushing up house prices in large cities and the country as a whole. While house prices stagnated in the 2000s, the widening supply gap correlates with the 30 % nominal rise in house prices that took place between 2010 and 2017. ([4])

([4]) Although rents have risen considerably in some large-city markets, the national aggregate has risen far less than house prices. Combined with a weak supply response for smaller rental flats in cities, the lagged rent response may amplify rent levels on the private-rental market in future, making housing less affordable.

Graph 1.2: **Prices and costs in construction**

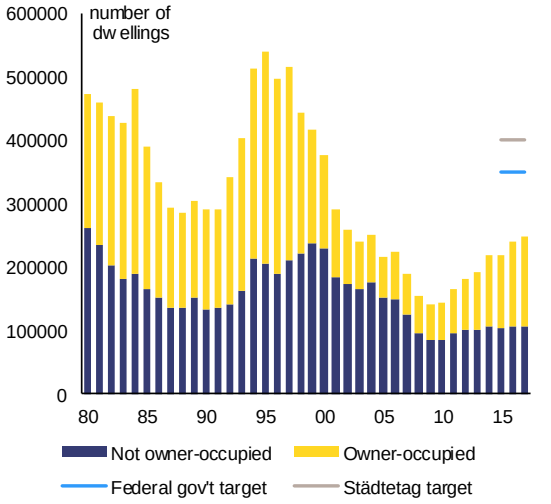


Note: quarterly seasonally and calendar adjusted data, last data point Q3 2018
Source: European Commission

The construction sector is operating at full capacity, as reflected by the rising prices of construction services and rising profit margins. Inflation in construction investment rose from 1.4 % in early 2016 to 5.2 % in the third quarter of 2018. Inflation in the value added of the construction sector has tended to be significantly stronger, suggesting that the prices of construction output rise faster than input prices. At the same time, real unit labour costs (i.e. the labour share) are actually falling, implying that building firms are maintaining some degree of wage moderation and becoming more profitable (see Graph 1.2).

The completion of new dwellings has risen strongly since the crisis, yet remains considerably below potential demand. Numbers completed rose from 158 000 in 2011 to 285 000 in 2017, although owner-occupied dwellings rather than rental flats accounted for the lion's share of the increase (See Graph 1.3). New residential investment thus expanded from 1.5 % of GDP to 2.0 % of GDP during that period. Yet the number of dwellings completed remains below the annual target of 400 000 unit completions. ([5]) Moreover, stagnating building permits suggest that annual dwelling completions will plateau at 300 000 units over the coming years (Gornig and Michelsen, 2018). The weak supply response is likely to keep pressure on house prices and rents, especially in major and southern cities. Although demographic pressures have been building up since the late 2000s, weak building activity has resulted in a housing gap put by most estimates at one million units (GdW, 2017) or significantly higher (Holm et al., 2018), with a particular focus on big cities and conurbations.

Graph 1.3: **New dwellings completed**



Source: Destatis, German Federal Government, Association of German Cities

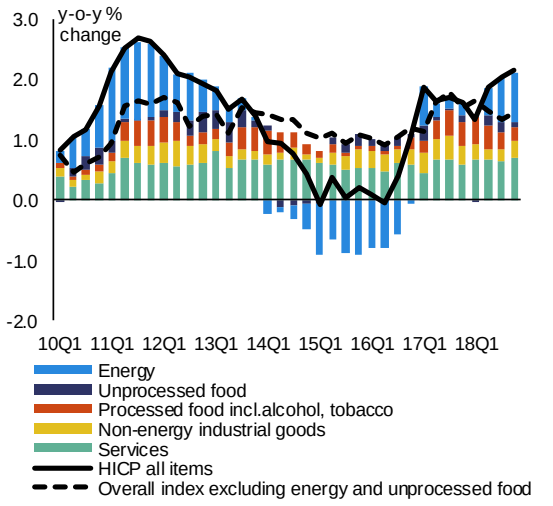
Clearing the housing supply gap would raise investment significantly. Commission estimates based on regional data suggest that just reaching a target of 350 000-400 000 annual completions would require additional construction investment of 1.0-1.5 % of GDP, compared to 2017 levels.([6]) Conversely, had 400 000 units been completed

([5]) In 2015, the Federal Institute for Research on Building, Urban Affairs and Spatial Development, BBSR, released its five-year estimate of the number of new dwellings needed per region, suggesting that nearly 300 000 units a year were needed in the late 2010s. In view of further backlogs and migration, the Federal Government referred to a target of 350 000 units in 2017. Given the backlog that had accumulated by 2018, the Association of German Cities (*Städtetag*), along with several industry and academic sources, are now calling for a target of 400,000 units annually.

([6]) This estimate is based on house prices (excluding land prices), completion statistics in square metres, and local targets at district (*Kreis*) level. The underlying targets at local level derive from BBSR (2015), and amount to about. 300 000 for Germany as a whole. For this estimate, it is assumed that the additional units needed to reach the target of 350 000 or 400 000 correspond solely to the 18 cities with the greatest needs. Note that in these cities, building costs are 20-50 % higher per habitable square metre than the national average, which affects the resulting investment need.

annually since 2011, investment would have been 2.0 % higher over 2011-2014. Input-output tables suggest that the current account surplus would then have been 0.5 pps. of GDP lower during that period. Filling the housing supply gap could thus have a significant impact on the current account surplus. The deep dip in construction investment (as a share of GDP) from the late 1990s to 2015 was the most significant change in German investment during the emergence of the current account surplus.

Graph 1.4: **Contributions to headline inflation**



Source: European Commission

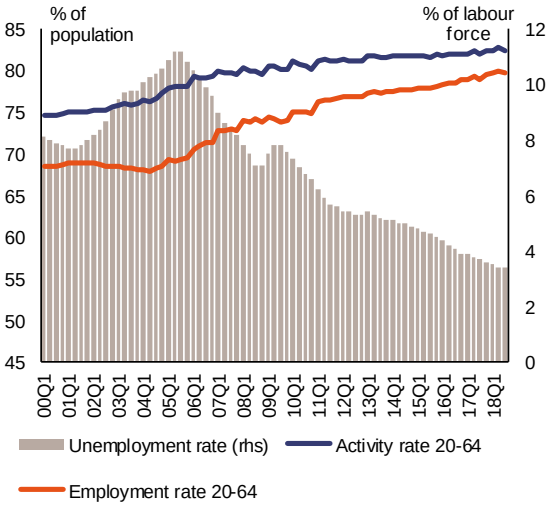
Inflation

HICP inflation increased to 1.9% in 2018 driven by energy prices, while core inflation remained unchanged at 1.5%. Inflation is expected to average 1.5% in 2019-2020, as energy inflation moderates further. Wage growth has been strengthening but would likely moderate again if the outlook remains subdued, which should keep core inflation from rising much further.

Labour market

Labour market performance improved further, with record low unemployment and high employment rates. On the back of strong labour demand resulting from continued economic growth, the employment rate reached 79.7 % (age 20-64) in the third quarter of 2018, one of the highest in the EU. This helped push unemployment down to a record low of 3.2 % in 2018. In 2018, GDP growth cooled off somewhat. Nevertheless employment growth (1.3 %) slowed down only marginally compared to 2017 (1.4 %) and the labour market has been showing increasing signs of labour shortages.

Graph 1.5: **Improving labour market**



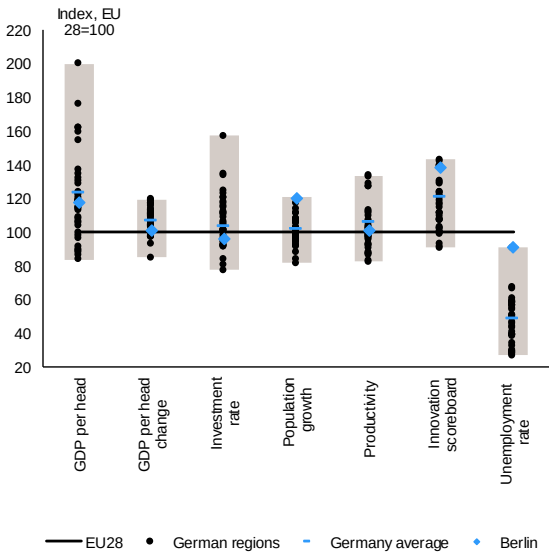
(1) Activity and employment rates (% of population), total, ages 20-64, seasonally adjusted
(2) Unemployment rate (% of labour force), seasonally adjusted
Source: European Commission

Despite record low unemployment and a high job vacancy rate, real wage growth has edged up only slightly. After nominal compensation growth hovered at around 2.5 % between 2014 and 2017, the relative scarcity of labour had some impact on wage settlements and contributed to a nominal compensation growth of 3 % in 2018. (See section 4.3). Given somewhat stronger inflation, this implies that real wage growth remains in the ballpark of somewhat above 1 %.

Social developments

The relative inclusiveness of growth continues to pose challenges. Households' real gross disposable income grew by 1.7 % in the year to 2017. However, this was below GDP growth (2.2 %), confirming a persistent pattern (see Table 1.2) and raising questions about the inclusiveness of growth. In 2017, the richest 20 % of society had an income 4.5 times higher than the poorest 20 %. The disparity was slightly less than in the previous year (4.6 in 2016). This was consistent with the change at EU level, from 5.2 to 5.1.

Graph 1.6: **Economic performance by regions, compared to the EU average**



Source: Eurostat

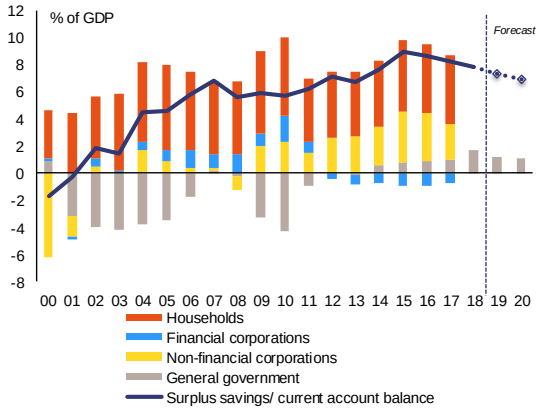
Regional disparities

Disparities in GDP per head between German regions have narrowed over time, but the eastern part of Germany remains weaker in many respects. Convergence was driven mainly by the catching up process of the eastern *Länder*. As a result, disparities between the eastern and the western *Länder*, which have been the focus of development policy since unification in 1990, are narrowing. However, in 2016 GDP per head in the east, in purchasing power standards, was still only 73 % of the figure for the west. Moreover, the east is facing challenges for future growth, including the lack of private sector research, ageing population and a shrinking labour force.

Disparities in unemployment between east and west have narrowed, yet persist. When the registered unemployment rate peaked in 2006, it was 18.7 % in the eastern *Länder* and 9.9 % in the western ones ([7]). The gap had narrowed by January 2019, with registered unemployment down to 7.1 % in the east and 4.9 % in the west. Though regional disparities in unemployment have narrowed, in January 2019 the registered unemployment rate was as high as 9.8 % in Bremen and 8.1 % in Berlin, well above that of the best performing *Länder*, Bavaria and Baden-Württemberg (3.3 %). Youth unemployment was also particularly high in Berlin in 2017, at 11.6 %, compared to the national average of 6.8 %. The reduction in unemployment in the east has not been accompanied by an increase in employment numbers, as the working age population has fallen considerably (see Section 4.4.2).

([7]) 'Registered unemployment' refers to the proportion of registered unemployed people in the labour force. This concept differs from the standard ILO definition, according to which a person is deemed unemployed if i) she currently does not have a job; ii) is actively seeking a job, and iii) is ready to starting working if a suitable job is offered to her.

Graph 1.7: **Sectoral net lending**



Source: Destatis, European Commission

Sectoral balances

Private sector net lending has edged down. Private borrowing rose further in 2018 above GDP growth, benefiting from declining interest rates, and private sector deleveraging slowed down. Corporate investment rose consistently, in line with or at a slightly more rapid rate than GDP growth, in response to rising capacity utilisation. Thus the corporate investment share of GDP has edged up. In addition, corporate savings have been declining somewhat as a share of GDP since 2016. The decline in the share of corporate savings in GDP in recent years is the consequence of a combination of multiple factors: slight declines in operating profitability, (foreign) investment income, and at the same time a moderate rise in dividend pay-outs from a historically low level, after a long post-crisis spell of strengthening equity buffers, and an ongoing increase in the share of labour costs (see Table 1.1). As a result, corporations, which have a level of indebtedness among the lowest in the euro area, reduced their net lending position and thus contributed to

reducing the savings surplus. This contrasts with earlier years, when their behaviour was key to explaining the rise in the current account.

Table 1.1: **Key components of income and final demand of non-financial corporations: contributions to the economy-wide net lending**

	2007	2009	2011	2012	2016	2017	10'17-09'18
Compensation of employees (-)	2.9	1.2	1.3	0.5	-0.1	-0.5	-0.8
Operating surplus (+)	4.6	1.5	2.7	1.5	2.3	2.1	1.8
Property income, net (+)	2.3	1.9	2.8	2.9	2.4	2.0	1.9
Corporate taxes (-)	-0.3	0.6	-0.1	-0.1	-0.2	-0.2	-0.4
Distributed income (-)	-3.1	-1.8	-1.2	-0.9	0.5	0.8	0.6
Saving, gross (+)	3.2	1.9	3.9	3.2	4.7	3.9	3.5
Fixed capital formation (-)	0.8	2.0	1.4	1.7	1.4	1.4	1.2
Net lending	6.1	7.9	7.4	8.5	9.4	8.5	7.3

(1) Percentage points. Accumulated change in the GDP share since 2001 (the latest year with a non-positive current account balance)
(2) (+) indicates a positive, (-) - a negative relationship with the current account balance
Source: European Commission

Households' net lending has stayed largely unchanged. The gross household savings rate rose further to 17.3 % of disposable income in 2017, the highest in the euro area (average: 11.9 %), and is expected to stay high, partly driven by provision for ageing and propped up by rising labour incomes. The latter have been driven both by rising employment and somewhat stronger wage growth. Meanwhile, household investment growth was maintained, which has stabilised households' net lending position. The improvement in labour income has not offset or countered the long-term trend of a decline in the share of household disposable income in GDP. Following the social security and labour market reforms of the 2000s, social transfers account for a permanently lower share of GDP. The share of non-labour income has also continued to decline as a result of two factors. The strong labour market has made dependent employment relatively more attractive in comparison with self-employment. Net property income has remained lower as a share of GDP than in earlier years, as corporations' dividend pay-outs remain low in the aftermath of the crisis (see Tables 1.1, 1.2). The proportion of income that comes from interest has continued to decrease in the context of low interest rates and has been below 0.5 % of GDP since mid-2016. Although the share of GDP accruing to households has been falling, the household propensity to save has actually increased slightly. The fluctuation of the ratio of household savings to GDP has thus been limited, as the decline in the private consumption share of GDP has largely followed income trends (see Table 1.2).

Table 1.2: **Key components of household income and final demand: contributions to the economy-wide net lending**

	2007	2009	2011	2017	10'17-09'18
Net wages (+)	-2.6	-1.0	-1.4	-0.8	-0.6
Social transfers (+)	-1.5	0.5	-1.2	-1.5	-1.6
Net non-labour income (+) o.w.	1.4	0.8	0.0	-3.3	-3.6
Distributed income of corporations (+)	2.0	2.2	0.5	-0.9	-0.7
Income from self-employment (+)	-0.3	-0.7	-0.3	-1.0	-1.0
Taxes (+)	-0.2	-0.2	0.0	-0.7	-0.8
Disposable income (+)	-2.4	-0.4	-2.9	-5.3	-5.4
Consumption (-)	2.3	-0.1	2.0	4.5	4.8
Saving (+)	0.2	0.2	-0.3	-0.3	-0.1
Investment (-)	0.9	1.7	1.0	1.2	1.1
S-I	1.1	1.9	0.8	0.9	1.0

(1) Percentage points. Accumulated change in the GDP share since 2001 (the latest year with a non-positive current account balance)
(2) (+) indicates a positive, (-) a negative relationship with the current account balance
Source: Destatis, European Commission

The public sector surplus is increasing. The sector whose net lending has been growing since the peak of the current account surplus in 2015 is general government. The strong cyclical position of the economy has favoured public savings. It has helped contain social transfer payments, while tax revenue grew strongly (almost 3 pps. of GDP by mid-2018 compared to 2010) (see Table 1.3).

Table 1.3: **Key components of government revenue and expenditure: contributions to the economy-wide net lending**

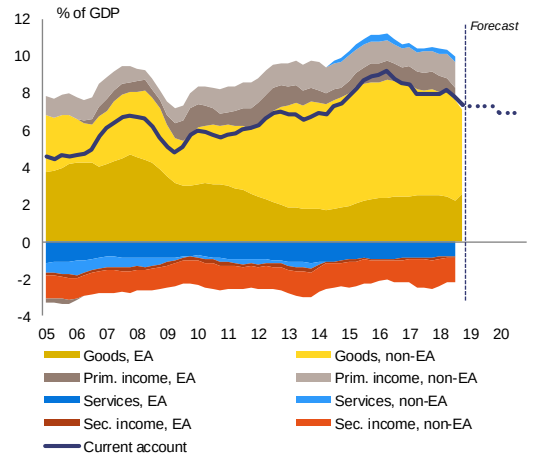
	2003	2008	2010	2017	10'17-09'18
Net lending (+) /net borrowing (-)	-1.1	2.9	-1.1	4.1	5.0
Net property income, paid (-)	-0.1	0.2	0.3	1.6	1.7
Direct taxes less subsidies (+)	-0.2	1.6	0.1	2.6	2.9
Social contributions (D61r) (+) less social transfers (D62p+D632p) (-)	-0.9	0.0	-1.0	-0.1	0.0
Indirect taxes (+)	0.1	0.1	0.2	0.0	-0.1
Services by public institutions (D631p+P32) (-)	-0.1	0.7	0.0	0.2	0.2
Net fixed capital formation (-)	0.1	0.2	0.0	0.1	0.0
Other capital expenditure, net (-)	0.0	0.1	-0.6	0.3	0.7
Other net transfers (incl. EU own resources) (-)	0.1	-0.1	-0.1	-0.5	-0.5

(1) Percentage points. Accumulated change in the GDP share since 2001 (the latest year with a non-positive current account balance)
(2) (+) indicates a positive, (-) a negative relationship with the current account balance.
Source: European Commission

Meanwhile the public investment ratio has not kept pace with growth in public revenue. A more pronounced correction of the current account surplus from its peak was constrained by relatively weak public investment. This seems to have been changing lately, as the capacity to plan and implement investments at municipal level is

showing first signs of improvement, though starting from a low level.

Graph 1.8: **Current account and component balances**



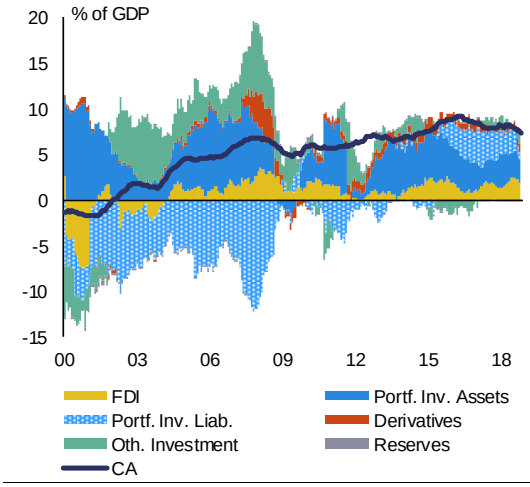
Note: four quarter moving average
Source: Deutsche Bundesbank, European Commission

External position

The current account surplus has been gradually declining since 2015. According to Bundesbank data, the current account surplus for 2018 stood at 7.4 % of GDP, suggesting a further decline compared to 2015 (8.9 %), 2016 (8.5 %) and 2017 (8.0 %). The fall in 2017 is due to an increase in net foreign transfers abroad (-1.7 % net compared to -1.3 % in 2016), and a narrowing of the trade balance from 8.5 % in 2016 to 8.2 %, whereas the primary income balance improved slightly to 2.1% of GDP. Compared to 2017, the trade balance for 2018 deteriorated by another 0.9 pps of GDP, while the secondary income balance and the services balance improved by a total of 0.4 pps and the primary income balance([8]) stayed stable. The trends observed in the current account balance can be also explained by the developments in the terms-of trade effects. The increase in the current account to its peak in 2015 was importantly driven by positive terms-of-trade effects (especially falling oil prices). Terms of trade improved further in 2016: however, domestic demand was strong while exports slowed down and the current account surplus decreased nonetheless. In 2017, with rebounding energy prices, deteriorating terms of trade narrowed the surplus further despite a positive growth contribution of foreign trade. In 2018 terms of trade effects continue to exert a downward pressure on the surplus.

The trade balance has been affected by structural and cyclical issues in the automotive sector. The disclosure that the environmental compliance test results of a number of German brands of diesel cars had been manipulated (the Diesel scandal) may have slowed down growth in car and parts exports since 2015. At the same time, the German car market became more open to imported brands. This caused net exports of cars to decline from 4.2 % of GDP in 2015 to 3.4 % for the year ending in September 2018. The slump was precipitated in the 3rd quarter of 2018 by delays in complying with a newly introduced testing procedure. (See also Box 1.1.)

Graph 1.9: **Current account balance and components of the financial account**



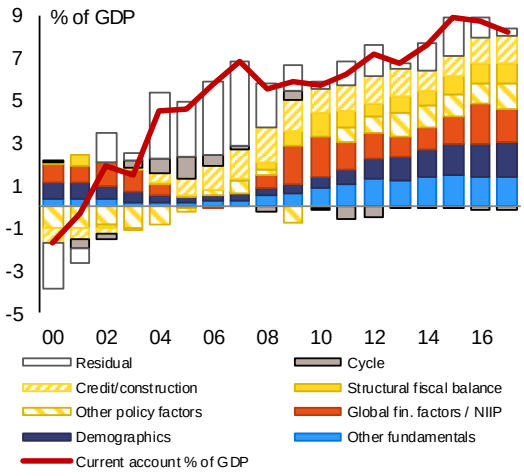
Note: Twelve month moving average
Source: Deutsche Bundsebank

Net capital exports comprise mainly flows of debt assets and direct investment into offshore centres. In recent years, the main channel of German foreign investment has been portfolio investments, which have accounted for roughly two thirds of the financial account balance since 2014. Since 2015, around half of these flows have consisted of German securities returning home (e.g. in the context of the Eurosystem's Asset Purchase Programme). Thus, the acquisition of debt assets has roughly halved compared to the years before that (see Graph 1.9). Net foreign

([8]) The key countries/ regions of origin of net primary income since 2016 are the Netherlands (0.4% of GDP), China (0.3% of GDP), USA (0.3%), Luxembourg (0.3%), Central America (0.2%).

direct investment has picked up somewhat since 2014. The key destinations during the period in question were the Netherlands (2014-15) and Luxembourg (2016-17). These two countries have tended to host large amounts of FDI through special purpose entities, driven by tax-planning motives (European Commission, 2017c). Other major destinations were the United States (2015 and 2018) and Spain (2018). All in all, however, it is difficult to infer to what extent capital exports are used to finance productive activities abroad.

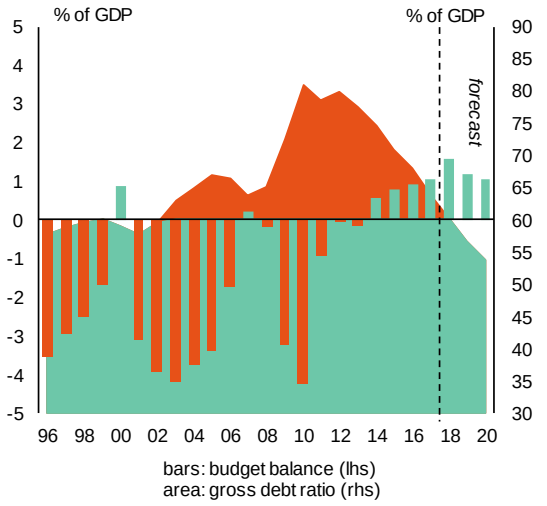
Graph 1.10: **Factors explaining the current account surplus**



Source: European Commission

The current account surplus remains considerably above what fundamentals suggest. According to the Commission's current account 'norm' calculations, fundamental determinants of savings and investment currently suggest a surplus of +3.0 % of GDP (compared to the latest value of 7.8 % of GDP). Though this is mostly due to ageing (+1.6 pps), the manufacturing intensity of German exports is another relevant factor (+0.8 pps). ([9]) Yet most of the surplus (+3.4 pps) and its dynamics is explained by factors that can be more directly influenced by policies. Private-sector deleveraging since 2000 explains a large part of the surplus — although its impact did not increase further in 2017 (+1.2 pps, unchanged) along with the fiscal stance (+0.9 pps, slight increase), and an increasing net international investment position that gave rise to a sizeable positive income balance (+1.6 pps, down from +1.9 pps in 2016).

Graph 1.11: **General government budget balance and gross debt**



Source: European Commission

Public finances

Germany is expected to meet the debt criterion, as government debt is projected to fall below the Maastricht Treaty reference value of 60 % of GDP. For the first time since 2002, Germany will fulfil again the debt criterion (see Graph 1.11). The introduction of the 'debt brake' in 2009 seems to have had a considerable and sustainable effect in reducing overall government debt and turning the budget balance from deficit to surplus. Since public debt peaked at 80.9 % of GDP in 2010, the figure has fallen continuously, and it is expected to fall below the 60 % threshold in 2019. Also benefiting from cyclical effects and low interest rates, the headline deficit fell significantly after 2010. In 2014 it gave way to a surplus, which has been sustainably increasing since then. In 2018, the headline budget surplus reached a peak at 1.7 % of GDP and is projected to remain positive in the years thereafter.([10]) As the debt brake became binding for the Federal Government in 2016 and will become binding for the *Länder* from 2020, general government debt can be expected to fall further over the coming years.

([9]) The current account 'norm' benchmark is derived from regressions capturing the main fundamental determinants of the saving-investment balance (e.g. demographics, resources), as well as policy factors and global financial conditions. See also Coutinho et al., (2018).

[10] Based on preliminary national data.

Box 1.1: The automotive sector in Germany

The automotive industry is a backbone of the German industry and has grown in importance. It is a significant contributor to German GDP and employment. The sector has continuously increased its share of total value added from 3.1 % in 1995 to 5.3 % in 2016, well above the EU average of 2.3 % in 2016 (with France, Spain and Italy at 1.5 %, 1.7 % and 1.4 % respectively). Similarly, its share of manufacturing increased from 13.7 % in 1995 to 22.6 % in 2016 (EU average 10.6 %). Motor vehicles and vehicle parts are Germany's most important export product, accounting for 19.2 % of German exports in 2017. The sector has one of the most internationalised value chains in the world. In 2017, about 66 % of the German-branded vehicles were produced abroad. The success of German original equipment manufacturers (OEMs) also relies on their suppliers, notably from the rest of the EU, representing up to 80 % of the value added.

In 2018, car sales experienced significant volatility owing to the move to new emissions test legislation at the beginning of September, which appears to be a temporary disruption. Car registrations were markedly up in July and August in seasonally adjusted terms before the new Worldwide Harmonised Light Vehicle Test Procedure standard came into force. Afterwards, they dropped sharply in September, as car manufacturers were not able to complete in time the certification of most of their car models. It remains to be seen how long bottlenecks related to the new emissions test legislation will persist.

Demand for new diesel cars has dropped significantly due to the diesel emissions scandal and the insufficient response by car manufacturers and policy makers. Car manufacturers of diesel-fuelled power trains had reverted to devices that turned off the emission-control technology in most normal uses. When these defeat devices were eventually uncovered and the responses of both policy makers and car manufacturers were perceived as being insufficient, demand for diesel cars slumped, also damaging the 'Made in Germany' brand both internationally and domestically. The possibility of city bans on Euro 5 and older diesel cars and the continuing environmental underperformance of diesel cars, including those that underwent a software update, foretell a further decline in demand. In October 2018, the share of new registrations of diesel cars fell below 30 % for the first time (from its peak of about 50 % in 2015). However, overall demand for new cars is expected to remain rather strong in the short run, as the drop in demand for new diesel cars is expected to be largely offset by higher demand for petrol cars. Moreover, external demand appears to be less affected, as exported cars are mainly petrol cars.

The shift towards low and zero emission mobility might lead to a global shift in value creation, affecting German car manufacturers and suppliers. A significant transition to alternative power trains (such as e-mobility and fuel cells) and automation is expected to take place in the medium to long term. The German Federal Government has introduced a package of stimulus measures for electric vehicles. However, e-mobility currently faces a number of challenges related to price, distance, charging infrastructure, charging time, and technological competition (e.g. charging batteries as opposed to replacing them). A possible intermediate step for e-mobility might be local 'island solutions', such as electric buses, postal lorries or taxis. As electric vehicles are significantly less complex than those with a combustion engine, the competitive advantage of the German OEMs and suppliers might – at least temporarily – diminish.

Germany is still an innovation leader in the automotive sector but securing its competitive position will require further investment in training, research and innovation. So far, the competitiveness of the German car industry has been determined largely by the supply of qualified labour and an efficient innovation ecosystem. The technological transformation of the car industry will require even stronger investment in quality education, in-house training, retraining and life-long learning. The automotive industry accounts for about 35 % of business R&D expenditure in Germany and about 40 % of patents. Nearly half of all global patents on automation in the automotive sector come from German firms. However, Germany faces strong competition from the US and China with regard to battery research. Even though R&D in Germany is increasingly focused on new technologies, especially those relating to automation and connectivity, this may not be sufficient to offset potential losses resulting from a lower degree of ambition in the area of e-mobility and other alternative power trains.

Table 1.4: **Key economic and financial indicators - Germany**

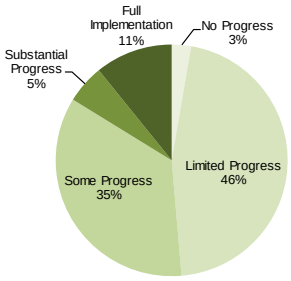
	2004-07	2008-12	2013-15	2016	2017	forecast 2018	forecast 2019	forecast 2020
Real GDP (y-o-y)	2.2	0.7	1.5	2.2	2.2	1.5	1.1	1.7
Potential growth (y-o-y)	1.3	1.0	1.7	1.6	1.6	1.9	2.1	2.0
Private consumption (y-o-y)	0.7	0.8	1.1	2.1	1.8	.	.	.
Public consumption (y-o-y)	0.5	1.9	1.9	4.0	1.6	.	.	.
Gross fixed capital formation (y-o-y)	3.1	0.5	1.4	3.5	2.9	.	.	.
Exports of goods and services (y-o-y)	9.9	2.2	3.9	2.3	4.6	.	.	.
Imports of goods and services (y-o-y)	7.7	2.2	4.1	4.1	4.8	.	.	.
Contribution to GDP growth:								
Domestic demand (y-o-y)	1.1	0.9	1.3	2.6	1.8	.	.	.
Inventories (y-o-y)	0.0	-0.3	0.0	0.2	0.0	.	.	.
Net exports (y-o-y)	1.2	0.2	0.2	-0.5	0.3	.	.	.
Contribution to potential GDP growth:								
Total Labour (hours) (y-o-y)	0.1	0.0	0.7	0.6	0.5	0.8	0.9	0.8
Capital accumulation (y-o-y)	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.5
Total factor productivity (y-o-y)	0.9	0.7	0.7	0.7	0.7	0.7	0.7	0.8
Output gap	-0.4	-0.7	-0.4	0.3	0.8	0.6	0.4	0.0
Unemployment rate	10.1	6.6	4.9	4.1	3.8	3.5	3.2	3.0
GDP deflator (y-o-y)	0.9	1.2	1.9	1.4	1.5	1.9	2.0	1.9
Harmonised index of consumer prices (HICP, y-o-y)	1.9	1.7	0.8	0.4	1.7	1.9	1.4	1.5
Nominal compensation per employee (y-o-y)	0.6	2.1	2.4	2.2	2.6	3.0	3.0	3.0
Labour productivity (real, person employed, y-o-y)	1.5	-0.2	0.7	0.9	0.7	0.2	.	.
Unit labour costs (ULC, whole economy, y-o-y)	-0.9	2.2	1.8	1.3	1.8	2.8	2.0	2.0
Real unit labour costs (y-o-y)	-1.8	1.0	-0.1	-0.1	0.3	0.9	0.0	0.1
Real effective exchange rate (ULC, y-o-y)	-1.9	-0.4	0.8	1.0	2.5	3.2	-0.8	-0.2
Real effective exchange rate (HICP, y-o-y)	-0.1	-1.6	-0.7	1.7	1.1	2.6	-1.3	-0.8
Savings rate of households (net saving as percentage of net disposable income)	10.1	9.9	9.4	9.8	9.9	.	.	.
Private credit flow, consolidated (% of GDP)	0.3	0.5	1.8	3.7	4.9	.	.	.
Private sector debt, consolidated (% of GDP)	115.2	106.7	99.9	98.5	100.1	.	.	.
of which household debt, consolidated (% of GDP)	65.6	58.7	54.2	52.9	52.7	.	.	.
of which non-financial corporate debt, consolidated (% of GDP)	49.6	48.1	45.7	45.6	47.3	.	.	.
Gross non-performing debt (% of total debt instruments and total loans and advances) (2)	.	2.1	2.1	1.8	1.6	.	.	.
Corporations, net lending (+) or net borrowing (-) (% of GDP)	1.7	2.4	2.4	2.6	1.9	1.3	1.4	1.3
Corporations, gross operating surplus (% of GDP)	26.9	25.8	24.9	25.5	25.3	24.9	25.2	25.2
Households, net lending (+) or net borrowing (-) (% of GDP)	5.8	5.4	4.9	5.1	5.1	4.8	4.7	4.5
Deflated house price index (y-o-y)	-2.0	0.7	2.8	5.3	2.9	.	.	.
Residential investment (% of GDP)	5.1	5.3	5.8	5.9	6.1	6.3	.	.
Current account balance (% of GDP), balance of payments	5.4	6.0	7.7	8.5	8.0	7.8	7.3	6.9
Trade balance (% of GDP), balance of payments	5.5	5.4	7.0	7.9	7.5	.	.	.
Terms of trade of goods and services (y-o-y)	-0.8	-0.5	1.7	1.7	-1.0	-0.7	0.0	0.0
Capital account balance (% of GDP)	-0.1	0.0	0.0	0.1	0.0	.	.	.
Net international investment position (% of GDP)	14.1	24.1	40.5	50.7	54.0	.	.	.
NIIP excluding non-defaultable instruments (% of GDP) (1)	9.6	18.9	31.8	37.5	41.5	.	.	.
IIP liabilities excluding non-defaultable instruments (% of GDP) (1)	125.3	163.4	155.9	151.4	140.3	.	.	.
Export performance vs. advanced countries (% change over 5 years)	14.8	0.0	-3.5	-0.3	1.7	.	.	.
Export market share, goods and services (y-o-y)	.	.	1.4	3.3	-1.1	.	.	.
Net FDI flows (% of GDP)	1.7	1.2	1.8	1.0	1.3	.	.	.
General government balance (% of GDP)	-2.2	-1.7	0.4	0.9	1.0	1.6	1.2	1.1
Structural budget balance (% of GDP)	.	.	0.7	0.8	0.9	1.5	1.0	1.1
General government gross debt (% of GDP)	65.5	75.4	74.3	67.9	63.9	60.1	56.7	53.7
Tax-to-GDP ratio (%) (3)	38.7	39.0	39.6	40.2	40.5	40.9	40.6	40.6
Tax rate for a single person earning the average wage (%)	42.3	40.4	39.5	39.7	.	.	.	.
Tax rate for a single person earning 50% of the average wage (%)	31.8	31.2	30.8	31.0	.	.	.	.

(1) NIIP excluding direct investment and portfolio equity shares
(2) Domestic banking groups and stand-alone banks, EU and non-EU foreign-controlled subsidiaries and EU and non-EU foreign-controlled branches.
(3) The tax-to-GDP indicator includes imputed social contributions and hence differs from the tax-to-GDP indicator used in the section on taxation.
Source: Eurostat and ECB as of 31-1-2019, where available; European Commission for forecast figures (Winter forecast 2019 for real GDP and HICP, Autumn forecast 2018 otherwise).

2. PROGRESS WITH COUNTRY-SPECIFIC RECOMMENDATIONS

Since the start of the European Semester in 2011, 51 % of all country-specific recommendations addressed to Germany have recorded at least "some progress". ([11]) Looking at the multiannual assessment of the implementation of the CSRs since these were first adopted, 51 % of all the CSRs made to Germany have recorded at least 'some progress'. 49 % of CSRs recorded 'limited progress' or 'no progress' (see Graph 2.1). Overall, for every Semester cycle, multiannual implementation in Germany has remained relatively weak, at or below the average progress made by other Member States. However, implementation scores improved in 2018.

Graph 2.1: **Overall multiannual implementation of 2011-2018 CSRs to date**



* The overall assessment of the country-specific recommendations on fiscal policy excludes compliance with the Stability and Growth Pact.
** 2011-2012: Different CSR assessment categories.
***The multiannual CSR assessment looks at implementation from the time when the CSRs were first adopted up to the February 2019 Country report.
Source: European Commission

While the fiscal position remained sound over time, public finances have been slow to become more growth-friendly. Between 2011 and 2018, Germany's fiscal position remained sound, showing high compliance with CSRs from the early 2010s as regards compliance with the medium-term budgetary objective and reducing debt. On the other hand, the structure of revenues and expenditure has been made only slightly more growth-friendly. On the revenue side, taxes on labour remained high. On the expenditure side, over-reliance on hospital care has continued, reducing the efficiency of healthcare expenditure. Moreover, expenditure on education and research and development has been falling short of the relevant national target. Overall, public investments remained subdued compared to needs, despite some improvement from the early 2010s. In addition, the tax system has become only marginally more efficient and investment-friendly. However, there were some encouraging developments in 2018, with expenditure on public investment and education increasing.

The growth potential of efficient market structures has not yet been exploited to the full. Efficient market structures contribute to higher value added and higher consumer welfare, yet little has been done in response to the relevant CSRs. Policy measures to boost competition in business services and regulated professions have been largely absent. Barriers to competition in railways have been reduced to only to a limited extent. The energy transition is relatively costly, while the development of energy networks has been slow — although the power grid action plan of 2018 may result in future improvements.

The labour market situation has been improving further, helped by past structural reforms and a strong economy. Since 2011, Germany has benefited from high employment growth and low unemployment, reflecting the favourable impact of past labour market reforms, employment-friendly social dialogue, the improved provision of early childhood education and care, and a competitive industry, among other factors. Despite the persistently high tax wedge, the overall employment rate rose continuously. The employment rate of older workers (over 50) improved on the back of a good labour market and earlier structural reforms. The introduction of the statutory general minimum wage in 2015 promoted transitions from mini-jobs to standard employment and helped to boost hourly wages at the bottom of the wage distribution. However, its effects have lessened over time. With new reforms, disincentives to work are expected to be reduced somewhat in 2019 and 2020. There is further potential to improve labour market outcomes, reflected in persistently high fiscal disincentives for second earners and an undersupply of early childhood education and care.

([11]) For the assessment of other reforms implemented in the past, see in particular section 4.1, 4.2, 4.3 and 4.4.

Table 2.1: **Summary table on 2018 CSR assessment**

Germany	**Overall assessment of progress with 2018 CSRs: Limited**
CSR1: *While respecting the medium-term objective, use fiscal and structural policies to achieve a sustained upward trend in public and private investment, and in particular on education, research and innovation at all levels of government, notably at regional and municipal levels. Step up efforts to ensure the availability of very high-capacity broadband infrastructure nationwide. Improve the efficiency and investment friendliness of the tax system. Strengthen competition in business services and regulated professions*. (MIP-relevant)	**Limited progress** • Some progress in achieving a sustained upward trend in public and private investment. • Limited progress in raising expenditure on education. • Some progress in raising expenditure on research and innovation. • Limited progress in ensuring the availability of very high-capacity broadband infrastructure nationwide. • Limited progress in improving the efficiency and investment friendliness of the tax system. • Limited progress in strengthening competition in business services and regulated professions.
CSR2: *Reduce disincentives to work more hours, including the high tax wedge, in particular for low-wage and second earners. Take measures to promote longer working lives. Create conditions to promote higher wage growth, while respecting the role of the social partners. Improve educational outcomes and skills levels of disadvantaged groups.* (MIP-relevant)	**Some progress** • Some progress in reducing disincentives to work more hours. • Some progress in reducing the high tax wedge in particular for low-wage earners. • Limited progress in reducing disincentives for second earners. • Limited progress in taking measures to promote longer working lives. • Some progress in creating conditions to promote higher wage growth. • Limited progress in improving educational outcomes and skills levels of disadvantaged groups.

(1) This overall assessment of CSR1 does not include an assessment of compliance with the Stability and Growth Pact.
Source: European Commission

Overall, Germany has made limited progress in responding to the 2018 country-specific recommendations (CSRs) ([12]). Some progress has been made towards achieving sustainable growth in public and private investment, a CSR closely related to the euro area recommendation about strengthening domestic demand and growth potential. This has been done by reforming federal fiscal relations and by allocating more resources to the *Länder* and municipalities and for specific infrastructure programmes. At the same time, despite promising initiatives, limited progress has been made so far with stepping up public spending on education. Although this is increasing in absolute terms, it has largely stagnated as a share of GDP. There has been some progress in raising expenditure on research and innovation. Private investment has increased noticeably as well. However non-residential construction has been increasing sluggishly in real terms, and essential infrastructure may not have kept up with the economy's needs. Announcements that the nationwide broadband infrastructure is to be improved are encouraging, but so far only small steps have been taken to put this into practice. Limited progress has been made with making the tax system more efficient and investment-friendly. Progress has also been limited in promoting competition in business services and the regulated professions. There has been some progress on issues related to the recommendation on the labour market, including on the advice about reducing the tax wedge for low-wage earners, yet related disincentives remain high. There are no signs that current pension reforms will promote longer working lives, and so far limited progress has been recorded in improving the educational outcomes and skill levels of disadvantaged groups. There has been some progress in creating the necessary conditions to promote higher wage growth.

([12]) Information on the level of progress and the measures taken in response to the policy advice in each subpart of a CSR is presented in the overview table in the Annex. This overall assessment does not include an assessment of compliance with the Stability and Growth Pact.

Box 2.1: EU funds and programmes contribute to addressing structural challenges and to fostering growth and competitiveness in Germany

EU solidarity continues to support structural change in Germany. Under the current Multiannual Financial Framework (2014-2020), the financial allocation from the European Structural and Investment Funds (ESI Funds) - assigned to Germany to help the country face development challenges - exceeds EUR 27.9 billion. This is equivalent to about 0.1 % of annual GDP. By the end of 2018, some EUR 18.6 billion (about 67 % of the total) had already been allocated to specific projects. In addition to the ESI Funds, the Connecting Europe Facility has allocated EUR 2.2 billion to projects on strategic transport networks. Moreover, many German research institutions, innovative firms and individual researchers have benefited from other EU funding instruments. An example is Horizon 2020, which has provided EUR 5.6 billion to improve innovation and research in Germany. Part of EU funds contributed to supporting the implementation of Country Specific Recommendations.

EU funding have helped to address policy challenges identified in the 2018 CSRs. ESI Funds contributed to improving educational and employment outcomes for disadvantaged groups, supporting over 1.3 million participants by the end of 2017, including more than 390 000 from minority backgrounds. Overall, more than 437 000 people have gained a qualification. The European Social Fund (ESF) has supported human capital investments, including 214 600 disadvantaged people with targeted measures mobilising their economic potential, 89 800 participants with education and training programmes, as well as 7 600 projects promoting employability of women. The European Regional Development Fund (ERDF) has supported closer collaboration between business and research institutions, as well as R&D investment in the private sector. By the end of 2017, 1 510 enterprises had been selected for support by the ERDF in building cooperation with research institutions and 3 860 enterprises in introducing new products to their markets. Horizon 2020 has supported 5 585 research projects covering a very broad thematic spectrum from 'Innovation in SMEs' (small and medium-sized enterprises) to 'Health, demographic change and wellbeing'.

ESI Funds also help mobilise private investment through financial instruments. By the end of 2017, EUR 1.06 billion of support from ESI funds had been allocated to financial instruments, including loans, guarantees and equity. This is expected to leverage substantial additional private investment.

In addition, the Commission can provide tailor-made technical support upon a Member State's request via the Structural Reform Support Programme to help Member States implement growth-sustaining reforms to address challenges identified in the European Semester process or other national reforms. Germany, for example, is receiving support for developing an institutional solution to modernise mechanisms for capturing and processing business data from multinational enterprise groups in the context of a globalised economy. The support measure focuses on the German statistical system, while it is also designed to help improve the quality of core economic data for policy-making purposes.

In absolute terms, Germany is the fourth biggest recipient of finance from the European Fund for Strategic Investments, but it ranks 22nd when considering the overall volume of approved operations as a share of GDP. Total financing amounts to EUR 7.3 billion and is set to trigger EUR 35.2 billion in additional private and public investments. For the Infrastructure and Innovation window, 74 projects([1]) were approved at a total value of about EUR 6.4 billion, set to trigger EUR 29.1 billion in total investment. Under the SMEs window, 29 agreements with intermediary banks worth EUR 974 million have been approved. These are set to trigger about EUR 6 billion in investments, with some 30 285 small and medium-sized and mid-cap companies expected to benefit from improved access to finance. One such project in Germany is 'Evotec medical research', which benefited from EUR 75 million in EU financing. Evotec is a drug discovery company, and the EUR 75 million loan enabled it to invest in researching and developing treatments for serious illnesses.

Further information: https://cohesiondata.ec.europa.eu/countries/DE

([1]) Including 36 multi-country projects.

3. OVERALL FINDINGS REGARDING IMBALANCES, RISKS AND ADJUSTMENT ISSUES

The 2019 Alert Mechanism Report concluded that a new in-depth review should be undertaken for Germany to assess the persistence or unwinding of the imbalances that affect it (European Commission, 2018a). In spring 2018, Germany was identified as having macroeconomic imbalances (European Commission, 2018b). The imbalances identified related in particular to excess savings and weak private and public investment. This chapter summarises the findings of the analyses in the context of the Macroeconomic Imbalance Procedure (MIP) in-depth review that are set out in various sections of this report. ([13])

Imbalances and their gravity

The German economy's persistent large current account surplus reflects a subdued level of consumption and investment relative to income. While there is currently a shift towards more domestic demand-driven growth and more investment, the overall shares of consumption and investment remain relatively low, given the favourable labour market, financing conditions and infrastructure investment needs.

The persistently subdued investment share of GDP continues to undermine Germany's future growth potential, and has implications for the euro area. Private investment is lagging behind infrastructure and housing needs. Additional construction investment to meet the targets for new dwellings could lower the current account surplus by 0.5 pps of GDP (cf. Section 1 on investment). Public investment has picked up, but a major investment backlog, with depreciation still exceeding new investment at municipal level, will take longer to make up. Stronger investment in innovation, quality education and skills, very high-speed broadband networks, sustainable transport and electricity infrastructures combined with structural reforms aimed at improving the investment-friendliness and efficiency of the tax system can raise potential growth in future. Structural reforms promoting better use of the labour market potential of so far under-represented groups could help address the already noticeable shortages of skilled labour. This would be of crucial importance especially as population ageing intensifies and immigration may slow down. Growth-enhancing policies could also have positive spillovers for the other EU countries.

Evolution, prospects, and policy responses

The current account surplus has been gradually declining since 2015. The trade balance has been affected by structural and cyclical issues in the automotive sector. Net capital exports were driven mostly by flows of debt titles, even if on a smaller scale than in earlier periods. Although foreign direct investment is growing, it has, until recently, been directed mostly at offshore centres. This makes it difficult to discern a link with productive activity abroad. Corporate sector net lending has edged down as profitability has weakened somewhat, while investment has remained robust. Households' net lending has remained largely unchanged, which puts it at a very high level compared with the country's EU peers. Improvements in labour incomes have boosted the saving rate, while increases in households' income and consumption have lagged behind GDP growth. The public sector surplus has grown as a result of stronger revenues from tax and social contributions and savings on social transfers, thanks to the strong cyclical position of the economy and to low unemployment.

The adjustment of the imbalance has been slow so far, but is expected to advance further. With the external environment becoming increasingly challenging for exporters, domestic demand is expected to be the key growth driver in 2018-2020, as set out in the Commission's Winter 2019 interim Economic Forecast. Efforts to reduce the public investment backlog are set to continue, combined with other expansionary fiscal measures. Private investment is also expected to increase further to keep the economy fit for technological change. The strong labour income and rising wages should support private consumption.

([13]) Analyses relevant to the in-depth review can be found in the following sections: public and private investment, the housing market (Chapter 1.), public finances (Section 4.1), financial sector (Section 4.2), labour market and social policy (Section 4.3), and sectoral and regional aspects of investment (Section 4.4). An asterisk shows that the analysis in that section contributes to the in-depth review under the MIP.

Table 3.1: **Outward spillover heat map for Germany**

	EU partner																										
	AT	BE	BG	HR	CY	CZ	DK	EE	FI	FR	DE	EL	HU	IE	IT	LV	LT	LU	MT	NL	PL	PT	RO	SK	SI	ES	SE	UK
Imports	15.6	10	6.6	7.9	0.8	27	5.6	2.9	3.7	3.8		3.2	24.2	8	3.8	2.9	4.4	19.6	3.8	14.1	12.8	4.1	8.4	19.3	13.8	3.5	3.8	2.4
Imports (in value added)	12.7	5.7	5.5	4.7	4.0	12.6	5.6	5.5	4.6	3.9		3.0	11.7	3.3	3.5	4.0	4.5	6.8	3.7	6.3	8.4	3.6	5.3	9.0	6.6	3.2	4.8	3.0
Financial liabilities	27.3	30.8	2.9	4.1	17.7	4.6	29.6	4.6	13.3	13.9		3.8	3	59.3	7.4	7	1.2	1032	24.1	55.1	0.8	9	0.5	2.7	9.8	4	12.4	20.5
Financial assets	53.6	29.8	9.5	9.6	31.4	15.8	19.6	4.0	31.1	27.0		17.7	22.3	63.5	17.1	10.4	15.4	1547.0	175.0	67.5	16.1	16.6	6.8	17.1	23.9	24.9	23.0	23.7
Liabilities (to banks)	9.5	1.3							1.5	6.3		1.1		0.3	9.6					19.3		1				4.5	5.5	7.9
Bank claims	9.3	4.8	0.5		11.2	3	3.7	0.4	6.7	5.4		1.8	2.4	8.9	4.4	1.1	0.5	121.6	14.8	8	9.6	5.2	0.2	1.9	2.6	4.3	5.3	10.5

Note: cross-border figures for Germany expressed as a % of the GDP of the partner country. The darkest shade of red corresponds to percentile 95 and the darkest shade of green to percentile 5. The percentiles were calculated for each variable based on the full available sample of bilateral exposures among EU countries. The blank spaces represent missing data. Data refer to: Imports — 2016, Imports (in value added) — 2014, Financial liabilities — 2015, Financial assets — 2015, Liabilities (to banks) — 2018-Q2, Bank Claims — 2018-Q2.
Source: UN, OECD, WIOD, BIS and European Commission

Currently, population ageing and concerns about the adequacy of future pension levels contribute to the rise in domestic savings. The demographic transition is pushing up the current account surplus, but should lower savings in the long run. Nevertheless, the current account surplus is expected to remain above the Macroeconomic Imbalance Procedure threshold and to decline only gradually in the medium term.

Given the size of the German economy and its strong trade and financial linkages, there are potentially strong spillovers to other EU countries. Germany's strong exports make it a key trading partner for all EU countries. Indeed, imports from Germany exceed 10 % of GDP in some countries, including the Czech Republic, Hungary, Austria, the Netherlands and Poland (see Table 3.1). Especially in the case of central and eastern Europe, this reflects the importance of international value chains coordinated by German companies, with a significant amount of trade being essentially intra-company transfers. As the most important of these value chains is car manufacturing, the potential negative spillovers can be significant if German carmakers fail to maintain their global competitive advantage. Financial linkages from the country are on average smaller than trade linkages, yet for some countries, they remain very strong. Given the large share of financial assets invested in Germany, economic developments in the country are particularly important for Austria, Ireland, Luxembourg, Malta and the Netherlands. Liabilities to German banks and bank claims on Germany are particularly concentrated for certain financial centres, such as Luxembourg, Malta, the Netherlands, the UK, Ireland and Austria. While structural reforms in Germany primarily increase its own GDP, they also have positive spillover effects on other euro area countries (see Box 3.1) ([14]).

More recently, Germany has taken some important policy steps to address its imbalances, but more efforts will be needed in the coming years to fully address Germany's imbalances. There have been policy advances in the area of public investment, though municipal level investment is still lagging behind. There have also been some smaller advances as regards investment in digital infrastructure, reducing disincentives to work and promoting wage growth. However, it remains to be seen if policy action has been decisive enough to produce the desired outcomes.

([14]) The simulations presented in Box 3.1 are in the spirit of the 2019 Council Recommendations for the euro area.

Box 3.1: Spillovers of structural reforms – the case of Germany

Structural reforms tend to have both positive and negative spillover effects on other countries, with uncertainty about the size and direction of the overall impact. While the demand effect (higher demand for foreign products) leads unequivocally to positive spillovers, reforms typically also improve a country's competitiveness, which can come at the (relative) expense of other countries. Whether the net effect is positive or negative depends on the relative strength of these two opposing channels and is likely to be reform-specific.

The European Commission's QUEST model([1]) was applied to simulate, in a harmonised way, the impact of a comprehensive set of reforms on all EU Member States.([2]) For a large set of structural indicators the benchmark is defined as the average of the three best-performing countries, and then in the simulation these gaps are closed by half, for all indicators together, for each country separately. An update of the 2014 exercise for Germany is shown in the table below, based on more recent indicators (but not capturing the most recently introduced reform measures). As the magnitude of the reform 'shocks' simulated here is based on a harmonised benchmarking exercise, they clearly do not correspond exactly to past European Semester country-specific recommendations. However, they do illustrate the potential economic impact of structural reforms on Germany itself and on the rest of the euro area.

Structural reforms would have a small but positive effect on the rest of the euro area. A broad range of structural reforms are simulated, including improving product market regulation and entry, labour market participation and taxation structure. Germany is a good performer overall, with limited gaps in structural indicators by comparison with EU best performers. The largest 'reform gaps' identified for Germany are in the tax structure (as captured by the relative share of labour tax revenues compared to consumption tax revenues), and lower labour force participation of low-skilled women. Altogether, the simulated ambitious reform package could lift GDP by 4 % after 10 years, and 6¾ % after 20 years (see Table 1). The reforms raise competitiveness, boosting exports, while imports also rise as demand increases. As the terms of trade fall by about 3 % after 10 years, the trade balance to GDP ratio actually falls slightly by 0.34 pps. The net spillover effect on the rest of the euro area is small but positive, and total euro area GDP increases by 0.3 % after 10 years.

Table 1: **Spillover effects of structural reforms – Germany closing half of the structural reform gaps**

	1	2	3	4	5	6	7	8	9	10	20
Germany											
GDP	0.66	0.91	1.16	1.49	1.85	2.30	2.80	3.27	3.71	4.11	6.81
Employment	0.69	1.17	1.52	1.97	2.45	2.97	3.5	3.97	4.38	4.74	6.73
Trade balance (% GDP)	-0.89	-1.26	-1.08	-0.77	-0.45	-0.25	-0.23	-0.27	-0.31	-0.34	-0.33
Rest of euro area GDP	-0.01	0.07	0.09	0.08	0.06	0.04	0.03	0.03	0.03	0.03	0.07
Euro area GDP	0.03	0.12	0.15	0.16	0.16	0.17	0.19	0.21	0.24	0.26	0.45

Source: European Commission

This simulation complements earlier QUEST simulations designed to model a more immediate demand stimulus. Earlier simulations include an increase in public investment and a reduction in personal income tax (European Commission, 2017a) and increases in expenditure on R&D and education (European Commission, 2018a).

([1]) For detailed information on the QUEST model and applications, see: http://ec.europa.eu/economy_finance/research/macroeconomic_models_en.htm.
([2]) The simulation follows the methodology of Varga and in't Veld (2014).

Overall assessment

The German economy's current account surplus continues to reflect a subdued level of consumption and investment relative to output and thus scope for further policy effort. The size and persistence of the surplus can only be explained in part by the country's industrial structure (i.e. the highly competitive manufacturing sector) and other characteristics of the economy and society. Thus, the current account surplus is significantly higher than

empirical benchmarks, after accounting for these German-specific characteristics in explaining cross-country differences. Subdued investment and private consumption have also contributed to the build-up of the external surplus. The necessary adjustments in the aftermath of the post-unification investment boom have resulted in significant scaling back of construction and planning capacity; this is hampering the renewal and expansion of key infrastructure. While there is currently a shift towards more domestic demand-driven growth, consumption and investment are still muted, given the favourable labour market, financing conditions and infrastructure investment needs. The continuing trend of relatively subdued domestic investment as a share of GDP is also undermining Germany's future growth potential and has implications for the euro area. Overall, there has been policy progress. However, more efforts are needed to fully address its imbalances, especially in the following ways:

- stepping up municipal investment, as well as investment in education, innovation and digital infrastructure,
- reducing disincentives to work and promoting wage growth,
- improving the tax system,
- stimulating competition in business services and regulated professions, and
- introducing measures to promote longer working lives.

Full implementation of declared policy initiatives (e.g. the coalition treaty of spring 2018) could help address macroeconomic imbalances.

Table 3.2: **MIP Assessment Matrix**

	Gravity of the challenge	Evolution and prospects	Policy response
	Imbalances (unsustainable trends, vulnerabilities and associated risks)		
External balance	Germany has a persistently large current account surplus considerably above the levels suggested by fundamental factors. Accumulated surpluses have resulted in a large positive net international investment position, which reached 54 % of GDP in 2017. The surplus reflects saving and deleveraging by all sectors of the economy: households, firms, and the public sector. Weak domestic investment has resulted in bottlenecks in taking up renewable energy sources, in the functioning of the transport infrastructure, in expanding the housing supply, in slow progress in digitisation, low investment in education as well as in a significant municipal investment backlog. All of this poses risks to Germany's potential growth in the future. In addition, as deleveraging pressures still weigh on EU growth, strengthening investment in Germany would benefit both Germany and its euro area and EU partners.	The German surplus came down somewhat from its peak of 8.9% of GDP in 2015, and reached 7.4 % in 2018, partially driven by commodity prices. It is projected to decline but to persist at well above 6 % of GDP in the medium term. Imports have been increasing, including relative to exports and GDP, over 2017 and 2018. Net capital exports have remained significant on account of repatriation of German bonds while investment in foreign debt securities slowed down. Net foreign direct investment is also significant, but partly driven by investments in offshore centres. A long spell of building up corporate equity buffers, fiscal consolidation and subdued investment have contributed most significantly to widening the savings surplus in recent years. Real private consumption increased robustly, by 2.1 % in 2016 and 1.8% in 2017 but growth slowed to just 1% in 2018 despite record employment and wages picking up speed. The low interest rates have been supportive of household investment, but the propensity to save has increased, possibly due to ageing related concerns. The share of households' disposable income in GDP has continued to decline, as has the share of consumption. The share of labour income has been recovering. Real wage increases remained modest, while record high dependent employment was also partly due to a decline in self-employment. The latter, together with still subdued property income have kept the share of non-labour income at a historically low level. Private sector investment has been increasing in response to high capacity utilisation. Nevertheless investment in infrastructure has barely reacted to supportive growth and funding conditions. Public savings have been rising as a share of GDP thanks to strengthening tax revenues and savings on social transfers. This has driven the fiscal surplus up, creating room for more public investment and other long-term growth enhancing expenditure.	Germany has taken some policy steps to address its imbalances. Public investment is increasing faster than GDP, but still more efforts are needed to clear the investment backlog. Public investment in 2017 and 2018 grew by close to 8 % nominally. This represents a noticeable increase compared to past years and the long-term average. However, given the backlog especially at municipal level, public investment still needs greater efforts to maintain the capital stock. The federal government is intensifying efforts to support investment at regional and municipal levels. With the creation of the Local Authority Investment Promotion Fund and the setting-up of a consultancy service agency "Partnerschaft Deutschland" the government had taken measures to support investment at lower administrative levels. Furthermore, the federal government has taken steps to create room for additional investment at these levels especially in education and research. Smaller steps forward were also recorded with regard to investing into Germany's digital infrastructure, reducing disincentives to work and promoting wage growth.

Conclusions from IDR analysis

- Germany is running a persistently large current account surplus reflecting private consumption restraint and subdued investment relative to savings in the private and particularly public sector. A relapse to weak domestic investment could constrain potential growth in the long term not only in Germany but also in the rest of the euro area.
- While private consumption has continued increasing in real terms, the ongoing recovery in the wage share of GDP has mainly resulted into higher savings. Wage growth increased somewhat with the tightening labour market, yet real wage growth remains modest. Disincentives to work for certain groups continue to reduce labour supply, disposable income and consumption opportunities.
- Public savings have increased thanks to strong taxes and contributions revenue and savings on social transfers. Steps taken to increase public investment have not yet resulted in a clear upward trend in the public investment-to-GDP ratio that appears required to close the infrastructure investment gap, especially at the municipal level. The widening fiscal surplus accounts for an increasing share of aggregate net saving, and thus the surplus. Efforts to improve the business environment for private investment have remained very limited. Regulatory restrictiveness in the services sector remains high and inefficiency in corporate taxation persists.

Source: European Commission

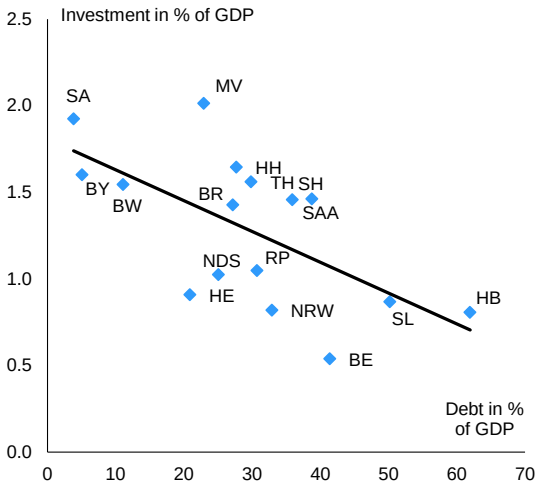
4. REFORM PRIORITIES

4.1. PUBLIC FINANCES AND TAXATION*

Public finances

Germany's public finances show a solid surplus and, the debt-to-GDP ratio is projected to comply with the Stability and Growth Pact's 60 % threshold. Since 2014 the government sector has achieved an overall budget surplus; this continuing trend is now becoming more pronounced. After 0.6 % of GDP in 2014, the headline balance reached 1.0 % of GDP in 2017 and increased to 1.7 % of GDP in 2018. Public debt also continues its sustained decline from a peak of 80.9 % of GDP in 2010. It has reached 60.1 % of GDP in 2018 and is expected to decrease further to 56.7 % in 2019 according to the Commission 2018 autumn forecast, falling below the 60 % Maastricht threshold for the first time since 2002. For a debt sustainability analysis and associated fiscal risks see Annex B.

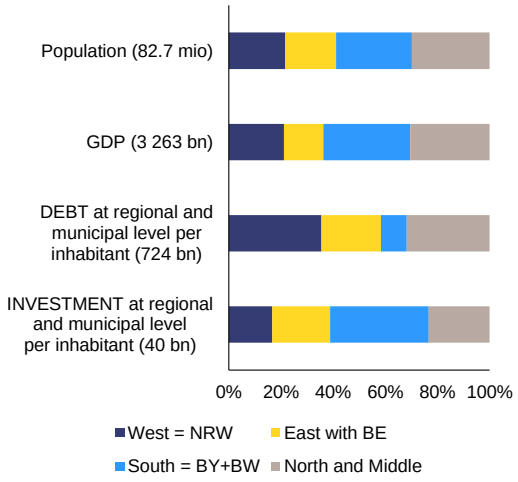
Graph 4.1.1: **Correlation between gross investment and debt in 2017**



Source: Destatis

Public investment by the German *Länder* shows a correlation with economic activity and, even more, with debt levels. Public investment as a share of GDP varies across the different regions in Germany (average: 1.24 % of GDP). The divide between the former West and East German *Länder* is still visible, but with some notable exceptions. Three of the regions with poor investment performance lie in the west: Bremen (HB 0.81 %), North Rhine-Westphalia (NRW 0.82 %) and Saarland (SL 0.87 %), whereas two regions with the highest investment rate lie in the east: Mecklenburg-West Pomerania (MV 2.01 %) and Saxony (SA 1.92 %). Investment expenditure is related to the level of economic activity measured by the share of GDP, however the correlation of public investment is even higher with the public debt level of the different *Länder* where more indebted *Länder* tend to invest less (see Graph 4.1.1). This negative correlation indicates that *Länder* having conditions of tight public finances lack the financial resources to invest sufficiently according to their level of economic activity. For example, Saarland and North Rhine-Westphalia, two formerly prosperous regions based on a strong coal and steel industry, struggle with the structural change in the economy, resulting in lower revenues from the local trade tax, higher social expenditures and poor investment levels.

Graph 4.1.2: **Regional debt and investment shares in 2017**



Source: Destatis

Regional disparities in public debt and investment levels are also strong among western *Länder*. If we divide Germany into four main economic areas (west: North Rhine-Westphalia (NRW), east: former East German regions including Berlin (BE), south: Bavaria (BY) and Baden-Württemberg (BW), north and middle: remaining regions), they show similar population numbers that correspond largely to each economic area's regional share of GDP (see Graph 4.1.2). However, debt at regional and municipal level per

inhabitant is disproportionally higher in the west (145 % of *Länder* average) and lower in the south (41 % of *Länder* average), while public investment is inversely lower in the west (65 % of *Länder* average) and higher in the south (146 % of *Länder* average). This also shows that disparities within former West Germany are much more pronounced than within former East Germany (93 % of average *Länder* debt and 86 % of average *Länder* investment). Comparing absolute debt levels per inhabitant between 2010 and 2017 shows that regions with already low debt levels are improving further, while others are lagging behind, with disparities widening. The consequences for public investment are that regions with more acute investment needs remain financially constrained and continue to accumulate an investment backlog.

Taxation

The German tax system, with its relatively high tax burden skewed towards labour, does not appear favourable to growth and investment. Germany raises a relatively high share of revenues from more distortive direct taxes, notably on labour. In 2017, the total tax burden was 39.1 % of GDP, equal to the EU average. Revenues from labour taxes as a share of GDP were relatively high in 2017 at 22.2 % of GDP (EU average 19.4 %). Personal and corporate income taxes in Germany (12.1 % of GDP) are equal to the EU average, whereas revenues from indirect taxes (10.7 % of GDP) are below the EU average (13.6 %). Revenues from consumption and environmental taxes (10.1 % and 1.8 % of GDP respectively in 2017) are also below the EU averages (11.1 % and 2.4 %). This is also the case for taxes on capital (6.7 % of GDP, EU average 8.6 %). Taxes on property (1.1 % of GDP v. 2.6 % EU average) are very low, as are recurrent property taxes (at 0.4 % of GDP v. 1.6 % EU average).

Despite measures to contain the growth of direct taxes, revenues from personal income and corporate income tax continue to increase. Revenues from direct taxes rose from 10.8 % of GDP in 2010 to 13.0 % in 2017, whereas the amount of indirect taxes collected slightly declined from 10.9 % to 10.7 % of GDP. The increase in direct taxes was driven mainly by personal and corporate income taxes. Over the same period, social security contributions increased slightly from 15 % to 15.3 % of GDP. This means that measures taken in recent years to contain the upward creep due to the 'cold progression' (i.e. bracket creep) and the additional income tax allowances have not yet had any impact on the figures. The tax wedge on labour has been stable at about 50 %, above the EU average of 46 %, and is the second highest in the EU. The tax wedge on low-income earners and secondary earners continues to be high compared to the EU average (see Section 4.3.1). Forecasts by the Ministry of Finance in the 2018 draft budgetary plan suggest that direct taxes ([15]) will not decrease in 2018 or 2019. The draft budgetary plan includes the abolition of the solidarity surcharge for 90 % of taxpayers as of 2021, which would help reduce the income tax burden. Full abolition of the solidarity surcharge would reduce the implicit tax rate on labour by 1 % (European Commission, 2017a). A number of changes in social security contributions, family benefits and personal income tax will affect taxes on labour from 2019 on and are expected to reduce the tax burden on low-income earners (see Section 4.3.1.).

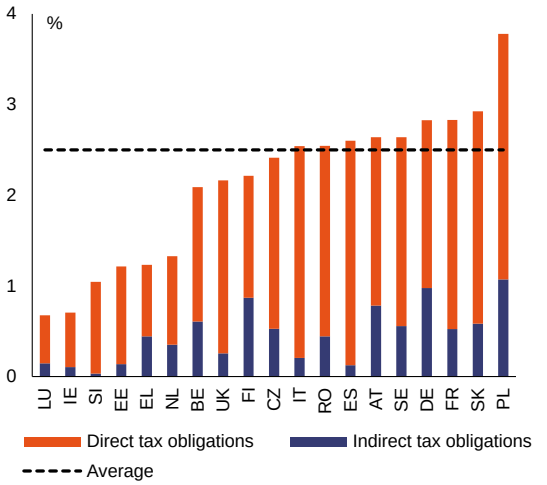
The tax system remains relatively inefficient and is therefore not very conducive to investment. Both statutory corporate tax rates and effective average tax rates are high (European Commission 2018b), which makes the presence of distortions more severe ([16]). For example, the debt bias in corporate taxation, which arises from the fact that debt financing costs are deductible from the corporate income tax base, whereas equity financing costs cannot be deducted, is the third highest in Europe (European Commission, 2018b).([17]) This could have a disproportionately adverse impact on investment by young, innovative and high-risk companies that usually rely more on equity financing. The same holds for family businesses, which tend to have a higher share of equity financing (Gottschalk et al., 2017). Also, the loss-carry forward provisions are relatively strict, limiting the loss-carry forward to 60 % of taxable income of a given year (ZEW, 2019). The recent reform of loss-carry forward

([15]) As measured by the taxes on income and wealth.
([16]) The effective average tax rate in 2017 stood at 28.8 %, compared to 20 % in the EU-28 (ZEW, 2018a).
([17]) Measured as the additional rate of return before taxes that an equity-financed investment needs to achieve to break even in comparison to a debt-financed investment, the bias amounts to 2.8 % in Germany.

provisions removed only certain limitations applicable to specific cases where the ownership of a young company changes. Other distortions in the tax system concern labour taxation, the fact that Germany's tax system corrects relatively little for market failures (especially where environmental taxation is concerned) and high tax compliance costs.

The German tax system remains complex and compliance costs are relatively high. A recent study (KPMG and GfK, 2018) which examined in detail tax compliance costs incurred by businesses found that Germany ranks 17th out of 20 EU countries in terms of total compliance costs relative to turnover ([18]) (see Graph 4.1.3). Similarly, the World Bank finds that the hours needed to comply with tax obligations in Germany come to 218, compared with an average of just 164 hours for 22 other EU countries. This is a reversal of the situation in 2006 (see Graph 4.1.4). Recent measures may have helped reduce tax compliance costs, but they do not address the complexity of the tax system. The current roll-out of the tax administration reform will probably help cut tax compliance costs. The same holds for the recent increase in the upper limit for immediate expensing of assets from EUR 410 to EUR 800. However, the system remains complex, particularly as businesses have to deal with two corporate income tax returns ([19]) based on complex legislation and up to 16 tax administrations that exchange too little information.

Graph 4.1.3: **Cost of tax compliance (as % of turnover)**



Source: European Commission (2018b).

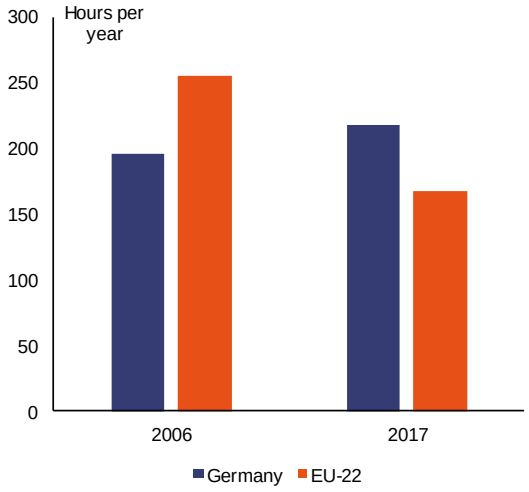
Ensuring a level playing field across businesses is also important to achieve a more efficient tax system. Arrangements, such as the so-called cum-ex and cum-cum trades, aim at unduly obtaining reimbursements of withholding taxes on dividends (Dutt et al., 2018; Buettner et al., 2018) or to benefit from exemptions or a lower rate of withholding tax. This has so far led to an estimated accumulated tax loss for Germany of at least EUR 31.8 billion (Spengel et al., 2017a; Spengel et al., 2017b). While Germany is not the only country affected by such schemes, it is where losses were highest in absolute terms. Although Germany has now also explicitly closed some of the loopholes that were perceived to allow these schemes to operate, further loopholes in the system remain ([20]), which might lead to new avoidance schemes in the future.

([18]) The ranking refers to all taxes. In terms of absolute tax compliance costs, Germany ranks last. It may be that for corporate income tax the result was impacted by the one-off costs related to the introduction of the obligatory E-Bilanz.

([19]) For corporate income tax and local trade tax.

([20]) The current tax rules give incentives to exploit differences in the treatment of dividends from domestic and foreign investors, as well as differences in the treatment of different type of income sources for foreign investors.

Graph 4.1.4: **Paying taxes: time to comply (hours per year)**



(1) EU-22 refers to the average for EU Member States, not including DE, CY, MT, LU, BG or HU.
Source: World Bank, Doing Business Database

Improving the design of the inheritance and gift taxes could reduce inequality, as inherited wealth preserves the large wealth inequality observed in Germany. The Gini coefficient for net wealth in Germany is one of the highest in the euro area. Wealth in Germany is very unevenly distributed: the richest 10 % of households own almost two-thirds of national wealth, the richest 1 % one-third, the richest 0.1 % have 17 % of assets – that is 41 000 households averaging EUR 40 million. As large income and wealth inequalities may be detrimental to economic growth, to macroeconomic stability, and to social cohesion, well-designed inheritance and gift taxes can combat wealth inequality, supporting social mobility and ensuring equality of opportunities in the least distortive manner and with an acceptable level of administrative complexity (OECD, 2018a; Iara, 2015). In 2017 revenues from inheritance and gift tax accounted for 0.19 % of GDP (about 0.5 % of total taxation). In Germany every year, EUR 250 to 300 billion are inherited or given away, and the trend is rising as the wealth of German households has risen to more than EUR 10 trillion. The distribution of inheritances is strongly unequal. The majority inherits nothing or only a little. 45 % of the population can expect to inherit more than EUR 50 000, only 8 % more than EUR 200 000, and 0.1 % more than EUR 5 million, EUR 17 million on average (Bach, 2018).

The German inheritance and gift tax grants large tax exemptions when family businesses are transferred to the next generation. This makes the system complex and inefficient, and disadvantages family businesses that change ownership via market transactions. These exemptions are considered fairly high and result in low effective inheritance tax burden for large and very large capital transfers (Bach and Thiemann, 2016; Dorn et al., 2017). Reforms in 2016 and 2018, following a judgment by the German Constitutional Court that such exemptions are too far reaching and unconstitutional, have changed the situation only marginally. Also, the economic rationale behind granting very generous tax exemptions for family owned businesses is questionable, as it is not clear why a change in ownership via inheritance, where a tax of 7 % to 30 % would be due, is harming jobs or the continuity of the business, whereas the acquisition through an independent third party who needs to pay the full market value is not (BMF, 2012; Kiziltepe and Scholz, 2016). So far, the inheritance and gift tax yields about EUR 6 billion a year, corresponding to an effective tax rate of about 2 %. This revenue could be approximately doubled if the tax exemptions were abolished. The additional revenues that would be generated from abolishing or substantially reducing the exemptions could be used to lower the tax rates of the inheritance and gift tax and in this way reduce the burden on smaller family businesses (Bach, 2018; see also Box 4.1.1, scenario 1). Potential perceived liquidity and financing constraints of new business owners could be addressed by allowing for a longer payment period of the tax obligation([21]), or by financial market solutions, whereby heirs could borrow at favourable conditions as the sum due would only be a fraction of the linked collateral.

Revenues from environmental taxes as a share of GDP are among the lowest in the EU. Germany's environmental tax revenue as a share of GDP fell from 2.4 % of GDP in 2005 to 1.8 % in 2017, compared to a fairly stable EU average of around 2.4 % of GDP (Graph 4.1.3). Environmental taxation encourages more efficient use of resources, and can boost investments and employment. However, in Germany these taxes do

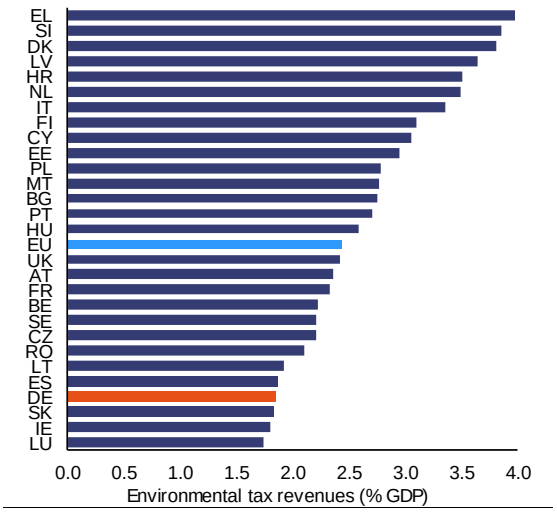
([21]) The current inheritance and gift tax system allow beneficiaries to pay the tax burden from current profits over a period of up to 7 years.

not serve their purpose of sending price signals to all polluters, as they are designed in such a way as to avoid many polluters having to pay, for example via exemptions or preferential rates. Transport fuel tax revenues have decreased as a share of GDP in recent years. Tax rates on motor fuels have not been adjusted since 2003. In addition, there is a favourable tax treatment of diesel compared to petrol, making Germany increasingly an outlier in that it privileges diesel technology through excise duties. Taxation of company cars is also favourable. The implicit tax rate on energy in Germany fell by 26 % to EUR 203.2 per toe between 2005 and 2016, compared with an EU average of EUR 234.8 per toe. Exemptions from the energy taxes and levies for energy-intensive processes were introduced in 2006, when the energy tax law was introduced. Exemptions for sections of the industry from the renewable surcharge add to the electricity bill of other industrial consumers and households and tend to distort price signals.

Fossil fuel subsidies have risen over the past decade. Such subsidies include energy tax and surcharges relief for energy intensive companies and various tax exemptions, e.g. for commercial aviation, public transport, and diesel used in agriculture. The abolition (or limitation) of such measures would allow a shift to taxes that are less detrimental to growth and help resolving environmental issues.

Distortive tax rates differ widely across energy users, fuels and carbon intensity, slowing down emissions reduction and investments in energy efficiency. Taxes and levies on electricity are higher per unit of energy than those on other energy carriers such as petrol and diesel, natural gas and heating oil in Germany (Agora Energiewende, 2018). Coal use is also taxed at lower rates than natural gas use, while there are income tax subsidies for commuting . Moreover, such taxation divergence may explain the slow progress made by Germany in terms of reducing its greenhouse gas emissions in sectors such as transport and heating and cooling, as covered by the Effort Sharing Decision. Projections indicate that Germany will exceed its 2017 Effort Sharing Decision target by more than 20 MtCO2, which makes it unlikely that the overall 2013-2020 target can be met.

Graph 4.1.5: **Environmental tax revenues (% GDP)**



Source: Eurostat

Box 4.1.1: Tax shift from labour to inheritances and gifts

As in previous years, the 2018 Council CSRs for Germany recommend reducing the high tax wedge for low-wage and second earners and improving the efficiency and investment-friendliness of the tax system. The tax wedge on labour in Germany is one of the highest in the EU, including for low-wage earners. Inheritance and gift tax, on the other hand, grants relatively large tax exemptions when family businesses are transferred to the next generation. This makes the system overly complex, inefficient and subject to tax planning (Bach, 2016; Bach and Thiemann, 2016; Kopczuk, 2012).

This box provides a summary of three hypothetical scenarios of tax shifts away from personal income and social security contributions and towards inheritances and gifts. ([1]) In the current system (baseline), inheritances and gifts are taxed at progressive rates that depend both on the value of a transfer and on the relational proximity of an heir to the deceased person or donor. Furthermore, certain types of wealth, such as business wealth, are partially tax-exempt. In the three hypothetical inheritance and gift tax scenarios, all tax exemptions are removed, but a basic allowance of EUR 400 000 per taxpayer is kept.

1. The first scenario replaces the progressive rates by a proportional rate of 10 %. The additional tax revenue over and above the baseline is used to reduce the personal income tax burden by raising the minimum threshold of the solidarity surcharge from EUR 81 to EUR 156/month (of tax liability).([2])

2. The second scenario keeps the existing progressive tax rates. The additional tax revenue over and above the baseline, is used to lower the personal income tax and social security burden, by raising the solidarity surcharge threshold further to EUR 316/month and by extending the midi-zone from EUR 850 to EUR 2 000/month, phasing in contributions linearly.

3. The third scenario keeps the existing progressive tax rates, except for the top bracket. The top marginal tax rate, applied to wealth transfers above EUR 26 million, is raised from 30 % to 50 %. The additional tax revenue over and above the baseline is used to flatten the 'middle-class bulge' by extending the second tax bracket from EUR 13 996 to EUR 16 500.

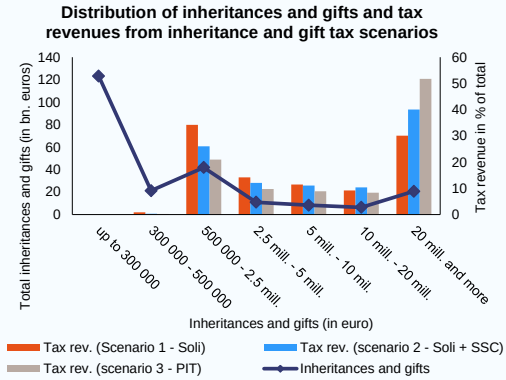
Static distributional and budgetary impact. The static overnight budgetary effect, in the absence of behavioural responses ([3]), differs substantially from one scenario to another. While the first scenario yields about EUR 550 million over and above the baseline, the second (+EUR 9.0 bn) ([4]) and third scenarios (+EUR 12.7 bn) increase revenue significantly more (Table 1). A large share of wealth transfers is tax-exempted and most (second-most) revenue is collected from inheritances of gifts above EUR 20 m. (EUR 500 000 – EUR 2.5 m) in all scenarios (Figure 2.1). All three tax shift scenarios lower the tax burden or social security contributions on labour and lead to higher income. The distributional impact of the solidarity surcharge ('Soli') reform (Scenario 1) is very limited, whereas the second scenario ranks highest in redistributive terms. All deciles of the income distribution benefit from flattening the 'middle class bulge' (Scenario 3), in particular households located between the fourth and the ninth decile (Figure 1.2).

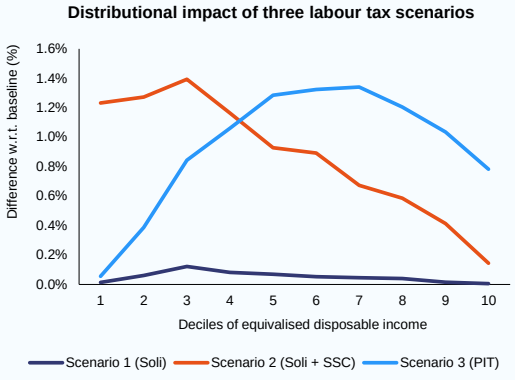
Table 1: **Budgetary impact of the reform scenarios (in million EUR)**

	Baseline	Absolute difference from baseline: Scenario 1 (Soli)	Scenario 2 (Soli + SSC)	Scenario 3 (PIT)
Part I: Inheritance and gift tax				
Tax revenue	6,305	546	8,964	12,670
Part II: Income tax burden				
Personal income tax (PIT)	381,834	-588	-331	-12,889
Total employee SSC	215,837	0	-9,819	0
Total means-tested benefits	71,410	-18	-1,110	-223
Net budgetary effect	-	-570	-9,041	-12,666

(1) EUROMOD simulations use 2018 tax rules as a benchmark, with 2016 incomes measured by the EU SILC survey, uprated to 2018.
Source: European Commission, Joint Research Centre, based on EUROMOD and based on Bach and Thiemann (2016) (inheritance and gift taxation).

Graph 1: **Overview of simulation results**





(1) According to the simulations, about EUR 235 billion of inheritances and gifts are transferred yearly. In all three scenarios, the tax is levied on the net value of an inheritance or gift, applying a basic allowance of EUR 400 000 per taxpayer. Tax rates vary across scenarios: a proportional rate of 10 % (scenario 1), the existing progressive rates, based on transfers from a parent (scenario 2) and the existing progressive rates as in scenario 2, replacing the top rate by 50 % (scenario 3).
Source: European Commission, Joint Research Centre, based on EUROMOD and based on Bach and Thiemann (2016) (inheritance and gift taxation).

Macroeconomic impact of the labour tax scenarios. There are no sizeable macroeconomic effects under the first scenario. However, the reduction of the tax burden on labour under the other scenarios increases employment and GDP, both in the short run and in the medium term (after 5 years). Employment increases by a similar amount in the medium term under scenarios 2 and 3 (+0.16 % or +0.18 %, respectively). This effect is mainly driven by low-skilled (scenario 2) and medium- and high-skilled employment (scenario 3). After five years, higher employment boosts economic output by 0.11 % (0.15 %), consumption by 0.18 % (0.24 %) and investment by 0.06 % (0.08 %) under scenario 2 (scenario 3) relative to the baseline.

([1]) The simulation of the inheritance and gift tax scenarios closely follows Bach and Thiemann (2016). It relies on a consistent micro-based distribution of net wealth of German households in 2015. The wealth distribution, created from the second wave of the Household Finance and Consumption Survey (HFCS), includes a supplementary part that adjusts for the under-representation of the very wealthy households in the survey data (Bach et al., 2018a). By combining the database with current mortality probabilities, by gender and age, we simulate the potential number of deaths over ten years (2015 – 2024). From this we infer the potential distribution of inheritances over the coming years, which enables us to simulate inheritance and gift tax scenarios. The simulation requires several assumptions, described in Bach and Thiemann (2016) and applied to the more recent data from 2015. In particular, we assume that net wealth for 2015 remains constant over the entire simulation period. Considering all assumptions, we expect the future inheritance and gift flow to be noticeably underestimated. Inheritance and gift tax revenue, under the current law (baseline), is estimated as the average of the values for 2016 and 2023, using the official projections made by the Ministry of Finance (BMF, 2018). The static distributional and budgetary impact of the corresponding income tax reforms is simulated using EUROMOD; see Figari and Sutherland (2013) for a comprehensive introduction to the

model. In simulating a tax shift from labour to wealth transfers, we combine two separate microsimulation models (EUROMOD and the model used by Bach and Thiemann, 2016). In doing so, we implicitly assume that the inheritance and gift tax is paid out of the wealth transfer without affecting the disposable income of the heirs. In other words, inheritances and gifts are treated as exceptional events.

([2]) The solidarity surcharge on capital income is not affected.

([3]) In particular, the second and third inheritance and gift tax scenarios are likely to trigger behavioural responses which could eventually lower overall tax revenue.

([4]) The change in PIT revenue is relatively small because of two opposing effects: exempting a larger share of income from the Soli (lower PIT) is partially offset by lower social security contributions, which in turn increases the PIT tax base (higher PIT).

Healthcare

Public spending on healthcare and long-term care in Germany is projected to increase in response to demographic developments, but fiscal sustainability risks are low. Total health expenditure per capita is among the highest in the EU, and expenditure as a share of GDP is also the second highest (11.3 % of GDP in 2017), with only France spending more in the EU. As a consequence of population ageing, healthcare expenditure on people insured under the Statutory Health Insurance scheme is projected to increase by 0.7 pps. of GDP, below the expected average growth level in the EU (0.9 pps. of GDP). Taking into account the impact of non-demographic drivers (such as medical and technological advances) on future spending growth, healthcare expenditure on people insured under the Statutory Health Insurance scheme is expected to increase by 1.5 pps. of GDP between now and 2070 (EU: 1.6) (European Commission, 2018d).

There is room for efficiency gains, especially in hospital and pharmaceutical care. The cost of in-patient hospital care is on the rise in Germany. Hospital care is characterised by a high density of healthcare facilities, mostly in urban settings, pointing towards a significant oversupply in some urban areas. The number of hospitals and hospital beds per 1 000 inhabitants and the average length of stay in German hospitals are declining only slowly and are still among the highest in the EU. 93 % of hospital expenditure goes on in-patient care involving an overnight stay, the second highest in the EU, while the shares of out-patient and day-care are very low. Better cooperation among the various healthcare services and with services providing social care and care for the elderly could improve efficiency.

Expenditure on pharmaceuticals is high and rising, and recent cost-containment reforms have not been able to stop the increase. Expenses incurred for pharmaceuticals by the Statutory Health Insurance funds and co-payments by patients rose by 3.7 % between 2016 and 2017, reaching EUR 39.9 billion. The main reason for the increase was newly licensed patent-protected pharmaceuticals, which account for 45 % of Statutory Health Insurance pharmaceutical expenditure (Schwabe et al., 2018). Germans spend the most per capita in the EU on retail pharmaceuticals. Annual pharmaceutical spending growth in hospital settings in Germany has outpaced that of retail pharmaceuticals in recent years. The Act on the Reform of the Market for Medicinal Products has been only partly effective in containing rising expenditure on pharmaceuticals, mainly because of the one year long free price setting by pharmaceutical companies. Unjustified restrictions of imports of prescription medicinal products from foreign online pharmacies continue.

The legal framework for statutory health insurance and private health insurance creates inefficiencies and challenges the solidarity principle in healthcare. Although several reforms have improved the situation, the current legal framework, which allows people on higher incomes, civil servants and the self-employed to opt out of the statutory health insurance scheme, weakens the risk- and income-based solidarity principle in healthcare. Moreover, doctors can charge patients with private health insurance more than those covered by the statutory health insurance scheme. This creates inequalities in waiting times and the accessibility of medical services. It also incentivises over-provision of health services to private health insurance patients. A working group on the future of the German healthcare system has been commissioned to put forward proposals by 2020, including on how to reform payment for health services.

Pension system

Demographic change will strain German public finances and challenge the adequacy of pensions. Fiscal sustainability risks are currently low in Germany, due in large part to a relatively high primary surplus. However, a less ambitious fiscal position, more in line with historical averages, would point to medium sustainability risks. The retirement of the baby boomer generation is affecting Germany more than other EU countries. By 2040, the country is expected to be facing one of the largest increases in spending on public pensions in the EU (up by 1.9 pps. of GDP), while the public pension benefit ratio is expected to fall by 4.4 pps., to 37.6, according to the 2018 Ageing Report (European Commission, 2018d) (see Box 4.1.2).

Fiscal framework

For the first time the macroeconomic forecast underlying the budgetary projections is endorsed by an independent body. In July 2018, the Regulation on the Economic Projections of the Federal Government ('*Vorausschätzungs-verordnung*') came into effect. It names the Joint Economic Forecast Project Group, comprising the five leading German economic research institutes, as the independent body responsible for endorsing the macroeconomic forecast underlying the draft budgetary plans. On 16 October 2018, the Joint Economic Forecast project group gave a favourable opinion endorsing the macroeconomic projections underlying the draft budgetary plan for 2019. As regards the upper limit on the general government structural deficit of 0.5 % of nominal GDP, the Stability Council's Advisory Board assesses Germany as complying with the rules (in its report of December 2018).

Germany continues to conduct spending reviews to increase the efficiency and effectiveness of government spending. Since 2015, the country has held yearly cycles of spending reviews targeting specific policy areas and ministries. The 2017-2018 cycle covered the topics of 'procurement of standardised bulk articles' and 'humanitarian aid and transition aid, including crisis prevention, crisis response, peace-keeping and development cooperation', whereas the ongoing review cycle for 2018-2019 analyses the 'management of receivables'.

The implementation of accrual accounting is uneven. Accrual accounting as a public accounting standard provides a comprehensive and transparent overview of a public body's financial position and performance and can support sustainability and intergenerational equity. A majority of public bodies in Germany at the municipal level have now switched to accrual accounting, but this is not the case at federal level or consistently at the state level.

Box 4.1.2: **Reform options for the German pension system**

While recent government measures commit to providing adequacy for certain groups, guaranteeing adequate pensions in the long run may require structural measures. The government has increased pension entitlements for mothers and for **people with disabilities** (see Section 4.3.2), and set two 'stop lines'(*doppelte Haltelinie*), capping the pension contribution rate at 20 % and setting a lower limit for income replacement rates at 48 % up to 2025. However, retaining these upper and lower limits under current policy settings is expected to require significant fiscal transfers. (Börsch-Supan et al., 2018) Since ageing will already affect the labour market strongly as of 2023, the Pension Commission's recommendations, due by March 2020, appear very timely.

The pensionable age is a key adjustment variable. Germany currently has an implicit link between pension levels and life expectancy (as pension indexation is linked to the ratio of pensioners to workers). Consequently, higher life expectancy means lower pension levels. Raising pensionable age by two thirds of life expectancy increases would maintain the current ratio of 1:2 in terms of the average time spent in retirement versus time spent working, without compromising pension adequacy. The link could be made explicit and applied to pensionable age, as is the case in the Netherlands, Denmark, and other countries.

Broader reforms of pension arrangements could also be considered. For instance, notional defined contribution systems([1]) could be one policy solution. Countries such as Sweden have had good experiences with a notional defined contribution system, even though there are also challenges (Weaver and Willén, 2014). Their potential advantages include the fact that they: (1) create a sense of fairness, as annual benefits are in line with life-time contributions; (2) make redistribution transparent, as any non-contributory credits can be clearly shown (credits for education, bring up of children, unemployment etc.); and (3) provide an automatic response to demographic change (longevity, fertility) and developments in employment. However, they need fine-tuning, as there are also disadvantages, including the lack of substitutes for pre-funding and the lack of an automatic balancing mechanism if annuities are frozen at retirement and the contribution rate is fixed.

Pension coverage could be improved to secure better retirement outcomes. Making the first public pension pillar more comprehensive, so as to cover self-employed people as well, would be helpful (see section in 4.3.2); however, civil servants still remain outside. In addition, well-designed second and third pillar pensions could significantly supplement the first pillar. Currently, occupational pensions cover about 56 % of workers in Germany and private pensions about 34% (the coverage of occupational and/or private pension is estimated at 70% of workers). There are a number of problems with the design of private pension schemes in Germany (*Riester-Rente*), such as information gaps, low/negative yields and high administrative costs. The wide variation in administrative costs suggests the existence of market failures, as providers with the highest administrative costs have not left the market. In addition, the current structure of Riester subsidies requires a specific set-up of life insurance plans and related guarantees, which contributed to portfolio allocation oriented towards low-yielding safe debt ([2]) and foreign debt securities. The tax incentives thus implicitly impede households from switching to third-pillar plans with higher returns and higher equity investment allocation.

In addition to adequacy and sustainability, the fairness and regressivity of the pension system also needs to be considered. In Germany, people at risk of poverty (with incomes below 60 % of the median income) live, on average, 10 years less than rich people (those with incomes above 150 % of the median income), and consequently receive their pension for a much shorter time. (Federal Government of Germany, 2017). Furthermore, compared to other OECD countries, net replacement rates for low-wage earners are particularly low in Germany (see Section 4.3.2). These factors lead to strong regressivity in the pension system from a life-time perspective.

([1]) Notional defined contribution schemes record each worker's contributions in an individual account and apply a rate of return to the accounts. The accounts are 'notional' in that both the incoming contributions and the interest charged on them exist only on the books of the managing institution.

([2]) One example is their feeding of EUR 60 bn into the Zinszusatzreserve that was introduced in 2011.

4.2. FINANCIAL SECTOR

Macro-financial stability

Germany's banking sector has appropriate capital and liquidity levels, but is challenged by relatively high costs. Fierce competition among Germany's various banks weighs on their profits, but, at the same time, finances the real economy on quite favourable terms. Running an extensive branch network, the operating costs of German banks are very high, with a cost to income ratio of more than 71.9 % at the end of 2017. Despite a 3.7 % decrease in staff number, this is 2.6 percentage points higher than in 2016.

Banks are still very much dependent on interest income. Interest intermediation income accounted for 69.5 % of bank revenues in 2017, a decline of 1.7 percentage points. Pure intermediation revenue sank by 7 % to EUR 71 billion, as banks are still cautious with negative deposit remuneration, hence reducing the profit margin. Yet the importance of intermediation income differs widely among bank types: it provides for 57.3 % of total operational results for big banks, which earn more trading profits and commissions. For the smaller savings banks, it stands at 73.9 % and at 75.3 % for (even smaller) cooperatives. The net interest margin varies considerably between banking types: 1.90 % for cooperatives, 1.87 % for savings banks compared to the average of 1.04 %.

An increasing share of deposits is remunerated negatively. In January 2017, 26 % of sight deposits faced negative interest rates. This rose to 50 % by December 2017. Negative interest rates concern mainly large corporate deposits. Since March 2017, the weighted remuneration of overnight company deposits has been negative. Only 4 % of the volume of households' deposits earns negative interest, but the number of banks passing on negative rates to clients quadrupled throughout 2017, rising from 3 % to 12 %.

Capitalisation is slightly above the EU average. In June 2018, German banks' Common Equity Tier 1 ratio stood at 15.8 %, compared to 14.9 % in the EU and 14.7 % in the euro area. In September 2018, the capital and reserves of all German banks were EUR 595 billion, a 63 % increase since September 2008, when Lehman Brothers went bankrupt. The ratio of balance sheet capital to unweighted total assets reached a new peak of 5.9 %. Except for the *Landesbanken* and mortgage banks, total equity rose in all bank categories over 2017. German capitalisation ratios have increased more slowly than elsewhere in Europe, as most banks in Germany are not stock companies able to issue shares, but are rather publicly or cooperatively owned, and tend to rely on organic capital accumulation.

The share of non-performing loans is half the euro area average. In June 2018, non-performing loans were 1.7 % of the total loan volume, 60 basis points lower than 12 months earlier. Hence, Germany scores well below the EU's and euro area's averages (3.4 % and 4.2 %).

Credit grows in line with nominal GDP and passive deleveraging has stopped. Banks' outstanding credit for the private non-financial sector was EUR 2 696 billion at the end of September 2018, 4.5 % higher than a year before, and something of an acceleration from the 2-3 % yearly increases observed earlier. Measured as a share of GDP, outstanding credit increased by 0.5 pps to 80.5 % of GDP in the year until end of September 2018. This minimal increase is the first time that private non-financial debt is growing again (relative to GDP) since 2001 when private sector outstanding credits peaked at around 103 % of GDP.

Mortgage growth at the aggregate level has been moderate, but some recent acceleration can be observed. Although the overall outstanding stock of mortgages increased (Graph 4.2.1), it did so at a pace similar to nominal GDP growth. Consequently, aggregate mortgages have been hovering around 35 % of GDP over the past six years. More recently, some moderate acceleration can be observed, as the annual expansion of housing credits was 4.5 % in September 2018, compared to 3.9 % 12 months earlier.

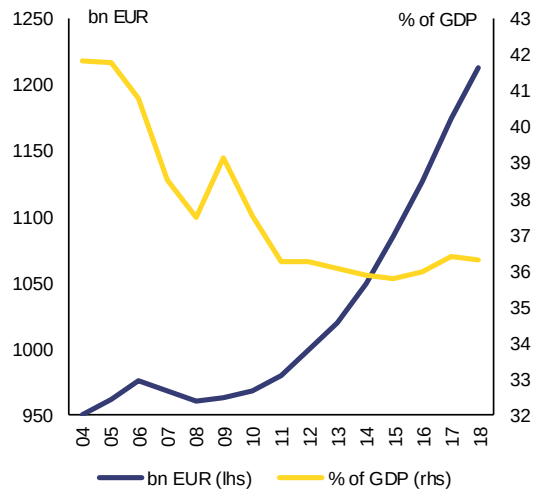
House price increases are not leading to any macroeconomic or financial stability risks. Whereas increases in recent years could be seen as a price normalisation process, by now housing markets in Germany's seven biggest cities are estimated to have reached overvaluations of up to 30 % (see also Chapter 1). Still, a real estate price correction of 30 % and the related financial stress is not expected to bring banks below regulatory capital minimums (Bundesbank, 2018).

Table 4.2.1: **Quarterly financial soundness indicators**

	14q4	15q4	16q2	16q3	16q4	17q1	17q2	17q3	17q4	18q1	18q2	EU 18q2	EA 18q2
Non-performing loans	3,9	3,0	2,8	2,7	2,6	2,5	2,3	2,1	1,8	1,7	1,7	3,4	4,2
o/w foreign entities	0,7	0,7	3,1	3,0	0,7	0,7	0,7	0,6	1,7	2,2	2,3	-	-
o/w NFC & HH sectors	6,7	4,9	5,0	4,9	4,6	4,6	4,3	4,0	3,0	2,9	2,8	-	-
o/w NFC sector	8,9	6,5	6,6	6,5	6,4	6,3	6,0	5,6	4,1	3,8	3,6	6,7	7,7
o/w HH sector	2,9	2,3	2,1	2,0	1,8	1,8	1,8	1,7	1,8	1,9	1,9	3,7	4,4
Coverage ratio	34,8	36,7	37,4	38,1	36,9	37,1	38,4	38,4	56,5	55,1	54,3	47,2	49,0
Return on equity(1)	2,5	1,7	1,6	1,3	2,2	2,4	1,9	2,0	2,9	4,1	4,8	8,0	6,8
Return on assets(1)	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,2	0,3	0,3	0,5	0,5
Total capital ratio	17,3	17,9	17,8	17,9	18,1	17,9	18,4	18,7	18,8	18,3	18,5	18,7	17,9
CET 1 ratio	14,3	14,9	14,8	14,9	15,0	14,9	15,4	15,8	15,9	15,4	15,8	14,9	14,7
Tier 1 ratio	14,8	15,4	15,4	15,5	15,6	15,6	16,0	16,4	16,4	16,0	16,3	16,2	15,6
Loan to deposit ratio	97,5	94,6	94,2	95,2	92,6	92,5	91,0	91,2	89,4	90,5	90,3	95,6	96,0

(1) Annualised data. o/w: out of which.
Source: ECB – CBD2 – Consolidated Banking data; own calculations

Graph 4.2.1: **Mortgage debt, volume and % of GDP**



Source: ECB

The borrower-based macro-prudential toolkit is not yet complete. The introduction of loan-to-value caps and maturity limits, i.e., amortisation requirements, was enabled in 2017. Yet the macro-prudential toolkit lacks income-based instruments, such as the possibility of introducing debt-to-income and debt-service-to-income limits. The loan-to-value caps' activation process legislated for by Germany is lengthy and complex. In other countries, supervisors have had to yield to political pressures when restraining the allocation of mortgages for reasons of macro-financial stability.

Squeezed revenues from the low interest rate environment, costs incurred through digitalisation, regulatory requirements and the entry of new competitors will intensify the challenges facing banks in the near future. The large number of small banks, coupled with a still relatively strong dependence on interest income, makes the German banking system more vulnerable to current challenges. Digitalisation requires costly upfront investments in software applications, back office, and internet security. Fintech and Bigtech companies increase competition in parts of the financial system and are thus expected to further reduce the margins of traditional banks.

Banks will need a strategic vision to address these challenges by reviewing their business model, considering mergers and cutting costs further. Realising hidden reserves, increasing the maturity transformation, and taking higher risks have kept profitability positive during the past years, and capital ratios still look healthy. Yet there will be a need in the future for a comprehensive strategy in keeping up with the increasingly digital and competitive environment.

Access to finance

Overall, firms have good access to credit and other forms of capital. According to the Commission/European Central Bank SAFE survey, access to credit is not a concern for most firms in Germany, as illustrated by the low levels of rejected loan applications. German small and medium-sized enterprises benefit from a huge network of banks, which serve the local economy. Relationship banking (the '*Hausbank*') means regional banks maintain an established client relationship over many years, resulting in an in-depth knowledge of the business seeking credit. This is helped by the fact that the backbone of

German industry is its *Mittelstand* - often non-listed, family-owned companies which, however, have a larger volume of activities (including export-oriented business) and more employees than the typical small and medium-sized enterprise. Such firms have fewer concerns about providing collateral for bank credit, but the owners, often founders who remain active in day-to-day business, shy away from the publicity and transparency that would come with a listing.

In addition to bank credit and classic bonds, Germany offers other financing alternatives. Promissory notes (*Schuldscheine*) are a widely-used alternative. Given that the set-up cost for a promissory note is a fraction of a classic bond, it remains a viable financing alternative for smaller companies as well as large ones. The German covered bond market is very strong, and the *Pfandbrief* (bank debenture with usually triple A rating) with its strict coverage rules caters for a widespread risk-averse attitude. In recent years, investors in bonds listed by medium-sized companies (*Mittelstandsanleihen*) have suffered heavy losses, which some have explained as negative selection, since bank credit would be the financing method of choice for small and medium-sized enterprises that are doing well.

The provision of venture capital has improved in recent years, but remains below the EU average. Although venture capital as a percentage of GDP has improved, it is still lower than in 2008 and also remains below the EU level of 0.04 % (Invest Europe, 2018). Aggregate private equity investment is also below the EU average. Corporate investors have become an increasingly important source of funding for start-up companies in Germany and have contributed to a significant expansion of the market in recent years. Moreover, non-venture capital companies investing in start-ups have also increased their investment volumes. Within the German venture capital market, corporate investment has become increasingly concentrated in a few metropolitan areas, with Berlin and Munich attracting a particularly large share of investment.

Despite increasing venture capital investment, the limited availability of scale-up capital is still an impediment to the growth of domestic start-ups. While overall framework conditions are favourable, obstacles remain, especially for the growth phase of young and innovative businesses, where funding opportunities are often limited. The lack of alternatives to later-stage rounds of financing for the capital-intensive scale-up phase is a constraint on the growth of domestic start-ups (Expert Commission on Research and Innovation, 2017). Although a number of support measures are in place, initiatives to encourage institutional investors such as insurance companies to invest in this market could help bridge this gap. The national investment bank *KfW* intends to further expand its support activities, using a separate investment company among other means.

4.3. LABOUR MARKET, EDUCATION AND SOCIAL POLICIES*

4.3.1. LABOUR MARKET

On the back of robust economic growth, the German labour market has continued to tighten. Employment is expected to have continued growing by 1.3 % in 2018, pushing unemployment down to its structural level, a record low of 3.2 % in Q4 2018, which is also highlighted in the Social Scoreboard accompanying the European Pillar of Social Rights. Employment growth in 2019 is expected to slow down as compared to 2018 as the labour market continues to show increasing signs of labour shortages. Employment and activity rates continue to improve, but more could be done to tap the potential of certain groups.

With record low unemployment and a high job vacancy rate, labour shortages are increasingly apparent. Reflecting the strong cyclical position and the steady decline of unemployment, the labour shortage indicator increased to very high levels in the first three quarters of 2018, which points towards a tightening labour market (see Graph 4.3.1) ([22]) This is also clear from the number of vacancies registered at the public employment service that reached a high level of around 800 000 (seasonally adjusted) in May 2018 and has remained at this level since (until January 2019),, and from the job vacancy rate, which reached 2.9 % for the first three quarters of 2018, up by 0.2 pp from the same period in 2017. The percentage of firms reporting a labour shortage as a factor limiting production in the service sector has risen to 30.5 %, for industry to 25.8 %, and for the construction sector to 15.8 % for the first three quarters of 2018.

Shortages of qualified staff may be an obstacle to economic development, requiring further investment. ([23]) Labour shortages have a strong regional dimension as well as a sectoral one. They hit the economically strong regions in southern Germany (Bavaria, Baden-Württemberg), while parts of the former East Germany, including Thuringia, are also affected. Sectors such as healthcare and long-term care (in particular elderly care), engineering and Information Technology development are particularly affected. ([24]) Though the government has implemented measures in some of these sectors, ([25]) they appear to be limited compared to the projected shortages, especially in underserved regions. New rules for immigration of skilled workers may increase the competitiveness of the sectors concerned. Improving human capital by stepping up investment in education and improving the skills of the labour force (see also Section 4.3.3) could help alleviate these concerns in the future, while also contributing to higher overall investment (see Section 4.4.)

Graph 4.3.1: **Beveridge curve**



(1) Annual data based in the average of the 4 quarters
Source: Eurostat, European Commission

Even as labour shortages increased, real wage growth has picked up little. Nominal earnings rose by 3.0 % in 2018, 0.5 pp higher than in

([22]) The ifo Institute's labour shortage indicator as well as the Federal Employment Agency's BA-X job vacancy index have been climbing to all-time highs since 2015.

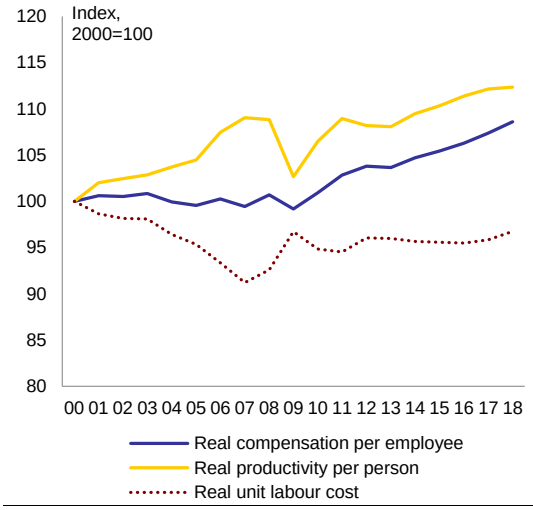
([23]) In a business survey (DIHK, 2018), 68 % of companies cited a shortage of qualified staff as an obstacle to investment, and the share of firms that said the shortage of skilled workers was impeding their innovation activity was even higher, at 82 % (DIHK, 2017). Limited availability of skilled staff was also the most frequently mentioned investment barrier in the EIBIS survey (EIB, 2018), with 84 % of firms naming this as an obstacle (EU average 77 %). Economic simulations suggest that the lack of about 440 000 skilled workers may be slowing down economic growth by about 0.9 pps. (IW, 2018).

([24]) Studies project a shortage of nursing staff in healthcare and long-term care sectors by 2030. The projected shortfall ranges from 260 000 (under a best-case scenario) and half a million (under the worst case scenario) (Rothgang et al., 2012).

([25]) Staff (Strengthening) Act (*Pflegepersonal-Stärkungsgesetz*), designed to make healthcare and long-term care accessible to employees in hospitals and residential homes. The act provides for a range of measures, including employing an additional 13 000 long-term care staff.

2017. ([26]) Gross wages and salaries grew somewhat more from 2.5 % in 2017 to 3.2 % in 2018. ([27]) Monthly negotiated wages are expected to have increased by 2.8 % in 2018, 0.2 pp higher than in 2017, leaving real negotiated wages unchanged. Wage agreements in the public sector were slightly more dynamic. ([28]) Part of the higher aggregate wage growth can be explained by the changing composition of the workforce (and in particular increasing average age) rather than by the increase in individual wages (European Commission 2018e). In addition, concentration of employment growth in better-paid full-time employment and a reduction of the employment share of marginal part-time work also contributed to overall wage growth in 2018. The accumulated gap between productivity and real wage growth since 2000 persists (graph 4.3.2) and is not expected to close rapidly in 2018 and 2019.

Graph 4.3.2: **Real unit labour cost, real compensation per employee and real productivity - compared to 2000**



Source: Eurostat, European Commission

Weaker coverage of collective agreements may have contained wage growth. Collective bargaining coverage continued to decline (by 2 pp from 2016 to 2017), to 49 % in the west and 34 % in the east. There are significant differences in terms of coverage across sectors, with better coverage in the public sector and industry, while services have a much lower coverage. The differences in coverage are also quite prominent across different wage groups, where only just over a quarter (27 %) of the two lowest wage quintiles was covered in 2014 by a collective agreement; in contrast, bargaining coverage in the two highest wage quintiles was over 60 % (Hayter and Visser, 2018). While in principle facilitating the legal preconditions for extension, the 2014 reform of the collective bargaining law has brought about no significant changes to the number of collective agreement extensions. This may indicate that there are still significant obstacles preventing extensions. ([29])

([26]) At the same time, inflation also accelerated slightly, from 1.7 % to 1.9 %.

([27]) Growth of nominal earnings is expected to accelerate further on the back of a one-off effect: the reintroduction of the rule requiring employers and employees to pay equal contributions to statutory health insurance in 2019. This reduces contributions for employees (and pensioners) by 0.5 pp, thereby increasing take-home pay.

([28]) For public employees at the federal and the municipal level, a wage agreement was reached, running for 30 months from March 2018, affecting about 2.3 million workers directly and 300 thousand workers indirectly. This stipulates wage increases and lump-sum payments, altogether yielding about 3.0 % of annualised nominal wage increase.

([29]) The recent reform did not change the role of the Collective Bargaining Committee and left its de facto veto power in place. In practice sectoral organisations are discouraged from applying for extension when they expect that the peak employers' association will reject it. (Hayter and Visser, 2018).

Box 4.3.1: Monitoring performance in light of the European Pillar of Social Rights

The European Pillar of Social Rights is designed as a compass for a renewed process of upward convergence towards better working and living conditions in the European Union.([1]) It sets out twenty essential principles and rights in the areas of equal opportunities and access to the labour market; fair working conditions; and social protection and inclusion.

Germany performs well on the indicators of the Social Scoreboard supporting the European Pillar of Social Rights. It is among the best performers as regards high employment, the youth NEET rate and the net earnings of a full-time single worker. Nonetheless, equal opportunities in the labour market and fair working conditions, as well as the issue of labour market segmentation, need continuing attention.

SOCIAL SCOREBOARD FOR GERMANY		
Equal opportunities and access to the labour market	Early leavers from education and training (% of population aged 18-24)	On average
	Gender employment gap	On average
	Income quintile ratio (S80/S20)	On average
	At risk of poverty or social exclusion (in %)	Better than average
	Youth NEET (% of total population aged 15-24)	Best performers
Dynamic labour markets and fair working conditions	Employment rate (% population aged 20-64)	Best performers
	Unemployment rate (% population aged 15-74)	Better than average
	Long-term unemployment (% population aged 15-74)	Better than average
	GDHI per capita growth	On average
	Net earnings of a full-time single worker earning AW	Best performers
Social protection and inclusion	Impact of social transfers (other than pensions) on poverty reduction	On average
	Children aged less than 3 years in formal childcare	To watch
	Self-reported unmet need for medical care	Better than average
	Individuals' level of digital skills	Better than average

Members States are classified according to a statistical methodology agreed with the EMCO and SPC Committees. The methodology looks jointly at levels and changes of the indicators in comparison with the respective EU averages and classifies Member States in seven categories (from "best performers" to "critical situation"). For instance, a country can be flagged as "better than average" if the level of the indicator is close to EU average, but it is improving fast. For methodological details, please consult the draft Joint Employment Report 2019, COM (2018)761 final.Data update of 29 January 2019.
NEET: neither in employment nor in education and training; GDHI: gross disposable household income.

Despite the overall good labour market situation, some challenges remain, such as reducing the number of the long-term unemployed. Since 2008, the number of people in long-term unemployment halved to around 900 000. However, at 1.6 % of the labour force in 2017, those in long-term unemployment accounted for 41.9 % of all unemployed people in the country. This represents considerable unused labour market potential.

Germany recognises that the provision of sufficient childcare, of good quality, for the under-threes is an essential condition to enable parents with caring responsibilities to work longer hours. It is thus implementing systematic and ambitious measures to improve the situation. These have resulted in a substantial increase in childcare provision. Moreover, in June 2018 Germany adopted a programme called 'Childcare financing' to support the expansion of childcare places for very young children, to increase the number of women working full-time. The programme, with a budget of EUR 3.28 billion, aims to provide an additional 100 000 childcare places. In September 2018, the Government adopted a bill on quality in early childhood education and care which took effect at the beginning of 2019 (see Section 4.3.3).

([1]) The European Pillar of Social Rights was proclaimed on 17 November 2017 by the European Parliament, the Council and the European Commission. https://ec.europa.eu/commission/priorities/deeper-and-fairer-economic-and-monetary-union/european-pillar-social-rights/european-pillar-social-rights-20-principles_en

While their share is still high, low-paid workers have generally benefited from the gradual introduction of the minimum wage since 2015. Hourly wages at the very bottom of the wage distribution, notably the two lowest wage deciles, increased substantially, while the number of hours worked in the bottom deciles have decreased. ([30]) However, the share of low-paid workers remains

([30]) In the same time research by Caliendo et al., (2017) shows that while average hourly wages at the lower end of the wage spectrum have increased, the number of hours worked in the bottom deciles have decreased, such that there was hardly any effect on monthly earnings.

large, at 22.7 % in 2016. Even if it has declined from 24.5 % in 2010, it is considerably above the EU average (17.2 % in 2014). (Institut für Arbeit und Qualifikation, 2018) and some 0.8 million are still earning below the minimum wage. The number of people employed only in mini-jobs fell by 6.8 % over 2010-2018 and employment subject to social insurance rose by around 18.1 % in the same period. There was sustained growth in the number of people employed in a mini-job as a second job: from 1 963 000 in 2010 to 2 364 000 in March 2014 and to 2 756 000 in March 2018.

Better use of and investment in women's labour market potential could reduce labour shortages and help tackle ageing. Germany has one of the highest employment rates for women in the EU, and this has been increasing steadily over the past 10 years, reaching 75.2 % in 2017. Female labour market participation is, however, more limited when one considers full-time equivalents, as almost half (46.8 %) of women's employment is part-time. The unadjusted gender pay gap is among the highest in the EU (in 2016, women in Germany earned 21.5 % less than men in hourly wages, the EU average being 16.2 %). While the adjusted gender pay gap is more limited, the considerable gap reflects the negative effect of part-time employment on wages and the over-representation of women in low-pay sectors, among other factors ([31]).

A number of measures are being taken to reduce disincentives to work more hours, yet major obstacles remain. The family benefit supplement, responsible for high marginal effective tax rates for single earners, expected to be tapered out from 2020 more gradually as income increases, instead of full withdrawal at the cut-off point. Other measures, such as the right to return to full-time employment, may also help get more women into jobs. However, taxes on labour in Germany remain relatively high (see Section 4.1), with a high tax wedge, especially for lower wage earners. ([32]) The particular rules governing joint income taxation for married couples (*Ehegattensplitting*) are a major factor in disincentivising longer working hours for second earners (Englisch and Becker, 2016; European Commission, 2018a).

Some measures have been taken to reduce the high tax wedge on low-income earners. While the reduction in the unemployment contribution was counterbalanced by the increase in the long-term care contribution rate (-0.5 pp. and +0.5 pp.), the midi-job threshold was increased from EUR 850 to EUR 1300, resulting in a more gradual phase-in of social security contributions. This reduces the tax wedge for certain groups of low earners, and the Government expects it to benefit 3.5 million employees, among them a large number of women working part-time. The developments warrant close monitoring, as there may be adverse effects arising from increased incentives for staying in part-time employment or reducing hours worked (Bach et al., 2018b). The reintroduction of the rule requiring employers and employees to pay equal contributions to statutory health insurance resulted in an average reduction of 0.5 pp. in contributions for employees and pensioners, thereby increasing take-home pay and unit labour costs. Yet as this was counterbalanced by an increase in employers' contributions, the effect of this measure on the tax wedge is neutral.

People with a migrant background have a lower employment rate than people with a native background, with a particularly high gap for women. In 2017, people born outside the EU represented as much as 12 % of the working-age population (20-64), but their employment rate continued to be, at 64.5 %, significantly lower than that of people born in Germany (81.6 %, a 17.1 pps. gap, while the EU average gap was 10.0 pp). Even migrants with a high level of education are less likely to be in employment. ([33]) Beyond immigrants, people with a migrant background born in Germany face unfavourable labour market outcomes, despite being born and educated in the country. ([34])

([31]) Most women work in public administration, education, health and social services, as well as in wholesale and other services, while industry, construction and agriculture employ fewer women.

([32]) Between 2013 and 2016, the tax wedge increased slightly from 42.0 to 42.2, whereas it further decreased from 33.8 to 32.5 for the EU-28 — calculated for a single worker with 50 % of average earnings, without children.

([33]) The employment rate for highly educated people born outside the EU stood at 73 % in 2017, compared with 90.4 % for native-born people with a similar level of education, Eurostat 2017.

([34]) In 2017, native-born people (aged 15-34) with two foreign-born parents had an employment rate of 74.9 %, 12.7 pp

Although slowly improving, labour market participation of refugees is a challenge, requiring further investment. The employment rate of people from the countries from which most refugees came ([35]) was 32.7 % in November 2018, 7.8 pps. higher than in November 2017. Refugee women's employment rate is only 8 % (IAB, 2019). The main obstacles to refugees' integration into the labour market are the lack of German language proficiency, missing or non-transferable qualifications, caring responsibilities towards children and relatives, and lack of experience with informal rules on the German labour market (Dietz et al, 2018). Efficient cooperation between institutions at local level is crucial. The number of refugees among the applicants registered with the Federal Employment Agency and applying for training more than doubled in 2017 compared with the previous year (2016: 10 300; 2017: 26 400). (BMBF, 2018). Although inflows of asylum seekers have slowed, they have triggered considerable long-term investment needs for regions and local communities in different areas: integration in the labour market, education and training, and social inclusion and housing. Investment in making refugees more employable may help them integrate faster into society and the labour market and help meet current labour market demands.

Germany has relatively high employment rates for older workers, but there is scope for further improvement. The employment rate of people aged 55-64 rose from 45.5 % in 2005 to 71.0 % in the first three quarters of 2018, one of the highest rates in the EU. This increase reflected the gradual rise of the retirement age, reduced early retirement pathways for unemployed people, and demographic effects. The employment rate in the 65-69 age group was 16.8 % in the first three quarters of 2018, above the EU average of 13.4 %. Creating incentives to work longer, including allowing people to stay in their jobs with flexible and/or shorter working hours, together with increased provision of upskilling (see Section 4.3.3) could further extend working lives.

4.3.2. SOCIAL POLICY

The number of people at risk of poverty or social exclusion fell during the period under consideration, reflecting improvements in labour market and social situation. In 2017, 19 % of the population was at risk of poverty or social exclusion. This figure is lower than the EU average (22.5 %). It is also below the German figures for 2016 (19.7 %) and 2014, when a peak was reached (20.6 %). This improvement was broad-based. The proportion of people suffering from severe material deprivation fell to 3.4 % in 2017, while the proportion of people under 60 living in households with very low work intensity fell to 8.7 %. The at-risk of poverty rate stood at 16.1 %, having declined from 16.5 % in 2016 (see Graph 4.3.5). Furthermore, the adequacy of minimum income benefits is relatively high, which reduces the severity of poverty among recipients ([36]). In addition to this, indicators relating to the coverage and adequacy of unemployment benefits score well ([37]).

Poor outcomes for the children of low-skilled people reveal challenges as regards equality of opportunity. Though children in Germany were at a much lower risk of poverty or social exclusion than children in the EU as a whole, ([38]) the picture was less favourable when their parents' background was taken into consideration. In 2017, the gap between the risk of poverty or social exclusion facing the children of low-skilled (often migrant) parents and the risk for children with highly skilled parents was 67 pps. This is substantially greater than the average gap in the EU (53.9 pps). Improving participation in high-quality early childhood education and care for

lower than among native-born people with a native background (87.6 %). Source: OECD-EU — Settling In 2018, based on national labour force survey. (Employment rate among 15-34 excluding those still in education).

([35]) According to German labour market statistics, these include: Afghanistan, Eritrea, Iraq, Iran, Nigeria, Pakistan, Somalia and Syria. The employment rate shown above differs from the usual Eurostat definition, and reflects the proportion of a) workers in employment covered by social protection as well as those in marginal employment, divided by b) number of people aged 15-64.

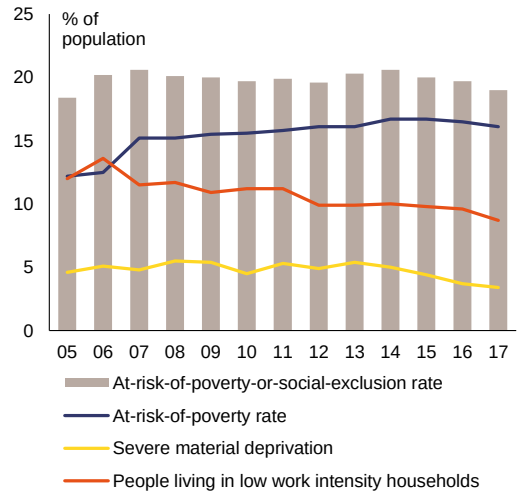
([36]) According to the results of the Social Protection Committee's 2018 benchmarking exercise on minimum income. See the 2019 draft Joint Employment Report for details.

([37]) According to the benchmarking exercise on unemployment benefits and active labour market policies conducted within the EMCO Committee. See European Commission (2018o) for details.

([38]) At 23.6 %, the risk of poverty or social exclusion for under-18-year-olds was well below the EU average of 29.1 % and remained relatively stable in 2017.

children of low-skilled parents can help break this cycle of disadvantage (Camehl and Peter, 2017) and would also make it easier for parents to combine work and family life. (See also Section 4.3.3.)

Graph 4.3.3: **Poverty and social exclusion**



Source: Eurostat

The government has introduced reforms to safeguard pension adequacy for certain groups of elderly people. The pension package which took effect in January 2019 is designed to improve pension adequacy, including higher pension entitlements for groups with relatively lower pensions ([39]) such as women with children born before 1992 (*Mütterrente II*) and people with disability pensions (*Erwerbsminderungsrente*) ([40]). The coalition agreement also includes a commitment to including self-employed people under the first pillar. This commitment seems timely, as in 2017 42 % of formerly self-employed people were at risk of poverty in old age. This figure is much worse than the at-risk-of-poverty rate of former employees (17 %) (European Commission, 2018f).

Yet the retirement income of low-income workers remains inadequate. People earning half the average wage can expect a replacement rate of 55 % of their previous income, well below the OECD average of 75 % (OECD, 2017; BMAS, 2017). The introduction of a 'basic pension' (Grundrente) ([41]) might be limited in scope. In many cases, those affected by old-age poverty would not meet the threshold of 35 contributions years, necessary to qualify for the supplementary benefit. (European Commission, 2018f). This is accompanied by other lingering long-term challenges in the pension system (see box in 4.1).

Housing costs in large cities put older and poorer people at greater risk of poverty. Although the housing cost overburden rate for the population as a whole has been falling since 2012, it was above the EU average of 10.2 % in 2017, standing at 14.5 % ([42]). For old people (aged 65 and over), it was particularly high at 20 %. The situation of poorer people is particularly severe. Although their rate of housing cost overburden has been falling since 2014, it remained above the EU average of 34.3 % in 2017, at 44.5 % ([43]). There are substantial disparities in housing cost increases across the country. This is a major challenge, especially in big cities. Microcensus data show a provision gap of 880 000 affordable dwellings in 10 large cities ranging from Berlin to Bremen. ([44]).The stock of social housing could provide for only half of this provision gap (Holm et al., 2018). The Federal Government's financial initiative to make 100 000 additional units of social housing available thus appears very timely. However, even this initiative will not cover supply gaps (see also Chapter 1 on housing shortages).

4.3.3. EDUCATION AND SKILLS

While Germany's education system has some advantages, it nonetheless faces challenges in terms of equality and needs more resources, more investment. Germany ranks high in employability of recent graduates and has

([39]) Reflecting distributional analysis for Mütterrente II, by Bach et al., (2018c).

([40]) The Act on Improvements to Benefits for Recipients of a Reduced Capacity Pension took effect in 2017.

([41]) The basic pension will be paid to elderly recipients of basic security benefits who have accrued 35 years of contributions through employment, child rearing or periods of long-term care. These people should receive an old-age benefit 10 % above the basic security benefit level.

([42]) The housing cost overburden rate is a measure of housing affordability used by Eurostat. It measures the proportion of the population spending more than 40 % of disposable income on housing costs.

([43]) The measurement refers to first income quintile, representing 20% of population with lowest income.

([44]) In some of these cities, including in Berlin and Bremen, the demand for affordable housing is amplified, given that in 2016 the risk of poverty or exclusion was at 25 % or above.

substantially increased participation in early childhood education and care. Still, while participation in education has risen overall, limited progress has been made on reducing the influence of socio-economic and migrant background on educational performance. Vocational education appears less attractive to young Germans relative to educational alternatives than it once did, and the provision of digital education at all levels struggles to meet Germany's ambition as a technological leader.

Public spending on education remains below the EU average and is hampered by structural factors to do with the design of fiscal relations. In 2016, public spending on education remained unchanged as a share of GDP at 4.2 %, lower than the EU average of 4.7 %. Out of overall government expenditure, 9.5 % went on education, which is also below the EU average (10.2 %). At the same time, specific challenges, including high recent immigration, call for increased spending efforts. Almost three quarters of public education expenditure is borne by the *Länder*, which are responsible for this policy area. At municipal level, investment shortfalls in schools and adult education come to 30 % of overall investment needs. At EUR 47.7 billion, these shortfalls have exceeded the size of shortfalls in the transport sector (KfW, 2018). The Federal Government and the *Länder* have not so far managed to reach agreement on a change in the constitution to extend the Federal Government's power to provide direct financial support to financially weak municipalities to include all municipalities.

Participation in early childhood education and care is almost universal for children over four, but supply gaps are still pronounced for the under-threes. In 2016, 96.6 % of children aged between four and compulsory school age were enrolled in early childhood education and care, compared with 95.3 % in the EU as a whole. Participation of under-threes was 30.3 % in 2017. National data suggest the demand-supply gap for that age group ranges from 7.4 % in East Germany to 13.1 % in West Germany (12.1 % overall). The authorities estimate that an additional 307 000 places for the under-threes are needed by 2025 (Federal Ministry of Family Affairs, Senior Citizens, Women and Youth, 2018). Several *Länder* have abolished tuition fees in early childhood education and care. Legislation adopted in September 2018 provides for a government investment of EUR 5.5 billion in improving the quality of early childhood education and care, to be implemented through individual contracts with the *Länder*.

Socio-economic and migrant background still strongly influence educational outcomes. Students belonging to disadvantaged groups perform worse even in primary education (Hussmann et al., 2017; Stanat et al., 2017), leave school earlier, and have greater difficulties in finding work placements in vocational education and training (BMBF, 2018; European Commission, 2018m). Overall, the school system (primary and secondary education) has become less stratified, due to the marked increase in the number of comprehensive schools with multiple educational tracks and school-leaving qualifications (*Autorengruppe Bildungsberichterstattung*, 2018). In general, later tracking of students is associated with lessening the influence of socio-economic factors on performance among secondary school students (OECD, 2016). To make the system more inclusive, the Federal Government plans to make placement in all-day primary schools a legal entitlement and to further expand provision of all-day schools. A range of targeted measures across all education levels, introduced by both the Federal Government and the *Länder*, are designed to improve equity further.

Integration of refugees into education continues, but further investment is needed. Since 2015, welcome classes and parallel support classes with a focus on language teaching for newly arrived migrant children have been developed at all school levels (BAMF, 2018). In higher education, a non-representative survey suggests that the number of refugee students newly enrolled in 2017-18 on bachelor, master or doctoral programmes reached 3 000, three times more than one year before. Between 20 and 25 per cent of refugee students are female (HRK, 2018).

The early school leaving rate is close to the national target, but remains high among people from a migrant background. At 10.1 %, the proportion of people aged between 18 and 24 who left education or training early in 2017 was close to the target of 10 %. However, young people born outside Germany have a far higher early school

leaving rate than those born in the country (15 pps gap). The same applies to people with disabilities compared to those without (19.1 pps. gap, compared with an EU average of 12.6 pps). This gives cause for concern, given that employment opportunities for low-skilled and unskilled people are dwindling.

Serious teacher shortages put a strain on educational provision. The shortage of teachers is especially pronounced in vocational education and training, special needs and primary education. Estimates of primary teacher needs up to 2025 vary between about 15 000 (KMK, 2018) and over 30 000 if additional challenges such as the expansion of all-day schooling are considered (Klemm and Zorn, 2018). There are significant regional differences; while 38.5 % of all schools in Baden-Württemberg are all-day schools, the percentage is 97.4 % in Saxony (2015). Career changers receiving fast-track and on-the-job training account for most new hirings in some regions (GEW, 2017). Moreover, specific challenges, such as the inclusion of special needs students and the integration of migrants, including refugee children, call for additional staff and for support and training for teachers. To increase the attractiveness of the profession, several *Länder* have raised salaries or introduced (or reintroduced) public servant status for teachers. The 10-year joint federal/ *Länder* quality initiative for teacher training, which started in 2013, was renewed in June 2018 and bolstered by a further EUR 64 million.

The long-term increase in higher education enrolment continues, yet upward mobility remains low. At 34 %, tertiary education attainment increased slightly in 2017 compared to 2016 (33.2 %), though it remains below the EU average (39.9 %). Enrolment, especially at universities of applied sciences (*Fachhochschulen*), rose considerably from 542 000 students in 2006 to 957 000 in 2016. Only about a quarter (27 %) of students in Germany have parents without tertiary education, the second lowest share in the EU. There has been little progress since 2012, when the figure was 23 % (DZHW, 2018). Tuition fees are low or non-existent. However, the heaviest burden on students' finances – accommodation costs – has increased substantially in recent years (DZHW, 2018). The Federal Government plans to expand the public support system for students (BAFöG), with higher grants and loans to more students.

Employment outcomes of vocational education and training students remain excellent, yet the system faces considerable challenges. The employment rate of recent vocational education and training graduates was 91.3 % in 2017, the highest in the EU. At the same time, the proportion of upper secondary students in vocational education and training decreased slightly to 46 % in 2016, below the EU average of 49 %. Despite slight increases in the number of people seeking training places (by 0.4 %), training places offered (1.5 %) and training contracts (0.6 %) in 2017, the number of unfilled apprenticeship positions increased compared to 2016, given the difficulty of matching demand and supply (BMBF, 2018). Increased links between vocational education and training providers and local businesses could further support the dissemination of the latest technologies and respond to emerging skills needs.

Targeted measures addressing the participation of workers in adult learning would help tackle labour shortages and incentivise longer working lives. Participation in adult learning in Germany stood at 8.4 % in 2017, below the EU average of 10.9 %, and is even lower among the low-skilled. Moreover, adult learning among unemployed people aged 25-64 stood at 8.4 % in 2017, below the EU average of 10.1 %. The planned Qualification Opportunities Act (*Qualifizierungschancengesetz*) is expected to improve access to and financial support for further education for employees whose occupational activities can be replaced by new technologies, who are affected by structural changes, or who are in jobs with a shortage of skilled workers. ([45]) Some 55 % of small and medium-sized enterprises report a shortage of skilled employees, especially of highly qualified engineers, technicians, researchers, medical staff and similar professionals. The Government is preparing a new National Continuing Training Strategy together with stakeholders.

([45]) At present, support is limited to employees without a vocational qualification, employees at risk of unemployment, and small and medium-sized businesses. In the future, all employees should be able to access further education, regardless of their qualifications, age and type of employer.

German citizens generally possess above-average digital skills, but there is a significant skills shortage, and provision of Information and Communication Technology education is uneven, requiring further investment. Generally schools are well-equipped with information and communication technology infrastructure in southern Germany and Hesse, in contrast to less well-equipped *Länder*, most of which lie in East Germany (IW, 2018). The *Digitalpakt Schule*, designed to upgrade provision of such education in schools, has yet to be implemented. Teachers' proficiency in integrating information and communication technology into their lessons varies from region to region and school to school. This also depends on the provision of in-service (continous) training in digital skills (Initiative 21, 2016). There are regular technical exchanges between the *Länder* on their respective measures (KMK, 2016), but only five *Länder* have included digital media in regulations on teacher graduates' examinations (Bertelsmann Stiftung, 2018). 3.7 % of employees are ICT specialists, but demand exceeds supply, with 55 000 ICT-related vacancies in October 2017 (Bitkom, 2017), while 67 % of small and medium-sized enterprises report a shortage of ICT skills among their employees. There is a significant gender gap among Science, technology, engineering and mathematics graduates, with 11.4 women per 1000 individuals (aged 20-29) versus 28.1 men in 2016. Only 16.6 % of information and communication technology specialists are women (2016). Additionally, the gender pay gap in the information and communication sector stood at 25 % in 2016 (European Commission, 2018p). To remedy the critical shortage of information technology professionals, the bill on the immigration of skilled foreign labour provides for specific rules for such professionals.

Investment needs

Targeted investment in education and training and supporting active inclusion are important for improving competitiveness and inclusive growth. Current shortages of skilled labour are among the main obstacles to business growth and investment, and disruptive technological change will create adaptation pressures in the future. These point to the need to spend more on education and training, and to improve their performance. Additional measures could help tap unused or under-used labour potential, including that of migrants. There are possibilities to upgrade skills and to improve the inclusiveness and quality of education and training, including by making the teaching profession more attractive. Investment in social inclusion, and the availability of quality full-time childcare and long-term care services creates both economic and social benefits.

4.4. COMPETITIVENESS REFORMS AND INVESTMENT*

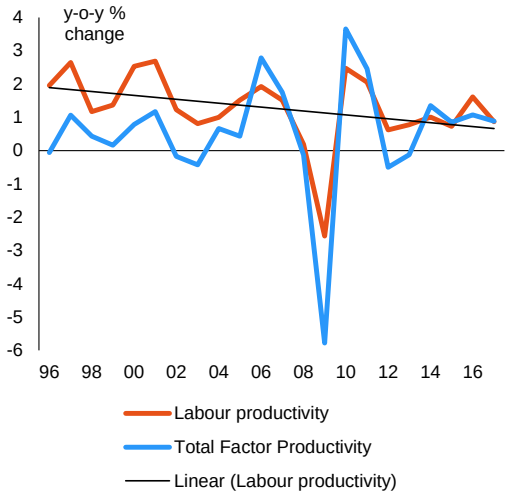
4.4.1. PRODUCTIVITY AND INVESTMENT NEEDS

To maintain Germany's competitive advantage and ensure sustainable and inclusive growth stronger investment efforts are needed in innovation, digitalisation, quality education and skills, very high-capacity broadband network and sustainable infrastructures. Germany is lagging behind in the deployment of very high-capacity broadband (in particular fibre-to-the-premises), in rural areas especially, where stronger investment can improve productivity growth. Stronger investments in sustainable transport and electricity infrastructure are crucial to meet climate, energy and environmental targets. Higher expenditure and investment in research and innovation, in particular among small and medium-sized enterprises, but also in education and skills (See Section 4.3) necessary for digital and technological adoption, can raise potential growth.

Productivity growth

Labour productivity growth in Germany has slowed down.. At the aggregate level, labour productivity growth in Germany has slowed down in recent decades (see Graph 4.4.1), but there are significant differences across sectors. Labour productivity growth has been high in medium-high technology sectors such as the automotive industry. However, in the construction sector, labour productivity growth has been stagnating, while in business services it has even been declining over the last decade. In the longer term, demographic change will lead to a reduction of the labour force potential. Productivity growth will therefore be crucial to support growth and will increasingly depend on investments in Information and Communication Technologies and non-Information and Communication Technologies capital, and on investments in intangible assets, such as research, development and innovation, raising total factor productivity. Reaping the benefits of digitalisation in the future will require a modern regulatory framework and further efforts in education and digital infrastructure. More investment in the circular economy and resource efficiency will help ensure sustainable consumption and production patterns, and has the potential to further raise productivity. Firm-level data indicate that the gap between the most and the least productive companies has widened over the last decade, suggesting that there may be obstacles to technology diffusion and obstacles preventing resources from being efficiently reallocated to their most productive uses. Germany performs relatively well as regards the efficiency of resource allocation at the economy-wide level, and macro-level allocative efficiency remained largely stable between 2000 and 2014. However, the aggregate figures mask significant differences between sectors. Allocative efficiency is particularly low in some sectors – such as business services –, which means that resources are allocated less efficiently, largely owing to the lack of competition in the sector (see European Commission, 2018l). Germany has not yet set up a new or appointed an existing institution to act as a German National Productivity Board in the sense of the corresponding Council Recommendation. While Germany has expressed a general intention to do so, a corresponding date yet needs to be announced.

Graph 4.4.1: **Labour and total factor productivity**



Source: European Commission

Investment needs

Public investment is increasing faster than GDP, but still more efforts are needed to clear the investment backlog. Public investment in 2018 grew by 7.7 % nominally and 3.8 % in real terms, posting robust growth for a fourth consecutive year. However, given the backlog at municipal level, public investment still needs additional efforts to maintain the capital stock. As in previous years, net investment at municipal

level remained negative in 2018, as existing infrastructure depreciated faster than it could be replaced. According to the national investment bank KfW, the investment backlog at municipal level rose significantly to EUR 159 billion in 2018, representing an increase of EUR 33 billion over the previous year (KfW, 2018). A survey by the European Investment Bank on "Municipal Infrastructure" identified tight budgets, lacking technical planning capacities and lengthy approval processes as major barriers to investment in Germany (EIB, 2017).

There has been a robust increase in private investment, though not across all asset types. Investment in equipment has grown strongly in recent quarters in response to record high capacity utilisation. Housing investment continues to boom, even though the construction sector reports capacity constraints. However, major challenges loom. The manufacturing sector is facing a slowdown in foreign trade, and, at the same time, the need to adapt to new consumer preferences and technological change (e.g. the automotive sector). Non-residential construction has been growing sluggishly, suggesting that essential infrastructure may not have kept up with the economy's needs.

Research and innovation

Germany has a strong research and innovation system, but in a context of slow productivity growth and negative demographic trends, higher investment in R&D and innovation could help the country secure its competitive position. R&D expenditure in Germany increased to 3.02 % of GDP in 2017, the fourth highest R&D intensity in the EU. The increase in business R&D intensity since 2010 (+0.27 pps.) has been higher than the increase in public R&D intensity (+ 0.04 pps.). According to the European Innovation Scoreboard, Germany's overall innovation performance has stagnated since 2010, and small and medium-sized enterprises' innovation activity is declining. ([46]) Over the last few years Germany has taken measures to further strengthen its sound research and science base, but there is scope for boosting scientific excellence further. Germany currently ranks eighth in the EU on the key indicator reflecting scientific excellence ([47]). Its policies have been effective in promoting incremental innovation, especially in the manufacturing sector, but the framework conditions for risky and disruptive innovations could be improved. In 2018, the German Government adopted the High-Tech Strategy for 2025, which is designed to promote knowledge transfer and entrepreneurship. An agency for the promotion of disruptive innovation is to be set up. The Strategy also includes a 3.5 % R&D intensity target and R&D tax incentives for small and medium-sized enterprises.

While cooperation between public research institutes and the business sector is generally well established, small and medium-sized enterprises are not benefiting fully from it. Germany's approaches to encouraging science-business cooperation (e.g. through the Fraunhofer Society organisations) are often taken as examples of best practice. However, the country's high scores on the relevant indicators ([48]) are often the result of strong cooperation between a few large manufacturing companies and public research institutes. As regards the share of SMEs cooperating with academia or public research institutes, Germany scores only slightly above the EU average ([49]).

([46]) The European Innovation Scoreboard shows a decrease in relative performance since 2010 in most of the indicators related to innovation in SMEs, intellectual assets and the impacts of innovation. https://ec.europa.eu/docsroom/documents/30681.

([47]) The proportion of the country's scientific publications that rank among the top 10 % most cited scientific publications worldwide.

([48]) With a volume of public R&D financed by business enterprises representing 0.12 % of GDP in 2015 (EU average: 0.05 %), Germany ranks first among EU countries.

([49]) Based on data from the Community Innovation Survey for 2014.

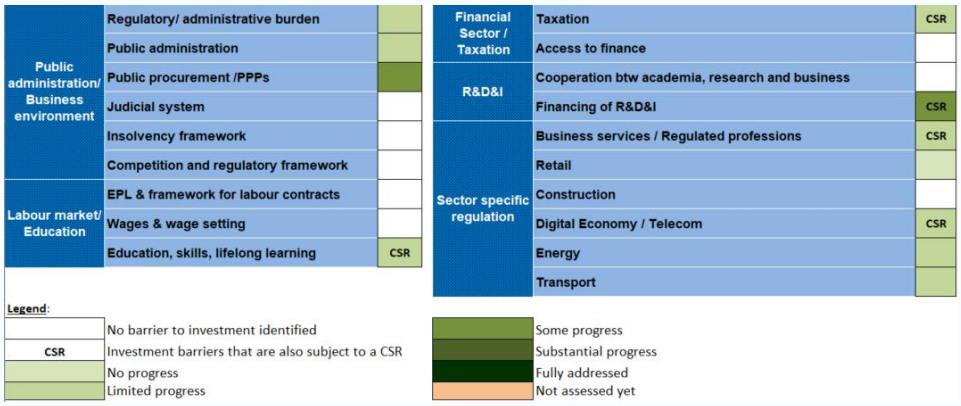
Box 4.4.1: **Investment challenges and reforms in Germany**

Macroeconomic outlook

Investment is relatively low as a share of GDP, which undermines Germany's future growth potential, and has implications for the euro area (see Chapters 1 and 3). Private investment has responded only in part to capacity utilisation and housing needs. Public investment has picked up, but a major investment backlog will take longer to unwind. Stronger capital accumulation will be needed to sustain potential growth in the future, especially as population ageing intensifies as expected and immigration may slow down.

Assessment of barriers to investment and ongoing reforms

The main barriers to private investment in Germany are: the inefficiency of the tax system (see Section 4.1), limited availability of scale-up capital (see Section 4.2), shortages of skilled labour (see Section 4.3); insufficient availability of certain network infrastructures, including very high-speed broadband (see Section 4.4.1); and a number of sectoral regulations, including regulations that restrict competition in business services and regulated professions (see Section 4.4.3).



Selected barriers to investment and priority measures that are under way

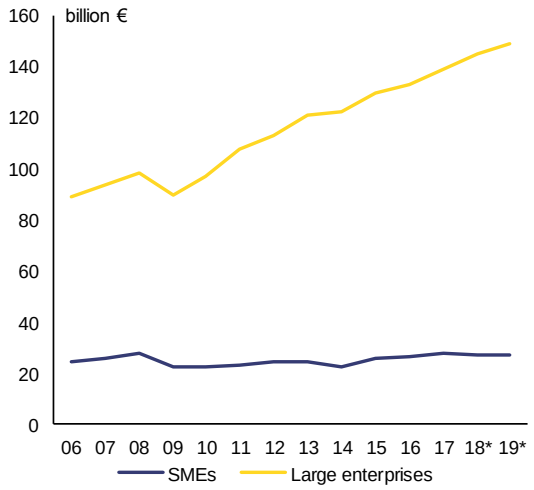
1. As the labour market tightens, availability of skilled labour is becoming more of a binding constraint, in particular for medium-sized companies. Current measures designed to reduce disincentives to work more (see Section 4.3.1), improve the financing of education and subsidise adult learning (see Section 4.3.3) may relieve this constraint to some extent.

2. The current design of federal fiscal relations has been a barrier to public investment at municipal level. The scope for public investment tends to be narrowed by a mismatch between the resources available from the various tiers of government and their individual investment responsibilities, and by the limited revenue autonomy of the *Länder* and municipalities. The ongoing reform of federal fiscal relations should further increase investment possibilities at municipal level, even though it falls short of more fundamental changes in terms of increasing the tax autonomy of the *Länder* and municipalities. (See also Section 4.1)

Germany is also stimulating investment through its national development bank, KfW, Europe's largest development bank, which committed a total financing volume of EUR 76.5 billion in 2017. KfW plays a major role in promoting energy-efficient housing, in financing municipal infrastructure such as public transport and sanitation, and in supporting individual entrepreneurs and start-ups through loans, equity and mezzanine financing. In addition to KfW, the Rentenbank is a national development bank active in financing agricultural projects, and the Länder have their local development banks (*Förderbank*), which are smaller, yet play an important role in financing municipal infrastructure and projects, including in housing.

Private investment in R&D is increasingly concentrated in large firms and in medium-high tech manufacturing sectors. While overall business expenditure on R&D shows strong growth rates, R&D has become increasingly concentrated in large firms and in medium-high-tech manufacturing sectors, particularly the automotive sector. R&D expenditure of large companies has increased considerably, whereas small and medium-sized enterprises' R&D expenditure has stagnated over the past decade (ZEW, 2018c). Small and medium-sized enterprises' expenditure on R&D as a percentage of GDP was at 0.17 % also much lower than the EU average of 0.30 % in 2015.

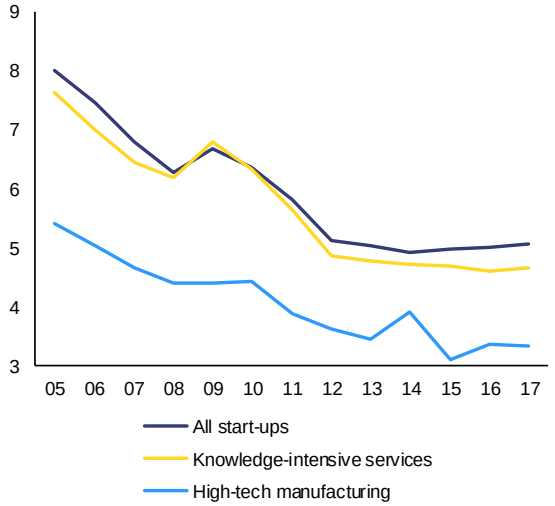
Graph 4.4.2: **Expenditure for R&D&I in Germany**



(1) 2018 and 2019 figures based on planned data
Source: ZEW

Entrepreneurial activity is hampered by regulatory barriers to starting a business and is increasingly influenced by demographic developments. Entrepreneurial activity has gradually been declining in most age groups, including those with highest entrepreneurial activity (i.e. between 30 and 50 years). The firm birth ratio has been declining in recent years, falling from 9.2 % in 2008 to 7.1 % in 2015, well below the EU average of 9.6 %. While low unemployment and the rising opportunity cost of starting a business are still the main reasons for the decline in start-up activity, regulatory barriers, such as those that affect the relative ease of starting a business, and demography are further significant factors. According to the World Bank indicator on the Ease of Starting a Business, Germany performs rather poorly (113th in the world). Demographic trends are expected to have a growing impact on entrepreneurial activity and the transfer of businesses in the coming years. At the end of 2018, the Federal Government launched an initiative (*Gründungsoffensive*) designed to boost entrepreneurial culture in Germany and to raise awareness of existing support programmes. However, more could be done to promote entrepreneurial skills in settings including secondary and tertiary education.

Graph 4.4.3: **Start-up rates in Germany**



(1) Start-up rate: start-ups by 100 incumbent firms
Source: ZEW

Start-up rates in Germany have been declining, and employment in fast-growing firms in innovative sectors has fallen. Start-up rates in Germany have been on the wane for the last 15 years in various sectors and regions. Start-up activity has been declining not only in non-technological sectors, but also in knowledge-intensive services and high-tech manufacturing (Graph 4.4.3). According to the Community Innovation Survey, the share of businesses with innovative activities has fallen, but continues to be among the highest in the EU. The share of employment in fast-growing companies in innovative sectors has fallen since 2012, and Germany performs below the EU average (see European Commission, 2018g).

Digitalisation

Germany has made some progress as regards the integration of digital technology in business settings, but small and medium-sized enterprises remain slow adopters of digital technologies, and a large proportion of them have a very low level of digitalisation. According to the Digital Scoreboard, German companies are increasingly taking advantage of the opportunities offered by online commerce: in 2017, 23.5 % of small and medium-sized enterprises sold online, while 11.3 % sold goods or services to customers in other countries. However, small and medium-sized enterprises are slow adopters of digital technologies and 34.6 % of them have a very low level of digitalisation. Only 5.3 % of German small and medium-sized enterprises used big-data analytics in 2016, for example, as compared with almost 10 % in the EU as a whole. To help small and medium-sized enterprises catch up with digitalisation, the Government is expanding a network of competence centres. Since July 2017, the 'go digital' support programme has been providing small and medium-sized enterprises all over the country with consultancy services via innovation vouchers, to advance their own digitalisation in the areas of IT security, digital marketing and digitalised business processes. Digital hubs are promoting closer cooperation between start-ups, small and medium-sized enterprises, industry, science and public administration (European Commission, 2018h). However, a lack of skilled human resources and capacities often holds these companies back from investing in digitalisation projects (see Chapter 4.3).

Germany is lagging behind in deploying very high-capacity broadband at national level, and particularly in rural areas, where stronger investment could improve productivity growth. The share of fibre connections is very low (only 8 % of households as of mid-2018), putting Germany some way behind several other EU countries (European Commission, 2018h). In October 2017, 23 700 business parks were not connected to a fibre network and 28 % of all companies lacked access to networks of at least 50 megabits. The 2018 Federal Government's coalition agreement includes a commitment to full coverage with gigabit-ready networks and prioritises fibre networks. It includes a commitment to establish a digital infrastructure fund. The fund will use the revenues from 5G-auction especially for the deployment of gigabit networks; additional financial means may be provided in accordance with the Budget Law. The coalition agreement indicates the allocation of 10 to 12 billion Euros until 2021 to support the deployment of gigabit networks. As the deployment of high-performance broadband networks in Germany is driven primarily by the private sector, the companies belonging to the Network Alliance for a Digital Germany committed themselves to investing around EUR 100 billion by 2023, in order to establish gigabit-capable converged infrastructure by 2025. However, public intervention in the deployment of ultrafast (≥100 Mbps) broadband infrastructure in rural areas remains crucial, and different options going beyond subsidies could be explored. The coalition agreement establishes the legal right to fast internet from 1 January 2025 and direct fibre connections for socio-economic drivers (schools, hospitals, business parks, etc.) by 2021. In November 2018, the German regulatory authority ("Bundesnetzagentur")published its final plan for the 5G spectrum auction scheduled for the spring of 2019. The number of licenses auctioned, and the conditions set by the regulator will have repercussions on competition and investment in this sector.

Investment in artificial intelligence and cybersecurity is needed if Germany is to remain globally competitive and safeguard digital sovereignty. In November 2018, the Federal Government adopted its artificial intelligence strategy, designed to consolidate Germany's role as a research location and use by small and medium-sized enterprises. The budget allocation is EUR 500 million in 2019 with an accumulated spending of EUR 3 billion by 2025. In September 2018, the Federal Ministry of the Interior, together with the Federation of German Industries, founded the Cyber-Alliance to promote key technologies for critical business processes. The aim was to safeguard the digital sovereignty of German industry and the state. There is a specific initiative to raise awareness of cybersecurity among small and medium-sized enterprises. The Agency for Innovation in Cybersecurity is being set up in 2019 with a view to funding innovative projects characterised by radical technological novelty, which could change the market.

Energy

The switch from centralised to decentralised energy generation entails significant investment opportunities and is fundamentally reshaping the German energy market. Significant investment are needed to make the electrical system more flexible in the light of this decentralisation trend, e.g. in electricity storage, the production of low-carbon fuels and green technologies.

The lack of an appropriate grid infrastructure is currently leading to financial losses in Germany and other EU countries. According to the German regulatory authority ("Bundesnetzagentur")(BNetzA, 2017), grid operators spent EUR 1.4 billion on congestion management measures to stabilise the electricity grid in 2017. This is about 60 % higher than the amount spent in 2016 (EUR 880 million). In addition, the amount of renewable energy curtailed increased in 2017, reaching 5 518 GWh (compared with 4 722 GWh in 2015 and 3 743 GWh in 2016). The German regulatory authority ("Bundesnetzagentur")attributed this increase in feed-in management measures and their costs to the connection of new offshore wind farms in 2016 and 2017.

Efforts are under way to improve internal networks, but the need for investment in additional transmission capacity is likely to grow still further. Investment costs for onshore grid development are expected to reach EUR 32-34 billion by 2030; according to transmission system operators, these costs may even reach EUR 50 billion by that date. The German Government has started making changes to planning laws that are relevant to grid expansion. By 2030, there will be more capacity from renewable energy sources, and old power plants are expected to be closed. If the grid extension lacks financial support or timely implementation, this will lead to higher costs related to congestion management and further distortions in market functioning, both inside Germany and in cross-border trade.

Congestion management in central Europe, including Germany, needs a solution that will facilitate cross-border electricity flows while ensuring system security. The current national arrangements for congestion management and bidding-zone definition in central Europe do not necessarily reflect existing congestion accurately, and this is leading to limitations on cross-border flows of electricity. Structural congestion in the transmission system, not fully reflected in the wholesale market, leads to additional loop-flows to neighbouring countries, thereby resulting in inefficient market outcomes (see section 4.4.3).

The environment and the circular economy

Germany is advancing towards a more circular economy, but will miss its national objective of doubling resource productivity by 2020. As regards the circular (secondary) use of materials, i.e. the share of material recovered and fed back into the economy, Germany is close to the EU average with 10.7 % in 2014, but behind neighbouring countries such as the Netherlands (26.7 %), Belgium (18.1 %), and France (17.8 %). Considerable additional efforts are required to meet the objectives of the updated Resource Efficiency Programme (PROGRESS II), especially as regards increasing secondary raw material use. Movements across the country to encourage reuse, repair and sharing are developing, but still have niche character. The next update of PROGRESS, planned for 2020, could develop a more comprehensive circular economy strategy covering the whole life-cycle of materials, and could incorporate the aspects of decarbonisation and digitalisation.

The EU and national circular economy ambitions and targets require a sustained increase in investments, including in R&D. Stronger investments, including in R&D, will be needed to reach the objectives of PROGRESS but also to comply with the new recycling targets for the post-2020 period and the EU Action Plan for the Circular Economy. Eco-innovation is an important enabling factor for the transition to a low-carbon, circular economy. Product design approaches and new business models can help to produce systemic circularity innovations, creating new business opportunities. The results of a 2017 Eurobarometer survey confirmed that there is room for further boosting reuse, repair and recycling in the German economy. The proportion of German small and medium-sized enterprises that have invested too little (i.e. less than 1 % of their

turnover) in resource efficiency increased by 9 pps. to 47 % between 2015 and 2017.

More investment in sustainable mobility solutions is required to tackle mobility and associated air quality challenges, support climate change mitigation and adaptation, and improve productivity. Air quality in Germany gives serious cause for concern, as the country is still failing to meet EU air quality standards. Germany has been referred to the EU Court of Justice for failing to comply with NO2 limit values. Traffic accounts for about 60 % of harmful NOx emissions in urban areas, and of this 72.5 % is caused by diesel vehicles. Vehicles running on alternative fuels have seen the steepest increase in new registrations, but the numbers remain far below the target value of one million electric cars by 2020 set by the government. (KBA, 2018) Cars remain by far the most commonly used means of transport for daily commuting. The average time spent in traffic jams is about 30 hours per year (European Commission, 2018i). Congestion and looking for parking spaces has been estimated to cost EUR 110 billion per year, or about 4 % of GDP (OECD 2018b). As transport is an intermediary service, this causes productivity losses in other sectors. Car sharing and ridesharing as options for more sustainable urban mobility are still heavily underexploited. A recent case study found that car sharing currently accounts for under one-tenth of passenger-kilometres by motor vehicle in Germany (Ecological Institute, 2018).

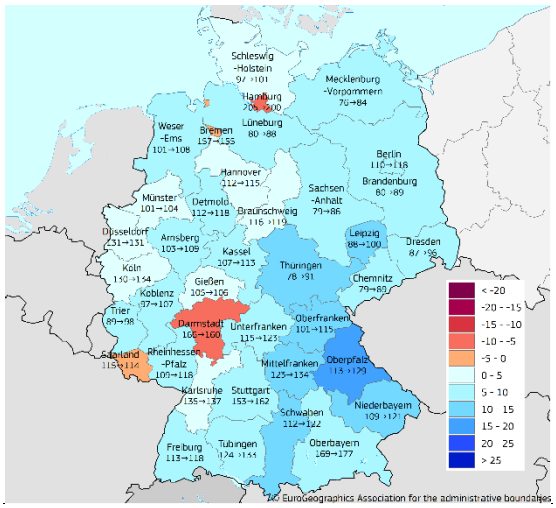
Surface water pollution by nitrates, especially groundwater pollution, remains a serious concern, imposing considerable costs on consumers who have to purify drinking water. Only marginal progress has been registered in reducing pollution. (UBA, 2018). Effective measures are needed to tackle excess deposits of nitrates and achieve compliance with the Nitrates Directive and the decision of the European Court of Justice.

4.4.2. REGIONAL DISPARITIES

East-west regional disparities in Germany persist, despite the convergence process that has been in progress since 1990. The eastern part of Germany remains the weaker region in terms of economic output, with the capital city, Berlin, being the only region to exceed average EU GDP per capita. Still, there has been significant economic convergence in Germany since reunification. While GDP per capita in the east was only 43 % of that in the west in 1991, it had risen to 72 % by 2010. However, more recently this convergence has slowed, with only a marginal 1 pp. increase to 73 % between 2010 and 2016 (BMWi, 2018a). While all the eastern regions improved their GDP per capita (PPS) relative to the EU average between 2010 and 2016, some of the strongest regions in the west registered a relative decline over the same period. Graph 4.4.4 and 1.6 illustrate the spread of regional GDP growth relative to the EU average. Similarly, east-west productivity disparities shrank during this period. By 2000, the eastern region had already increased its productivity to 69 % of the western value, growing further to reach 78 % by 2017 (BMWi, 2018a). Convergence between labour market outcomes has also remained strong in recent years.

Regional disparities within Germany go beyond the east-west divide. Although the north-south divide among the *Länder* of former West Germany is not as clearly defined, it nonetheless exists. Apart from city-states such as Hamburg and Bremen, the northern *Länder* perform worse in terms of economic output than their southern counterparts. In addition, there are western regions whose relative position has declined as a result of structural change in the economy (e.g. Hamburg and Darmstadt, see also Graph 4.4.4).

Graph 4.4.4: **Change in GDP per head (PPS), 2007-2016**



(1) PPS: Purchasing Power Standard
The values correspond to the GDP per head relatively to the EU28 in 2007 and 2016, respectively (EU28=100). The colours correspond to the change in the index from 2007 to 2016, with blue ones indicating an increase in the ratio. EU28 real GDP per head grew by 3.4% over the period.
Source: European Commission

The aim of phasing out coal from German electricity generation will change the economic and social development path of several regions. To meet its CO2 reduction targets, Germany intends to phase out coal-fired power production. The Commission on Growth, Structural Change and Employment has recommended in January 2019 to end coal-fired electricity generation by the end of 2038 at the latest. According to a study drawn up for the Commission , in 2016 almost 20 000 people were directly employed in the lignite industry, including mining, power plant operation and reuse of former mines. Taking into account indirect links, 55 000 people could be affected. The strongest negative effects are expected in the *Länder* of Brandenburg, Saxony and Saxony-Anhalt, though North Rhine-Westphalia will also be affected.

Disparities can also be found in the investment rate between the eastern and western *Länder* (see also section 4.1). Investment in the early years of reunification had a strong bias towards the eastern *Länder*. In 1995, investment per inhabitant in the east was 141.5 % of that in the west. This fell to below 100 % in 2000 and to 67.3 % by 2015. The disparity as regards investment in the manufacturing sector is even more pronounced, with investment per capita in the east standing at just 53 % of the equivalent for the western *Länder* (BMWi, 2018a).

Demographic changes such as rising urbanisation; and population decline in rural areas aggravate regional differences, and this affects healthcare as well. While the population of the country as a whole is growing, certain regions are experiencing significant demographic decline, and this is most pronounced in a number of eastern regions. Rural-urban migration results in rising urban populations and expanding conurbations. A number of urban centres in eastern Germany, such as Leipzig, Dresden, Erfurt and Magdeburg, have seen substantial increases in population, even where the regional population is in decline overall. Elsewhere, the populations of large cities such as Berlin, Hamburg, Munich, Frankfurt and Stuttgart, plus those of their urban hinterlands and wider catchment areas, are expanding rapidly. There are disparities in the regional distribution of medical practitioners, and, due to numerous forthcoming retirements of elder physicians, access to primary healthcare may soon become challenging for certain rural and remote areas. Moreover, the annual mean concentrations of NO2 in 2016 – compared with the EU annual limit value (40 µg/m3) – revealed worrying outcomes for growing cities such as Berlin (51.06 µg/m3), Hamburg (50.46 µg/m3) and Wiesbaden (52.95 µg/m3).

Urban regions are also facing socio-economic challenges arising from poverty and unemployment. City-dwellers are more likely to be at risk of poverty or social exclusion (23.7 %) compared with those living in towns or suburbs (17.6 %) or in rural areas (17.2 %). Cities with wide disparities in individual districts, perhaps because of a highly differentiated social structure, are particularly badly affected. In many cities these socio-economic inequalities are combined with higher rates of foreign nationals and migrants among the population. For instance, in 2016, 28 % of the population of Frankfurt am Main were foreign nationals, whilst nationally this figure stood at 10.5 %. The unemployment rate in Germany is low and below the EU average, but shows significant regional differences (see Chapter 1.).

Competitiveness across Germany varies significantly, closely matching economic output

levels. Compared to other regions in the EU, the innovation performance of German regions is relatively good. All German regions are either strong innovators or innovative leaders. Five German regions (Oberbayern, Tübingen, Stuttgart, Berlin and Karlsruhe) belong to the 25 most innovative regions in Europe. Still, there are major regional differences: the south of Germany is more innovative than the north and the east (European Commission, 2018j). This generally correlates with a greater share of high-technology employment, R&D expenditure and higher productivity levels. There are no headquarters of major companies located in the eastern *Länder*; this could partially explain the weakness of private research and development in these regions.

There is a digital divide between rural and urban areas in next-generation access coverage. Although Germany has a fixed broadband coverage of 98 %, next-generation access (≥30Mbps) reaches only 54 % of rural areas, by comparison with a national average of 84 % (European Commission, 2018h). This is likely to make areas beyond the reach of next-generation access significantly less competitive, adversely affecting their ability to attract and retain businesses and generate employment opportunities in high-value-added industries.

4.4.3. SINGLE MARKET INTEGRATION

Internal market for goods and services

Germany plays an important role in further developing the Single Market. It has particularly benefited from the integration in the Single Market (European Commission, 2018n). It is also the largest importer of goods in the EU, with Hamburg being the third biggest port in Europe. Germany therefore has an important responsibility in ensuring that non-compliant products do not enter the EU. Unlike most Member States, Germany does not provide data on customs controls in the field of product safety and compliance. Despite a reduction in the number of pending infringement proceedings, Germany still lags behind the EU average in this respect according to the Single Market Scoreboard.

Barriers to competition in business services in Germany remain high in comparison to other EU Member States and changes in the regulation could boost economic activity and investment. According to the Intra-EEA OECD Services Trade Restrictiveness Index, the level of regulatory restrictiveness in Germany is above the Single Market average in many sectors, including architecture, engineering, legal, computer services. This leads to higher mark-ups and higher prices, which is problematic given the substantial share of services inputs in the German manufacturing industry. Some professional services are viewed as over-regulated, where exclusive rights, compulsory chamber membership, and regulation of prices and fees stifle competition (IMF, 2018). Only limited measures have been taken so far, following individual court decisions on certain regulated professions.

Restrictions in the retail sector are far-reaching. According to the Retail Restrictiveness Indicator published by the Commission in 2018, Germany is among the ten most restrictive countries for both establishment and daily operations. This prevents the entry of innovative business models and response to consumer demand. The planning rules are very detailed and limit the sale of a large variety of goods to certain specific areas. Restrictions also apply to daily operations.

The sharing economy could provide markets with new dynamics, broaden consumer choice, create jobs and encourage entrepreneurial activity. A recent study has underlined the economic relevance of the 'sharing economy' in Germany and has analysed existing regulatory challenges (BMWi, 2018b). Regulation differs across regions and cities, and authorisation schemes can be burdensome.

Energy Union

The lack of transmission capacity of internal electricity lines from north to south creates additional loop flows that strain the grid capacity of neighbouring countries. If such loop flows can be expected, interconnectors are forced to reserve some of their transmission capacity for absorbing the loop flow electricity. As a result, less cross-border capacity is available for cross-border electricity trade. In addition, German transmission system operators may be tempted to reduce the available cross-border capacity, thus reducing

electricity inflow into Germany, so as to avoid aggravating congestion on internal power lines. Ultimately, this creates inefficiencies for the Single Market, leading to a loss in overall economic welfare.

Germany has interconnectors with almost all its neighbours, but further investment in cross-border capacity could strengthen German exports. A first interconnector with Belgium (ALEGrO) is under construction. ALEGrO is planned to be fully operable from 2020 onwards and it is expected to further facilitate the trade in electricity between the two countries, potentially improving security of supply.([50]) With 9 %, Germany's interconnection level is slightly below the 10 % interconnection target for 2020. Increasing additional cross-border capacity could enable additional income to be earned from energy exports. Investment in cross-border capacity would thus boost German exports.

Electricity and gas retail markets remain competitive, but there is little flexibility or demand response in the wholesale sector. Ensuring that markets continue to function smoothly and achieving correct market-based investment signals is an ongoing challenge. There is very little flexibility and demand response traded in the wholesale and ancillary services markets. Only 3.5% of households generate electricity. Smart meters are a precondition for engaging consumers in the market. However, the rollout planned in Germany excludes residential consumers with less than 6 000 kWh annual consumption. Even for large consumers, the rollout is scheduled to take many years.

Germany appears to be on track to reach its European 2020 renewable energy target, but some recent trends could jeopardise that. Renewable energy accounted for just 15.5 % of gross final energy consumption in 2017, while the target is 18 %. Despite strong investments in 2017, there is a lack of certainty as regards the future investment opportunities for renewables in Germany. The long time taken to issue permits, legal challenges and increased planning restrictions adversely affect the deployment of wind power, in particular. This is also reflected in the undersubscription of an auction held in October 2018, at which only just over 50 % of the auctioned 670 MW were allocated. A lack of competition at auctions is also likely to push prices up. In addition, relatively strong economic growth and, possibly, population increase may have contributed to recent increases in energy consumption in Germany.

Investments in electrification, system flexibility, sector coupling, and progress in energy efficiency in all sectors could help Germany meet its Effort Sharing target for 2030 and reduce its import dependency on fossil fuels. More than 60 % of German energy consumption relies on imports, which is above the EU average. Reasons for this include high imports of crude oil and natural gas liquids (97 %), hard coal (95 %), and natural gas (89 %). In its National Energy and Climate Plan to be submitted by 31 December 2019 in line with the Regulation 2018/1999 on the Governance of the Energy Union and Climate Action , Germany will provide an overview of its investment needs until 2030 for the different dimensions of the Energy Union, including renewable energy, energy efficiency, security of supply, and climate change mitigation and adaptation. The information provided, including in the draft plan submitted on 20 December 2018, will further contribute to the identification and assessment of energy and climate-related investment needs for Germany.

Low emissions reduction means that Germany is likely to miss the Effort Sharing target set under EU law. Preliminary data shows that Germany will fail to meet its Effort Sharing interim target for 2017 by a margin of 7 pps. In particular, the transport (+ 6 pps.) and agriculture (+ 1 pps.) sectors increased their share of total emissions in Germany between 1990 and 2017 (see Table 4.4.1). Similarly, the latest projections suggest an underachievement of 3 pps. for 2020. In view of recent macroeconomic developments (population growth and economic development), this estimate is optimistic. Consequently, stronger measures are needed to meet the even stricter 2030 target of -38 % under the Effort Sharing Regulation. The latest projections estimate that this target will be missed by 16 pps without additional measures.

([50]) If the interconnector can be considered technically operational, it is important to make capacity available and to maximise capacity actually made available to the market.

Table 4.4.1: **Emissions Effort Sharing sectors**

Effort Sharing sectors	Share of total emissions		Changes in emissions		Reduction target in *Klimaschutzplan* (climate protection plan)
	1990	2017	1990-2017	2016-2017	1990-2030
Transport	13 %	19 %	4 %	3.1 %	-40 % to -42 %
Residential	11 %	10 %	-31 %	0.0 %	-66 % to -67 % for buildings
Commerce, retail, and service sectors	6 %	4 %	-50 %	1.7 %	-66 % to -67 % for buildings
Agriculture	7 %	8 %	-20 %	0.3 %	-31 % to -34 %
Waste management	3 %	1 %	-74 %	-4.3 %	No specific target

(1) Data for 2017 are estimates
Source: BMU (2018), BMUB (2016)

Climate policies and investments have the potential to generate net economic benefits for Germany. It is estimated that the net present value of measures from the Climate Action Programme 2020 and the National Action Plan on Energy Efficiency exceed costs by approximately EUR 150 billion. Households, in particular, are expected to benefit from a net cost reduction of EUR 26 billion (BMU, 2018).

Germany has developed a climate change adaptation policy. The country implemented an adaptation strategy (BMUB, 2008) a decade ago and is performing well on almost all of its adaptation preparedness indicators (European Commission, 2018k). Furthermore, all *Länder* have developed regional adaptation strategies covering 100 % of German territory. Implementing these adaptation strategies requires additional investments.

Transport infrastructure

Past investment levels have been insufficient, leading to an accumulated investment backlog, especially in rail infrastructure and bridges, with relevance for the euro area beyond the current account surplus. The quality of transport infrastructure is generally high, but investment in recent years has increased only nominally; in real terms, it has remained constant at 0.6 % of GDP and thus below pre-crisis levels. Consequently, the increases might be insufficient to make up for the investment backlog while improving infrastructure to meet future needs at the same time. As in other EU Member States, besides infrastructure investment to build new projects or to upgrade existing infrastructure to higher standards, there is also a significant need for maintenance to preserve construction parameters of existing infrastructure. Policy measures taken at national level to relieve municipalities financially, such as the infrastructure programme under the Municipal Investment Promotion Act or the enlargement of the services of the infrastructure consulting service company, are only able to address the investment backlog in transport infrastructure to a limited extent.

Germany is making good progress with implementing the TEN-T network, but investment needs remain high. A recent estimate by Germany assumes that between 2021 and 2030 EUR 115 billion would be needed on the German sections of the TEN-T core and comprehensive network (European Commission, 2017b). The German Infrastructure Plan for 2030 fully reflects the requirements set in the TEN-T regulation. However, long-term political and financial commitments to complete important cross-border infrastructure, especially in the railway sector, are often lacking at both national and regional level. As Germany is a major transit country, this not only harms the functioning of the internal market but also contradicts the modal shift and climate targets set at European and national level. Not until 2021 will the federal transport infrastructure company be operational and able to address the complex planning responsibilities across the different levels of government. Complicated and lengthy approval procedures will be addressed by a strategy to help speed up planning and permit issue processes. However, it is not yet possible to predict how much it will speed up individual projects.

Competition in the railway sector is increasing in two subsectors (freight and regional passenger trains), but the market share of new entrants to the market for long distance passenger train services remains low. New

entrants to the long distance passenger train services market still accounted for only about 1 % of the market in 2016, and no progress was observed in 2017 or 2018. The main reason for this is the high level of track-access charges for long-distance passenger rail transport, which result in high operating costs, the necessity for sizeable investments in suitable rolling stock and the need to secure attractive infrastructure slots. In 2017 and 2018, 45 % and 66 % of train/km on suburban and regional railway networks respectively have been tendered competitively (BAGSPNV, 2018). For rail freight the market share of new entrants is already close to 50 %. Additionally, the rail freight masterplan of 2017 (BMVI, 2017) introduces 66 measures to support rail freight further, including the reduction in track access charges for rail infrastructure. However, implementation of the 'future of rail freight' programme, which is part of the masterplan, will not start before 2020.

4.4.4. GOVERNANCE AND INSTITUTIONAL QUALTIY

Digital public services

Germany is lagging behind in respect to digital public services. Germany is still among the EU countries with least online interaction between public authorities and citizens. Currently, eGovernment services are fragmented and not always very user-friendly, and progress in this field has been relatively slow in the past. Several measures were taken by the Federal Government to improve the situation. An exclusive legislative competence of the Federal Government was incorporated into the Constitution. The Online Access Act obliges the Federal Government and the *Länder* to offer their administrative services online within five years and to link their respective portals in a portal network. The Federal Government plans to provide EUR 500 million for the implementation of the law and to set up an e-government agency to develop standards and pilot projects. The IT Planning Council launched two projects: the digitalisation programme and the National Gateway Network.

Due to the low deployment and use of eHealth services, Germany foregoes possible efficiency gains for its healthcare system. Only 7 % of Germans use online health services from time to time (European Commission, 2018h). By way of comparison, almost half the population of Estonia and Finland do so. The extremely low use of eHealth services reflects the comparatively low adoption of eHealth, for instance among general practitioners (European Commission, 2019). Implementation of the main eHealth project, the electronic health card and its service infrastructure has been dragging on for more than a decade. To give new impetus, in 2015 the German Government introduced the new E-Health law that sets milestones for the deployment of a digital eHealth infrastructure and the comprehensive use of the electronic health card in all medical establishments as of mid-2018. However, the deadline had to be extended to mid-2019. Apart from a few pilot projects, electronic health records and e-prescriptions have still not been rolled out in Germany.

Investment needs in eHealth concern the digital service infrastructure, data storage and protection and the training of health professionals in using eHealth tools. Based on the E-Health law, the electronic health card gives patients and members of the medical professions access to emergency data, medications plans and an electronic health record. Special mobile phone applications should as of 2021 give patients access to their electronic health record. Furthermore, in 2018 the German Medical Association, using its self-regulatory powers, eased the traditional ban on remote treatment in the professional code for physicians, to enable consultations in telemedicine.

Public procurement

Public procurement in Germany is characterised by a decentralised public procurement landscape, a complex legal system and a lack of data and transparency. At 1.2 % of GDP, Germany has, for years, recorded the EU's lowest values for contracts published EU-wide (the EU average is 4.25 % of GDP). Greater transparency could improve the quality of services and allow for further efficiency gains. It could also improve accountability and trust in public investment. In parts of the health sector, the numbers of contract notices published are low and there are numerous cases in which only one bid is received. So far, public procurement still often resorts to established or less innovative solutions,

leaving potential for developing innovative products and services untapped.

The use of eProcurement has become mandatory, which may also help address the lack of data. Data on public procurement is currently not collected centrally. This lack of data will be less pronounced once the regulation on public procurement statistics is fully implemented. Better use of eProcurement could also improve data availability in public procurement. It has been mandatory since 18.10.2018 to use eProcurement for all public procurement procedures above the EU threshold, which is an important step. Nevertheless, the complex legal system, with different layers of legislation at federal and *Länder* level, still presents challenges for public buyers and economic operators alike.

ANNEX A: OVERVIEW TABLE

Commitments	Summary assessment ([51])
2018 country-specific recommendations (CSRs)	
CSR 1: While respecting the medium-term objective, use fiscal and structural policies to achieve a sustained upward trend in public and private investment, and in particular on education, research and innovation at all levels of government, in particular at regional and municipal levels. Step up efforts to ensure the availability of very high-capacity broadband infrastructure nationwide. Improve the efficiency and investment-friendliness of the tax system. Strengthen competition in business services and regulated professions.	Germany has made **Limited Progress** in addressing CSR 1
While respecting the medium-term objective, use fiscal and structural policies to achieve a sustained upward trend in public and private investment,	**Some Progress** Overall, the investment situation shows signs of improvement, but further action is still needed. Public investment in 2018 grew by 7.7 % nominally and by 3.8 % in real terms. This represents a noticeable increase compared to past years and the long-term average. However, given the backlog especially at municipal level, public investment still needs greater efforts to maintain the capital stock. This could be achieved, in particular by addressing planning constraints as well as the high regional differences of public investment, which suggest that the current fiscal set up does not yet provide all municipalities with sufficient financial resources and staff to significantly step up their investment levels. Private investment has increased noticeably as well, but not across all asset types.

([51]) The following categories are used to assess progress in implementing the 2017 country-specific recommendations (CSRs):

No progress: The Member State has not credibly announced nor adopted any measures to address the CSR. This category covers a number of typical situations, to be interpreted on a case-by-case basis taking into account country-specific conditions. They include the following:

-no legal, administrative, or budgetary measures have been announced

-in the national reform programme,

-in any other official communication to the national Parliament/relevant parliamentary committees or the European Commission,

-publicly (e.g. in a press statement or on the government's website);

-no non-legislative acts have been presented by the governing or legislative body;

-the Member State has taken initial steps in addressing the CSR, such as commissioning a study or setting up a study group to analyse possible measures to be taken (unless the CSR explicitly asks for orientations or exploratory actions). However, it has not proposed any clearly-specified measure(s) to address the CSR.

Limited progress: The Member State has:

-announced certain measures but these address the CSR only to a limited extent; and/or

-presented legislative acts in the governing or legislative body but these have not been adopted yet and substantial further, non-legislative work is needed before the CSR is implemented;

-presented non-legislative acts, but has not followed these up with the implementation needed to address the CSR.

Some progress: The Member State has adopted measures

-that partly address the CSR; and/or

-that address the CSR, but a fair amount of work is still needed to address the CSR fully as only a few of the measures have been implemented. For instance, a measure or measures have been adopted by the national Parliament or by ministerial decision, but no implementing decisions are in place.

Substantial progress: The Member State has adopted measures that go a long way towards addressing the CSR and most of them have been implemented.

Full implementation: The Member State has implemented all measures needed to address the CSR appropriately.

	Equipment investment has grown robustly in response to record high capacity utilisation. Housing investment continues to boom even if the construction sector reports capacity constraints and price increases. Non-residential construction has been increasing sluggishly in real terms, suggesting that essential infrastructure may not have kept up with the economy's needs.
and in particular on education,	**Limited Progress** Spending rose in real terms but remained flat as a share of GDP at 4.2%. Important investment were announced in the coalition agreement. However, the investment backlog in education is by now bigger than in other sectors at municipal level. Legislative changes for direct government investment in the *Länder* is put on hold, with a stalling effect on important investments in education infrastructure and other projects (digital education).
research and innovation at all levels of government, in particular at regional and municipal levels.	**Some Progress** R&D intensity increased from 2.71 % of GDP in 2010 to 3.02 % in 2017. The national (and EU) target of 3 % has thus been achieved. In real absolute terms, growth was also faster than the EU average. While expenditure by the business sector grew faster than spending by the government and the higher education sectors, R&D intensity in the business sector also expanded faster in pps (from 1.82 % in 2010 to 2.09 % of GDP in 2017) than in the public sector (where it increased from 0.89 % of GDP in 2010 to 0.93 % in 2017).
Step up efforts to ensure the availability of very high-capacity broadband infrastructure nationwide.	**Limited Progress** Overall, there are encouraging announcements to improve the nationwide broadband infrastructure, but so far only small steps have been taken regarding their implementation. Germany is lagging behind in the deployment of very high-capacity broadband on a national level, and particularly in rural areas. The market share of fibre optics connections was still at a very low level of only 2.1 % in July 2017, compared to a significantly higher EU average of almost 12.9 %. Concerning take-up rates for ultrafast connections (DAE target III), 11.1 % of German households subscribe to 100 Mbps or more. This is way below the EU average of 15.4 %. The Federal Government has acknowledged the problem and has taken first steps to address it. The special 'Digital Infrastructure' fund was announced and EUR 2.4 billion was allocated from the 2018 federal budget. Moreover, a Gigabit Investment Fund of EUR 10-12 billion was included in the coalition agreement of the parties forming the

	federal government, to be spent by 2021 (i.e. in the next four years) in order to roll out gigabit infrastructure. If implemented, this could be a big step towards a more future-proof digital infrastructure in Germany.
Improve the efficiency and investment-friendliness of the tax system.	**Limited Progress** Overall, there is still more action needed to improve the efficiency and investment-friendliness of the tax system. Although some measures are expected to lead to improvements, the most important distortions are not fully addressed, the tax system overall remains complex and the marginal tax burden on new investments or for taking up (additional) work is still high. After some improvements in this area in recent years, relatively little progress has been made over the past year. Germany adopted a reform designed to modernise and automate tax administration procedures in 2017, but this is still in the process of being implemented. As of 2018, Germany simplified the tax treatment of mutual investment funds and their investors. At the same time, it removed some restrictions on offsetting losses when loss-making companies are bought by new investors. It remains to be seen if these two new measures can actually trigger additional real investment.
Strengthen competition in business services and regulated professions.	**Limited Progress** Barriers to competition in business services remain high in comparison with other EU Member States. Data on business dynamics and profitability are suggesting lower competitive pressures in key business services sectors such as legal, accounting, architectural and engineering activities, which lead to higher mark-ups. Professional services are still overregulated, where exclusive rights, compulsory chamber membership, and regulation on prices and fees stifle competition. This is problematic given the high share of services inputs in the German manufacturing industry. Changes in the regulation of services could boost economic activity and investment in Germany. Policy actions to stimulate competition in business services and regulated professions have not been recorded, with the exception of minor measures as a follow-up to individual court decisions concerning the professions of lawyers and tax advisors.
CSR 2: Reduce disincentives to work more hours, including the high tax wedge, in particular for low-wage and second earners. Take measures to promote longer working lives. Create conditions to promote higher wage growth, while respecting the role of the	Germany has made **Some Progress** in addressing CSR 2

social partners. Improve educational outcomes and skills levels of disadvantaged groups.	
Reduce disincentives to work more hours,	**Some Progress** A number of measures were taken to reduce disincentives to work more hours. From 2019, the midi-job earning threshold was raised from EUR 850 to EUR 1300, resulting in a more gradual phase-in of social security contributions. This will reduce marginal tax rates for certain groups of low wage earners. Further measures, such as the right to return to full time employment, may also contribute to higher employment of women.
including the high tax wedge, in particular for low-wage [earners]	**Some Progress** As of 2019, the social security burden on self-employed people has been reduced, as their monthly minimum health insurance contribution will fall from EUR 360 to EUR 160. The family benefit supplement, responsible for high marginal effective tax rates for certain family types, such as single earners with children, will be phased out more gradually when earned income increases, instead of full withdrawal at the cut-off point. Unemployment contributions will be reduced by 0.5 pps from 2019; however, this will be counterbalanced by a 0.5 pps increase in the long-term care contribution rate. The reintroduction of the rule requiring employers and employees to pay equal contributions to statutory health insurance will result in an average reduction of 0.5 pps in contributions for employees and pensioners, thereby increasing take-home pay and unit labour costs. However, as this is counterbalanced by an increase in employers' contributions, the effect on the tax wedge is neutral. The increase in the basic personal allowance in 2019 appears to roughly match inflation, so it will not result in an effective reduction in taxation.
and second earners.	**Limited Progress** Some efforts have been recorded to promote the use of the alternative factor method (*Faktorverfahren*) to tackle the high marginal tax rates on take-home pay for the second earner, given the current set-up of joint income taxation for married couples (*Ehegattensplitting*). However, disincentives to working more hours persist. In addition to the joint taxation framework, these include a persistent supply gap in the provision of full-time quality childcare.
Take measures to promote longer working lives.	**Limited Progress** The increases in pension entitlements for women with children born before 1992 (*Mütterrente II*) and for people with disability pensions (*Erwerbsminderungsrente*) are expected to

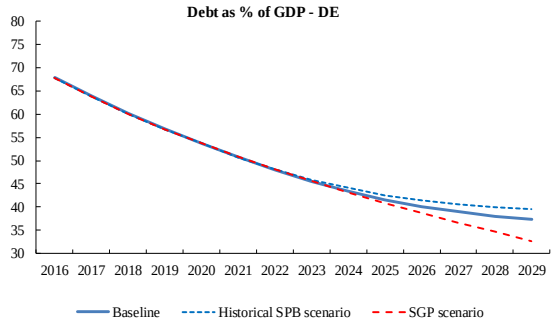
	improve pension adequacy for these groups. Yet neither these measures, nor the double pension stopline (*Doppelte Haltelinie*) — setting a minimum benefit rate and maximum contribution rate until 2025 — are expected to promote longer working lives. There is no official assessment yet of the impact of the flexible retirement (*Flexirente*) reform, which entered into force in 2017, and the Pension Commission's proposals for increasing pension system sustainability and adequacy are not expected until March 2020.
Create conditions to promote higher wage growth, while respecting the role of the social partners.	**Some Progress** Nominal wage growth accelerated to 3.2 % in 2018. However, real wage growth has not yet picked up. Some measures have been taken to support wage growth, while the effect of earlier measures has tended to fade away. Earlier policy measures, such as the introduction of the general statutory minimum wage in 2015, had a substantial impact on wage growth. However, by now, low wages have largely adjusted and the increase in the minimum wage currently sends limited price impulses, which is also reflected in the reduction of the wage drift. Collective bargaining coverage continued to decline in 2017. A collective agreement was reached for public employees at the federal and the municipal level, affecting about 2.3 million workers directly and 300 thousand workers indirectly. The agreement, which runs for 30 months from March 2018, stipulates wage increases and lump-sum payments, which, taken together, will yield about 3.0 % of annualised nominal wage increase. This is about 0.6 pps higher annualised than the previous wage agreement for the sector, which is somewhat below the increase in inflation since the previous agreement was reached in early 2016.
Improve educational outcomes and skills levels of disadvantaged groups.	**Limited Progress** Several measures to improve equity are being implemented by the Länder. However, socio-economic and/or migrant background still strongly impact educational participation and outcomes. Recent national sources on education mark insufficient progress over time. Remedial measures, such as increasing the number of all-day schools, are threatened by serious shortages of teaching staff.

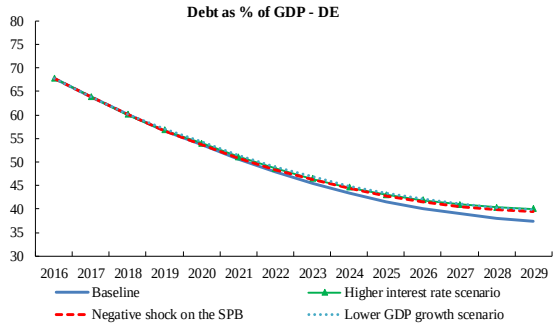
Europe 2020 (national targets and progress)	
Employment rate of the population aged 20-64 years: 77 %	79.8 % in the year ending September 2018.
Employment rate of the population aged 55-64 years: 60 %	71.0 % in the year ending September 2018.
Employment rate of women: 73 %	75.7 % in the year ending September 2018.
R&D target: 3.0 % of GDP, of which one-third public and two-third private	3.02 % in 2017, of which about one-third public and two-third private.
Greenhouse gas (GHG) emissions target: -14 % in 2020 compared with 2005 (in sectors not included in the EU emissions trading scheme)	According to the latest national projections submitted to the Commission and taking into account existing measures, the non-ETS greenhouse gas emissions between 2005 and 2020 are expected to decrease by 10.7 %. This means that the target is expected to be missed by a margin of 3.3 pps. Based on preliminary data, the intermediary reduction target for 2017 of 9.5 % was missed by 6.8 pps.
2020 renewable energy target in gross final energy consumption: 18 %	15.2 % in 2017 (preliminary)
2020 Energy efficiency, indicative national 2020 target:276.6 Mtoe (primary energy consumption)	Germany decreased its primary energy consumption between 2005 and 2016 by 6.8 %, to 295.8 Mtoe.
Early school leaving target: <10 %.	At 10.1 % in 2017, Germany is close to the European target and to the national target and below the EU average of 10.7 %.
Tertiary education target: 40 % (Europe 2020) or 42 % (national target).	Germany is continuing to increase tertiary attainment, which stood at 34.0 % in 2017 but remained below the EU average of 39.9 % and the EU target of 40 %. The national target of 42 % also includes ISCED level 4 (unlike the EU target), and has thus been met (48.8 % in 2017).
Target for reducing the number of people at risk of poverty or social exclusion, expressed as an absolute number of people: 20 % reduction in the number of long-term unemployed by 2020 as compared with 2008 (i.e. reduction by 320 000 long-term unemployed).	The number of long-term unemployed people (LFS definition) fell by 950 000 between 2008 and 2017 (by about 58 %).

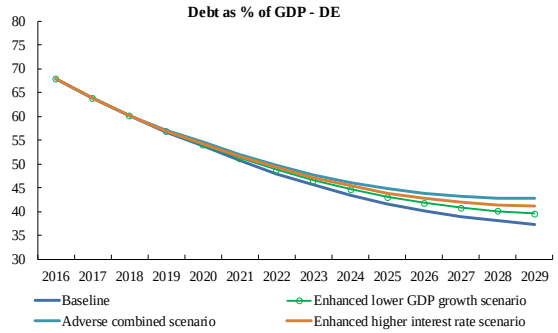
ANNEX B: COMMISSION DEBT SUSTAINABILITY ANALYSIS AND FISCAL RISKS

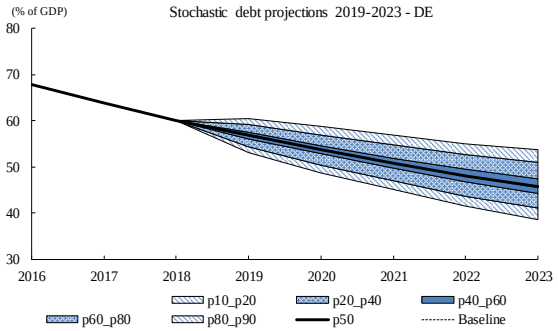
General Government debt projections under baseline, alternative scenarios and sensitivity tests

DE - Debt projections baseline scenario	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Gross debt ratio	**63.9**	**60.1**	**56.7**	**53.7**	**50.7**	**48.0**	**45.5**	**43.4**	**41.6**	**40.1**	**39.0**	**38.0**	**37.3**
Changes in the ratio (-1+2+3)	*-4.0*	*-3.7*	*-3.4*	*-3.0*	*-3.0*	*-2.7*	*-2.4*	*-2.1*	*-1.8*	*-1.5*	*-1.2*	*-1.0*	*-0.7*
of which													
(1) Primary balance (1.1+1.2+1.3)	**2.1**	**2.5**	**2.0**	**1.9**	**1.9**	**1.8**	**1.7**	**1.6**	**1.5**	**1.3**	**1.1**	**1.0**	**0.9**
(1.1) Structural primary balance *(1.1.1-1.1.2+1.1.3)*	***1.8***	***2.4***	***1.8***	***1.9***	***1.9***	***1.8***	***1.7***	***1.6***	***1.5***	***1.3***	***1.1***	***1.0***	***0.9***
(1.1.1) Structural primary balance (bef. CoA)	*1.8*	*2.4*	*1.8*	*1.9*	*1.9*	*1.9*	*1.9*	*1.9*	*1.9*	*1.9*	*1.9*	*1.9*	*1.9*
(1.1.2) Cost of ageing					*0.1*	*0.2*	*0.4*	*0.6*	*0.8*	*1.1*	*1.3*	*1.5*	*1.6*
(1.1.3) Others (taxes and property incomes)					*0.1*	*0.1*	*0.2*	*0.3*	*0.4*	*0.5*	*0.5*	*0.6*	*0.6*
(1.2) Cyclical component	***0.4***	***0.3***	***0.2***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***
(1.3) One-off and other temporary measures	***-0.2***	***-0.2***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***
(2) Snowball effect (2.1+2.2+2.3)	**-1.4**	**-1.2**	**-1.4**	**-1.1**	**-1.1**	**-0.9**	**-0.8**	**-0.5**	**-0.4**	**-0.2**	**0.0**	**0.1**	**0.2**
(2.1) Interest expenditure	*1.0*	*0.9*	*0.9*	*0.8*	*0.8*	*0.8*	*0.9*	*0.9*	*1.0*	*1.0*	*1.1*	*1.2*	*1.2*
(2.2) Growth effect	*-1.4*	*-1.1*	*-1.1*	*-0.9*	*-1.0*	*-0.8*	*-0.7*	*-0.5*	*-0.5*	*-0.4*	*-0.3*	*-0.3*	*-0.3*
(2.3) Inflation effect	*-1.0*	*-1.1*	*-1.2*	*-1.0*	*-1.0*	*-1.0*	*-0.9*	*-0.9*	*-0.9*	*-0.8*	*-0.8*	*-0.8*	*-0.7*
(3) Stock-flow adjustments	**-0.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**









Short term	Medium term	S1	Debt sustainability analysis (detail)							DSA	S2	Long term
				Baseline	Historical SPB	Lower GDP growth	Higher interest rate	Negative shock on SPB	Stochastic projections			
			Risk category	LOW	LOW	LOW	LOW	LOW	LOW			
			Debt level (2029)	37.3	39.6	39.9	40.0	39.5				
			Debt peak year	2018	2018	2018	2018	2018				
			Percentile rank	26.0%	29.0%							
			Probability debt higher						1.0%			
			Dif. between percentiles						15.0			
LOW (S0 = 0)	LOW	LOW (S1 = -2)								LOW	LOW (S2 = 1.7)	LOW

Note: For further information, see the European Commission Fiscal Sustainability Report (FSR) 2018.

[1] The first table presents the baseline no-fiscal policy change scenario projections. It shows the projected government debt dynamics and its decomposition between the primary balance, snowball effects and stock-flow adjustments. Snowball effects measure the net impact of the counteracting effects of interest rates, inflation, real GDP growth (and exchange rates in some countries). Stock-flow adjustments include differences in cash and accrual accounting, net accumulation of assets, as well as valuation and other residual effects.

[2] The charts present a series of sensitivity tests around the baseline scenario, as well as alternative policy scenarios, in particular: the historical structural primary balance (SPB) scenario (where the SPB is set at its historical average), the Stability and Growth Pact (SGP) scenario (where fiscal policy is assumed to evolve in line with the main provisions of the SGP), a higher interest rate scenario (+1 pp. compared to the baseline), a lower GDP growth scenario (-0.5 pp. compared to the baseline) and a negative shock on the SPB (calibrated on the basis of the forecasted change). An adverse combined scenario and enhanced sensitivity tests (on the interest rate and growth) are also included, as well as stochastic projections. Detailed information on the design of these projections can be found in the FSR 2018.

[3] The second table presents the overall fiscal risk classification over the short, medium and long-term.

a. For the short-term, the risk category (low/high) is based on the S0 indicator. S0 is an early-detection indicator of fiscal stress in the upcoming year, based on 25 fiscal and financial-competitiveness variables that have proven in the past to be leading indicators of fiscal stress. The critical threshold beyond which fiscal distress is signalled is 0.46.

b. For the medium-term, the risk category (low/medium/high) is based on the joint use of the S1 indicator and of the DSA results. The S1 indicator measures the fiscal adjustment required (cumulated over the 5 years following the forecast horizon and sustained thereafter) to bring the debt-to-GDP ratio to 60 % by 2033. The critical values used are 0 and 2.5 pps. of GDP. The DSA classification is based on the results of 5 deterministic scenarios (baseline, historical SPB, higher interest rate, lower GDP growth and negative shock on the SPB scenarios) and the stochastic projections. Different criteria are used such as the projected debt level, the debt path, the realism of fiscal assumptions, the probability of debt stabilisation, and the size of uncertainties.

c. For the long-term, the risk category (low/medium/high) is based on the joint use of the S2 indicator and the DSA results. The S2 indicator measures the upfront and permanent fiscal adjustment required to stabilise the debt-to-GDP ratio over the infinite horizon, including the costs of ageing. The critical values used are 2 and 6 pps. of GDP. The DSA results are used to further qualify the long-term risk classification, in particular in cases when debt vulnerabilities are identified (a medium / high DSA risk category).

ANNEX C: STANDARD TABLES

Table C.1: **Financial market indicators**

	2013	2014	2015	2016	2017	2018
Total assets of the banking sector (% of GDP)[1)]	266.4	265.5	251.4	246.6	235.3	229.9
Share of assets of the five largest banks (% of total assets)	30.6	32.1	30.6	31.4	29.7	-
Foreign ownership of banking system (% of total assets)[2)]	4.1	4.4	4.4	7.1	6.9	6.6
Financial soundness indicators:[2)]						
- non-performing loans (% of total loans)	-	3.9	3.0	2.6	1.8	1.7
- capital adequacy ratio (%)	18.7	17.3	17.9	18.1	18.8	18.5
- return on equity (%)[3)]	1.3	2.5	1.7	2.2	2.9	4.8
Bank loans to the private sector (year-on-year % change)[1)]	0.5	1.3	2.3	3.7	3.9	4.8
Lending for house purchase (year-on-year % change)[1)]	2.0	2.4	3.5	3.7	4.0	4.5
Loan to deposit ratio[2)]	-	97.5	94.6	92.6	89.4	90.3
Central Bank liquidity as % of liabilities[1)]	-	1.1	1.0	1.1	1.6	1.5
Private debt (% of GDP)	102.7	98.6	98.2	98.5	100.1	-
Gross external debt (% of GDP)[2)] - public	45.8	48.7	43.6	39.8	34.1	32.1
- private	41.1	41.3	44.6	44.3	43.9	44.2
Long-term interest rate spread versus Bund (basis points)*	-	-	-	-	-	-
Credit default swap spreads for sovereign securities (5-year)*	14.9	12.7	7.7	11.5	8.1	5.7

1) Latest data Q3 2018. Includes not only banks but all monetary financial institutions excluding central banks.
2) Latest data Q2 2018.
3) Quarterly values are annualised.
* Measured in basis points.
Source: European Commission (long-term interest rates); World Bank (gross external debt); Eurostat (private debt); ECB (all other indicators).

Table C.2: **Headline Social Scoreboard indicators**

	2013	2014	2015	2016	2017	2018 [6]
Equal opportunities and access to the labour market						
Early leavers from education and training (% of population aged 18-24)	9.8	9.5	10.1	10.3	10.1	:
Gender employment gap (pps)	9.6	9.1	8.7	8.2	7.9	8.1
Income inequality, measured as quintile share ratio (S80/S20)	4.6	5.1	4.8	4.6	4.5	:
At-risk-of-poverty or social exclusion rate[1] (AROPE)	20.3	20.6	20.0	19.7	19.0	:
Young people neither in employment nor in education and training (% of population aged 15-24)	6.3	6.4	6.2	6.7	6.3	:
Dynamic labour markets and fair working conditions[†]						
Employment rate (20-64 years)	77.3	77.7	78.0	78.6	79.2	79.8
Unemployment rate[2] (15-74 years)	5.2	5.0	4.6	4.1	3.8	3.4
Long-term unemployment rate[3] (as % of active population)	2.3	2.2	2.0	1.7	1.6	1.4
Gross disposable income of households in real terms per capita[4] (Index 2008=100)	102.9	104.2	105.3	106.9	108.5	:
Annual net earnings of a full-time single worker without children earning an average wage (levels in PPS, three-year average)	25413	25935	26528	27040	:	:
Annual net earnings of a full-time single worker without children earning an average wage (percentage change, real terms, three-year average)	0.1	0.5	1.1	1.7	:	:
Public support / Social protection and inclusion						
Impact of social transfers (excluding pensions) on poverty reduction[5]	34.0	33.2	33.5	34.8	33.2	:
Children aged less than 3 years in formal childcare	27.0	27.5	25.9	32.6	30.3	:
Self-reported unmet need for medical care	1.6	1.6	0.5	0.3	0.3	:
Individuals who have basic or above basic overall digital skills (% of population aged 16-74)	:	:	67.0	68.0	68.0	:

(1) People at risk of poverty or social exclusion (AROPE): individuals who are at risk of poverty (AROP) and/or suffering from severe material deprivation (SMD) and/or living in households with zero or very low work intensity (LWI).
(2) Unemployed persons are all those who were not employed but had actively sought work and were ready to begin working immediately or within two weeks.
(3) Long-term unemployed are people who have been unemployed for at least 12 months.
(4) Gross disposable household income is defined in unadjusted terms, according to the draft Joint Employment Report 2019.
(5) Reduction in percentage of the risk of poverty rate, due to social transfers (calculated comparing at-risk-of poverty rates before social transfers with those after transfers; pensions are not considered as social transfers in the calculation).
(6) Average of first three quarters of 2018 for the employment rate, long-term unemployment rate and gender employment gap. Data for unemployment rate is annual (except for DK, EE, EL, HU, IT and UK data based on first three quarters of 2018).
Source: Eurostat

Table C.3: **Labour market and education indicators**

Labour market indicators	**2013**	**2014**	**2015**	**2016**	**2017**	**2018** [4]
Activity rate (15-64)	77.6	77.7	77.6	77.9	78.2	78.5
Employment in current job by duration						
From 0 to 11 months	12.1	12.0	12.2	12.4	12.5	:
From 12 to 23 months	9.2	8.8	8.9	9.0	9.4	:
From 24 to 59 months	15.5	16.2	15.9	15.3	15.6	:
60 months or over	60.8	60.7	60.6	59.9	59.6	:
Employment growth* (% change from previous year)	0.6	0.8	0.9	1.3	1.4	1.3
Employment rate of women (% of female population aged 20-64)	72.5	73.1	73.6	74.5	75.2	75.6
Employment rate of men (% of male population aged 20-64)	82.1	82.2	82.3	82.7	83.1	83.8
Employment rate of older workers* (% of population aged 55-64)	63.6	65.6	66.2	68.6	70.1	71.0
Part-time employment* (% of total employment, aged 15-64)	26.6	26.5	26.8	26.7	26.9	26.8
Fixed-term employment* (% of employees with a fixed term contract, aged 15-64)	13.4	13.1	13.2	13.2	12.9	12.5
Participation in activation labour market policies (per 100 persons wanting to work)	30.8	31.1	30.3	19.5	:	:
Transition rate from temporary to permanent employment (3-year average)	36.1	32.9	29.1	30.3	31.3	:
Youth unemployment rate (% active population aged 15-24)	7.8	7.7	7.2	7.1	6.8	6.2
Gender gap in part-time employment (aged 20-64)	38.3	37.8	38.0	37.9	37.5	37.4
Gender pay gap[1] (in undadjusted form)	22.1	22.3	22.0	21.5	21.0	:
Education and training indicators	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
Adult participation in learning (% of people aged 25-64 participating in education and training)	7.9	8.0	8.1	8.5	8.4	:
Underachievement in education[2]	:	:	17.2	:	:	:
Tertiary educational attainment (% of population aged 30-34 having successfully completed tertiary education)	32.9	31.4	32.3	33.2	34.0	:
Variation in performance explained by students' socio-economic status[3]	:	:	15.8	:	:	:

* Non-scoreboard indicator

(1) Difference between the average gross hourly earnings of male paid employees and of female paid employees as a percentage of average gross hourly earnings of male paid employees. It is defined as 'unadjusted', as it does not correct for the distribution of individual characteristics (and thus gives an overall picture of gender inequalities in terms of pay). All employees working in firms with ten or more employees, without restrictions for age and hours worked, are included.

(2) PISA (OECD) results for low achievement in mathematics for 15 year-olds.

(3) Impact of socio-economic and cultural status on PISA (OECD) scores. Values for 2012 and 2015 refer respectively to mathematics and science.

(4) Average of first three quarters of 2018 for the activity rate, employment growth, employment rate, part-time employment, fixed-term employment. Data for youth unemployment rate is annual (except for DK, EE, EL, HU, IT and UK data based on first three quarters of 2018).

Source: Eurostat, OECD

Table C.4: **Social inclusion and health indicators**

	2012	2013	2014	2015	2016	2017
Expenditure on social protection benefits* (% of GDP)						
Sickness/healthcare	9.4	9.7	9.7	9.8	9.8	:
Disability	2.2	2.2	2.2	2.2	2.3	:
Old age and survivors	11.0	10.9	10.9	10.9	10.9	:
Family/children	3.1	3.1	3.1	3.2	3.2	:
Unemployment	1.1	1.1	1.1	1.0	1.0	:
Housing	0.6	0.6	0.6	0.6	0.5	:
Social exclusion n.e.c.	0.2	0.2	0.2	0.3	0.4	:
Total	27.6	27.9	27.7	28.0	28.2	:
of which: means-tested benefits	3.3	3.3	3.4	3.5	3.7	:
General government expenditure by function (% of GDP, COFOG)						
Social protection	18.8	18.9	18.8	19.0	19.3	:
Health	6.8	7.0	7.1	7.1	7.2	:
Education	4.2	4.3	4.2	4.2	4.2	:
Out-of-pocket expenditure on healthcare (% of total health expenditure)	13.9	13.1	12.6	12.7	12.4	:
Children at risk of poverty or social exclusion (% of people aged 0-17)*	18.4	19.4	19.6	18.5	19.3	18.0
At-risk-of-poverty rate[1] (% of total population)	16.1	16.1	16.7	16.7	16.5	16.1
In-work at-risk-of-poverty rate (% of persons employed)	7.8	8.6	9.9	9.7	9.5	9.1
Severe material deprivation rate[2] (% of total population)	4.9	5.4	5.0	4.4	3.7	3.4
Severe housing deprivation rate[3], by tenure status						
Owner, with mortgage or loan	0.5	0.5	0.3	0.7	0.2	0.3
Tenant, rent at market price	3.5	3.0	3.6	3.2	3.8	3.5
Proportion of people living in low work intensity households[4] (% of people aged 0-59)	9.9	9.9	10.0	9.8	9.6	8.7
Poverty thresholds, expressed in national currency at constant prices*	10772	10544	10454	10862	11169	11462
Healthy life years (at the age of 65)						
Females	6.9	7.0	6.7	12.3	12.4	:
Males	6.7	7.0	6.8	11.4	11.5	:
Aggregate replacement ratio for pensions[5] (at the age of 65)	0.5	0.5	0.5	0.5	0.5	0.5
Connectivity dimension of the Digital Economy and Society Inedex (DESI)[6]	:	:	62.1	66.9	69.1	71.5
GINI coefficient before taxes and transfers*	50.5	51.7	51.6	51.5	50.8	50.0
GINI coefficient after taxes and transfers*	28.5	29.7	30.7	30.1	29.5	29.0

* Non-scoreboard indicator
(1) At-risk-of-poverty rate (AROP): proportion of people with an equivalised disposable income below 60 % of the national equivalised median income.
(2) Proportion of people who experience at least four of the following forms of deprivation: not being able to afford to i) pay their rent or utility bills, ii) keep their home adequately warm, iii) face unexpected expenses, iv) eat meat, fish or a protein equivalent every second day, v) enjoy a week of holiday away from home once a year, vi) have a car, vii) have a washing machine, viii) have a colour TV, or ix) have a telephone.
(3) Percentage of total population living in overcrowded dwellings and exhibiting housing deprivation.
(4) People living in households with very low work intensity: proportion of people aged 0-59 living in households where the adults (excluding dependent children) worked less than 20 % of their total work-time potential in the previous 12 months.
(5) Ratio of the median individual gross pensions of people aged 65-74 relative to the median individual gross earnings of people aged 50-59.
(6) Fixed broadband take up (33 %), mobile broadband take up (22 %), speed (33 %) and affordability (11 %), from the Digital Scoreboard.
Source: Eurostat, OECD

Table C.5: **Product market performance and policy indicators**

Performance indicators	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Labour productivity per person[1] growth (t/t-1) in %						
Labour productivity growth in industry	-2.00	-0.75	4.23	2.33	4.46	1.34
Labour productivity growth in construction	-2.60	-3.08	3.19	0.38	0.81	0.77
Labour productivity growth in market services	0.06	0.85	0.31	0.17	-0.44	1.01
Unit Labour Cost (ULC) index[2] growth (t/t-1) in %						
ULC growth in industry	3.70	4.08	-1.63	0.49	-2.32	0.76
ULC growth in construction	4.78	2.86	0.01	3.34	1.70	1.85
ULC growth in market services	3.59	0.45	3.41	3.15	2.93	2.35
Business environment	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Time needed to enforce contracts[3] (days)	394	394	459	479	499	499
Time needed to start a business[3] (days)	14.5	14.5	14.5	10.5	8.0	8.0
Outcome of applications by SMEs for bank loans[4]	0.28	0.17	0.58	0.35	0.38	0.18
Research and innovation	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
R&D intensity	2.87	2.82	2.87	2.91	2.92	3.02
General government expenditure on education as % of GDP	4.20	4.30	4.20	4.20	4.20	:
Employed people with tertiary education and/or people employed in science and technology as % of total employment	43	43	44	44	45	45
Population having completed tertiary education[5]	25	25	23	24	24	25
Young people with upper secondary education[6]	76	77	77	77	78	78
Trade balance of high technology products as % of GDP	1.05	1.05	0.90	0.96	1.03	0.97
Product and service markets and competition				**2003**	**2008**	**2013**
OECD product market regulation (PMR)[7], overall				1.80	1.41	1.29
OECD PMR[7], retail				3.38	2.88	2.71
OECD PMR[7], professional services				3.03	2.82	2.65
OECD PMR[7], network industries[8]				1.87	1.33	1.27

(1) Value added in constant prices divided by the number of persons employed.
(2) Compensation of employees in current prices divided by value added in constant prices.
(3) The methodologies, including the assumptions, for this indicator are shown in detail at: http://www.doingbusiness.org/methodology.
(4) Average of the answer to question Q7B_a. '[Bank loan]: If you applied and tried to negotiate for this type of financing over the past six months, what was the outcome?'. Answers were scored as follows: zero if received everything, one if received most of it, two if only received a limited part of it, three if refused or rejected and treated as missing values if the application is still pending or if the outcome is not known.
(5) Percentage population aged 15-64 having completed tertiary education.
(6) Percentage population aged 20-24 having attained at least upper secondary education.
(7) Index: 0 = not regulated; 6 = most regulated. The methodologies of the OECD product market regulation indicators are shown in detail at: http://www.oecd.org/competition/reform/indicatorsofproductmarketregulationhomepage.htm
(8) Aggregate OECD indicators of regulation in energy, transport and communications.
Source: European Commission; World Bank — Doing Business (for enforcing contracts and time to start a business); OECD (for the product market regulation indicators); SAFE (for outcome of SMEs' applications for bank loans).

Table C.6: **Green growth**

Green growth performance		2012	2013	2014	2015	2016	2017
Macroeconomic							
Energy intensity	kgoe / €	0.12	0.12	0.11	0.11	0.11	0.11
Carbon intensity	kg / €	0.34	0.35	0.33	0.32	0.32	-
Resource intensity (reciprocal of resource productivity)	kg / €	0.49	0.49	0.49	0.47	0.46	0.44
Waste intensity	kg / €	0.14	-	0.14	-	0.14	-
Energy balance of trade	% GDP	-3.6	-3.4	-2.8	-2.0	-1.5	-1.7
Weighting of energy in HICP	%	12.6	12.4	11.9	11.8	10.4	10.5
Difference between energy price change and inflation	%	3.6	3.2	-1.6	-5.5	-5.0	-0.2
Real unit of energy cost	% of value added	26.3	21.0	21.5	22.4	23.5	-
Ratio of environmental taxes to labour taxes	ratio	0.10	0.09	0.09	0.09	0.08	-
Environmental taxes	% GDP	2.1	2.1	2.0	1.9	1.9	1.8
Sectoral							
Industry energy intensity	kgoe / €	0.08	0.08	0.07	0.07	0.07	0.07
Real unit energy cost for manufacturing industry excl. refining	% of value added	23.8	17.6	18.3	19.4	20.5	-
Share of energy-intensive industries in the economy	% GDP	9.7	9.5	9.5	9.5	9.7	-
Electricity prices for medium-sized industrial users	€ / kWh	0.13	0.14	0.16	0.15	0.15	0.15
Gas prices for medium-sized industrial users	€ / kWh	0.04	0.05	0.04	0.04	0.03	0.03
Public R&D for energy	% GDP	0.04	0.05	0.05	0.04	0.04	0.04
Public R&D for environmental protection	% GDP	0.02	0.03	0.03	0.03	0.02	0.03
Municipal waste recycling rate	%	65.2	63.8	65.6	66.7	67.1	67.6
Share of GHG emissions covered by ETS*	%	51.5	51.1	51.4	50.3	49.9	-
Transport energy intensity	kgoe / €	0.56	0.55	0.57	0.57	0.59	0.59
Transport carbon intensity	kg / €	1.40	1.41	1.45	1.48	1.50	-
Security of energy supply							
Energy import dependency	%	61.9	63.0	61.9	62.2	63.7	63.9
Aggregated supplier concentration index	HHI	13.8	15.0	15.2	18.1	25.1	-
Diversification of energy mix	HHI	0.24	0.25	0.25	0.25	0.25	0.25

All macro intensity indicators are expressed as a ratio of a physical quantity to GDP (in 2010 prices)
Energy intensity: gross inland energy consumption (Europe 2020-2030)(in kgoe) divided by GDP (in EUR)
Carbon intensity: greenhouse gas emissions (in kg CO2 equivalents) divided by GDP (in EUR)
Resource intensity: domestic material consumption (in kg) divided by GDP (in EUR)
Waste intensity: waste (in kg) divided by GDP (in EUR)
Energy balance of trade: the balance of energy exports and imports, expressed as % of GDP
Weighting of energy in HICP: the proportion of 'energy' items in the consumption basket used for the construction of the HICP
Difference between energy price change and inflation: energy component of HICP, and total HICP inflation (annual % change)
Real unit energy cost: real energy costs as a percentage of total value added for the economy
Industry energy intensity: final energy use in industry (in kgoe) divided by gross value added of industry, including construction (in 2010 EUR)
Real unit energy costs for manufacturing industry excluding refining : real costs as % of value added for manufacturing sectors
Share of energy-intensive industries in the economy: share of gross value added of the energy-intensive industries in GDP
Electricity and gas prices for medium-sized industrial users: consumption band 500-20 00 mWh and 10 000-100 000 GJ; ; figures excl. VAT.
Recycling rate of municipal waste: ratio of recycled and composted municipal waste to total municipal waste
Public R&D for energy or for the environment: government spending on R&D (GBAORD) for these categories as % of GDP
Proportion of GHG emissions covered by EU Emission Trading System (ETS) (excluding aviation): based on greenhouse gas emissions (excl land use, land use change and forestry) as reported by Member States to the European Environment Agency.
Transport energy intensity: final energy use in transport sector including international aviation, (in kgoe) divided by transport industry gross value added (in 2010 EUR)
Transport carbon intensity: GHG emissions in transport sector divided by gross value added of the transport activities
Energy import dependency: net energy imports divided by gross inland energy consumption plus consumption of international maritime bunkers
Aggregated supplier concentration index: Herfindahl-Hirschman index for net imports of crude oil and NGL, natural gas and hard coal. Smaller values indicate larger diversification and hence lower risk.
Diversification of the energy mix: Herfindahl-Hirschman index of the main energy products in the gross inland consumption of energy
* European Commission and European Environment Agency
Source: European Commission and European Environment Agency (Share of GHG emissions covered by ETS); European Commission (Environmental taxes over labour taxes); Eurostat (all other indicators)

ANNEX D: INVESTMENT GUIDANCE ON COHESION POLICY FUNDING 2021-2027 FOR GERMANY

Building on the Commission proposal for the next Multiannual Financial Framework for the period 2021-2027 of 2 May 2018 (COM (2018) 321), this Annex D presents the preliminary views of the Commission services on priority investment areas and framework conditions for effective delivery of the 2021-2027 Cohesion Policy. ([52]) These priority investment areas are derived from the broader context of investment bottlenecks, investment needs and regional disparities assessed in the report. This Annex provides the basis for a dialogue between Germany and the Commission services in view of the programming of the cohesion policy funds (European Regional Development Fund and European Social Fund Plus).

Policy Objective 1: A Smarter Europe – Innovative and smart industrial transformation

Germany boasts some of the most innovative regions in the EU, however performance varies between regions and the country as a whole has slipped from its former position of 'Innovation Leader' to 'Strong Innovator'. Therefore priority investment needs ([53]) have been identified to 'enhance research and innovation capacities and the uptake of advanced technologies', and in particular to:

- strengthen innovation performance and foster productivity growth by identifying smart specialisation areas on the basis of national and regional needs and potential.
- facilitate the transition towards new technologies, based on smart specialisation strategies.
- boost expenditure on research and development and innovation, particularly private investment of small and medium-sized enterprises and in the East of Germany. Continue investment in the development of key enabling and emerging technologies.
- enhance technology transfer between the public and private sectors, in and across regions and beyond borders, especially in new value chains.
- build synergies and joint projects with other Länder, regions and Member States.

Widespread adoption of new Information and Communications technology would support productivity growth in Germany, leading to more sustainable trajectories. Therefore priority investment needs have been identified to 'reap the benefits of digitisation for citizens, companies and governments', and in particular to:

- increase Information and Communications Technology uptake in small and medium-sized enterprises, including supporting infrastructures and services, supporting the development and implementation of business models based on new technologies, with a special focus on digital newcomers and laggards.
- enhance the provision of public e-services including possible cross-border activities when there is a need and improve their uptake by citizens.

Private research and innovation in Germany is concentrated in large enterprises rather than small and medium-sized enterprises, the latter having fallen behind their international counterparts, which impacts on their competitiveness. Hence, priority investment needs have been identified to 'enhance growth and competitiveness of small and medium-sized enterprises' especially in the East of Germany, and in

([52]) This Annex is to be considered in conjunction with the Proposal for a Regulation of the European Parliament and of the Council on the European Regional Development Fund and on the Cohesion Fund COM(2018) 372 and the Proposal for a Regulation of the European Parliament and of the Council on the European Social Fund Plus COM(2018) 382 and in particular as regards the requirements for thematic concentration and urban earmarking outlined in these proposals

([53]) The intensity of needs is classified in three categories in a descending order - high priority needs, priority needs, needs.

particular to:

- support small and medium-sized enterprises to increase their own innovation competence, by implementing innovation and fostering cooperation with other small and medium-sized enterprises and research organisations, also in other Member States.
- provide support for small and medium-sized enterprises to bridge the critical stages of development (incl. scale-up), especially for innovative start-ups, in particular in transition regions. Improve possibilities for small and medium-sized enterprises business succession by providing advice and funding.
- make the economy more circular and resource-efficient, for example by supporting eco-innovations and business models for more sustainable products and production systems.

The German economy faces the challenge of a significant shortage in qualified workers, the risk of automation and shortcomings in respect of life-long learning outcomes. Investment needs have been identified to 'develop skills for smart specialisation, industrial transformation and entrepreneurship', and in particular to:

- provide support for upskilling of the workforce, refining and reshaping of skill sets of existing occupations and (re)training workers towards new demands, including the cross-border labour market.
- promote the good practises for high-tech leadership skills and develop measures within smart specialisation strategies to overcome the shortage of highly-skilled professionals.
- strengthen the integration of education and training institutions, including higher education and centres of vocational excellence, within national and regional innovation, technology diffusion and skills development ecosystems.
- develop skills in smart specialisation areas for small and medium-sized enterprises, in particular in relation to digitalisation, industrial transformation and entrepreneurship, in cooperation with education and training institutions.

Policy Objective 2: A low carbon and greener Europe – Clean and fair energy transition, Green and blue investment, circular economy, climate adaptation and risk prevention

Germany is not on track with the European and national indicative energy efficiency targets, where continued sustained efforts are required. Priority investment needs have been identified to 'promote energy efficiency measures', and in particular to:

- promote energy efficiency in public buildings. Cohesion policy could continue to be used to renovate the existing building stock.

Germany is experiencing significant change in the energy sector, as it moves towards renewable sources, but electricity networks are too slow in adapting to renewable production, with insufficient progress in transmission and distribution grids and the storage of electricity. Investment needs have been identified to 'develop smart energy systems, grids and storage at local level', and in particular to:

- support research and development, demonstration projects on energy storage and flexible generation capacities and smart distribution grids at local level, including cooperation with partners from other

regions and Member States.
The challenges of climate change and natural disasters, especially floods, threaten certain regions in Germany. Investment needs haven been identified to 'promote climate change adaptation, risk prevention and disaster resilience', and in particular to: • increase cross border and transnational cooperation in finding the most suitable, in particular nature based, adaptation and risk prevention measures and applying such measures.
There is room to improve the circularity of the German economy, particularly in the small and medium-sized enterprises sector. Investment needs have been identified to 'promote the transition to a circular economy', and in particular to: • support small and medium-sized enterprises to make their use of resources more efficient and productive for example with tools like demonstrations of new technologies or processes, and case study databases. • support small and medium-sized enterprises, especially in the East of Germany, to make their business processes more circular, particularly by supporting small and medium-sized enterprises in implementing circular economy solutions and sharing best-practices with other regions and Member States.
Policy Objective 4: A more social Europe – Implementing the European Pillar of Social Rights
The high share of women in part-time work reflects their not fully used labour market potential. Priority investment needs have therefore been identified **to promote women's labour market participation, a better work-life balance including access to full-time childcare and all day schools, especially by addressing regional disparities in provision**, and in particular to: • develop and implement work-life balance policies and support the sustainable labour market reintegration of persons who have been absent due to caring duties; • supporting social partners and enterprises to raise awareness and address gender segmentation in the labour market and the gender pay gap.
Germany is experiencing skilled labour shortages with a strong regional dimension, while people with a migrant background find it harder to access the labour market. Priority investment needs have therefore been identified **to improve the quality, equity, effectiveness and labour market relevance of education and training, and to promote lifelong learning, notably flexible upskilling and reskilling, taking into account digital skills, facilitate career transitions and promote professional mobility**, and in particular to: • build flexible pathways between education and training and work and improve uptake of basic and digital skills; • develop and implement methods and technologies delivering tailored support to disadvantaged learners; address teachers' upskilling to better prepare them for an inclusive school system with a diverse classroom environment; • develop and implement access to lifelong learning and guidance services; • support active labour market policies, upskill and reskill the labour force through adult learning

programmes, including for migrants and low-skilled adults.

The labour market participation of refugees and significant regional differences in the risk of poverty or social exclusion remain challenges. Priority investment needs have therefore been identified **to promote the socio-economic integration of third country national**s and **to promote the social integration of people at risk of poverty or social exclusion, including the most deprived and children** and in particular to:

- improve access to employment through individualised support, guidance and access to vocational education and training and support a successful transition from school to employment.
- support social inclusion and social innovation promoting the social integration and health status of children at risk of poverty or social exclusion

Policy Objective 5 – A Europe closer to citizens by fostering the sustainable and integrated development of urban, rural and coastal areas and local initiatives

Germany is experiencing varied territorial dynamics, marked by growth of certain areas - particularly regional urban centres, where urban and social challenges such as integration of migrants, unemployment and poverty can be found. Investment needs have been identified to 'foster integrated social, economic and environmental development, cultural heritage and security in urban areas', and in particular to:

- support Smart City initiatives in cities, in particular in cooperation with universities, experimental projects, smart urban mobility (including cross-border connections, where appropriate) as well as investments in relation to the low-carbon economy agenda.
- develop urban-rural cooperation, especially around growing major cities.
- develop deprived neighbourhoods in order to increase attractiveness for enterprises and workforce. Tackle social transformation processes, including integration of migrants.
- improve access to social housing through support of community based solutions and integrated services
- increase planning capacity of public administrations, especially by developing or creating specialised common capacities, in particular for the roll out of broadband in small and rural municipalities.
- promote cooperation and the exchange of knowledge and expertise between towns and cities, both within the regional and national context, while also reaching out to other EU regions.

Germany is facing structural transition challenges in the coal mining regions as a result of the planned phasing out of coal. Investment needs have been identified to 'foster integrated social, economic and environmental local development, cultural heritage and security, including for rural and coastal areas also through community-led local development', and in particular to:

- develop coal regions, managing structural change in order to increase attractiveness for enterprises and the workforce, complementing the EU Coal Regions Initiative.

Factors for effective delivery of Cohesion policy
• improved public procurement performance, in particular as regards publication rates and small and medium-sized enterprises participation; • broader use of financial instruments and /or contributions to a German compartment under InvestEU for revenue-generating and cost-saving activities; • a balanced number of intermediate bodies and strengthening their performance; • take into account the lessons learnt in Saxony during the implementation of the Commission pilot project on industrial transition, in particular as regards the impact of new technologies, decarbonisation and the promotion of inclusive growth; • adequate participation and strengthened capacity of social partners, civil society and other relevant stakeholders in the delivery of policy objectives.

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