



**Brussels, 8 March 2018
(OR. en)**

6361/18

**ECOFIN 144
UEM 47
SOC 72
EMPL 53
COMPET 90
ENV 95
EDUC 56
RECH 61
ENER 62
JAI 138**

COVER NOTE

From:	Secretary-General of the European Commission, signed by Mr Jordi AYET PUIGARNAU, Director
date of receipt:	8 March 2018
To:	Mr Jeppe TRANHOLM-MIKKELSEN, Secretary-General of the Council of the European Union
No. Cion doc.:	SWD(2018) 204 final
Subject:	COMMISSION STAFF WORKING DOCUMENT Country Report Germany 2018 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 COUNCIL, THE EUROPEAN CENTRAL BANK AND THE EUROGROUP 2018 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

Delegations will find attached document SWD(2018) 204 final.

Encl.: SWD(2018) 204 final

6361/18

MSC/sl

DGG 1A

EN



Brussels, 7.3.2018
SWD(2018) 204 final

COMMISSION STAFF WORKING DOCUMENT

**Country Report Germany 2018
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 COUNCIL, THE EUROPEAN CENTRAL BANK AND THE
EUROGROUP**

**2018 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**

{COM(2018) 120 final}

CONTENTS

Executive summary	1
1. Economic situation and outlook	4
2. Progress with country-specific recommendations	11
3. Summary of the main findings from the Macroeconomic Imbalances Procedure in-depth review	14
4. Reform priorities	19
4.1. Public finances, fiscal frameworks and taxation*	19
4.2. Financial sector*	23
4.3. Labour market, education and social policies	26
4.4. Beyond the aggregate: ageing, inequality and savings*	35
4.5. Investment	38
4.6. Sectoral policies	46
Annex A: Overview table	53
Annex B: Macroeconomic Imbalances Procedure Scoreboard	58
Annex C: Standard tables	59
References	65

LIST OF TABLES

Table 1.1:	Key economic and financial indicators – Germany	10
Table 2.1:	Summary table on 2017 CSR assessment	12
Table 3.1:	MIP assessment matrix – Germany	18
Table 4.2.1:	Financial soundness indicators, all banks in Germany	23
Table B.1:	The MIP Scoreboard for Germany (AMR 2018)	58
Table C.1:	Financial market indicators	59
Table C.2:	Headline Social Scoreboard indicators	60
Table C.3:	Labour market and education indicators	61
Table C.4:	Social inclusion and health indicators	62
Table C.5:	Product market performance and policy indicators	63
Table C.6:	Green growth	64

LIST OF GRAPHS

Graph 1.1:	Demand components of GDP growth	4
Graph 1.2:	Contributions to headline inflation	6
Graph 1.3:	Sectoral net lending	6
Graph 1.4:	Determinants of household disposable income	6
Graph 1.5:	Current account and component balances	7
Graph 1.6:	Balance of goods by broad economic category	7
Graph 1.7:	Current account balance and components of the financial account	7
Graph 1.8:	Factors explaining the current account surplus	8
Graph 1.9:	General government budget balance and gross debt	9
Graph 1.10:	Tax wedge - 2016	9
Graph 2.1:	Overall multiannual implementation of 2011-2017 CSRs to date	11
Graph 4.1.1:	Government balance and trends in selected revenues and expenditures	19
Graph 4.1.2:	Taxes by economic function	19
Graph 4.2.1:	Mortgages and corporate loans in billion EUR and in % of GDP	24
Graph 4.2.2:	Annual change of different household loan categories	24
Graph 4.2.3:	Funding sources of non-financial corporations	25
Graph 4.3.1:	Phillips curve in Germany: compensation growth and unemployment rate	26
Graph 4.3.2:	Trends in labour costs and its components	29
Graph 4.3.3:	Employment rate by citizenship	30
Graph 4.3.4:	Gini coefficient and poverty risk	31
Graph 4.4.1:	Dependency ratios (2036 population forecast) and savings rates of DE	36
Graph 4.4.2:	Savings rates by age groups – measured in 2015	37
Graph 4.5.1:	Capital stock	38
Graph 4.5.2:	Gross fixed capital formation in the private sector	38
Graph 4.5.3:	Potential growth and contributions	39
Graph 4.5.4:	Productivity developments	40
Graph 4.5.5:	Housing overvaluation gap	40
Graph 4.5.6:	Gross fixed capital formation in the public sector	41
Graph 4.5.7:	Net public investment by level of government	42
Graph 4.5.8:	Net capital stock by type of activity	43
Graph 4.6.1:	Business expenditure on R&D (BERD) performed by SMEs	47
Graph 4.6.2:	Venture capital investment (market statistics) in 2016	47

LIST OF BOXES

Box 2.1:	Tangible results delivered through EU support to structural change in Germany	13
Box 3.1:	Euro area spillovers	17
Box 4.3.1:	Monitoring performance in light of the European Pillar of Social Rights	27
Box 4.3.2:	Policy highlights: The introduction of the general minimum wage	28
Box 4.5.1:	Investment challenges and reforms in Germany	44
Box 4.6.1:	Collaborative economy	50

EXECUTIVE SUMMARY

Germany's enduring economic upswing offers an opportunity for policy action aimed at fostering higher potential growth, which can prepare the country for future challenges.

Boosting public and private investment, where gaps have been clearly identified, can help maintain the efficiency of the capital stock and raise productivity to prepare for future challenges such as new digital business models, low-emission transport and decentralised (renewable) energy production. Better involvement of the underrepresented groups in the labour market can help address the looming shortage of skilled labour stemming from demographic change. Boosting investment and expenditure in education, including lifelong learning, and in research and development are also key in raising long-term growth potential.⁽¹⁾

The German economy showed robust growth in 2015-2017, driven by domestic demand.

Real GDP growth was at 1.9 % in 2016 and 2.2 % in 2017. In 2017, private consumption grew for the second year running by 2 %. Underpinned by the continued economic expansion, unemployment fell to a record low of 3.6 % by the fourth quarter of 2017, despite the growing labour force. Employment growth continued, with the employment rate reaching 79.1 % in the third quarter of 2017, as both demand for labour and the labour supply increased. Despite record low unemployment and high job vacancy rates, wage growth remains moderate. The positive output gap and high capacity utilisation are expected to spur investment. Inflation rose from 0.4 % in 2016 to an average of 1.7 % in 2017 on the back of rising energy prices.

The budget balance continues to improve, while government debt remains on a downward path.

In 2016, the government surplus reached 0.8 % of

GDP, higher than in 2015, rising further to a record high of 1.2 % of GDP in 2017, partly due to lower interest payments on public debt. The budget is expected to remain in surplus in headline and structural terms in 2018 and 2019 as well. The gross debt-to-GDP ratio is set to fall further from 68.1 % in 2016 to below the 60 % Maastricht threshold over the next couple of years, possibly by 2019.

Given its economic importance and strong integration in EU value chains, Germany is a source of potentially significant spillovers to other EU countries. A further rise in domestic demand, including through higher public investment in R&D and education, would increase Germany's actual and potential growth. It would also stimulate demand and GDP growth in other EU countries, including those that need to bring debt down.

Germany has made limited progress in addressing the 2017 country-specific recommendations. Limited progress has been made towards achieving a sustainable upward trend in public investment, including public spending on education, research and innovation. **Some progress** has been made in addressing capacity and planning constraints on infrastructure investment. There has been **limited progress** towards stimulating competition in the business services and regulated professions, reducing disincentives to work for second earners and helping them to move into standard employment, promoting higher real wage growth, and reducing the high tax wedge for low-wage earners. **No progress** has been achieved in making the tax system more efficient and conducive to investment.

Regarding progress in reaching the national targets under the Europe 2020 strategy, Germany is performing well on the employment rate, early school leaving and poverty, improving tertiary education attainment, investment in research and development (R&D), and increasing the share of renewable energy. However, it is unlikely to reach its national indicative energy efficiency and climate targets by 2020.

Germany performs relatively well on the indicators of the Social Scoreboard supporting the European Pillar of Social Rights. It has very

(1) This report assesses Germany's economy in the light of the European Commission's Annual Growth Survey published on 22 November 2017. 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 - boosting investment, pursuing structural reforms and ensuring responsible fiscal policies. At the same time, the Commission published the Alert Mechanism Report (AMR) that initiated the seventh round of the macroeconomic imbalance procedure. The AMR found that Germany warranted an in-depth review, which is presented in this report.

low unemployment but a large gender employment gap. Strong social dialogue and a relatively advanced welfare model underpin Germany's competitive economy.

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

- **The current account surplus is expected to edge down further in the future, but to remain high.** 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, may have reached a turning point in 2016. However, the factors keeping investment low relative to savings remain in place.
- **Demographic change and rising income inequality up to 2014 partly explain the rise and persistence of the current account surplus.** Rising income inequality, linked to demographic and labour market changes, may have constrained private consumption and increased the trade balance. In addition, population ageing and concerns about the adequacy of future pension levels and old-age poverty could explain a rise in domestic savings. According to economic theory and model estimates, the demographic transition is currently pushing up the current account surplus by a substantial amount, but should lower savings in the long run.
- **Private investment has picked up, but business investment remains subdued as a proportion of GDP, suggesting that obstacles to investment persist.** Housing seems to account for most of the increase in private investment, while investment in non-residential construction is slow to pick up. Though investment in machinery and equipment has increased to pre-crisis levels, as a share of GDP it remains subdued. On average, investment in intangible assets, such as R&D, has grown in importance. However, it is largely concentrated in medium-high tech sectors and in larger firms, while small and medium-sized enterprises and the services sector in general are tending to under-invest. This explains large productivity gaps between manufacturing and services, which are likely to dampen potential growth. Despite favourable financing conditions, non-financial corporations remain net lenders. Barriers to investment include demographic trends resulting in shortages of skilled labour, taxation and administrative burden, regulatory restrictiveness in the services sectors and the shortfall in very-high-capacity broadband.
- **While public investment increased recently, the public investment gap remains large, particularly as regards investment in infrastructure and education.** Real public investment growth turned positive in 2015, after showing negative growth rates in the years before. This improvement reflects government efforts to boost investment. The accumulated investment backlog at municipal level fell to some extent in 2016, but remains large at an estimated 4 % of GDP. The biggest shortfalls are in education, where the national spending target has not been met, and in infrastructure. While the Federal Government and the *Länder* kept their construction investment stable, such investment by municipalities fell steadily, with negative net investment also in 2017. Investment in public infrastructure is still held back by capacity and planning constraints at municipal level. Measures to overcome these have yet to show results. In addition, there is scope for enhancing digital public services and improving public procurement.
- **Germany is lagging behind on very-high-capacity broadband deployment, and the digital divide between urban and rural areas remains a particular challenge.** Only a comparatively small proportion of German territory is covered by fibre-based access networks. Instead, upgrading existing copper cable networks continues to be the dominating incumbent's preferred technological solution. However, many services rely on very high connectivity. Lack of such connectivity holds back investment, especially by small and medium-sized businesses, many of which are located in semi-rural and rural areas.

- **Germany's tax and social security systems are not particularly progressive or supportive of employment and private investment.** There is a relatively strong emphasis on more distortive direct taxes, notably on labour income, while revenues from consumption and environmental taxes are lower. Household income and consumption are restrained by the high tax wedge on labour, especially for low earners. The statutory corporate tax rate is among the EU's highest. Taxes on inheritance and gifts allow large-scale transfer of wealth from one generation to the next and preserve the high wealth inequality. Healthcare efficiency could be improved by better integrating primary, ambulatory specialist and in-patient care and making better use of eHealth.
 - **The banking sector is not very profitable, but the equity and leverage situation remains acceptable.** Nationally aggregated profitability seems low, and ongoing consolidation is improving efficiency relatively slowly. Still, capitalisation ratios are satisfactory, and the non-performing loans' ratio is low, in the context of a relatively small loan stock, particularly for non-financial corporations. While the housing market continues to be buoyant, overall house price developments are not causing macro or financial stability risks. The venture capital market remains less developed than that of other international innovation leaders.
 - **Wage growth remains moderate, despite record low unemployment and high job vacancy rates.** The German labour market is performing well on aggregate, with strong employment growth and low unemployment. However, the prevalence of part-time work especially among women, and a large low-wage sector present structural challenges. Moderate recent wage growth is partly attributable to slow productivity increases in services, weak inflation expectations, low collective bargaining coverage in some sectors, and a reduction in structural unemployment.
 - **Despite growing skilled labour force shortages, the labour market potential of certain groups remains underused.**
- Disincentives to work persist, particularly for second earners and the low-waged; they include the substantial tax wedge, tax rules, and the lock-in effects of the mini-job earning threshold. Long-term unemployment, though falling, remains sizable. An ageing population poses further challenges to the labour market, social policy and education in the medium to long term. Improvements in family and education policies, adult learning and in the integration of people with a migrant background into education and employment could reduce inactivity and in-work poverty, improve social cohesion and potential growth alike.
- **Germany has a solid social protection system overall, but there are concerns about the future.** In 2015, the rise in the risk of poverty and inequality has halted and the income position of low income households improved. Nevertheless, future deterioration of pension adequacy in the statutory first pillar is expected to increase the risk of poverty in old age, especially for low-wage earners or people with atypical work and interrupted employment history. The gender pension gap is one of the highest in the EU. Social outcomes for migrants and their children remain a concern.
- Other key economic issues analysed in this report which highlight particular challenges facing Germany's economy are as follows:
- **Germany's electricity networks are adapting to renewables production at a slow rate, and significant investment in transmission and distribution grids is still lacking.** Substantial delays in carrying out many projects have incurred considerable costs to German and European electricity networks and electricity markets. The lack of north-south internal lines strains the electricity trade with Germany's neighbours, as domestic congestion tends to be pushed to the borders. Moreover, there is scope for higher energy efficiency in transport.
 - **Progress on emissions reduction has been slow.** Germany is expected to miss its Europe 2020 Effort Sharing Decision target for greenhouse gas emissions. The transport sector has been particularly slow to cut emissions of both greenhouse gases and local air pollutants.

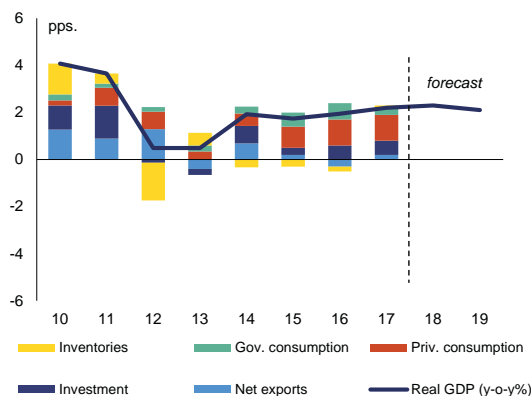
1. ECONOMIC SITUATION AND OUTLOOK

GDP growth

The German economy continued to grow strongly in 2017. Germany's real GDP growth rate was a solid 2.2 % driven by private consumption and investment. Export growth picked up amid a strengthening euro area recovery while the strong domestic demand caused imports to accelerate. On balance, foreign trade had a small positive contribution to growth.

Economic sentiment continues to improve across sectors, suggesting continued expansion in the coming quarters. Survey data show expectations of improving orders, higher output and greater demand. Capacity utilisation has continued to increase, which bodes well for investment. The strong labour market, favourable world trade developments the expansion in the euro area should help to sustain the enduring upswing. Overall, real GDP growth is expected to strengthen to 2.3% in 2018 and remain above 2% in 2019 (see Graph 1.1).

Graph 1.1: Demand components of GDP growth



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

Potential growth is benefiting from the sustained rise in labour supply and total factor productivity while capital accumulation is lagging behind. Potential GDP growth has strengthened in recent years reaching around 2 % in 2016 (see Graph 4.5.3). It was driven by expanding labour supply on the back of improving participation and recent high net migration. The number of foreign nationals in the labour force increased from 3.5 million in 2011 to 4.8 million

in 2016. In addition, total factor productivity growth has been strong, consistently exceeding the euro area average (see 'Labour market' below and Sections 4.3 and 4.5). Capital accumulation, on the other hand, has made a relatively small contribution to potential growth. In the medium to long term, labour input is unlikely to grow as strongly along the extensive margin. Therefore, to sustain potential growth, it will be important to enhance capital accumulation by stepping up productive investment.

Investment

The positive demand outlook and high capacity utilisation are expected to boost investment. Private investment in equipment has been recovering since the soft patch of 2016; it has grown strongly last year, returning to the pre-crisis levels. Further increases are likely amid favourable demand prospects, not least from the euro area and the rest of the EU. Consistently rising capacity utilisation should also boost the efforts to renew and expand the capital stock. Housing investment grew strongly in the first two quarters of 2017 and is expected to continue growing, though more slowly. This booming sector is sustained by ample order book backlogs and a steady flow of building permits. Non-residential construction has continued to stagnate to some extent, casting doubt on firms' long-term expansion strategies. Public investment in 2017 increased by around 5.1 % nominally and 2.9 % in real terms posting robust growth for a third year in a row (see Section 4.5).

Labour market

Employment growth continued, spurred by increased labour demand and supply. Employment grew by 1.3 % in 2016 and 1.5 % in 2017, and by the third quarter of 2017 the employment rate climbed to 79.1% for those aged 20-64. This brought the unemployment rate for the age group 15-74 down further to a new post-unification low of 3.8 % in 2017. Youth unemployment at 6.7% in 2017 was one of the lowest in the EU. Despite population ageing, the labour supply increased mainly driven by increasing labour market participation of women, older workers and incoming workers from other EU countries.

Although the labour market tightens and the output gap closes, wages continue to grow at a moderate pace. Although nominal compensation per employee increased by 2.4 % in 2017, slightly above their growth rate of 2.2 % in 2016, real compensation growth decelerated from 1.8 % to 0.7 %. Several factors have kept wage increases moderate so far. These include increased labour supply; relatively limited collective bargaining coverage in some sectors; and a stronger role of non-wage components in collective bargaining (see Section 4.3).

The large proportion of part time work, particularly among women, prevents the full use of workers' labour market potential. Despite high employment rates for women (74.5 % in 2016), the equivalent in full-time employment is only 58.1 % as part-time employment remains among the highest in the EU. Women with a migrant background and women with caring responsibilities are more often in part-time work. The current arrangement of joint taxation of income for married couples (*Ehegattensplitting*), non-contributory health insurance coverage for non-working spouses, and the high marginal tax rates just above the earnings threshold of a mini job, create disincentives to work more hours. This lower labour market attachment is combined with a large gender pay gap (22.0 % compared to an EU-average of 16.3 % in 2015).

In addition, the labour market potential of people with a migrant background is not being fully used. In the third quarter of 2017, the employment rate of non-EU nationals (aged 20-64) was 54.6 %, just slightly below the EU average for non-EU nationals (58.0 %) but 27.2 pps. lower than the rate for German nationals. Women with a non-EU nationality had an employment rate of 45.4 % 32.9 pps. lower than for women of German nationality.

Social developments

Income inequality has begun to decline (see Annex C). This reverses a decade-long trend of increasing inequality of disposable income distribution, which peaked in 2014 at close to the EU average. The latest figures show a modest reduction in the S80/S20 ratio, which measures the income of the richest 20 % of households in relation to that of the poorest 20 %. For Germany,

the share fell to 4.6 in 2016, owing to an improvement in the incomes of poorer households. This trend is believed to have continued in 2017. The improvement reflects rising wages, which have also reduced the amount of in-work poverty. The share of income of the richest 20 % has fallen slightly. This may reflect a slowing of the wage premium on skills, as the incomes of the low and medium-skilled rose faster in 2016 than those of the highly skilled.

However, wealth inequality in Germany is high in international comparison. In 2014, the Gini coefficient for net wealth in Germany at 0.76 was the second highest in the euro area (whose Gini coefficient, calculated on the basis of data from the second wave of the ECB's Household Finance and Consumption Survey, was 0.69).⁽²⁾ For Germany, the P90/50 ratio was 7.7, meaning that a person who fell just within the richest 10 % of the population had roughly 8 times the wealth of a person in the middle of the wealth distribution. Like wealth as a whole, financial and real assets were distributed unevenly.

Inequality of opportunity also remains a concern. While overall the risk of poverty has begun to decline modestly (see Section 4.3 on social policy), the poverty risk faced by the children of low-skilled parents has continued to rise reaching 64.7 % in 2016. PISA results also showed a strong link between socioeconomic status and educational performance, partly explaining the underperformance of children with a migrant background. (see Section 4.3).

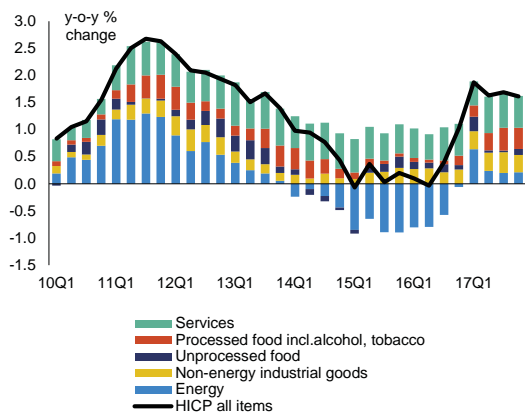
Inflation

Inflation is expected to remain moderate. HICP picked up from 0.4 % in 2016 to an average of 1.7 % in 2017 on the back of rebounding energy prices and related second round effects (see Graph 1.2). Core inflation (excluding energy and unprocessed food) has increased from just above 1 % over 2015-16, to 1.5 % in 2017 and is expected to rise to 1.7 % over this year and next, in the context of strong demand and higher wage growth. Overall headline inflation dynamics are

⁽²⁾ The high wealth Gini is partly explained by the fact that pension entitlements are not included. Germany's rather well-developed pension system reduces the need to accumulate private wealth (see Frick and Grabka, 2010).

projected to be in line with the euro area's and to oscillate around 1.6 %. Dampened by the expected stable energy prices, this moderate inflation should support household purchasing power.

Graph 1.2: Contributions to headline inflation

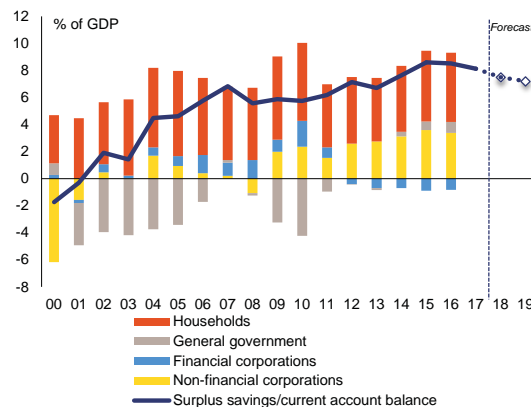


Source: European Commission

Sectoral balances

The widening of domestic saving-investment balance, reflected in the increasing current account surplus, may have reached a turning point in 2016. Private borrowing increased further in 2016 slightly above GDP growth and the rate of net asset accumulation by the private sector stabilised. Nominal corporate investment increased in 2016, with a further significant rise in 2017, while corporate savings are set to fall slightly as a share of GDP. As a result, corporations, whose indebtedness is among the lowest in the euro area, contributed to the slight reduction in the savings surplus. The household savings rate increased to 17.1 % in 2016, propped up by low consumer price inflation, but is forecast to have declined to 16.6 % in 2017, as consumer demand remained robust and inflation rose. Still, the household savings rate will likely remain the highest in the euro area (which averages 12.3 %). After rebounding in 2016, household investment is expected to have grown strongly in 2017, lowering the net lending balance further. A further fall in public sector indebtedness is expected, thanks to the favourable macroeconomic outlook (see 'Public finances' below).

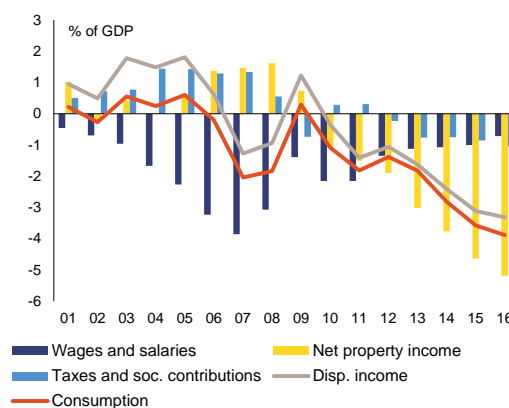
Graph 1.3: Sectoral net lending



Source: European Commission

However, the consumption share of GDP remains relatively low, as the high household saving rate is being sustained. The GDP share of labour income has increased since 2011, but so have the shares of income tax and social security deductions. The share of property income has been falling as a result of less generous dividend payouts by corporations and lower interest income. The saving rate has nevertheless remained stable, while consumption has declined in parallel with household disposable income as a proportion of GDP. Nonetheless, real consumption has actually increased as purchasing power has been boosted by low inflation. Even so, the consumption share of GDP (53 % in 2016 and 2017) has remained low from an historical perspective.

Graph 1.4: Determinants of household disposable income



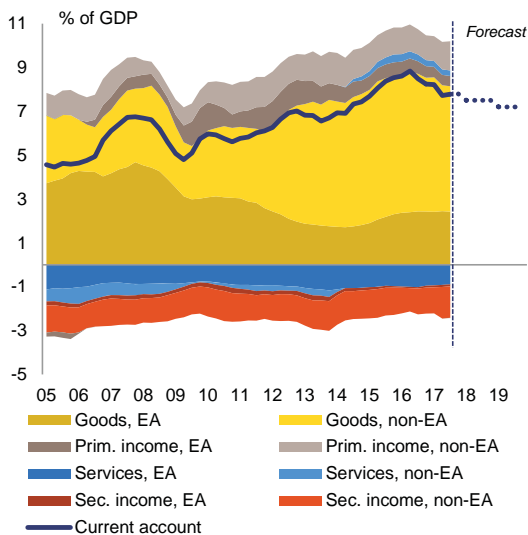
Note: Cumulated change in pps of GDP since 2000

Source: European Commission

External position

The current account surplus has edged down from a historically high level and is expected to decline slowly in the coming years. In 2016, it fell to 8.2 % of GDP, from a peak of 8.5 % in 2015, while it stood at 7.8 % for the year ending in November 2017. The trade surplus stayed largely stable at 8.5 % in 2016, but fell to 8.2 % for the year ending in November 2017. Between 2013 and 2016 cheaper energy and other commodity prices drove the widening of the trade balance by 2 pps. of GDP, but since then terms-of-trade effects have gone into reverse. The trade balance is also contracting in real terms. The export outlook is expected to be favourable and to fuel German exports. At the same time, strong domestic demand is expected to keep import growth above export growth and to further ease of the current account surplus ratio. Nevertheless, the current account is expected to remain above the MIP threshold of 6% of GDP for a number of years.

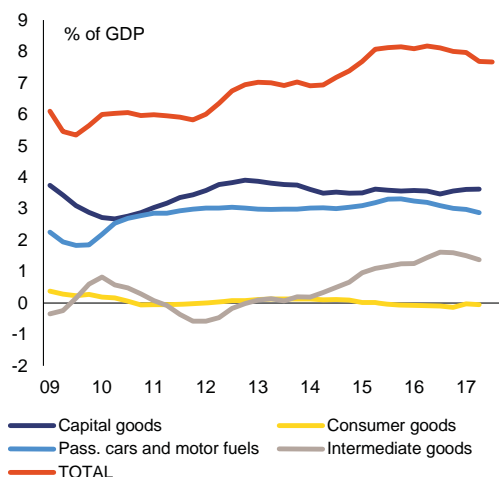
Graph 1.5: Current account and component balances



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

The current account surplus with respect to the rest of the euro area stabilised at 2.4 % of GDP in 2016-17. Recovery in the euro area goes hand-in-hand with stronger German exports and a growing export ratio with respect to the region. At the same time, the ratio of euro area imports to Germany remains robust, although imports from other regions are growing at a faster rate.

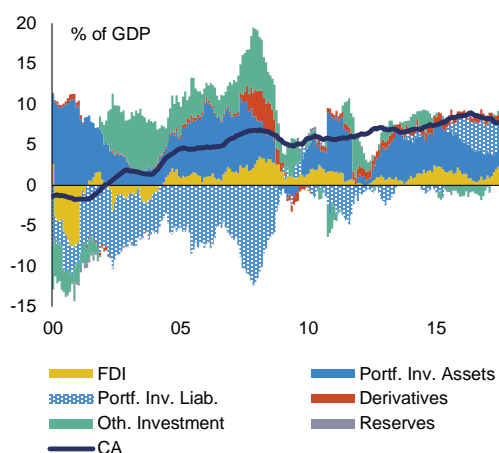
Graph 1.6: Balance of goods by broad economic category



Note: four quarter moving average
Source: European Commission

The trends behind the widening trade balance may have started reversing. The balance of trade in intermediate goods widened by 2 pps. of GDP in the course of 2012-2016, largely in parallel with the widening of the overall trade balance. Since mid-2016, imports of intermediate goods have become relatively more important, and the balance has been coming down. In addition, net exports of passenger cars peaked in 2015 and have been declining since, as more foreign cars are making their way onto the German market.

Graph 1.7: Current account balance and components of the financial account



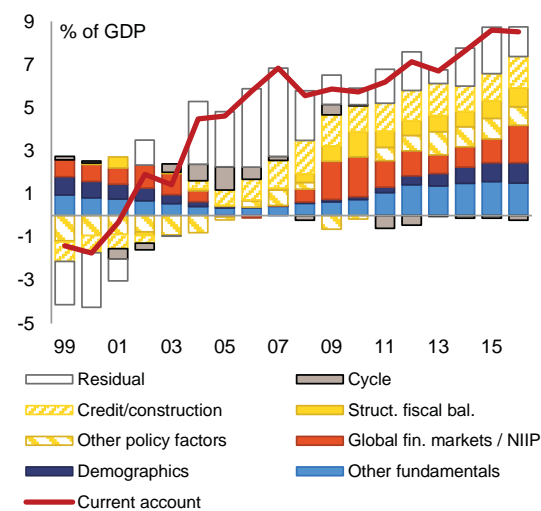
Note: twelve month moving average
Source: Deutsche Bundesbank

In addition, there has been a shift in a composition of the financial account. Portfolio investments, in particular in foreign debt instruments, which typically are of a relatively short-term and speculative nature, have been the main foreign investment outlet, accounting for the bulk of net capital exports. Following the 2009 financial crisis, German portfolio investment abroad tended to significantly exceed portfolio investment in the country by non-residents. However, since mid-2015 German residents have been scaling down portfolio investment. In parallel, a wave of repatriation of German securities has set in, from investors for whom the safe haven motive for holding German government bonds no longer counterbalances their low returns. Thus, a significant part of the current account surplus in recent years reflects disinvestment by non-residents, rather than German capital exports as it was the case in the past (Graph 1.7). This disinvestment by non-residents has also been related to the increased purchases of German government bonds by the Bundesbank in the context of ECB's Public Sector Purchase Programme and has coincided with an increase of Germany's Target 2 surplus.

Nonetheless, the current account surplus remains considerably above what fundamentals suggest. According to the Commission current account 'norm' calculations, fundamental savings-investment determinants currently suggest a surplus of +2.5 pp, which is mostly due to ageing, but also due to the manufacturing intensity of German exports. ⁽³⁾ Yet most of the surplus and its dynamics is explained by non-fundamental factors. Private-sector deleveraging since 2000 explains a large part of the surplus, along with the fiscal stance, and an increasing net international investment position (NIIP) giving rise to a sizeable positive income balance. Overall, the sustained current account surpluses have led to a NIIP somewhat above what fundamentals suggest.

⁽³⁾ 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 European Commission, 2017a.

Graph 1.8: Factors explaining the current account surplus

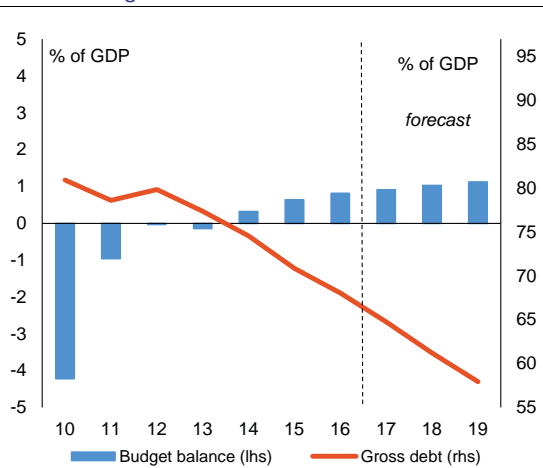


Source: European Commission

Public finances

The general government budget balance continues to improve, while public debt continues to fall. In 2016, the headline surplus reached 0.8 % of GDP, higher than in 2015, rising further to a record high of 1.2 % of GDP in 2017. The surplus would have been even higher (by around 0.2 %), as it already included the repayment in 2017 of a nuclear fuel tax ruled invalid by the German Constitutional Court. From its recent peak in 2010, with a government deficit at 4.2 % of GDP, Germany has consistently improved its government balance, turning it into a surplus from 2014 on. What made this improvement possible was the fact that government revenue rose from 43.0 % of GDP to 45.0 % between 2010 and 2016. At the same time, public spending fell from 47.3 % of GDP to 44.2 %. Since 2015, all levels of government (federal, state, municipalities and social security) have been making a positive contribution to the budget surplus. The positive government balance is also reflected in falling government debt, which reached 70.9 % in 2015, falling further to 68.1 % in 2016. According to the Commission's 2017 autumn forecast, the debt ratio can be expected to fall below the 60 % Maastricht threshold in the next few years, possibly by 2019.

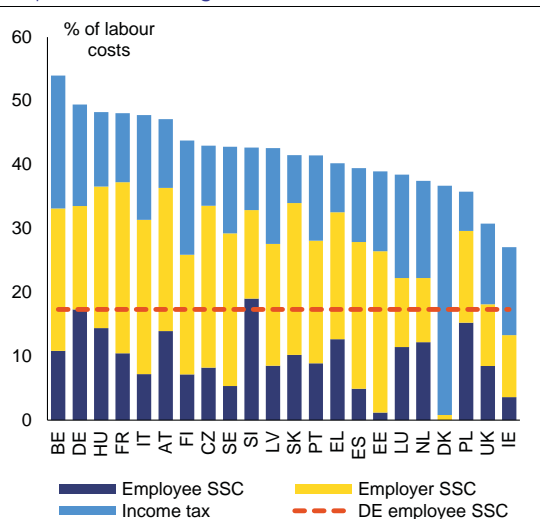
Graph 1.9: General government budget balance and gross debt



Source: European Commission

The tax wedge⁽⁴⁾ remains substantial and has been a major source of increasing government revenue over the last few years. The increase in government revenue by around 2.0 % of GDP between 2010 (43.0 %) and 2016 (45.0 %) is based mainly on income taxes, which contribute 1.3 % to the rise. According to 2016 data, Germany's tax wedge is one of the EU's largest at 49.4 % (average of 22 comparable European OECD countries: 41.7 %) for a single earner earning 100 % of the average wage without children. Graph 1.10 shows that, as in other countries, income tax accounts only for about one third of the tax wedge. It is rather social security contributions that account for the biggest share. However, unlike in most other European countries, that the German employers pay a smaller share (16.2 %) than employees (17.3 %). The employees' share is one of the largest in Europe (the average, for 21 comparable European OECD countries, is 10.1 %). (See also Section 4.1).

Graph 1.10: Tax wedge - 2016



Note: SSC = social security contributions

Source: OECD

⁽⁴⁾ The tax wedge on labour represents the difference between the total labour cost of employing a worker and the worker's net earnings. It is defined as personal income tax and employer and employee social security contributions (net of family benefits) as a percentage of total labour costs (the wage and employer social security contributions).

Table 1.1: Key economic and financial indicators – Germany

	2004-07	2008-12	2013-14	2015	2016	forecast		
						2017	2018	2019
Real GDP (y-o-y)	2.2	0.7	1.2	1.7	1.9	2.2	2.3	2.1
Potential growth (y-o-y)	1.3	0.9	1.4	1.7	1.9	1.9	1.9	1.9
Private consumption (y-o-y)	0.7	0.8	0.8	1.7	2.1	.	.	.
Public consumption (y-o-y)	0.5	1.9	1.5	2.9	3.7	.	.	.
Gross fixed capital formation (y-o-y)	3.1	0.5	1.2	1.5	3.1	.	.	.
Exports of goods and services (y-o-y)	9.9	2.2	3.2	5.2	2.6	.	.	.
Imports of goods and services (y-o-y)	7.7	2.2	3.3	5.6	3.9	.	.	.
Contribution to GDP growth:								
Domestic demand (y-o-y)	1.1	0.9	1.0	1.8	2.4	.	.	.
Inventories (y-o-y)	0.0	-0.3	0.1	-0.3	-0.2	.	.	.
Net exports (y-o-y)	1.2	0.2	0.1	0.2	-0.3	.	.	.
Contribution to potential GDP growth:								
Total Labour (hours) (y-o-y)	0.1	0.0	0.5	0.6	0.8	0.7	0.6	0.4
Capital accumulation (y-o-y)	0.3	0.3	0.2	0.3	0.3	0.4	0.4	0.5
Total factor productivity (y-o-y)	0.9	0.7	0.7	0.8	0.8	0.9	0.9	0.9
Output gap	-0.5	-0.9	-0.5	-0.3	-0.2	0.0	0.2	0.3
Unemployment rate	10.1	6.6	5.1	4.6	4.1	3.7	3.5	3.2
GDP deflator (y-o-y)	0.9	1.2	1.9	2.0	1.3	1.5	1.9	1.6
Harmonised index of consumer prices (HICP, y-o-y)	1.9	1.7	1.2	0.1	0.4	1.7	1.6	1.6
Nominal compensation per employee (y-o-y)	0.6	2.1	2.3	2.7	2.2	2.5	2.7	3.0
Labour productivity (real, person employed, y-o-y)	1.5	-0.2	0.5	0.8	0.6	0.8	.	.
Unit labour costs (ULC, whole economy, y-o-y)	-0.9	2.2	1.8	1.8	1.6	1.8	1.6	1.9
Real unit labour costs (y-o-y)	-1.8	1.0	-0.1	-0.2	0.2	0.2	-0.2	0.2
Real effective exchange rate (ULC, y-o-y)	-2.0	-0.4	2.9	-2.6	1.3	2.3	2.4	0.1
Real effective exchange rate (HICP, y-o-y)	0.0	-1.6	1.5	-4.3	1.6	0.6	2.0	.
Savings rate of households (net saving as percentage of net disposable income)								
	10.1	9.9	9.2	9.6	9.7	.	.	.
Private credit flow, consolidated (% of GDP)	0.3	0.5	1.3	3.0	3.8	.	.	.
Private sector debt, consolidated (% of GDP)	115.2	106.7	101.1	98.7	99.3	.	.	.
of which household debt, consolidated (% of GDP)	65.6	58.7	54.7	53.3	53.1	.	.	.
of which non-financial corporate debt, consolidated (% of GDP)	49.6	48.1	46.4	45.4	46.2	.	.	.
Gross non-performing debt (% of total debt instruments and total loans and advances) (2)	.	2.1	2.1	2.0	1.8	.	.	.
Corporations, net lending (+) or net borrowing (-) (% of GDP)	1.7	2.4	2.2	2.7	2.6	2.4	2.0	1.7
Corporations, gross operating surplus (% of GDP)	26.9	25.8	24.8	25.2	25.0	24.8	25.0	24.9
Households, net lending (+) or net borrowing (-) (% of GDP)	5.8	5.4	4.8	5.2	5.1	4.6	4.4	4.4
Deflated house price index (y-o-y)	-2.0	0.7	2.1	4.1	5.4	.	.	.
Residential investment (% of GDP)	5.1	5.3	5.9	5.7	5.9	6.0	.	.
Current account balance (% of GDP), balance of payments	5.4	6.0	7.1	8.5	8.2	7.8	7.5	7.2
Trade balance (% of GDP), balance of payments	5.5	5.4	6.5	8.0	7.9	.	.	.
Terms of trade of goods and services (y-o-y)	-0.8	-0.5	1.2	2.6	1.5	-0.9	0.5	-0.2
Capital account balance (% of GDP)	-0.1	0.0	0.0	0.0	0.0	.	.	.
Net international investment position (% of GDP)	14.1	24.1	37.7	48.6	54.4	.	.	.
Net marketable external debt (% of GDP) (1)	9.6	18.9	30.5	36.9	41.6	.	.	.
Gross marketable external debt (% of GDP) (1)	125.3	163.4	157.4	150.6	147.9	.	.	.
Export performance vs. advanced countries (% change over 5 years)	14.8	0.0	-4.0	-1.1	-0.3	.	.	.
Export market share, goods and services (y-o-y)	-0.3	-3.5	2.0	0.0	3.3	.	.	.
Net FDI flows (% of GDP)	1.7	1.2	1.6	1.8	0.7	.	.	.
General government balance (% of GDP)	-2.2	-1.7	0.1	0.6	0.8	0.9	1.0	1.1
Structural budget balance (% of GDP)	.	.	0.5	0.8	0.9	0.9	0.9	1.0
General government gross debt (% of GDP)	65.5	75.4	76.0	70.9	68.1	64.7	61.1	57.9
Tax-to-GDP ratio (%)	38.7	39.0	39.6	39.8	40.4	40.6	40.5	40.6
Tax rate for a single person earning the average wage (%)	42.3	40.4	39.5	39.6	39.7	.	.	.
Tax rate for a single person earning 50% of the average wage (%)	31.8	31.2	30.8	30.9	31.0	.	.	.

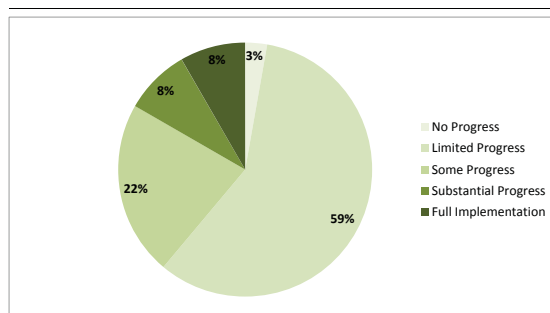
(1) (1) NIIP excluding direct investment and portfolio equity shares. (2) Domestic banking groups and stand-alone banks, EU and non-EU foreign-controlled subsidiaries and EU and non-EU foreign-controlled branches.

Source: Eurostat and ECB as of 30 Jan 2018, where available; European Commission for forecast figures (Winter forecast 2018 for real GDP and HICP, Autumn forecast 2017 otherwise)

2. PROGRESS WITH COUNTRY-SPECIFIC RECOMMENDATIONS

Progress with implementing the recommendations addressed to Germany in 2017 has to be seen in a longer term perspective since the introduction of the European Semester process in 2011. ⁽⁵⁾ Looking at the multi-annual assessment of the implementation of the CSRs since these were first adopted, 38 % of all the CSRs addressed to Germany have recorded at least 'some progress'. 62 % of CSRs recorded 'limited' or 'no progress' (see Graph 2.1). Overall, for every Semester cycle, multi-annual implementation in Germany has remained relatively weak, remaining below the average of the progress made by other Member States. Moreover, the gap in reform implementation between Germany and other countries has widened over time, despite the fact that since 2014 Germany has been subject to in-depth monitoring under the Macroeconomic Imbalances Procedure (MIP).

Graph 2.1: Overall multiannual implementation of 2011-2017 CSRs to date



* The overall assessment of the country-specific recommendations related to fiscal policy exclude compliance with the Stability and Growth Pact.

** 2011-2012: Different CSR assessment categories.

***The multiannual CSR assessment looks at the implementation since the CSRs were first adopted until the February 2018 Country report.

Source: European Commission

A sound fiscal position masks missed fiscal and structural reform opportunities. Germany has managed to preserve a sound fiscal position since 2011, ensuring compliance with its medium-term budgetary objective and keeping debt on a downward path. It has also taken some first steps to improve fiscal governance, which involves matching fiscal capacity and responsibilities better at federal and *Länder* level. Reforming efforts to make the tax system more efficient and modernise the tax administration have however remained

⁽⁵⁾ For the assessment of other reforms implemented in the past, see in particular section 4.1, 4.2, 4.3, 4.5 and 4.6.

limited in scope, and no measures have yet been taken to comprehensively review corporate taxation and the local trade tax (*Gewerbesteuer*). While the effects of some recent measures such as steps to increase funding and planning capacity at municipal level will be visible later, public investment has expanded only to a small extent, despite the good financial situation. This may have meant missing out on possibilities to improve potential growth, especially given the low-interest-rate environment.

The good labour market outcomes result mainly from earlier reforms and institutional strengths, rather than recent measures. High employment growth and low unemployment reflect the strong cyclical upturn combined with the favourable impact of past labour market reforms, employment friendly social dialogue, and a competitive export industry. Between 2011 and 2016, the tax wedge for workers earning two-thirds of the average wage was cut by only 0.3 pps., to 45.3 %. During the same period, the EU-28 average fell by 0.9 pps. to 36.8 %. While the 2014 pension reform facilitated earlier retirement, it is not yet clear whether measures to incentivise later retirement through greater flexibility will have the intended effect. In addition, fiscal disincentives for second earners and people with mini-jobs remained largely unchanged. Policy inertia contributes to some lock-in of productive capacity, thus hindering further increases in productivity and potential growth. Even if the introduction of the statutory general minimum wage in 2015 had an impact, wage increases remained moderate. This also reflected that, despite some government efforts to improve bargaining coverage, coverage of collective agreements stagnated.

Education spending has remained subdued. Education spending remained well below the EU average as a share of GDP (2011 4.3 %, 2015: 4.2 %, against an EU average of 4.9 %). While availability of full-time childcare facilities and all-day schools improved, the attendance of children under 3 years of age remained slightly below the Barcelona objectives. It even fell by 0.2 pps. to 32.7 % in 2016 as demand expanded as a result of immigration. Despite some measures, the education system remains marked by socioeconomic inequalities, and across the *Länder* significant performance differences persist.

Table 2.1: Summary table on 2017 CSR assessment

Germany	Overall assessment of progress with 2017 CSRs: Limited
<p>CSR1: <i>While respecting the medium-term objective, use fiscal and structural policies to support potential growth and domestic demand as well as to achieve a sustained upward trend in investment. Accelerate public investment at all levels of government, especially in education, research and innovation, and address capacity and planning constraints for infrastructure investments. Further improve the efficiency and investment-friendliness of the tax system. Stimulate competition in business services and regulated professions.</i></p>	<p>Limited progress (1)</p> <ul style="list-style-type: none"> • Limited progress in using fiscal and structural policies to support potential growth and domestic demand as well as to achieve a sustained upward trend in investment. • Limited progress in accelerating public investment at all levels of government and in particular in raising public expenditure on education, research and innovation. • Some progress in addressing capacity and planning constraints for infrastructure investment. • No progress in improving the efficiency and investment friendliness of the tax system. • Limited progress in stimulating competition in business services and regulated professions.
<p>CSR2: <i>Reduce disincentives to work for second earners and facilitate transitions to standard employment. Reduce the high tax wedge for low-wage earners. Create conditions to promote higher real wage growth, respecting the role of the social partners.</i></p>	<p>Limited progress</p> <ul style="list-style-type: none"> • Limited progress in reducing disincentives to work for second earners. • Limited progress in facilitating transitions to standard employment. • Limited progress in reducing the high tax wedge for low-wage earners. • Limited progress in creating conditions to promote higher real wage growth, respecting the role of the social partners.

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

Source: European Commission

To date, there is no comprehensive strategy to modernise the regulated professions and to boost competition in the service sector.

Extensive regulatory restrictions and administrative formalities apply to firms providing services in Germany, especially where business services are concerned. Germany submitted an action plan to the European Commission in January 2016, including a range of measures, such as modifying the legal provisions governing certain specific professions: lawyers and patent attorneys, tax advisers, and auditors. Yet, it has only partially adopted or implemented the measures described. Overall, progress is limited.

Overall, Germany has made limited progress in responding to the 2017 country-specific recommendations (CSRs) (6). Limited progress has been made towards achieving sustainable growth in public investment, a CSR closely related to the euro area recommendation about

strengthening domestic demand and growth potential. This is done by stepping up investment in infrastructure and boosting the funding available under the Municipal Investment Promotion Fund for modernising school buildings, including digital infrastructure. At the same time, there has been limited progress with stepping up public expenditure on education, research and innovation which even if increasing in absolute terms, has remained largely stagnant as a share of GDP. Some progress has been made with tackling capacity and planning constraints on investment in infrastructure. No progress has been made with making the tax system more efficient and investment-friendly. Progress was limited in promoting competition in the business services and regulated professions. Progress was limited on issues also related to the euro area recommendation on labour market, including on reducing disincentives to work for second earners, facilitating transition to standard employment and reducing the tax wedge for low-wage earners. Similarly, limited progress has been made with creating conditions for higher real wage growth.

(6) Information on the level of progress and actions taken to address the policy advice in each respective 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: Tangible results delivered through EU support to structural change in Germany

Germany is a beneficiary of significant European Structural and Investment Funds (ESI Funds) support and can receive up to EUR 28 billion until 2020. This represents around 4% of public investment ⁽¹⁾ annually over the period 2014-2018. By 31 December 2017, an estimated EUR 14.9 billion (53 % of the total) was allocated to projects on the ground. These investments help creating 1 500 new research jobs in supported public and private research facilities. Another 8 100 researchers benefit from investments in their institutions. More than 100 interactive innovation partnerships have been launched boosting the innovation culture in the agricultural and forestry sector in Germany. 1 600 children enjoy improved childcare facilities or schools in North Rhine-Westphalia. In rural areas, more than 20 million rural inhabitants benefit from supported investment in basic services and infrastructures.

ESI Funds help address structural policy challenges and implement country-specific recommendations. Investments in research and development in the private sector are stimulated, among others, by the enhanced use of financial instruments such as loans, grants or guarantees for public interventions. The Funds invest in coaching for people with a distance to the labour market which in turn helps enhance the overall labour market participation with specific measures aimed at improving the job prospects of older workers.

Various reforms were undertaken already as precondition for ESI Funds support ⁽²⁾. For example, all German regions developed or updated Smart Specialisation Strategies for research and innovation. Remarkable in a European context is the strong focus of the strategies on the productive environment and materials, reflecting the structure of the German economy.

Germany is advancing the take up of the European Fund for Strategic Investments (EFSI). As of December 2017, overall financing volume of operations approved under the EFSI amounted to EUR 5 billion, which is expected to trigger total private and public investment of EUR 21.9 billion. More specifically, 53 projects involving Germany have been approved so far under the Infrastructure and Innovation Window (including 26 multi-country projects), amounting to EUR 4.4 billion in EIB financing under the EFSI. This is expected to trigger about EUR 17 billion in investments. Under the SME Window, 21 agreements with financial intermediaries have been approved so far. European Investment Fund financing enabled by the EFSI amounts to EUR 632 million, which is expected to mobilise approximately EUR 4.9 billion in total investment. Over 28 800 smaller companies or start-ups will benefit from this support. RDI ranks first in terms of operations and volume approved, followed by energy, transport and SMEs.

Funding under Horizon 2020, the Connecting Europe Facility and other directly managed EU funds is additional to the ESI Funds. By the end of 2017, Germany has signed agreements for EUR 2.1 billion for projects under the Connecting Europe Facility.

<https://cohesiondata.ec.europa.eu/countries/DE>

⁽¹⁾ Public investment is defined as gross fixed capital formation + investment grants + national expenditure on agriculture and fisheries.

⁽²⁾ Before programmes are adopted, Member States are required to comply with a number of so-called ex-ante conditionalities, which aim at improving conditions for the majority of public investments areas.

European Structural and Investment Funds help address challenges to inclusive growth and convergence. Notably, they contribute by coaching people so that they can re-enter the labour market thereby enhancing overall labour market participation. For example, they offer specific measures for older workers in order to improve their job prospects. Investments in R&D in the private and the public sector are stimulated, also through the use of financial instruments (see Box 2.1).

3. SUMMARY OF THE MAIN FINDINGS FROM THE MACROECONOMIC IMBALANCES PROCEDURE IN-DEPTH REVIEW

The in-depth review for the German economy is presented in this report. In spring 2017, Germany was identified as having macroeconomic imbalances, in particular relating to its large current account surplus reflecting excess savings and subdued investment. The 2018 Alert Mechanism Report (European Commission, 2017d) concluded that a new in-depth review should be undertaken for Germany to assess developments relating to identified imbalances. Analyses relevant for the in-depth review can be found in the following sections: public finances in section 4.1; the financial sector in section 4.2; the labour market and social policy, in the respective subsections of section 4.3; inequality and demographics in section 4.4, public and private investment, the housing market and public procurement in the respective subsections of section 4.5. (7).

Imbalances and their gravity

Germany's large and persistent current account surplus stems from the successful export performance of its manufacturing sector not being matched by corresponding domestic investment and consumption, despite a pick-up since 2015. Although a surplus on the current account is consistent with the German economy's structural characteristics, its current high level and persistence are not attributable to fundamental factors alone (see section 1 on current account 'norm' discussion). Rather, it has resulted from the interaction of various domestic and external factors. Chief among these are the two negative private investment shocks, which ensued from the bursting of the dotcom and financial market bubbles, and the relative disadvantage of German debt securities in terms of returns coupled with the limited flexibility of households' investment strategies. Also, it cannot be ruled out that concerns about pension adequacy push up the aggregate saving rate that would be expected in view of the strong age cohorts approaching retirement age ('baby boomers'). Moreover, significant positive terms-of-trade effects - in view

of cheaper imports and despite the depreciation of the euro and low inflation - have served to amplify the surplus in nominal terms in 2014-2016. Over time, these various factors have pushed up net savings across all sectors of the economy, while at the same time depressing the consumption and investment ratios.

Given its size and strong trade and financial linkages with the rest of the euro area, the existing economic challenges of the German economy also have wider implications for the euro area. Thus, implementing policies that increase potential growth in Germany can help to support the ongoing euro area recovery and, in turn, ease debt reduction needs faced by highly indebted Member States. Box 3.1 illustrates the effects on domestic and foreign GDP of an increase in spending on R&D and education. The two simulations presented therein follow the spirit of the euro area recommendation 1⁽⁸⁾, in particular as regards improving growth potential and supporting the creation of quality jobs.

Evolution, prospects, and policy responses

The current account surplus has been falling since 2015 but remains above the rate suggested by fundamental factors and is expected to remain above the MIP threshold. For the 12 months ending in November 2017, it stood at 7.8 % of GDP, suggesting a further decline compared to 2015 (8.5 %) and 2016 (8.2 %). This correction was mainly driven by the trade balance, which declined to 8.2 % for the 12 months ending November after hovering at around 8.5 % in 2015 and 2016. In particular, imports have strengthened in line with domestic demand benefitting all major trading partner areas, including the euro area. In addition, contributing to a gradual correction of the current account surplus, the negative secondary income balance has widened (from -1.3 % of GDP in 2016 to -1.6 % for the 12 months ending in November 2017) as a result of higher private sector transfers (notably remittances) abroad. However, net capital exports have remained high

(7) An asterisk indicates that the analysis in the section contributes to the in-depth review under the MIP.

(8) European Commission recommendation for a Council recommendation on the economic policy of the euro area (22.11.2017).

although their composition has changed. In recent quarters, they have been driven by recalling German bonds rather than by acquiring foreign debt securities. The former has also coincided with a mounting TARGET 2 balance. Outward foreign direct investment abroad saw some recovery in comparison to 2016. All in all, accumulated current account surpluses have resulted in a large positive net international investment position, which reached 55.1% in 2016, somewhat above what fundamental factors would suggest.

The private saving-investment balance did not widen further in 2016. Private borrowing rose further in 2016 slightly above GDP growth, while the rate of net asset accumulation by the private sector stabilised. Nominal corporate investment increased in 2016 and further in 2017, while corporate savings are projected to have fallen slightly as a proportion of GDP. This implies that companies, which are among the least indebted in the euro area, have helped bring down the savings surplus. The household savings rate rose to 17.1 % in 2016, propped up by low consumer price inflation, but is projected to have fallen to 16.6 % in 2017, in line with robust consumer and rising inflation. However, the household savings rate is likely to remain the highest in the euro area (whose average is 12.3 %). In 2016, the household investment growth rebounded and households' net lending position weakened marginally. Household investment is expected to have grown strongly in 2017, lowering the net lending balance further.

Until recently, corporate investment has been held back, despite the low interest rate environment. While private investment has recovered to pre-crisis levels, business investment has remained largely flat as a share of GDP. Moreover, in view of the favourable financing conditions and low interest rate environment, a more forceful pick-up could have been expected. Uncertainty over long-term business prospects is often mentioned as a probable contributory factor in domestic investment restraint in recent years. In terms of its components, non-residential construction (e.g. infrastructure) investment has stagnated after years of decline before the crisis. By contrast, investment in residential construction has recently seen strong growth, partly reflecting a sizable accumulated housing supply shortage. While private infrastructure investment continued to stagnate in 2017, foreign direct investment

(reinforcing foreign production locations) picked up. This suggests it may be useful to review potential obstacles other than uncertainty to private investment. They include: inefficiency in corporate taxation; the high administrative burden; the less developed venture capital market compared to international innovation leaders; regulatory restrictiveness in the services sector; and delays in implementation of electricity and broadband infrastructure projects.

Public investment, which has been muted, has fallen short of depreciation. As mentioned in Section 4.5, net public investment turned negative in 2003. This outcome reflects a gradual scaling back of investment in maintaining and expanding public infrastructure. The design of federal fiscal relations may also have contributed to protracted underinvestment, especially at municipal level, where net investment has been markedly negative since 2003. It is also partly a reaction to the post-unification investment boom in eastern Germany and the consolidation needs in western Germany, notably at municipal level. An additional annual public investment of 0.3 % of GDP over the next decade would be needed to close the investment backlog at the municipal level. The latter is estimated at EUR 126 bn in 2017, according to the yearly survey conducted by the public development bank KfW (2017a).

Years of restrained growth in consumption have also dampened domestic demand and contributed to the building up of the external surplus. High unemployment, a long period of wage moderation and a fall in the total number of hours worked in the first half of the 2000s resulted in low growth in disposable incomes, even if consumer price inflation was supportive of purchasing power. Wage growth picked up from 2014, but not to the extent the tightening labour market situation and unit labour costs in relation to the euro area average would suggest. Since 2014, nominal wage growth remained roughly stable even as inflation picked up in 2017, resulting in the slowing down of real wage growth. Disincentives to work for certain groups are constraining labour participation, disposable income and consumption opportunities. These include a high tax wedge for low-wage earners, disincentives for second earners to increase working hours and the fiscal treatment of mini-jobs that creates lock-in effects.

The adjustment of the current account surplus is expected to be only gradual in the medium term. Both export and import growth is expected to remain strong, while terms of trade effects are set to have an only limited impact. Stronger import growth is expected to be driven by a pick-up in equipment investment and demand for foreign inputs along the value chain amidst stable domestic and foreign demand growth. As a result of stronger growth of imports as compared to exports, Germany's trade surplus should continue to ease leading to a gradual decline in the current account surplus. Over a longer period of time, the large-scale demographic shift from working to retirement age is expected to start to lower the aggregate savings rate and thus the current account surplus. However, in the medium term, the current account surplus is expected to remain above the MIP threshold and to decline only gradually. (European Commission, 2017b)

The policy response to address the imbalances has remained limited so far. Although the federal fiscal reform and the relieving of municipalities from certain social spending obligations will strengthen the fiscal position of the *Länder* and municipalities, it remains to be seen to what extent this additional fiscal space will actually be used for additional public investment. The consultancy and the federal transport infrastructure company, set up in the context of the reform of fiscal relations to support the local governments in planning and implementing investment projects, can be expected to accelerate public investment. Yet, this reform falls short of increasing the tax autonomy of the *Länder* and municipalities, which could have further increased the scope for public investment. Efforts to improve the business environment for private investment have remained limited. The same holds for efforts to reduce the high tax wedge for low earners and work disincentives for second earners, with a view to supporting labour market participation, disposable income and consumption.

Overall assessment

The German economy displays a persistently large current account surplus, which reflects a subdued level of investment relative to saving. The size and persistence of the surplus can only be partly explained by the country's industrial structure (e.g. the highly competitive manufacturing sector) and other characteristics of

the German economy and society. Hence, it is significantly higher than empirical benchmarks, taking into account these factors in explaining cross-country differences, and much above the level that would be required to stabilise the already high net international investment position (i.e. above the NIIP benchmark)⁽⁹⁾. Subdued investment and private consumption, resulting in an excess of saving over investment, have also contributed to the build-up of the external surplus. This can be partly explained by necessary adjustments in the aftermath of the post-unification boom, including prolonged wage moderation, labour market reforms and significant scaling back of construction activity. While there is currently a clear and robust shift towards more domestic demand-driven growth, both consumption and investment remain relatively low, given the favourable cyclical, labour market, financing conditions and infrastructure investment needs.

Continued relatively subdued investment as a share of GDP also undermines Germany's future growth potential, and has implications for the euro area. While private consumption has picked up, private investment has remained restrained, despite favourable financing conditions. Public investment has picked up, though budget projections indicate scope under EU and national fiscal rules for further increases. Persistently low investment could hamper Germany's economic growth in the long term. Stronger capital accumulation would be needed to sustain potential growth in the future, especially if population ageing intensifies and immigration slows down. Given Germany's size and strong trade and financial linkages with the rest of the euro area, expanding investment could also ease deleveraging needs faced by highly indebted Member States.

Overall, the policy response to address the imbalances has so far remained limited. The federal fiscal reform and associated measures led to a moderate improvement of fiscal space and investment capacity for municipalities. Efforts to improve the business environment for private investment have remained limited. The same holds for efforts to reduce the high tax wedge for low earners and work disincentives for second earners.

⁽⁹⁾ Work on the methodology for estimating current account benchmark is ongoing in cooperation with the Economic Policy Committee.

Box 3.1: Euro area spillovers

Based on the European Commission's QUEST model ⁽¹⁾, this box compares the effect of an increase in expenditure on R&D and education ⁽²⁾. These scenarios specifically aim at improving potential growth, thereby addressing long-term challenges of the German economy and complementing earlier simulations that aimed at a more immediate economic boost, including an increase in public investment and a reduction in personal income tax (European Commission, 2017c).

Not surprisingly, the overall effects are relatively limited in the short-run. Based on model assumptions, education reforms lead to only very gradual changes in aggregate skill levels due to cohort effects, as it takes time for the new, better-skilled cohorts to enter to the labour force ⁽³⁾. R&D subsidies may be even accompanied by a slight decline of GDP, as stronger R&D activity detracts high-skilled labour from other sectors of the economy. Fostering R&D should therefore ideally be combined with policies that increase the supply of high-skilled workers, e.g. investment in tertiary education, in order to dampen the competition for high-skilled labour.

While the reforms already generate certain positive spillovers in the short run, their impact increases considerably over time. Both simulated reforms together positively contribute to GDP and employment in the rest of the euro area in the longer term. For an identical amount of fiscal spending, the long-term positive spillovers are particularly high for the R&D expenditure, while also being significant for the education measures. It is estimated that increasing R&D expenditure by 1 % of GDP will raise GDP in the rest of the euro area by about 0.4 % in 15 years and by 0.6% in 20 years. This will be achieved through increased domestic output and thanks to knowledge spillovers, resulting from the international dissemination of innovations that foster intangible capital formation and productivity gains abroad. Increasing education expenditure by 1 % of GDP across-the-board of education institutions is expected to increase the GDP of the rest of the euro area by 0.15 % after 20 years through the trade channel; spillovers in the form of cross-border knowledge dissemination are absent in the scenario of higher domestic spending on education. Spillovers are further mitigated by the fact that domestic competitiveness gains (more net exports) partly offset positive demand spillovers (more net imports) to the rest of the euro area.

Table 1: Impact of the reform scenarios in Germany and in the rest of the euro area

Years	Germany								Rest of euro area							
	1	2	3	4	5	10	15	20	1	2	3	4	5	10	15	20
R&D subsidy (1 % GDP)																
GDP	-0.10	-0.55	-0.66	-0.54	-0.29	1.46	3.25	4.39	0.02	-0.01	0.00	0.02	0.04	0.15	0.39	0.61
Employment	0.33	0.43	0.42	0.39	0.38	0.38	0.37	0.36	0.01	0.00	0.02	0.05	0.08	0.20	0.33	0.41
Trade balance (% GDP)	-0.09	-0.12	-0.06	-0.01	0.02	0.06	0.07	0.07	0.12	0.17	0.17	0.16	0.15	0.14	0.06	0.04
Government balance (% GDP)	-0.55	-0.55	-0.61	-0.64	-0.63	-0.39	-0.07	0.20								
Education subsidy (1 % GDP)																
GDP	0.42	0.45	0.56	0.70	0.84	1.54	2.30	2.86	0.01	0.01	0.02	0.02	0.03	0.06	0.11	0.15
Employment	0.16	0.15	0.11	0.09	0.07	0.00	-0.13	-0.26	0.01	0.02	0.02	0.03	0.03	0.07	0.11	0.13
Trade balance (% GDP)	-0.17	-0.15	-0.12	-0.10	-0.10	-0.08	-0.06	-0.06	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.02
Government balance (% GDP)	-0.29	-0.34	-0.35	-0.35	-0.35	-0.33	-0.31	-0.31								

(1) To illustrate the reading of the table: increasing expenditure on education by 1% of GDP (about EUR 30 bn) increases German GDP by 0.42% of GDP in the first year following the measure and by 2.86% in the twentieth year following the measure.

Source: European Commission

⁽¹⁾ Detailed information on the QUEST model and applications is available at: http://ec.europa.eu/economy_finance/research/macroeconomic_models_en.htm.

⁽²⁾ For illustration, the expenditure increase on R&D and education is assumed to be permanent and scaled to 1 % of GDP in both cases. The budgetary-closure rule is deactivated during 20 years, so that the scenarios correspond to debt-financed fiscal expansions. Monetary policy rates are assumed to remain unchanged, not responding to the increase in public investment during the first two years.

⁽³⁾ The simulation scenario assumes that the additional spending increases productivity of employees at all skill-levels. Though the model cannot differentiate different types of education, one could assume that increased spending on adult education would be effective in the short to medium-term, while general education has rather long-term effects.

Table 3.1: MIP assessment matrix – Germany

	Gravity of the challenge	Evolution and prospects	Policy response
Imbalances (unsustainable trends, vulnerabilities and associated risks)			
External balance	<p>Germany has a persistently large current account surplus, which came down marginally to 8.2 % of GDP in 2016 and recently decreased to 7.8% for the year ending in November 2017. Accumulated surpluses have resulted in a large positive net international investment position, which reached 55.1 % of GDP in 2016.</p> <p>The surplus reflects saving and deleveraging by all sectors of the economy: households, firms, and the public sector. High corporate savings and low investment have contributed most significantly to the widening of the savings surplus in recent years.</p> <p>Weak domestic investment 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.</p>	<p>The German surplus is projected to decline but to persist at more than 7 % of GDP in the medium term. Imports have been increasing, including relative to exports and GDP, over the recent quarters. Net capital exports have remained significant on account of repatriation of German bonds while investment in foreign debt securities slowed down.</p> <p>Real private consumption has strengthened, by 2.1 % in 2016 and 2017, and is expected to slow down only marginally. The low interest rates have not translated into significant changes in household consumption patterns, but rather reinforced the propensity to save. An extended period of dynamic wage growth would support private consumption, provided it also translates fully into disposable income.</p> <p>At its current level, investment contributes little to potential growth. Private sector investment has increased recently but as a share of GDP it remains sluggish at 17.9 % in 2016. Importantly, investment in infrastructure has barely reacted to supportive growth and funding conditions, casting doubt on the evolution of the economy's future productive capacity.</p> <p>Public investment picked up in 2016 and 2017. However, there has been no reversal of the markedly negative net investment at municipal level. Public investment is set to grow at a stronger pace, once financial relief and planning support that has been granted to federal states and municipalities is starting to bear fruit.</p>	<p>The policy response so far has remained limited. Important steps have been taken to increase public investment, but they have not yet resulted in a clear upward trend in the public investment-to-GDP ratio.</p> <p>Germany has used its available fiscal space only to a limited extent and has not taken full advantage of exceptionally favourable financing conditions to meet its investment needs and improve conditions for private investment</p> <p>Relieving municipalities of social expenditure obligations will increase their scope for public investment. The additional revenue of 0.3 % of GDP allocated to the federal states as part of the agreed reform of federal fiscal relations could also facilitate public investment at all government levels. A consulting service for municipalities has been put in place and may alleviate administrative constraints on public infrastructure investment.</p> <p>Limited efforts have been made in 2017 to stimulate competition in the services sector, improve the efficiency of the tax system, reduce the high tax wedge (especially for low wage earners), reducing disincentives for second earners, facilitating the transition to standard employment and creating conditions to promote higher real wage growth, respecting the role of the social partners.</p>
Conclusions from IDR analysis			
	<ul style="list-style-type: none"> Germany is running a persistently large current account surplus reflecting subdued investment relative to savings in both the private and public sector. Persistently weak domestic investment could constrain potential growth in the long term. This could entail macroeconomic risks and affect the rebalancing and growth prospects of the rest of the euro area, when deleveraging pressures in several Member States persist. While private consumption has strengthened, business investment has remained restrained, despite the favourable financing conditions. An even stronger increase in private consumption is hampered by only moderately rising wages despite a rather tight labour market as well as a persistently high tax burden and disincentives to work for certain groups. Public investment has picked up, though the available fiscal space has not been fully used. 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. 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. Disincentives to work for certain groups continue to reduce labour supply, disposable income and consumption opportunities. 		

Source: European Commission

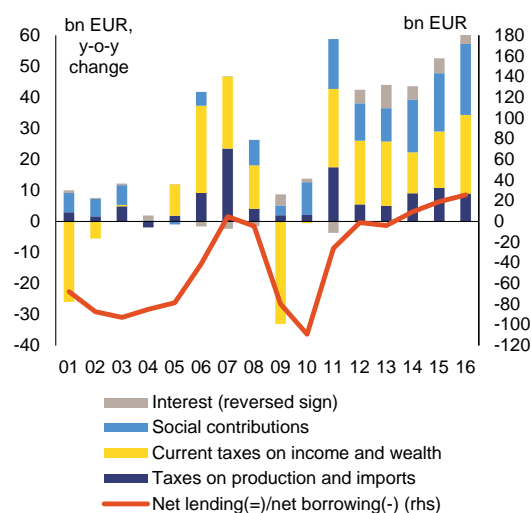
4. REFORM PRIORITIES

4.1. PUBLIC FINANCES, FISCAL FRAMEWORKS AND TAXATION*(¹⁰)

Public finances

Germany's public finances are robust, and the debt-to-GDP ratio is improving. Since its bottom in 2010 (-4.2 % of GDP) in the aftermath of the financial crisis, the budgetary balance has consistently improved, becoming positive in 2014, and rising to +0.8 % in 2016 and to 1.2 % in 2017. Likewise, overall government debt, which peaked at 81.0 % of GDP in 2010, has fallen continuously, reaching 68.1 % in 2016. According to the Commission's 2017 autumn forecast, it is expected to fall below the 60 % Maastricht threshold by 2019 (European Commission, 2017b). While government revenues increased by 2.0 pps. of GDP between 2007 and 2016, mainly owing to higher income taxes and social security contributions (see graph 4.1.1), government expenditure increased by only 1.3 pps. of GDP.

Graph 4.1.1: Government balance and trends in selected revenues and expenditures

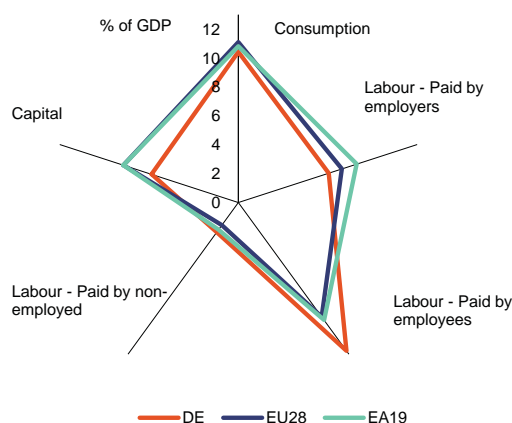


Source: European Commission

Taxation

The overall level of taxation corresponds to the average among the Member States, but the tax wedge is high. The overall level of taxation at 39 % of GDP in 2016 lies between the euro area average of 40.1 % and the EU average of 38.9 %. The tax wedge for low earners (at 50% of the average wage) is high and only 9.2 pps. lower than the tax wedge for high wage earners (at 167% of the average wage), indicating relatively low progressivity compared to other EU countries. Social security contributions account for about two thirds of the tax wedge, while income tax accounts for only one third. Importantly, employees contribute well above average to the security systems, while employers' contributions are still below average (see also Box 4.1 which displays various possible scenarios to remedy this state of affairs).

Graph 4.1.2: Taxes by economic function



Source: European Commission, 2017c

By comparison with other EU countries, Germany places a relatively strong emphasis on more distortive direct taxes, notably on labour, to raise revenues. Taxes on income from employment amounted to 19.3 % of GDP in 2015, the 6th highest figure in the EU-28. By contrast, revenue from taxes on consumption and capital fall at the lower end of the distribution, ranking 23rd and 15th out of 28 countries. In 2015, revenues from recurrent property taxes came to 0.4 % of

(¹⁰) An asterisk shows that the analysis in the section contributes to the in-depth review under the MIP (see Section 3 for an overall summary of main findings).

GDP, which is well below the EU average of 4.3 %. All in all, taxes on labour contribute above average to government revenue in Germany, by comparison with other EU countries, while capital taxes are much lower.

Over the past ten years, transfer property taxes have become increasingly important in the financing of states' budgets. All the *Länder*, except Bavaria and Saxony have increased their tax rates on property transfers since 2007. In a number of cases, the rate almost doubled. Overall, almost all *Länder* now apply rates between 5 % and 6.5 %, up from a uniform 3.5 % in 2007. In combination with higher real estate prices, the increased rates have boosted tax revenue considerably. This trend is expected to continue (IW Köln, 2017).

There is potential for shifting taxation from labour to other tax bases less detrimental to growth, including environmental taxes. At 1.9 % of GDP, the overall level of environmental taxes is quite low in Germany compared with the EU average of 2.4 % of GDP.⁽¹¹⁾ In 2004, the level was still at the EU average, but since then it has fallen steadily. This decrease was driven mainly by a decrease in transport fuel taxes. The tax rates on motor fuels have not been adjusted since 2003. As a result, they have been eroded by inflation to the level before the ecological tax reform. The tax advantage on marginal rates on diesel compared to petrol is among the highest in the EU, although diesel has a more harmful impact on ambient air quality than unleaded petrol. Exemptions from the energy tax for specific energy-intensive processes were introduced in 2006, when the energy tax law was introduced. In recent years, no measures have been taken to broaden the tax base by reducing environmentally harmful tax incentives, such as energy tax reductions and the favourable taxation of company cars. Such measures would allow a shift to tax sources less detrimental to growth and help to resolve environmental issues (see also Section 4.6).

Germany's tax system is still not very conducive to investment. Its statutory corporate tax rate of

⁽¹¹⁾ The renewable energy surcharge (*EEG-Umlage*), which comes to about 0.8 % of GDP is not included in this statistic as it not a tax in the legal sense.

31 % is among the EU's highest and it is also high in comparison with other major economies (ZEW, 2017a).⁽¹²⁾ Apart from inefficiencies arising from the inclusion of some non-profit elements in the local trade tax base, the system is susceptible to special tax planning to minimise tax payments.⁽¹³⁾ Similarly, the effective average tax rate stands at 28.2 %, significantly above the EU average 20.9 %. Moreover, the debt bias in corporate taxation also remains high 7th highest in the EU. This is because debt financing costs are deductible from the corporate income tax base, whereas the same treatment is not extended to equity financing costs. In the 'International Tax Competitiveness Ranking' of 35 OECD countries (Pomerlo, 2017), Germany's system ranks 21st overall and 14th as regards corporate tax. The low ranking, in 29th position of personal income taxation, also applicable to transparent entities as partnerships, is a result of the system's complexity and the high tax rates. Moreover, loss-carry forward provisions are relatively strict, limiting the amount to 60 % of the taxable income for a given year. Finally, Germany also ranks very low (31st out of 33 countries examined,) as regards attractiveness to businesses engaged in digital activities (ZEW, 2017b).

In the past few years, a number of targeted measures have been taken to make the tax framework more conducive to investment. The INVEST grant programme, set up in 2013, supports private investors wishing to acquire a stake in innovative new companies. Under this programme, investors in start-ups receive a tax free grant worth 20 % of the sum invested. The programme was expanded as of January 2017 (see section 4.6 on venture capital) and the maximum grant was doubled. An exit grant for individuals selling their shares was introduced, amounting to 25 % on the capital gains, which roughly covers the tax due on the sale.⁽¹⁴⁾ A recent study notes that some of the INVEST scheme's features constitute good practice, such as the use of upfront relief administered outside the tax system, and the

⁽¹²⁾ This is the result of a local trade tax (*Gewerbsteuer*) added to the corporate income tax as well as the solidarity surcharge.

⁽¹³⁾ Entschließung des Bundesrates zur Verhinderung von Gestaltungsmodellen zur Minderung der Gewerbesteuer mittels Lizenzzahlungen – 'Gerechte Verteilung der Gewerbesteuer zwischen den Gemeinden gewährleisten'

⁽¹⁴⁾ Furthermore, shares can now be held by either a natural person or by an associated company and follow-up financing support was introduced.

scheme's transparent cost and impact monitoring of the scheme (PWC and IHS, 2017). Other measures taken in 2016 include: simplified taxation of investment funds, revisions to the rules for tax loss carry forwards and measures to modernise tax administration procedures (see European Commission, 2017c).

Reducing tax exemptions from inheritance tax can help address the highly unequal distribution of wealth and broaden the tax base to allow reducing the burden on smaller family businesses. With 0.16 % of GDP inheritance tax accounts for only 0.41 % of total tax revenue, according to 2012 data. Estimates suggest that a total of about EUR 200 to 300 billion (around 6-10 % of GDP) is given as a gift or inherited in Germany every year (Bach and Thiemann, 2016). These capital transfers are highly concentrated at the top of the wealth distribution: one third of the total amount of inheritances and gifts is transferred to just 1.5 % of beneficiaries, who receive inheritances of over EUR 500 000. The 0.08 % of cases involving transfers exceeding EUR 5 million received 14 % of the transfer volume and more than half of corporate transfers, which are currently largely exempt from inheritance tax. The 2016 reform of the inheritance tax is expected to change little in this regard. A reduction of the tax exemptions would significantly broaden the tax base, which would make it possible to reduce tax rates and lower the burden on smaller family businesses (Bach and Thiemann, 2016).

Low recurrent taxes on property and inheritance should be seen in the context of substantial wealth inequality. At 0.76, the 2014 Gini coefficient for net wealth in Germany was the second highest in the euro area (whose overall Gini coefficient was 0.69, based on data from the second wave of the European Central Bank's Household Finance and Consumption Survey). The wealthiest 10 % of the population hold about 60 % of total wealth, while the lower half of all households holds only around 1 %. Real estate ownership and business assets were strongly concentrated among the wealthier households, with only 10 % holding shares or business assets, and 13 % holding mutual investment funds. In the absence of a wealth tax, higher and more targeted inheritance taxes applied to the wealthiest strata of society could help reducing wealth inequality. In a recently published report on wealth and poverty by

the German government (Federal Ministry for Labour and Social Affairs, 2017a), two thirds of respondents said inheritances were their main source of wealth, rather than savings.

Healthcare

The German health system is performing well, although it is costly and there is scope for efficiency gains. Health expenditure as a percentage of GDP, 11.3 % in 2016, is the highest in the EU and the ratio has increased by 1.2 pps. However, over the period 2016-2070, the expected increase of 0.7% in the public expenditure on health care (7.4% of GDP in 2016 excluding expenditure on long-term nursing care but including capital formation), appears moderate compared to 0.9% for the EU also in light of the ageing population in Germany (European Commission, 2018). Germany provides 813 beds per 100 000 population, the highest ratio in the EU (515). However, bed capacity has been reduced by 3.9 % since 2005, which is less than the EU average of 11.9 %. The average length of a hospital stay in 2015 (9 days) was among the EU's highest. France, for instance, is at the lower end of the distribution with only 5.5 days. High rates of avoidable hospital admissions for chronic diseases also suggest over-provision of hospital care and room for better integration of primary care, ambulatory specialist care and in-patient care (OECD and European Observatory on Health Systems and Policies, 2017).

Expenditure on pharmaceuticals is high and growing. Germans spend the most per capita on retail pharmaceuticals in the EU. The consumption of prescribed defined daily doses rose by over 50 % between 2004 and 2015. Overall, pharmaceutical expenditure has increased by about 70 % since 2000 — more than any other cost item covered by statutory health insurance (SHI). The main reason for this is patent-protected new originator products, though generics account for a substantial share of the total (81 % in 2016). The daily treatment costs of patented medicines are on average 16 times higher than for generics. (Schwabe et al, 2017)

The legal framework for statutory health insurance (SHI) and private health insurance (PHI) creates inefficiencies and challenges the solidarity principle in health care. The SHI is

based on the principle of ability to pay (risk- and income based solidarity), while the PHI is financed through risk-related premiums. SHI contributions are independent of risk and based on income up to a certain threshold, and non-earning spouses and children are covered without any surcharges. PHI premiums are risk dependent and separate premiums have to be paid for spouses and children. Although several reforms have been made, the current legal framework, which allows people on higher incomes, civil servants and the self-employed to opt out of SHI, undermines the risk- and income-based solidarity principle in health care (Busse et al., 2017). Moreover, doctors can charge PHI patients more than those covered by SHI. This creates inequalities in waiting times and accessibility for medical services, as well as incentives for overprovision of health services to PHI patients (see also Chapter 4.3).

Fiscal framework

The Federal Government has implemented an endorsement process to guarantee the independence of the macroeconomic forecast underlying the budgetary projections. The Commission's Opinion on Germany's Draft Budgetary Plan for 2017 (European Commission, 2017d) noted that there is still no procedure to have an independent body produce or endorse the macroeconomic forecast, as stipulated in Regulation (EU) No 473/2013. The German legislator adopted a law that defines the process for the preparation of macroeconomic forecasts by the government and the process for their endorsement by an independent body. The law came into effect on 4 July 2017. In September 2017, the ordinance governing the appointment of an independent body ("*Vorausschätzungsverordnung*") was published. In accordance with Regulation (EU) No 473/2013, the "*Gemeinschaftsdiagnose*", an association of several economic research institutes, is appointed as an independent body tasked with assessing and confirming the forecast released by the Federal Government. The ordinance will come into effect on 1 July 2018. As regards the compliance with the upper limit on the general government structural deficit of 0.5 % of nominal GDP, the Advisory Board of the Stability Council provides a favourable assessment in its report of December 2017 (Stability Council, 2017).

Since 2015-2016, the Federal Ministry of Finance conducted spending reviews designed to make federal budget spending more effective.

The first cycles of spending reviews focused on the following policy programmes: 'support of combined traffic ⁽¹⁵⁾', 'support for the professional mobility of young people seeking vocational training in Germany', 'housing', and 'energy and climate'. The ongoing review cycle for 2017/2018 covers the topics 'procurement of standardised bulk articles' and 'humanitarian aid and transition aid including crisis prevention, crisis response, peace-keeping and development cooperation'.

⁽¹⁵⁾ Combined traffic is a special form of freight transport in which semi-trailers, trucks or containers are transported along the main part of the transport route by rail or by inland waterway, while lorries are used to pick up and deliver loaded units from the loading and unloading points. The aim of combined traffic is to promote environmentally friendly means of transport.

4.2. FINANCIAL SECTOR*

Banking sector

The main challenges facing the industry are squeezed revenues from the low-interest-rate environment and costs incurred owing to digitalisation and regulatory requirements. Heavy dependence on interest income (more than 73 % of aggregate revenue) and the large number of small institutions make German banks particularly vulnerable to these challenges. At a time when they have very high operating costs — in 2016 the cost-to-income ratio exceeded 69 % — banks may need a strategic vision to address these challenges. This could involve adapting their business model, considering mergers, and cutting costs.

Maintaining positive profitability through realising hidden reserves, increasing the maturity transformation, and more risk-taking does not appear to be sustainable. The survey on low interest rates (*German Central Bank, 2017*) indicated that structural adjustments are necessary to maintain profitability. If interest rates stay at current levels, small and medium-sized banks expect their profits to fall further between 2016 and 2021. This would imply a drop of 16 % in their return on total capital. Moreover, keeping up with regulatory developments has a large fixed cost component.

Profitability remains very low. ECB data shows that Return on Equity (RoE) stood at 0.6 % in March 2017, amongst the lowest in the EU. Lacklustre performances by several medium-sized banks, low intermediation margins, and a weaker capacity to generate non-interest income all weigh on profits. While overall employment expanded strongly in Germany, in the banking and insurance sectors it fell by 10 000 in the first half of 2017,

according to the federal employment service. Significant headcount reduction usually has up-front costs and lead to cost savings only in the medium term. The number of branches decreased by only 14.4 % between 2007- and 2016, keeping Germany in the top third of EU countries with the highest branch density.

At the same time, the equity and leverage situation remains acceptable. Banks' June 2017 Tier 1 ratio stands at an acceptable level (16.0 %), slightly above the EU average (15.4 %). Yet, the leverage ratio is the lowest in the EU in percentage. Compared to most member states, German capitalisation ratios increased less, as most banks in Germany are not listed on the stock exchange and therefore rely more on organic capital generation instead of issuing shares. Asset quality is very strong. End June 2017, non-performing loans (NPL) amount to 1.6 % of total gross loans, compared to 1.9 % twelve months earlier and significantly below the euro area's average of 4.5 %. Loan-loss provisions went from 42.4 % to 43.6 % between June 2016 and June 2017.

Housing market developments do not yet give rise to neither macro- nor financial stability risks. House price increases are particularly pronounced in some cities, yet overall the process can still be considered (the end of) a normalisation process across time and countries (see Chapter 4.5, IMF 2017a). Housing loans' growth keeps on accelerating, 4.2 % year-on-year in September 2017 compared to 3.8 % in September 2016. The overall outstanding stock of mortgages now stands 20 % above its January 2011 value (Table 4.2.1). Nonetheless as nominal GDP grew at a similar pace, aggregate mortgages hover around 36 % of

Table 4.2.1: Financial soundness indicators, all banks in Germany

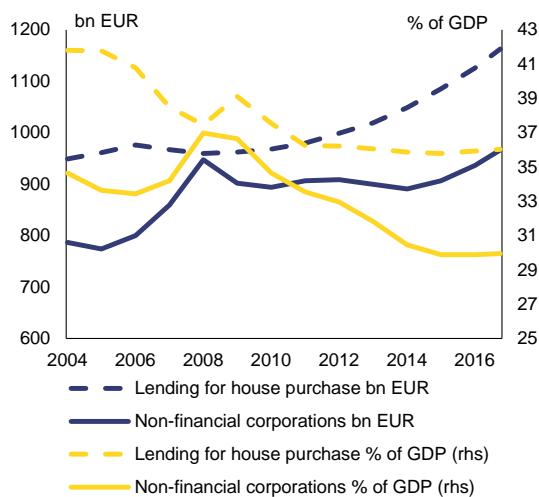
(%)	2010	2011	2012	2013	2014	2015	2016	2017Q2
Non-performing debt	2.4	1.6	1.7	1.8	2.5	2.0	1.8	1.6
Non-performing loans	-	-	-	-	3.9	3.0	2.6	2.3
Non-performing loans NFC	-	-	-	-	8.9	6.5	6.4	6.0
Non-performing loans HH	-	-	-	-	2.9	2.3	1.8	1.8
Coverage ratio	35.0	40.1	38.3	42.8	34.8	36.7	36.9	38.4
Loan to deposit ratio*	84.7	83.4	82.5	80.1	79.2	78.4	78.5	78.4
Tier 1 ratio	11.4	11.7	13.8	15.2	14.8	15.4	15.6	16.0
Capital adequacy ratio	15.3	15.8	17.4	18.7	17.3	17.9	18.1	18.4
Return on equity**	1.9	2.2	1.1	1.3	2.5	1.7	2.2	-
Return on assets**	0.1	0.1	0.0	0.1	0.1	0.1	0.1	-

*ECB aggregated balance sheet: loans excl to gov and MFI / deposits excl from gov and MFI **For comparability only annual values are presented

Source: ECB

GDP over the past 6 years, which lends further evidence to the assessment that current real estate price increases are not primarily driven by mortgage lending.

Graph 4.2.1: Mortgages and corporate loans in billion EUR and in % of GDP



Source: ECB

Corporate loans continue to accelerate in line with economic developments and slightly lower credit standards. Outstanding corporate loans have increased by 4.1 % over the 12 months preceding September 2017. This represents an acceleration from 3.2 % one year earlier. The main drivers were the services sector (including real estate) and to a lesser extent manufacturing (e.g. machinery, chemicals). Particularly strong credit growth for longer maturities may indicate a more positive outlook for companies. Still, in relative terms, corporate loans barely amount to 30 % of GDP (Graph 4.2.1). This stands below European Commission fundamentals-based benchmarks for Germany, and reflects more than a decade of deleveraging ⁽¹⁶⁾.

New leasing contracts are on track for another record-year. The leasing market Europe-wide amounted to EUR 164 billion in the first half of 2017 — out of which EUR 59 billion stemmed from Germany. Leasing in Europe grew by

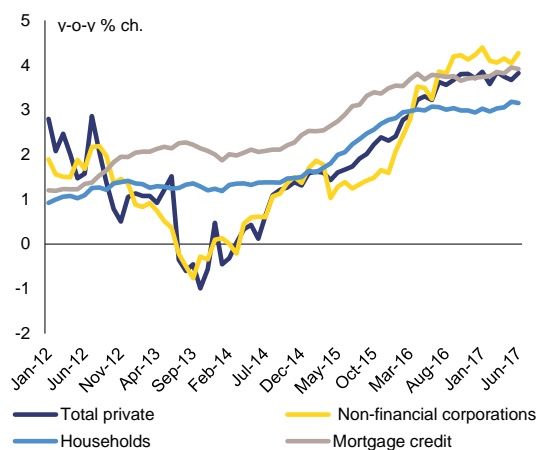
⁽¹⁶⁾ Fundamental-based benchmarks are derived from regressions capturing the main determinants of credit growth and taking into account a given initial stock of debt. See also European Commission (2017), "Benchmarks for the assessment of private debt", Note for the Economic Policy Committee"

10.5 %, while the German market grew 5.7 %, pulled by vehicle leasing which grew 6.3 %.

Despite offering one of the lowest yields in the euro area, German private sector deposits grew 3.6 % annually. ECB statistics show that corporates' new overnight deposits bear negative interest rates on average, i.e. -0.01 % since March 2017. Household deposits with maturities up to 2 years yield 0.28 % — the euro area's lowest returns. Private sector deposits grew 3.6 % yoy in November 2017 totalling EUR 3 531 billion (109 % of GDP – 67% coming from households, 18% from corporates and 24% from the non-bank financial sector), which exceeds the rather low level of private sector loans (EUR 2 777 billion) by 23 pps. of GDP.

Overall, deposits have increased slightly above nominal GDP growth, at times when the German private sector debt grows at moderate pace. As both household and corporate indebtedness decline slightly as percentage of GDP, passive deleveraging continues despite Germany's private sector debt being amongst the lowest in the euro area.

Graph 4.2.2: Annual change of different household loan categories

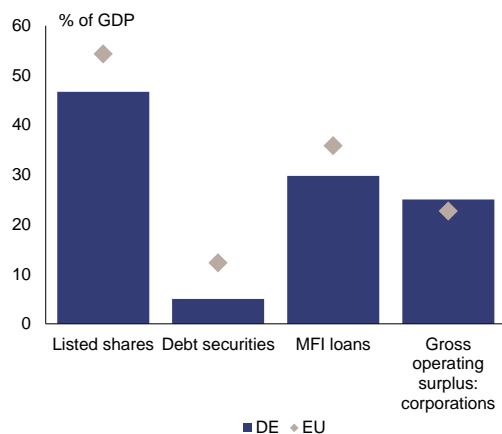


Source: ECB

The economy is strongly financed through own funds, while both debt and equity finance is below EU average. Unlike companies in other big member states that rely more on capital markets, the classic German *Mittelstand* (medium-sized enterprises) relies more on internally generated funds as evidenced by the slightly above EU-

average gross operating surplus (25.0 % and 22.7 % respectively, cf. Graph 4.2.3).

Graph 4.2.3: Funding sources of non-financial corporations



(1) Listed shares and debt securities represent total liabilities based on national accounts (Eurostat), loans by Monetary financial institutions (MFI, including banks) represent outstanding amounts (ECB BSI). In addition, gross operating surplus derives from national accounts.

Source: ECB, European Commission, Invest Europe

Listed shares represent the largest funding source to corporations. They amount to 46.7 % of GDP, 7.3 percentage points below EU average. Since the turn of the century German companies have embarked on a long-lasting deleveraging trend. While German corporates traditionally relied strongly on bank financing, now the importance of bank loans is considerably below EU average (29.8 % versus 35.8 %). After a decade of net negative debt issuance, German companies' net bond stock has stabilised in early 2016. Debt securities amount to barely 5.0 % of German GDP versus an EU average of 12.3 %. In addition to debt securities, many public entities and small and medium sized enterprises in Germany rather use a promissory note (*Schuldschein*), which is a mixture between a bond and a loan. Their set-up cost is a fraction of normal debentures as for instance no prospectus has to be drawn up. Between January and August already EUR 21 billion were emitted with an average interest rate of 1.23 % compared to EUR 25.4 billion in new emissions for 2016 adding up to a total outstanding of EUR 86 billion (2.7 % of German GDP). 40 % of emitters are foreign (mainly Austrian) companies. As some notes qualify for deposit guarantee scheme protection they are not accounted under debt securities. The role of

venture capital remains relatively limited (see Chapter 4.6 for more in-depth discussion).

Overall, banks display healthy stability ratios and ample liquidity. Cost cutting still has a long way to go in times where challenges of digitisation have to be addressed. Banks will have to re-orient their business strategy to reduce dependence on interest margins. Yet, smaller margins are somewhat counterbalanced through growing loan volumes as liquidity is amply available. The real economy is thus benefiting from the high liquidity position and competition in the sector. Only 11 % of companies surveyed in Germany in spring 2017 cite financing difficulties as a restraining factor, 4 pp less than in 2014. Most companies do not claim any financing constraints and agree that it's the least important factor hampering investment (59 %) (Cologne Institute for Economic Research, 2017; German Savings Banks Association, DSGV, 2018).

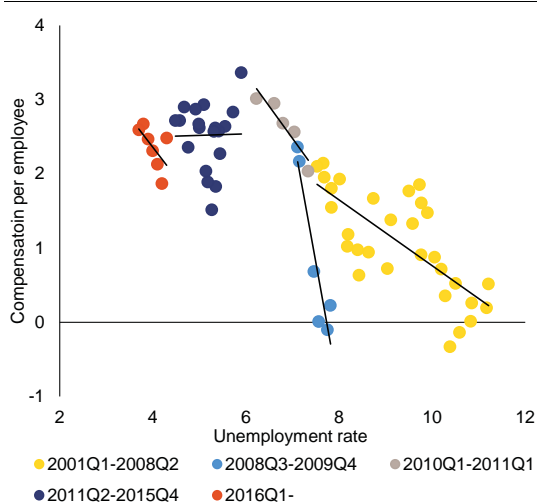
4.3. LABOUR MARKET, EDUCATION AND SOCIAL POLICIES

Labour market*

Despite record low unemployment and high job vacancy rates, wage growth remains moderate.

On the back of sustained economic growth, employment continues to grow and unemployment has dropped to record lows (see Section 1). Graph 4.3.1 displays the link between wage growth and unemployment rate (the so-called Phillips curve) for different periods starting from 2001. The relationship appeared stable before the crisis, moving leftward after, pointing to further structural improvements in the German labour market. In 2011-2015, this relationship became also flatter.⁽¹⁷⁾ In 2016, wages expanded at above 2% and accelerated somewhat to 2.7% in the first three quarters of 2017 as the labour market tightened, showing some responsiveness.

Graph 4.3.1: Phillips curve in Germany: compensation growth and unemployment rate



(1) Nominal compensation per employee is calculated as a total compensation of employees divided by total number of employees. The total compensation is defined as the total remuneration, in cash or in kind, payable by an employer to an employee in return for work done by the latter during the accounting period and it has two components: i) Wages and salaries payable in cash or in kind; and ii) Social contributions payable by employers.

Source: European Commission, Eurostat

Weak inflation expectations, falling structural unemployment and the level of productivity

(17) A flattening of the Phillips curve suggested by the chart is confirmed by estimates that control for cyclical unemployment, productivity growth. In addition, the reduction in the NAWRU exerts an independent downward pressure on wages. Now as structural unemployment is reduced, at the same level of unemployment wages accelerate less than they would have done in the past.

growth partly explain the moderate nature of recent wage growth. The level of productivity growth impacted wages, while inflation expectations have remained weak. Recent wage increase have not yet compensated for the accumulated divergences between wage and productivity. Over 2000-2016, real labour productivity per person increased by about 10.8 %, while real compensation per employee only increased by about 6.2 %. The recent increase in immigration did not seem to have prevented strong wage dynamics in lower wage segments particularly affected by immigration.

The modest increases of low wages and the higher number of hours worked in lower wage deciles contributed to keep wage growth subdued before the minimum wage introduction. Based on the recently released Eurostat survey on the Structure of Earnings Statistics, while the proportion of full-time employees (40 hours per week/160 hours per month) remained high, the proportion of employees who worked less than 10 hours per week rose between 2010 and 2014 from 6.7 % to 8.8 %.⁽¹⁸⁾ Because of these changes in the distribution towards mini- and midi-jobs employees, which in general receive a lower wage than full-time employees, it is estimated that aggregate wage growth was 16 % lower than without a shift in the distribution.⁽¹⁹⁾ This effect can persist if transition to regular employment is not ensured (Galassi, 2016).

Weaker coverage of collective bargaining may have also contained wage growth. Over the past 30 years, coverage has declined more rapidly in Germany than in other western European countries, from about 85 % in 1985 to 56 % in 2014 (See European Commission, 2016b for causes). In Germany, the sector-led bargaining system resulted in subdued wage developments in sectors with weaker unions – most of them dealing with non-tradables, such as services.

(18) With the introduction of the minimum wage working hours were reduced from 40.1 hours per week in 2014, to 36.3 hours in 2015. However, this trend stopped in 2016 (36.2 hours). (Destatis, 2017)

(19) Based on a shift-share analysis of the impact of the change in structure of jobs on wage growth between 2010 and 2014, using the Structure of Earnings Statistics.

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

The European Pillar of Social Rights, proclaimed on 17 November 2017 by the European Parliament, the Council and the European Commission, sets out 20 principles and rights to benefit citizens in the EU. In light of the legacy of the crisis and changes in our societies driven by population ageing, digitalisation and new ways of working, the Pillar serves as a compass for a renewed process of convergence towards better working and living conditions.

Germany performs relatively well on the Social Scoreboard ⁽¹⁾ supporting the European Pillar of Social Rights. Germany has high employment rates and very low unemployment. Regarding equal opportunities in the labour market and fair working conditions, the issue of labour market segmentation deserves continuing attention.

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)	Good but to monitor
Dynamic labour markets and fair working conditions	Employment rate (% population aged 20-64)	Best performers
	Unemployment rate (% population aged 15-74)	Best performers
	GDHI per capita growth	On average
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	On average
	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 situations"). 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 2018, COM(2017) 674 final. NEET: neither in employment nor in education or training; GDHI: gross disposable household income

A number of challenges remain, such as making it more attractive for women to work more hours and reducing the high gender pay gap. Specific tax arrangements create disincentives for second earners (*Ehegattensplitting*) and low wage earners (marginal tax rate) to work longer. Changing the default tax combination from 2018 only slightly adjusts the situation. Germany took measures to address the gender pay gap by adopting in 2017 the Act on greater wage equality between women and men. Companies are expected to analyse wage developments on a regular basis, prepare a report and undertake measures ensuring equal pay for equal work.

Germany has with 6.8 % (November 2017) one of the lowest youth unemployment rates in Europe. The German dual system of vocational education and training provides an excellent approach to skill development; in particular initial vocational education and training. Thanks to this system the country enjoys low youth unemployment and provides young people with high skill levels. About 50 percent of all school-leavers attend vocational training provided by companies, reach high skills level allowing companies to acquire skilled staff. Overall, vocational integration benefits and services for young people are

provided both by the Federal Government and by the *Länder* and local authorities. Job centres, employment agencies and youth welfare offices, providing social services, cooperate in order to provide young people with one-stop support. Germany also has various initiatives that all share the goal of helping young people to transit successfully from school to vocational training or academic study and subsequently into employment.

¹ The Social Scoreboard includes 14 headline indicators, of which 12 are currently used to compare Member States performance. The indicators "participants in active labour market policies per 100 persons wanting to work" and "compensation of employees per hour worked (in EUR)" are not used due to technical concerns by Member States. Possible alternatives will be discussed in the relevant Committees. GDHI: gross disposable household income.

*Box 4.3.2: Policy highlights: The introduction of the general minimum wage***Germany introduced on 1 January 2015 a statutory general minimum wage of 8.50 EUR per hour.**

This was seen also as a response by German legislators to the continued erosion of the collective bargaining system and declining bargaining coverage, which resulted in a high share of low paid workers. Now a commission (*Mindestlohnkommission*), which represents employers and employees, and includes labour market researchers as observers, is responsible for recommending adjustments of the minimum wage, based on comprehensive analysis of the labour market. The government either accepts the recommendation or leaves the minimum wage unchanged. The minimum wage was first increased as of 1 January 2017 to 8.84 euros, where the Commission took into account in particular recent developments of collectively agreed wages. In general the minimum wage is applicable in all branches of activity and all regions, with exceptions for apprentices, certain interns, people aged below 18 years and long-term unemployed people during their first six months of employment. Temporarily further exemptions were allowed for collectively agreed sectoral minimum wage floors, which incentivised collective bargaining and may have allowed mitigating negative employment consequences. In addition to the statutory general minimum wage, branch-specific minimum wages may be applied.

Fears that the introduction of the minimum wage would lead to significant employment losses have not materialised. Helped by the expansion phase of the business cycle, employment creation remained strongly positive, even in East Germany where wage increases were particularly pronounced due to the low initial wage level. Only so-called mini-jobs (marginal part-time employment) declined noticeably at the start of 2015. Many of these lost mini-jobs were upgraded to regular, socially insured employment. An evaluation of the effects of the minimum wage is planned for 2020.

Beyond workers's wages, work satisfaction also improved. The introduction helped to increase lower wages at the bottom of the distribution, as expected. Moreover, it also incentivised employers to invest in human capital, improve working conditions, and thus increased employees' satisfaction at the workplace (Pusch and Rehm, 2017)

Some aspects of the minimum wage setting may merit fine-tuning. Continuous assessment of the impact of the minimum wage remains an important task for the Commission, and the system may be tested when the economic cycle will worsen. In addition, it is not clear whether the resources available for enforcing the minimum wage are adequate to tackle non-enforcement. Out of the 27,323 investigations conducted in the first half of 2017, about 10 % (2,433) found non-compliance, primarily in construction and the hospitality industry. Early 2016, still a significant number of workers were earning below the minimum wage, with estimations ranging from 750 000 workers based on a survey of firms (Destatis, 2017) to nearly 2 million workers based on the SOEP survey of individuals (Burauel et al, 2017).

As a result, service sector wages are the lowest in the EU relative to manufacturing wages (80 % in Germany, 91 % in the euro area, 103 % in the EU-28). Moreover, while collective agreements could have been extended, thereby partly remedying the reduction in the coverage of original agreements, this was done only a very few cases. Although the law introducing the general minimum wage provided for an easing of the conditions for general extensions⁽²⁰⁾, the number of general extensions remained similar to that in previous years, with 447 extensions in July 2017. (Federal Ministry for Labour and Social Affairs, 2017b)

The introduction of the statutory general minimum wage helped to increase lower wages. The introduction of the statutory general minimum wage in 2015 increased wages at the bottom of the distribution, as expected (see Box 4.3.2).

The current round of wage negotiations has a strong focus on working time flexibility, on top of wage increases. The 2017-2018 wage negotiation round covers 9.7 million employees in the metal and electronics industries, the civil service, and the construction industry. IG Metall, the trade union of workers in the metal and electronics industries called at the start of the negotiations for the possibility of opting for a 28-hour working week rather than a 35-hour one. This

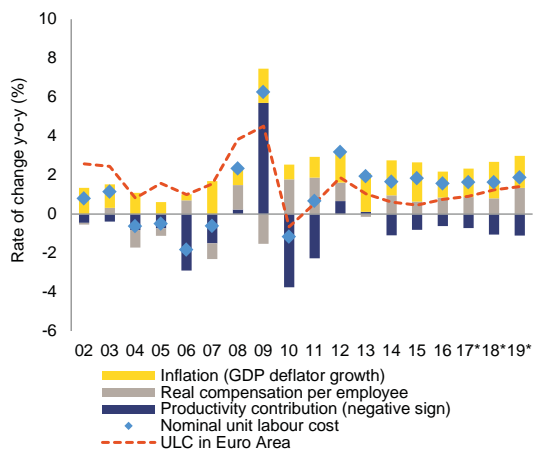
⁽²⁰⁾ The condition for the original agreement to cover 50 % of employees in the sector was abolished.

was also the outcome of the ‘choice’ model agreed between Deutsche Bahn and trade unions, which allowed employees to choose between a wage rise of 2.6 %, six more days of annual leave, or a one-hour reduction in weekly working hours ⁽²¹⁾.

External price competitiveness remains strong.

As a result of wage growth and moderate productivity gains, the nominal unit labour cost increased 1.7 % in the first three quarters of 2017, above that in the euro area, indicating a slight loss in the external competitive position. As inflation rose, real earnings growth decelerated, from 1.8 % in 2016 as a whole to 0.7 % in Q3 2017. (Graph 4.3.2)

Graph 4.3.2: Trends in labour costs and its components



* Forecast values taken from European Commission autumn 2017 Forecast

Source: European Commission

A tight labour market and ageing population call for fully utilising the labour force.

Vacancies registered by the public employment service have been rising steadily, reaching 770 000 by November 2017. Demographic ageing means that cohorts entering the labour market are smaller and immigration can only partially offset this trend (see also Section 4.4). At the same time, there was still substantial long-term unemployment 862 000 in November 2017, (for further discussion see also European Commission, 2017c). The high female part-time employment rate is accompanied by the second highest gender gap in part-time employment (37.5 % as compared with an EU

⁽²¹⁾ 56 % of employees have opted for more annual leave, 2 % for shorter working hours and 42 % for higher wages.

average of 23.1 %). As a result, Germany has a very wide gender pay gap⁽²²⁾. To reduce the gender pay gap, the Parliament adopted a law to promote transparency in wage structures between women and men in March 2017. Under this law, companies with over 500 employees are expected to assess wage developments regularly, report on them, and take action to make sure that women and men earn equal pay for equal work.

Disincentives to working longer hours, coupled with the lack of sufficient childcare and all-day school facilities are key reasons for women’s lower attachment to the labour market.

Germany has one of the highest tax wedges ⁽²³⁾ for low earners, which creates disincentives to working or to working longer hours. About 60 % of low earners in 2015 were women (Kalina and Weinkopf, 2017). The impact of parenthood on employment is also higher in Germany: the employment rate of women with children under 6 is 16.1 pp. lower than that of women without children, versus an EU average of 8.8 pp. (See also Box 4.3.1)

With increased demand for childcare and more places in all-day schools, it remains key to improve quality in early childhood education and care.

In 2015, 97.4 % of 4 to 6-year-olds’ were enrolled in early childhood education and care establishments. The rate is markedly lower for the under-threes. The participation rate in daycare of school children up to 11 rose from 10.6% to 16.1% between 2006 and 2015, while the participation rate in all-day schools rose from 9.8% to 39 % (Conference of Ministers of Culture, 2016). However, in early childhood education and care alone, unsatisfied demand and demographic changes necessitate more than 600 000 additional places until 2025 for children up to school age (German Youth Institute, 2017). Issues persist around service quality and flexibility. In 2017, additional

⁽²²⁾ In 2015, the unadjusted gender pay gap was 22% as compared with an EU average of 16.3%. Much of this disparity can be explained by working time, economic activity and occupation (men work longer hours, in better paid NACE sectors and occupations, and take fewer career breaks compared with women). However, an unexplained gender pay gap of 7.7% remains (Boll et al., 2016).

⁽²³⁾ The tax wedge on labour represents the difference between the total labour cost of employing a worker and the worker’s net earnings. It is defined as personal income tax and employer and employee social security contributions (net of family benefits) as a percentage of total labour costs (the wage and employer social security contributions).

financing of EUR 1.1 billion was approved for additional places. The Government also announced that a ‘quality development law’ was to be drawn up.

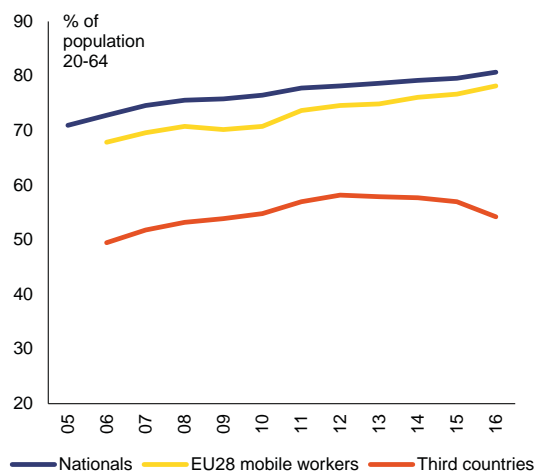
Mini-jobs provide flexible arrangements for people who want to work a limited number of hours, but also create lock-in effects. The total number of mini-jobs remained around 7.5 million. The number of people whose only job was a mini job fell from 5.1 million in 2014 to 4.8 million in 2017, while the number of those with a mini-job as their second job rose from 2.0 million in 2010 to 2.7 million in 2017. Nearly half of people with mini-jobs are either of pensionable age or students, and the majority are women. This seems to suggest that mini-jobs have not led to an ever increasing erosion of standard employment. However, there appear to be strong lock-in effects. High marginal tax rates just above the earnings threshold of EUR 450 yield strong threshold effects and in 2016 more than 23 % of mini-jobbers earned exactly EUR 450. Interaction with the tax system (exemptions for secondary jobs, tax treatment of second earners) further increases lock-in effects.

People with a migrant background are generally less well integrated into the labour market, notably to limited language skills and lower qualifications. The employment rate of nationals of other EU countries rose by 1.5 pp. between 2015 and 2016, reaching 78.2 %, as they move to Germany to take up employment. However, the same does not hold for non-EU migrants. The employment rate of non-EU nationals fell by almost 3 pp between 2015 and 2016. It is below the EU average (54.2 % v 56.5 %) and significantly below the employment rate of German nationals (26.5 pp. lower; see Graph 4.3.3). The main reason for this is the large inflow of non-labour migrants who face considerable difficulties in finding jobs. Women are particularly affected with an employment rate of 44.7 %: Lack of language skills together with lower qualifications seem to be among the main reasons for this. Getting non-EU nationals into jobs will thus continue to pose a lasting challenge (Bähr et al., 2017, Gürtzgen et al., 2017).

While overall youth unemployment in Germany is one of the lowest in the EU, young people with a migrant background face challenges. This is also reflected in the significantly higher

NEET (young people neither in education, employment or training, aged 15-24) rate of third country nationals as compared to that of nationals (21.1% vs 5%). Moreover, the employment situation of native-born with foreign born parents (i.e. second-generation) is also unfavourable. ⁽²⁴⁾The proportion of early leavers from education and training among foreign-born students (23.2 %) was almost three times that of students born in Germany (8.2 %) in 2016.

Graph 4.3.3: Employment rate by citizenship



(1) Employment rates of people aged 20-64 (percentage of population), non-seasonally adjusted

Source: Eurostat

While the number of newly-arrived asylum seekers has fallen, integrating the large number of young refugees into education and work represents a long-term challenge. The total number of newly-arrived asylum seekers (according to registrations in the EASY-system) fell strongly in 2017 to an estimated 198 000 (Federal Office for Migration and Refugees, 2018), from about 890 000 in 2015. Various stakeholders ranging from the Federal Government, the *Länder* and local governments to the Federal Office for Migration and Refugees (BAMF), public employment services, social partners, companies and foundations took important measures in 2017 aimed to help the new arrivals to find work, with an expanded range of integration courses focusing on career guidance and vocational training.

⁽²⁴⁾ In 2014, native born with foreign born parents had lower employment rate (56.2%) by around 19.6 % points than native-born without a migrant background (75.8%) (Eurostat, lfsq_14lel).

(Federal Ministry of Education and Research, 2017) Considering difficulties in labour market integration, demand for training and active labour market policies is expected to remain strong in 2018.

Social policy*

The steady rise in the at-risk of poverty rate and inequality seen since the crisis slightly reversed. In 2016, the percentage of the population at risk of poverty or social exclusion continued to fall, owing to improvements in all of its three components. The at-risk of poverty rate has fallen slightly, from 16.7 % to 16.5 %, the first decline since the crisis. Following a steady increase since the crisis, in-work poverty also fell slightly in 2016. However, this improvement remains modest (and only benefits men, as in-work poverty among women increased further). Further improvements are held back by disincentives to work longer (second earners, mini-jobs lock-in effect, see above) and the moderate wage dynamic.

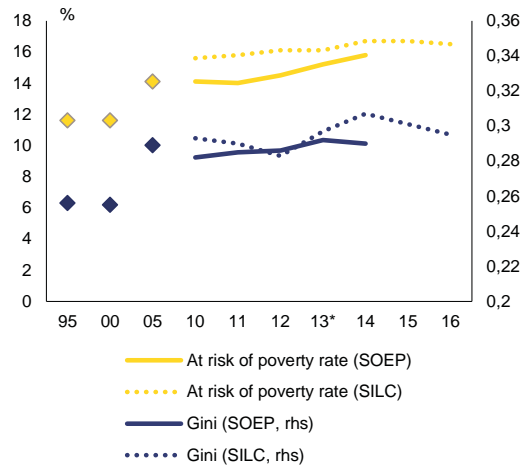
Positive economic and labour market developments are only recently accompanied by reduced income inequality. In 2016, the richest 20 % of households had 4.6 times as much income as the poorest 20 %, a decline of 0.2 from the previous year. Germany currently lies somewhere in the middle of the EU countries, according to the Gini index of equivalised disposable income⁽²⁵⁾. However, income inequality worsened in the early 2000s, and the Gini coefficient subsequently hovered around this higher level (see Graph 4.3.4). The recent declines in inequality and poverty risk may be explained by the positive labour market developments, plus the new national minimum wage. Improvements in the income position of low income households have helped reduce rising disposable income inequality. Germany ranks well above or close to EU average for indicators related to coverage and adequacy of unemployment benefits.⁽²⁶⁾ Still, duration for a one year work record is comparatively low and unemployed

⁽²⁵⁾ The Gini coefficient of equivalised disposable income takes values between 0 and 1 and is a measure of equal or unequal distribution. Higher values show a higher level of inequality.

⁽²⁶⁾ According to the benchmarking exercise in the area of unemployment benefits and active labour market policies conducted within the EMCO Committee. See the draft Joint Employment Report 2018 for details.

overall have a high at-risk of poverty rate. Germany also performs well for the indicators related to adequacy of minimum income benefits, which play a major role as the last safety net.

Graph 4.3.4: Gini coefficient and poverty risk



* Break in time series in SOEP due to a change in sampling methods

** Values take owner-occupied living space into account

1) At risk of poverty rate: proportion of people with an equivalised net income below 60 % of the median income
Source: Federal Ministry for Labour and Social Affairs, 2017

The declining replacement rate in the statutory first pillar has a negative effect on pension adequacy and increases the risk of poverty in old age. At 17.6 % in 2016, the risk of poverty in old age (i.e. above 65) was above the EU average of 14.7 % and higher than the average for the total population (16.5 %). The risk of poverty in old age applies particularly to former low-wage earners or people with atypical jobs, self-employed people without employees or those with an interrupted employment history (temporary agency workers). Moreover, Germany has the second widest gender pension gap in the EU (45.7 %). In addition, the replacement rate of the statutory pension scheme is expected to decline (see Chapter 4.4). In response, in June 2017 the Bundestag enacted three bills on the pension reform which also address old-age poverty. They include tax credits for low earners, an increase in basic public allowances and additional incentives for employers offering occupational pension schemes. Even if fiscal sustainability risks are currently low in Germany, making it more attractive to work more and longer, can help increase old-age income, boost potential

output, improve the fiscal outlook, and reduce the need to save for retirement.

Self-employed people may be particularly at risk of old age poverty as a result of limited social protection. Those self-employed people who do not have compulsory pension schemes for the free professions and who do not have considerable personal means have little protection on retirement. Inadequate pension entitlements for the self-employed will make them dependent on means-tested pension supplements in old age or if their earnings capacity is reduced (Bäcker, 2014; Geyer, 2014; Brettschneider and Klammer, 2016). Former self-employed people already account for a high share of recipients of this benefit (Federal Ministry for Labour and Social Affairs, 2017c).

The young are more vulnerable than the elderly in some respects. In 2016, the material deprivation rate of people over 65 was considerably lower, at 7.0 %, than that of children below 18 (10.6 %). Persistent generational inequalities may have a severe impact on intergenerational fairness. (European Commission, 2017e). Moreover, Germany a high gap in the EU between people with disabilities and those without as regards being at risk of poverty or social exclusion (15.6 pps. vs the EU average of 10.1 pps. The rising cost of housing has a considerable impact on the poor. In 2016, despite an overall declining trend, the housing cost overburden rate of people at risk of poverty was still significantly above the EU average (15.6 % vs. 11.1 %).

Social outcomes for migrants and their children remain a concern. Foreign workers have not benefited from the recent fall in the rate of in-work poverty. Their poverty risk rose from 16.8 % in 2015 to 17.7 % in 2016, while the situation improved for German workers (falling from 8.8 % to 8.4 %). Although the poverty risk for children of foreign nationals improved considerably in 2016 (20.9 %, vs. 23.5 % in 2015), they are still at a much higher risk than the children of German parents (14.5 %, vs 13.7 % in 2015).

Access to health remains good, though inequalities persist between regions and groups. While operating at high cost and with certain inequalities in access (see Section 4.1.), unmet medical needs for medical care are very low in

Germany (0.5 % of the population) and the density of physicians, nurses and hospitals in Germany is among the highest in the EU. However, Germany is among the four OECD countries with the largest regional differences in the number of hospital beds per 10 000 inhabitants (OECD, 2016d). National data show that some rural areas, particularly in the eastern *Länder* are short of doctors, while some regions in the west lack enough nurses. Despite the growing number of nursing graduates, national studies predict considerable future shortages in the profession, owing to demographic ageing.

Education and skills

Spending on education remains below the EU average and the government target with possible negative implications for potential growth. Public expenditure on education remained at flat as a share of GDP in 2015 and below the EU average (see Section 4.5). This gives cause for concern in view of the numerous new challenges, including the integration of newly arrived migrants, growing student numbers and digitisation. Distribution constraints on public spending in education due limited cooperation possibilities between central and federal level remain largely in place; despite a change in the Base Law. Support from the federal government due to the constitutional changes, in force since June 2017, are at present restricted to investments in school infrastructure for financially weak municipalities (Federal Ministry for Economic Affairs and Energy, 2017a).

Educational outcomes are stable overall but remain considerably influenced by socio-economic background. According to the 2015 OECD Programme for International Student Assessment (PISA), the share of top performers in the highest socio-economic quartile is above the OECD average in science, mathematics and reading, while the share of weak performers in that group is below average. In science, the difference in the rate of low achievers between the lowest and highest social quartiles is 23 pp., equivalent to a difference of almost 3 years of schooling⁽²⁷⁾. While these results mark an improvement in the equity of the German education system since PISA

⁽²⁷⁾ The difference between mean scores equals 103 score points; a score difference of 38 points is associated with 1 year of schooling.

2006 (OECD, 2016b), they show that considerable disparities remain. A national survey on linguistic and mathematical competences of 4th graders marks little progress in lessening the influence of socioeconomic factors on educational success compared to earlier studies (Institute for Educational Quality Improvement, 2017).

There is a wide performance gap between native-born and foreign-born students. In PISA 2015 low performance in science was 11.8 % for children without a migrant background versus 42.2 % for immigrants. Children of immigrants (second generation) closed the gap only partially at 31.1 % (European Commission, 2016c). This is of concern given the very substantial share of second generation students in Germany (13.2 % compared to 6.5 % across the EU).

Renewing the teaching workforce raises challenges. In Germany, 45 % of primary and secondary teachers are aged 50 or above, compared with 35 % in the rest of the EU. The necessary replacement of retired teachers has already led to general supply gaps in some regions and subject areas such as mathematics and sciences (Standing Conference of the Ministers of Education and Cultural Affairs, 2013). To alleviate the situation, pensioned teachers are reactivated, teachers from abroad are recruited and more and more career changers are being accepted into the profession, often without prior pedagogical training but with tailored accompanying support after they take up teaching⁽²⁸⁾. Flexible provisions are necessary to address the growing demand for teachers with even higher than expected student numbers (Klemm and Zorn, 2017), but they do not provide a permanent solution. Commonly agreed standards for career changers and measures to increase the attractiveness of the teaching profession might contribute to further raise the teacher supply.

University education is becoming more widespread but is more difficult to accomplish for students with a migrant background. The rate of people obtaining a tertiary degree has reached 33.2 % in 2016⁽²⁹⁾. Upward mobility, i.e.

young people earning tertiary degrees, above the education level of their parents, is lower in Germany than the OECD average. This might be partially explained by the traditionally strong prevalence of Vocational Education and Training (VET) (OECD, 2016b) and its good employment prospects. Students with a migrant background face much bigger hurdles to complete their tertiary studies: they experience dropout rates of 43 % versus 29 % for the student population without a migrant background (Ebert and Heublein, 2017).

Employment rates for VET graduates continue to be high but fewer people are choosing this education path. The proportion of Germany's upper secondary VET students (ISCED 3) slightly decreased in 2015 to 46.8 %, just below the EU average of 47.3 %. The employment rate of recent VET graduates in 2016 was at 90.1 % markedly higher than the EU average of 75 %. In 2016, the number of unfilled apprenticeship positions registered by the Federal Employment Agency reached a new record high of 43 500, while 20 600 registered applicants did not find a suitable apprenticeship. This points to a significant mismatch in qualifications and at sectoral and regional levels (Federal Ministry of Education and Research, 2017). Efforts to better advertise the VET system include orientation and information campaigns at secondary schools, outreach to higher education dropouts and improvements in VET training, for example, through experience abroad. Digitalisation in VET focuses on inter-company vocational training, competence centres speeding-up the digitalisation in training and funding for digital equipment of SMEs.

Adult learning is below the EU average and remains a particular challenge for the low-skilled. Adult participation in learning remained at 8.5 % in 2016, practically unchanged and below the EU average of 10.8 %. Reaching the low-skilled and unskilled, the long-term unemployed and older people is especially difficult. In the context of the Upskilling Pathways: New Opportunities for Adults recommendation (European Commission, 2016d) several steps are being undertaken in Germany to address the low-skilled adult population of 7.5 million adults —

⁽²⁸⁾ Estimates find that this concern up to 10 % of all teachers hired in 2016, and in some federal states as much as one third of newly hired primary teachers (BDK, 2017).

⁽²⁹⁾ The national target of 42%, which includes ISCED level 4 qualifications, has been passed and reached 46.8 % in 2016

(Federal Ministry for Economic Affairs and Energy, 2017a).

many of them in employment — who lack basic reading and writing skills (Grotlüschen, 2016).

4.4. BEYOND THE AGGREGATE: AGEING, INEQUALITY AND SAVINGS*

Inequality

Income inequality increased in Germany in the early 2000s, and wealth inequality is high in international comparison. These facts are summarised in the recent Poverty and Wealth Report and were largely confirmed by a previous country report and an in-depth review which argued that high income inequality may result in a high overall propensity to save (Federal Ministry for Labour and Social Affairs, 2017; European Commission, 2017c and 2014a).

Rising inequality may be linked to demographic and labour market changes. The real incomes of the lowest income decile fell by 8 % between 1991 and 2014, owing to the expansion of the low wage sector, population ageing and lagging adjustments of transfers (Grabka and Goebel, 2017). Structural changes in the labour market, such as the increase in low wage employment, atypical employment, and decreasing unionisation, contributed to divergent real wage developments (Federal Ministry for Labour and Social Affairs, 2017). However, this result needs to be seen in the light of labour market reforms and other factors which changed the composition of the employed labour force during the period in question⁽³⁰⁾. With the improved employment rate, inequality of earned income among the whole population has decreased from 2005 onwards, and has even gone down below the level of the year 2000 (Felbermayer et al., 2016).

Theoretical literature suggests that inequality may have a dampening effect on macroeconomic developments. The theoretical literature on the impact of inequality on macroeconomic developments has identified several channels: i) the growth channel: high income inequality implies that a large proportion of income is channelled to high-income groups, which have a higher propensity to save. This could dampen private consumption and consequently growth; ii) the incentive channel: high income inequality increases the incentives for low-income groups to achieve higher income gains, which could have a positive effect on productivity (Mirrlees, 1971; Lazear and Rosen, 1981); iii) the human capital channel: high income inequality

⁽³⁰⁾ For instance, employment grew from 39 million in 2005 to 43 million people in 2014.

reduces opportunities for private investment in education. This could reduce the human capital base in the medium to long run, with a corresponding negative effect on productivity (Galor and Zeira, 1993).

Recent empirical evidence for Germany is consistent with the theoretical literature suggesting that inequality may have an effect on growth, its components and the trade balances.⁽³¹⁾ Recent empirical studies by the OECD find a negative impact of income inequality on growth (Cingano, 2014; OECD, 2015).⁽³²⁾ The study by Albig et al (2017) hints at the possibility that Germany's cumulative real GDP growth rate over 1991-2015 could have been higher if income inequality had stayed constant. The study identifies the human capital channel as the main driver of this result, whose negative impact kicks in with a delay of one decade. This illustrates the case for timely anticipatory policy action, especially in the field of equality of opportunity in education (see Chapter 4.3). Furthermore, the share of consumption in disposable household income decreases substantially with increasing monthly income, suggesting that there is a significant difference in savings rates across the income distribution⁽³³⁾. The study by Albig et al (2017) indicates that the savings rate might have risen more and that private consumption was somewhat weaker between 1991 and 2015 compared to the case where the Gini coefficient had remained constant. It also points out that the trade and current account surplus may have increased due to a stronger effect of rising inequality on imports than on exports.

Population ageing

As a result of increasing life expectancy and lower birth rates, the share of elderly people in the population has increased. Apart from the standard population ageing, there are some specific features characterising the German age

⁽³¹⁾ There is no general consensus in the literature about the direction or the size of the effect of inequality on growth. For more details, see the meta-analysis described in Neves et al. (2016).

⁽³²⁾ For a review of these studies, see Federal Ministry for Economic Affairs and Energy (2017b).

⁽³³⁾ See also Brenke and Wagner (2013), who show that the savings rate for the first quartile of the income distribution is significantly lower than that for the fourth quartile, and that this gap widened significantly over 1995-2007.

distribution. First, there is the large group of 'baby-boomers' born between the mid-1950s and mid-1960s. Second, the birth cohort following the 'baby-boomers' (born since the mid-1970s) had particularly low levels of births per year.

The consequences of this pattern are significant for the German economy and the current account. The 'baby-boomers' are currently in their prime working age, where work income and savings are highest. However, when most of this group reaches pensionable age, the German labour force will shrink substantially, while the group of pensioners will grow strongly. This cohort effect of the 'baby-boomers' will also affect macroeconomic variables, such as overall savings, the sum of income tax payments⁽³⁴⁾, and overall social security contributions.

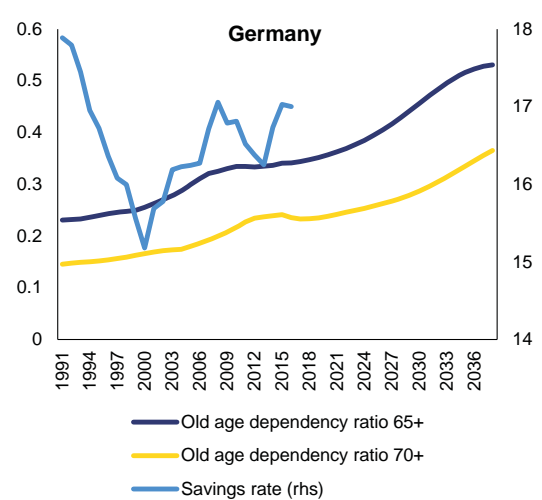
According to economic theory, demographics are currently contributing to the German surplus, but should lower savings in the long run, thereby balancing the current account. Anticipation of ageing can be a key driver of higher savings. This may help explain the very high German current account surplus. However, the current account increase implied by theory (e.g. Buiters, 1981; Obstfeld and Rogoff, 1995) is always temporary. In particular, the current account position should increase when larger cohorts pass through high saving stages of the life cycle and are faced with 'ageing news' (positive cohort effect). It should then decrease when a larger proportion of the population grows older and their savings rate is lower (negative cohort effect).

Moreover, population ageing also provides a rationale for Germans to invest a significant share of savings abroad. An ageing population may also be affecting domestic investment patterns, resulting in rather subdued investment growth at home and higher investment abroad. The prospect of shrinking domestic labour supply and waning domestic demand are depressing returns on domestic investment. Yields on assets abroad are likely to be higher, owing to a more favourable age structure (e.g. Barro and Sala-i-Martin, 2003). This

⁽³⁴⁾ The effect on income taxes is aggravated by the transition in the tax treatment of pension payments towards taxing them when paid out. For details, see Beznoska and Hentze; 2016.

theoretical pattern leads to a positive and increasing NIIP, as can be observed in the German case.

Graph 4.4.1: Dependency ratios (2036 population forecast) and savings rates of DE

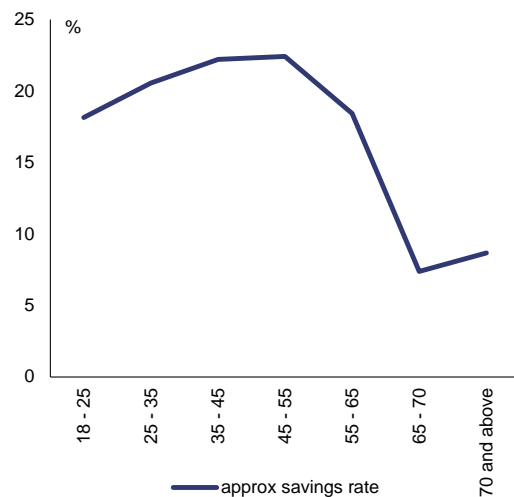


Source: Eurostat

However, there seem to be also other factors at play that influence the structurally high German saving rate. German saving rates have recently fluctuated at around 15 to 17 %, significantly above the rates of most other European countries. This is sometimes explained by a specific German propensity to save (European Commission, 2014a). Moreover, elderly and young households in Germany depart from economic theory in that they do not dissave on average (see Graph 4.4.2). The result is known as the 'German savings puzzle' (see, for instance, Belke et al., 2015; Boersch-Supan et al., 2001)⁽³⁵⁾, which contrasts with Modigliani's standard economic theory of the life-cycle model of income and consumption smoothing (Ando and Modigliani, 1963). As a result, the adjusted German version of the life cycle savings pattern appears structurally higher across all age cohorts than what one would expect in the light of standard theory.

⁽³⁵⁾ The pattern characteristic of the 'German savings puzzle' can, however, be observed in some other EU member states as well.

Graph 4.4.2: Savings rates by age groups – measured in 2015



Source: European Commissions' calculation, based on Destatis, continuous household budget survey (Laufende Wirtschaftsrechnungen)

Additionally, pension adequacy might be at risk for the 'baby boomers' and subsequent generations, thereby contributing to stronger precautionary savings. As the German public pension system is designed as a pay-as-you-go system⁽³⁶⁾⁽³⁷⁾, ageing will challenge the system's overall sustainability⁽³⁸⁾, which may affect old-age poverty (see Chapter 4.3). In turn, this is likely to encourage precautionary savings to compensate for the expected reduction in old-age income. Employment-specific second pillar pensions may compensate to some extent (by contributing to future incomes). However, their impact is constrained because it is not mandatory for firms to have them or for workers to enrol. Additionally, they are less attractive to mobile workers who change employers.

The federal government has also provided incentives for making additional precautionary savings. To compensate for the lower pension level, private pension savings were encouraged;

⁽³⁶⁾ In a 'pay as you go' system, the contributions of the working-age population pay for pensions directly.

⁽³⁷⁾ According to Bloom et al., 2007, econometric analysis shows that households' savings are lower in countries with pay-as-you-go pension schemes and higher in those with capital-based schemes.

⁽³⁸⁾ According to European Commission's projections, ageing-related costs are expected to increase by around 4.2 pps. of GDP between 2016 and 2070 (European Commission, 2018).

most notably by the '*Riester-Rente*' which was introduced in 2002. Those reforms may also have pushed up private savings, as they strongly incentivised old-age provision. Moreover they focus on safe, but low-yielding assets, which are to a large extent sourced from abroad (European Commission, 2016b). Additionally, the low interest rate environment might also be a reason for private households to further increase their savings in order to achieve a certain nominal amount ('nominal illusion').

Several studies have focused on empirically identifying the present impact of demographics on the current account⁽³⁹⁾, but results vary depending on the methodology applied. In the Commission's 'current account norm' model⁽⁴⁰⁾ (European Commission, 2017a) the overall current account level that can be empirically attributed to country-specific factors yields a German surplus of 2.5 % for 2016, which is significantly below the actual level. In contrast, the IMF's model estimates a German current account surplus for 2016 of about 4.5 % of GDP (IMF, 2017b). Interestingly, the contribution of factors other than demographics to the 'estimated current account norm' is roughly the same (1.6 pps.), but the two models differ substantially in the estimation of the demographic impact (3 pps. for the IMF vs 1.1 pps. in the Commission model).

In the long run, empirical models suggest that the German current account balance is likely to become negative as a result of population ageing. In an overlapping generation's model, Busl et al. (2012) estimate that the cohort effect of the 'baby-boomers' being in their prime saving age will make a positive contribution to the German current account surplus until 2030. However, in the longer term, large-scale transitions from working to retirement age will start to bring down the aggregate saving rate and, thus balance the current account. According to ZEW, this negative cohort effect will yield a German current account deficit of 2 % of GDP by 2033.

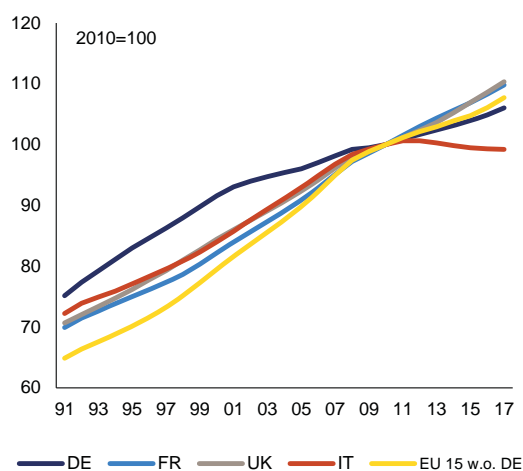
⁽³⁹⁾ Following the work of Chinn and Prasad (2003), several authors, including Phillips et al. (2013), Lane and Milesi-Ferretti (2012), Salto and Turrini (2010), Lee et al. (2008), and Gruber and Kamin (2007), have contributed.

⁽⁴⁰⁾ 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.

4.5. INVESTMENT

Despite the recent pick-up in investment growth, important asset types still need to catch up. Despite a strong economic performance in the wake of the crisis, Germany's capital stock increased much more slowly than that of the rest of the EU-15, with potentially negative effects on the long-term potential growth (Graph 4.5.1). As regards the various asset types, investment in machinery and equipment has started to respond to the economic upswing; investment in intellectual property products has grown consistently and is gradually increasing in importance; and investment in residential construction is picking up too, although supply is still lagging behind housing needs in certain areas. On the other hand, investment in other construction is stagnating, possibly affecting essential infrastructure.

Graph 4.5.1: Capital stock



Index 2010=100

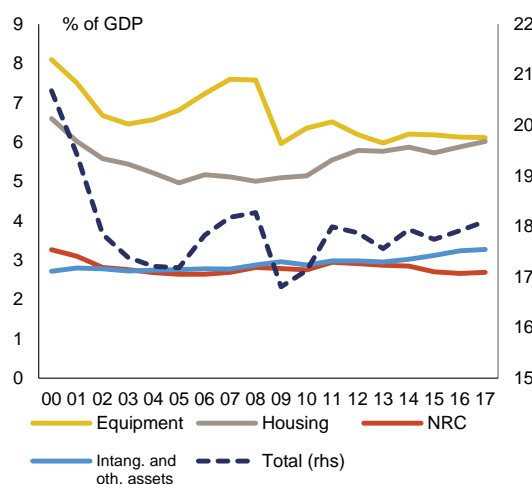
Source: European Commission

Private investment development*

Private investment has picked up and is expected to grow briskly in the short to medium term, but business investment intensity remains weak. Investment in machinery and equipment has posted strong real increases in the course of 2017 reacting to record high orders, high capacity-utilisation rates and a favourable outlook. It has reached pre-crisis levels, but its intensity remains subdued against the backdrop of favourable financing conditions and declining relative prices for machinery and equipment. On the other hand investment in non-residential construction (NRC)

is stagnating. Investment in intangible assets has continued to gain importance on aggregate, but disparities across sectors and firm sizes are persistent. The private investment share of GDP seems to be rising mainly on account of housing investment, driven by both real increases and price inflation (Graph 4.5.2).

Graph 4.5.2: Gross fixed capital formation in the private sector



Source: Destatis, European Commission

Private investment in intangible assets appears to be concentrated in some sectors and restrained in others. Investment in intangible assets⁽⁴¹⁾ is crucial to promoting productivity growth (Thum et al., 2017). This includes investment in R&D and software, and vocational and life-long learning. A particular need is investment in digital skills, essential for innovation and the dissemination of technology. While large technology-intensive corporations, particularly in the automotive sector, are investing in intangible assets, the services sector and small and-medium-sized enterprises (SMEs) are lagging behind by comparison with other advanced economies (OECD, 2016c). Investment appears to be strongly concentrated in only a few sectors, with often fewer than half of the companies in those sectors investing in intangible assets (Belitz et al., 2017).

⁽⁴¹⁾ The System of National Accounts (SNA) currently captures R&D, mineral exploration, computer software and databases, entertainment, literary and artistic originals under the asset category "intellectual property products", while the broader term "intangible assets", synonymously termed also "knowledge based capital", can include also assets which are not captured by the SNA.

Furthermore, recent data suggest that the share of SMEs in business R&D expenditure has been gradually declining in recent years (See also Section 4.6). All this points towards a considerable sector and company-size specific concentration of investment in intangible assets and possibly underinvestment in SMEs and other sectors, such as services, which can dampen potential growth. The increasing average age of firm owners, especially where SMEs are concerned, could be one of the reasons for their lower research and innovation activity, as older entrepreneurs are typically more risk-averse towards investments in innovation.

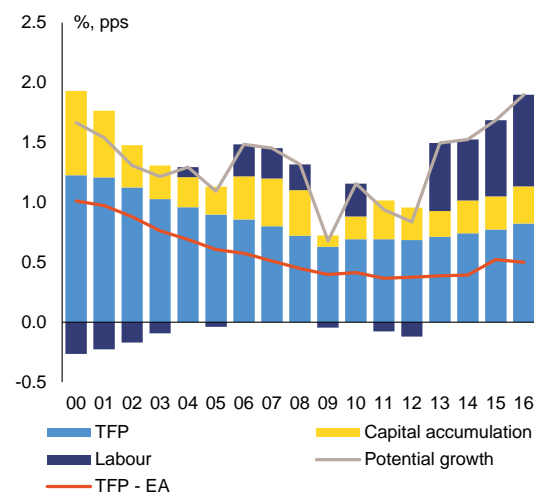
Despite favourable financing conditions, non-financial corporations remain net lenders. While SMEs have positive net investment (EUR 44 billion in 2016), larger companies continue to invest at a lower rate than capital depreciation (KfW, 2017b). With a good self-financing capacity and an equity ratio of 30 %, German companies rely less on external finance. In this context, the standard push factor, low interest rates, appears to have hardly any impact on firms' investment decisions.

Obstacles to investment, according to company surveys include shortages of skilled labour administrative and infrastructure constraints and the tax treatment of innovation activity. According to a recent company survey (DIHK, 2018), 68% of businesses report a lack of skilled personnel as a bottleneck to investment and according to a different survey (DIHK, 2017), an even larger share, 82% of businesses, report shortages of skilled human resources as an obstacle to their innovation activities.. This affects SMEs more than big business. Substitution of capital for labour is considered to have limitations (where capital and labour are complementary), especially for SMEs. The prospect of a shrinking labour force is thus likely to put a lid on domestic investment growth in the medium and long run. Improving human capital, investing more in education and skills of the workforce, could help offset this risk and contribute to higher investment. Other obstacles to business innovation include the administrative burden and the lack of broadband internet (an obstacle reported by 65% and 58% of businesses respectively).

Productivity*

Labour productivity and total factor productivity are growing faster than the euro area average, but sector-specific challenges remain. Productivity growth is the most important driver of long-term growth and a prerequisite for maintaining Germany's high living standards. Overall, labour productivity is growing faster than the euro area average, especially in medium-high technology sectors, such as motor vehicles, chemicals or machinery and equipment. In contrast, labour productivity growth in the services sector has been a long way below that of the manufacturing sector over the last decade (Graph 4.5.4). While total factor productivity shows a stronger increase than the euro area average, the annual growth rate for the last three years for which records are available has remained stable and below pre-crisis growth levels.

Graph 4.5.3: Potential growth and contributions



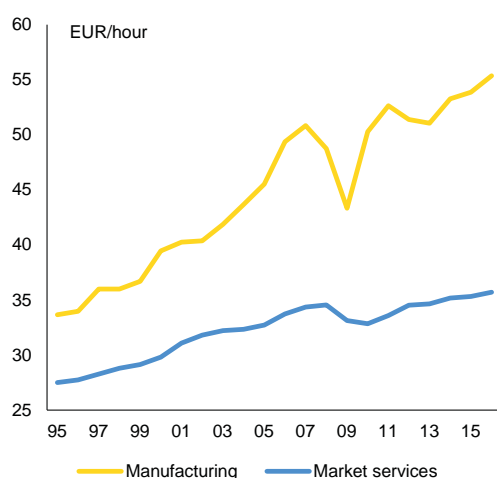
Source: European Commission

Available firm-level data show that the gap between the most and the least productive companies has widened over the last decade. This applies to both labour productivity and total factor productivity, suggesting that there are obstacles preventing resources from being efficiently reallocated to their most productive uses⁽⁴²⁾. Recent research by the OECD further suggests that about 12 % of capital is sunk in “zombie

⁽⁴²⁾ Data from the Competitiveness Research Network (CompNet), available up to 2012. Update with more recent data currently under progress, but not yet available.

firms” (firms that have been in existent for over a decade and have had an interest coverage ratio of less than one over three consecutive years). This may act as a barrier to reallocation and productivity growth (McGowan et al., 2017). The concentration of investment in intangible assets in a few sectors and firms has also exacerbated the performance gap.

Graph 4.5.4: Productivity developments



(1) Value added per hour worked, prices of 2010
 (2) Market services include activities with classification codes G (Trade), H (Transport), I (Hospitality), J (Communications), M and N (Professional and Business services).

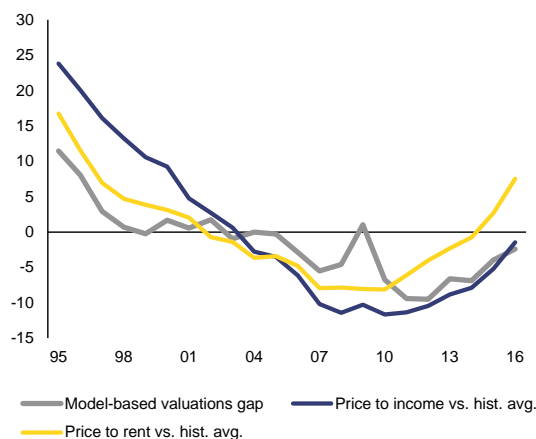
Source: European Commission

Developments in the housing market*

The housing market is facing strong demand fuelled by rising incomes, low interest rates, and high levels of net migration. Price heterogeneity across regions has increased strongly, especially in and around the major urban centres. While prices increased overall (Graph 4.5.5), overvaluation in some major urban centres reached about 15-30 %. However, this is not excessive in international comparison (Bundesbank, 2017) and there is no indication so far of a national house price bubble and macro-prudential risks remain contained (see also Section 4.1). The strong price increases reflect buoyant residential demand, and scarce, even if slowly catching up, supply. Measures to ease supply constraints have double benefits: improving the housing situation and mitigating overvaluation risks. Measures for renovating and upgrading can also contribute to climate policy goals and reduce costs of living.

More investment could help make affordable housing more widely available. Most studies agree that Germany faces a significant construction backlog in major and intermediate urban areas, though there is no agreement on the extent of this gap (Dahl and Goralczyk, 2017). Government estimates suggest that the current 250 thousand units completed annually need to increase to 350 thousand, while other broad-based studies suggest a gap closer to 200 thousand units over the next five years, to compensate for underinvestment since 2010. Estimates that take account of official statistics on construction costs per square metre suggest that closing the gap would imply increasing residential investment by 0.8-1.6 % of GDP. To open up attractive urban space for new dwellings, higher complementary investment in urban transport and utilities (e.g. in water supply and waste treatment) might also be necessary. The latter does not seem to have kept up, which has resulted in a decline capital stock and potentially capacity bottlenecks (Graph 4.5.8). Although the rental price break (*Mietpreisbremse*) could contain increases in rental prices in the short run, increases in house prices are trickling down over time. A lasting policy for affordable housing requires an adequate supply response (see also IMF 2017a).

Graph 4.5.5: Housing overvaluation gap



(1) Overvaluation gap estimated as an average of the price/income, price/rent and fundamental model valuation gaps. Long-term values are computed over 1995-2016.

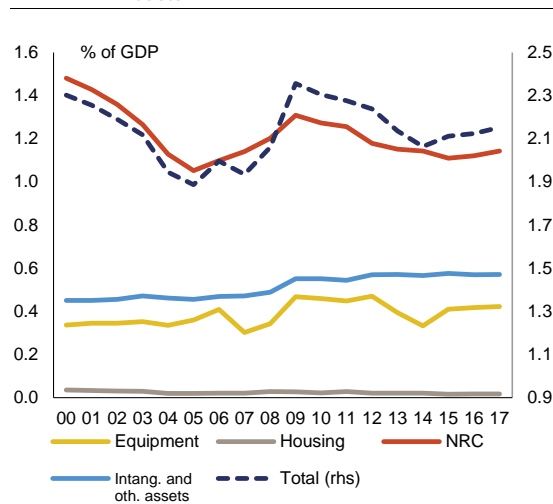
Source: European Commission

Filling the housing supply gap could have a significant impact on the current account surplus. The large dip in construction investment (as a share of GDP) from the late 1990s until 2015

was the most significant change in German investment during the emergence of the current account surplus. Remedying the sizeable accumulated shortage of housing, would have a significant impact on the current account. Given historical elasticities and input-output estimates, the main impact of increasing investment in housing would be to push up domestic nominal GDP. In addition such a change would also result in spillovers, strong effects in nominal demand in the rest of the euro area, based on latest estimates of international inter-industry technology coefficients. Raising construction investment – including also renovation and upgrading – by EUR 30-60 billion over five years (i.e. 1-2 % of GDP) to close the supply gap, would thus translate into a 0.25-0.5 pps. reduction in the current account surplus, not taking secondary effects on labour markets, wages, etc. into account. Eradicating the entire construction backlog within five years would probably require an increase in construction investment of more than 3 pps. from its current share of 10 % of GDP.

The Federal Government has introduced a number of measures aimed at alleviating the shortage of dwellings. First, it introduced Housing Construction Campaign, a package of measures designed to tackle housing shortages and rising house prices. Second, it has committed to contributing an annual EUR 1 billion over 2016 – 2019 to social housing projects supporting families, students, pensioners and refugees. Third, to deal with the ongoing refugee crisis, KfW has made EUR 1 billion available since 2015 for municipal authorities to provide housing for refugees. Fourth, the urban development assistance programme “Social City” focuses on stabilising and upgrading economically and socially deprived urban areas and is an example of successful collaboration among various bodies at federal and *Länder* level. For 2017, EUR 190 million of funding was made available for this programme.

Graph 4.5.6: Gross fixed capital formation in the public sector



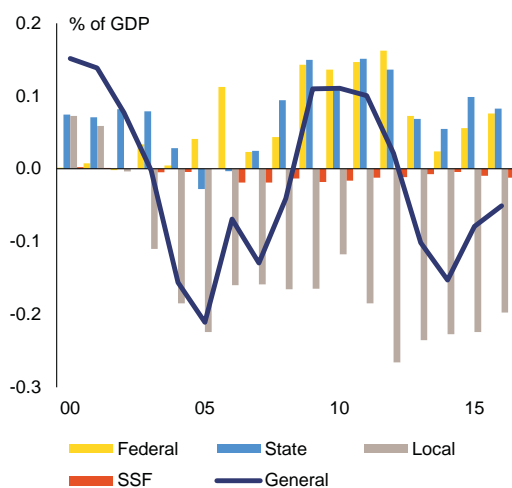
Source: Destatis, European Commission

Public investment including knock-on effects on private investment*

Public investment is picking up but a significant backlog has largely remained in place. Real public investment increased robustly in 2015-2017 in comparison to the sometimes negative growth rates in the years before (Graph 4.5.6). This trend reflects the efforts by the government to strengthen investment, but the public capital stock as a share of GDP is still declining. Investment as a percentage of capital stock in the government sector and also public investment as a percentage of public expenditure are lower in Germany than in other EU-15 countries and the euro area average⁽⁴³⁾. The biggest fall since the crisis has been recorded in construction and the only sector, which has expanded in line with GDP over the years, is intellectual property.

⁽⁴³⁾ With specific regard to government investment, the gross fixed capital formation recorded for the general government depends on the classification of units and in some cases specific transactions (European Commission, 2016e).

Graph 4.5.7: Net public investment by level of government



Source: European commission

Local authorities' net investment in infrastructure has been falling for years, resulting in a large investment backlog.

Municipal authorities are responsible for over half of public investment, so it is vital to address the challenges facing this level of government. While the federal government and the *Länder* have managed to keep their construction investment stable, the municipalities suffered from a continuous decline. In the early 1990s, about 17 % of their expenditure went on infrastructure. The figure had dropped to 13 % by 2000 and 10 % by 2010, falling further to 8 % by 2016. The gravity of the reduction in investment can also be seen by the continuously negative net investment of municipalities (around EUR 6 billion annually over 2010-2016, 0.2 % of GDP), as new investments only replace about 80 % of the capital stock lost through depreciation each year (Graph 4.5.7). According to the yearly survey conducted by the public development bank KfW (2017a), the municipal investment backlog had reached about EUR 126 billion (4 % of GDP) by 2017. Within this backlog, the areas with the biggest shortfall are: 'Infrastructure and streets' (27 %) and 'Schools and education' (26 %). Closing the investment backlog at municipal level would require an additional annual public investment of 0.3 % of GDP over the next decade.

Measures to bridge the gaps in the skills and planning capacity needed for public investment have yet to yield results. Two of the main factors

holding back public investment are staff shortages and a lack of engineering expertise; funding is less of a problem. Staff reductions in recent years, particularly at municipal level, have contributed to a loss of skills and the capacity to plan, organise and manage investment projects, particularly relatively large-scale ones. The government has now responded to this challenge by setting up a service agency (*PD – Berater der öffentlichen Hand GmbH*) that offers assistance in managing investment projects to Germany's 11 000 municipalities. However, it was not until 2017 that the agency became operational, and the take-up rate has been rather low so far. Time will tell how effective it will prove to be; one issue is the large number of municipalities, which could create capacity bottlenecks at the agency itself. The new Infrastructure Company for Transport (*Infrastrukturgesellschaft Verkehr*) is being set up in order to concentrate knowledge and staff at federal level, so as to manage large-scale investment projects more effectively. It is scheduled to be set up in 2018 and become fully operational by 2021. A comprehensive long-term investment strategy could also help incentivise more investment by providing clarity and certainty about future developments.

Public investment in education, R&D and digital infrastructure can have long-term crowding-in effects on private investment.

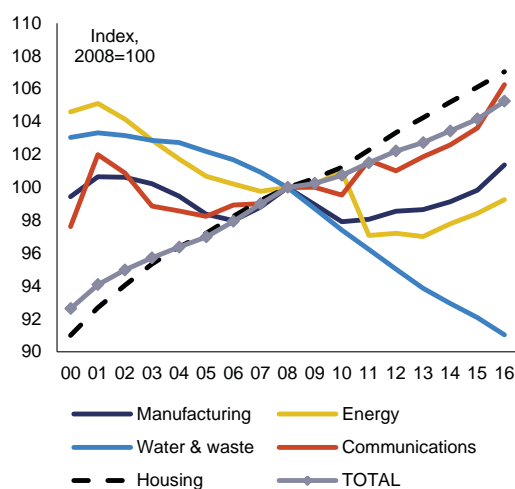
A recent study suggests that public investment, e.g. in digital infrastructure and education, can have positive long-term effects on private investment (crowding-in effects) (Krebs and Scheffel, 2016) – the positive effects are also shown in the QUEST simulations shown in Box 3.1. Public expenditure on education has remained at 4.2 % of GDP in 2015 and below the EU average⁽⁴⁴⁾ of 4.8 % across the EU. The national target of 10 % of GDP for spending on education and research by 2015 was not met and spending remained at 9.1 % of GDP in 2015. This corresponds to an investment gap estimated at EUR 27.2 billion (0.9 % of GDP; German Trade Union Confederation, 2017).

In contrast, public investment can be expected to crowd out some private investment in the

⁽⁴⁴⁾ Complete comparability of public education expenditure can however not be achieved because of the different organisation of work-based components in VET in different Member States, where (private) expenditure by companies in Germany is considerable.

construction sector. Public structural and civil engineering orders, including contracts for road construction, are at an historically high level last reached at the turn of the century. Orders in the road construction sector are peaking. However, the surge in public construction orders is coming up against capacity bottlenecks in the construction sector. The current high capacity utilisation, combined with lengthy planning permission processes and construction design procedures, may slow down increases in public investment. While there has so far been no overheating (Gornig and Michelsen, 2017a and 2017b), price increases for construction services can be expected (Ifo Institute, 2017). Many construction firms plan to invest more, though skills shortages have been reported as the main bottleneck for capacity expansion (DIHK, 2017).

Graph 4.5.8: Net capital stock by type of activity



Chain linked volumes

Source: European Commission

Germany is expanding communication networks, but is lagging behind in the deployment of very high-capacity broadband.

The expansion of the communication networks was stepped up in 2016 (Graph 4.5.8). The deployment of a very high-capacity digital infrastructure, including next-generation gigabit-networks⁽⁴⁵⁾, is a pre-requisite for competitiveness

⁽⁴⁵⁾ The Commission's strategy on Connectivity for a European Gigabit Society, adopted in September 2016, sets out a vision of Europe where availability and take-up of very high capacity networks enable the widespread use of

and the take-up of cutting-edge digital innovations. However, only 7.3 % of the territory was covered by fibre-based access networks, with an EU average of 26.8 % (IHS and Point Topic, 2018). Instead, the incumbent, where the German government is an anchor stakeholder, prefers to use vectoring. Vectoring is a technique to upgrade the existing copper cable networks used as a technological solution for expanding digital networks and connecting new users due to its cost-effectiveness and currently acceptable data transfer capacity.

The digital divide between urban, semi-rural and rural areas is a particular challenge.

Currently only 36.2% of rural areas and 67.7% of semi-rural areas have access to fast internet (≥ 50 Mbit/s (Federal Ministry of Transport and Infrastructure, 2017) and only 2.4 % of rural areas are covered with fibre-based access networks (Fibre to the Home) (IHS and Point Topic, 2018). However, many services, such as mobile health devices for monitoring chronic health conditions or telemedicine services that can improve access to care for patients living in remote or sparsely populated areas, rely on ultrafast connectivity. In addition, many of Germany's SMEs are located in semi-rural and rural areas.

Market failures could account for the underinvestment in broadband in rural and semi-rural areas.

Because of the high fixed costs of investment, unit costs increase significantly as population densities drop, i.e. in rural and semi-rural areas. If deployed on commercial terms, broadband networks therefore tend to profitably cover only population in urban areas. However, in a recent survey 86 % of all the companies interviewed considered broadband rollout to be the most important task for the new government (Federal Ministry for Economic Affairs and Energy, 2017c). Widespread and affordable access to broadband generates positive externalities because of its capacity to accelerate growth and innovation in all sectors of the economy. Different financing models, such as a wholesale-only approach or different cooperation models, could facilitate the roll-out of rural broadband (WIK-Consult, 2017).

products, services and applications in the Digital Single Market.

Box 4.5.1: Investment challenges and reforms in Germany

Section 1. Macroeconomic perspective

Total investment in Germany proved to be fairly resilient to the crisis. Still, non-residential construction investment is stagnating, leaving an accumulated backlog unaddressed. Investment in machinery and equipment has picked up and reached pre-crisis levels but is yet to reach pre-crisis intensity (see Chapter 1 and Section 4.5). Investment in housing has picked up since 2010 but indications are that it still needs to catch up with rising housing needs. In the next few years, housing investment is expected to develop dynamically, while non-residential construction will require a permanent improvement in business confidence and the capacity to set up, plan and implement public investment projects.

Section 2. Assessment of barriers to investment and ongoing reforms

Barriers to private investment in Germany are not related to financing constraints (see Section 4.2), but rather to high regulatory burden and shortages of skilled labour. More ambitious liberalisation of regulated professions could spur investment in the affected sectors and in the wider economy (European Commission, 2015b).

Public administration/ Business environment	Regulatory/ administrative burden		Financial Sector / Taxation	Taxation	CSR	
	Public administration	CSR		Access to finance		
	Public procurement / PPPs			R&D&I	Cooperation btw academia, research and business	
	Judicial system				Financing of R&D&I	CSR
	Insolvency framework				Business services / Regulated professions	CSR
	Competition and regulatory framework				Retail	
Labour market/ Education	EPL & framework for labour contracts		Sector specific regulation	Construction		
	Wages & wage setting			Digital Economy / Telecom		
	Education			Energy		
			Transport			

Legend:	
	No barrier to investment identified
CSR	Investment barriers that are also subject to a CSR
	No progress
	Limited progress
	Some progress
	Substantial progress
	Fully addressed

Main barriers to investment and priority actions underway:

1. The relatively high level and complexity of corporate taxation and high tax administration costs remains a key barrier. While measures have been taken to simplify certain areas of taxation, enhance tax administration and improve conditions for venture capital, no further initiatives have been taken or are planned to review corporate taxation or the local trade tax (*Gewerbesteuer*).
2. As the labour market tightens, availability of skilled labour is becoming more of a binding constraint, in particular for medium-sized enterprises. Measures that reduce disincentives for working more hours (for people working in mini-jobs or second earners), along with a stronger focus on training and adult learning could considerably alleviate this constraint.
3. Regulatory restrictiveness in the services sectors gives rise to low productivity and uncompetitive pricing which affects also the costs and performance of the manufacturing sector. Limited action has been announced with respect to further liberalizing professional services.
4. The current design of the 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 available resources of the different layers of government and their individual investment responsibilities, and by limited revenue autonomy of federal states and municipalities. Several measures have been recently taken to improve public investment conditions at municipal level. The agreed 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 tax autonomy of federal states and municipalities.

Business environment

Efforts to reduce the bureaucratic burden have had some effect but could still be strengthened, for example to further improve conditions for start-ups. Germany has a favourable business environment and is ranked 20th out of 190 in the 2018 World Bank Doing Business Review (World Bank, 2017). While most sub-indicators are high in the ranking, disadvantages remain regarding the administrative burden for starting a business and for registering property. Several measures have been taken over the last years to improve the business environment and reduce the administrative burden for businesses, including two laws to reduce red tape and the introduction of a ‘one-in, one-out’ rule to avoid a further increase in the administrative burden. Some measures have also been taken in recent years to make public procurement procedures simpler, more flexible and more user-friendly. However, the friendliness of the tax system for private investment still ranks low by EU-wide comparison. Small businesses and start-ups would particularly benefit from reducing inefficiencies in taxation and modernising the tax administration, including by further enhancing electronic services (European Commission, 2017f).

Public administration

Germany is not using the potential of eGovernment. It is one of the EU countries with the lowest online interaction between public authorities and citizens. Only 19 % of Germans with internet access use eGovernment services actively (European Commission, 2017g). According to the eGovernment Monitor 2017 (Initiative D21, 2017), the use of eGovernment and satisfaction with its services actually decreased over the last year. Currently, eGovernment services are fragmented and not very user-friendly. Following an amendment to the Basic Law, adopted in December 2016, the Federal Government now has the legislative powers to design access to the administrative services of the federal and *Länder* authorities, including the municipalities. The accompanying law – the Online Access Improvement Act (*‘Onlinezugangverbesserungsgesetz’*), stipulates that the Federal Government, *Länder* and local authorities must offer their administrative services online within five years and make them easily accessible via a linked network of portals. These

new powers could help advance the development of eGovernment services.

Germany is lagging behind other EU countries in deploying and using eHealth. While almost half of the population, in Estonia and Finland (49 %) use online health services from time to time, according to a 2017 Eurobarometer survey, only for 7 % of Germans do so. (European Commission, 2017g) This corresponds with the comparatively low adoption of eHealth both among general practitioners and hospitals, an area in which Germany scored below the EU average in a Commission survey (European Commission, 2013 and 2014b). Although the federal government’s eHealth law of 2015 sets inter alia milestones for the deployment of a digital eHealth infrastructure and the comprehensive use of the electronic health card in all medical establishments as from mid-2018, it is still unclear whether this objective will be met.

Public procurement*

Higher publication rates could improve the quality of services and allow for further efficiency gains. At 1.2 % of GDP, Germany has, for years, recorded the EU's lowest values for contracts published under EU rules (the EU average is 4.25 % of GDP). In the health sector the incidence of non-publication and the number of cases in which only one bid is received are striking. Examples include the purchase of medical imaging equipment or medicinal products. In general, the lack of data is a problem. The regulation on public procurement statistics (*‘Vergabestatistikverordnung’*) – once operational – is a step in the right direction to improve this situation.

A smarter use of public procurement could also encourage innovation. Despite the introduction of a centre of excellence for innovative public procurement in 2013, only limited progress seems to have been made at federal and regional level towards encouraging innovation through public procurement. The fact that 67 % of contracts are still awarded on the basis of the lowest price offer may also be an obstacle to innovation.

4.6. SECTORAL POLICIES

Innovation, venture capital, entrepreneurial activity and digital economy*

Research and Innovation

Germany is one of the EU's innovation leaders, but in a context of slow productivity growth and negative demographic trends, the challenge is to secure its competitive position at the forefront of research and innovation. With 2.94 % of GDP in 2016, Germany has the 3rd highest R&D intensity in the EU, but there are significant disparities at regional level. There has been a consistent upward trend in total public and private R&D expenditure in the last decade. While business R&D intensity increased by 0.3 pps. between 2007 and 2016, public R&D intensity rose by only 0.2 pps. A more ambitious R&D intensity target of 3.5 % was proposed by the Expert Commission on Research and Innovation.

Over the last few years Germany has taken measures to further strengthen its already solid research and science base, but there is scope for scientific excellence to improve. Germany has a solid science base, supported by initiatives such as the *Pact for Research and Innovation*, which funds science and research institutes; the *Higher Education Pact*, which supports higher education institutes in providing quality education; the *Excellence Strategy*, a successor programme to the *Excellence Initiative*; and the tenure-track programme to support young scientists. However, Germany currently ranks only 8th in the EU on the key indicator reflecting scientific excellence.⁽⁴⁶⁾ This suggests there is scope for further progress.

Though overall cooperation between public research institutes and firms is strong, SMEs still face challenges in benefiting from it. Germany's policies to encourage science-business cooperation (e.g. the Fraunhofer Society) are often taken as examples of worldwide best practice. However, the country's high scores on the relevant indicators⁽⁴⁷⁾, are often the result of strong

cooperation between mainly large manufacturing companies and public research institutes. As regards the rate of cooperation between SMEs and academia or research institutes, Germany scores only slightly above the EU average, according to the Community Innovation Survey 2014.

Private investment in R&D has been increasingly concentrated in large firms and in medium-high tech manufacturing. 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. While SMEs' R&D intensity has remained static over the past decade (Graph 4.6.1), the R&D intensity of large companies has increased considerably (KfW, 2017b; ZEW, 2017c). SMEs' expenditure on R&D at 0.17 % of GDP is also much lower than the EU average in 2015 (0.30 %). Political discussion has returned to considering tax incentives for business R&D, which, if appropriately designed, could foster R&D investment also in young and innovative firms.

Employment in fast-growing firms in innovative sectors⁽⁴⁸⁾ has fallen, as has the share of innovative firms and entrepreneurship overall. The latest data show that the proportion of total jobs for which high-growth innovative firms account has fallen and that Germany's score is below the EU average.⁽⁴⁹⁾ Similarly, the share of innovative businesses as a percentage of the total has fallen, although it continues to be the highest in the EU⁽⁵⁰⁾ (KfW, 2017b; ZEW, 2017c). Moreover, though there are some very dynamic start-up environments in large cities such as Berlin, the overall trend in entrepreneurship is negative. This applies to all sectors, including knowledge-

⁽⁴⁶⁾ The proportion of the country's scientific publications that rank among the top 10 % most cited scientific publications worldwide.

⁽⁴⁷⁾ With a volume of public R&D financed by business enterprises representing 0.12 % of GDP in 2014 (EU average: 0.052 %), Germany ranks first among EU countries. It ranks 3rd in public-private scientific co-publication as a share of the total number of publications, with 3.5 % in 2015 (EU average: 2.8 %).

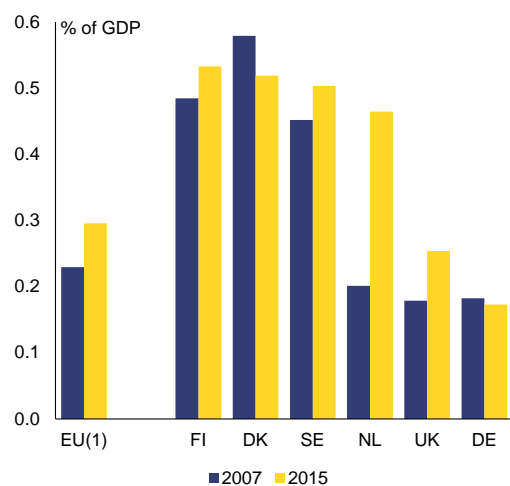
⁽⁴⁸⁾ Number of employees in high-growth enterprises (HGEs) in the 50 % most innovative sectors, as a share of total employment for enterprises with 10 or more employees. HGEs are defined as enterprises with an average annual growth in employees greater than 10 % a year, over a three-year period, and with 10 or more employees at the beginning of the observation period.

⁽⁴⁹⁾ The share of employment in fast-growing enterprises in innovative sectors fell from 5.9 % in 2012 to 4.5 % in 2014 (EU average: 4.8 %).

⁽⁵⁰⁾ According to the Community Innovation Survey, innovative enterprises with ten employees or more accounted for 79 % of the total in 2010, falling to 67 % by 2014 (whereas the EU-average share fell from 53 % in 2010 to 49 % in 2014).

intensive ones. The firm birth ratio⁽⁵¹⁾ 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 %. The negative trends observed may be explained in part by the favourable labour market situation, with good job opportunities making entrepreneurship less attractive. However, these downward trends might also reflect the first effects of an ageing population. Demographic trends may have an increasing impact on entrepreneurial activity in the coming years, including on the transfer of existing businesses.

Graph 4.6.1: Business expenditure on R&D (BERD) performed by SMEs



(1)EU: The values were estimated by DG Research and Innovation. (2)ES, LU, NL, RO, SI, UK: Beaks in series
Source: Eurostat

Entrepreneurship and access to finance

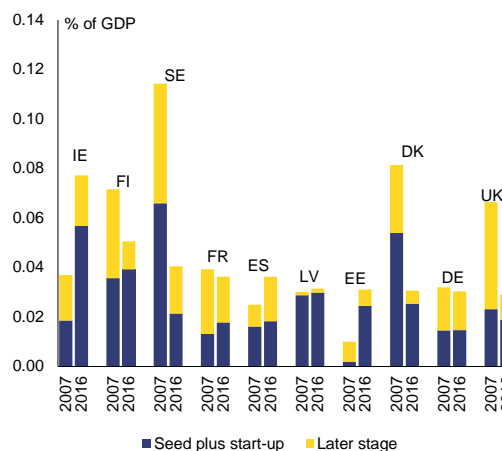
A number of measures have been taken to strengthen entrepreneurial activity, and especially to attract private investments in risk capital. A law was passed to extend the use of loss carry-forwards, which can be relevant to young and innovative companies. Moreover, an ‘ERP/EIF growth facility’ co-investment fund of EUR 500 million was launched in March 2016 to support later-stage financing of innovative companies. Following a detailed evaluation in 2016, the scope of the INVEST programme was further widened in June 2017 and now includes an exit grant of 25 % of capital gains to compensate for taxation of

⁽⁵¹⁾ Births of enterprises as a percentage of the population of active enterprises.

capital gains (see also Section 4.1). To encourage more investment in the venture capital market, an important milestone was achieved in 2017 in providing investors with an exit option. ‘Deutsche Börse Network’ provides support to SMEs which are considering going public, and a new SME stock market segment, ‘Scale’, was launched in March 2017, replacing the previous entry standard.

However, the venture capital market remains less developed compared to other international innovation leaders. Seed and early stage financing has recovered since the beginning of the financial crisis in 2008. However, at 0.03 % of GDP in 2016, it falls well below the levels in other EU countries such as Ireland (0.08 %), Finland (0.05 %) and Sweden (0.04 %), and below international competitors such as the US (Graph 4.6.2).

Graph 4.6.2: Venture capital investment (market statistics) in 2016



Source: Invest Europe, Eurostat.

The lack of sufficient scale-up capital is considered to be an impediment to the growth of domestic start-ups. Most efforts in Germany have been focused on supporting early-stage financing. The availability of later rounds of financing at the capital-intensive scale-up phase, on the other hand (later stage venture capital and growth financing) is still very subdued and is considered a constraint on the growth of domestic start-ups (EFI, 2017). The main reason for this is the scarcity of sufficiently large amounts of finance and of large venture capital funds. Initiatives to encourage institutional investors such as insurance companies to invest in this market

could help bridge this gap. Recently, support for developing venture debt in Germany was introduced into the political debate, with a view to providing an alternative source of capital for start-ups.

Skill shortages have become the main obstacle to innovation, especially for SMEs. Exacerbated by the adverse demographic trend, skills shortages have become a major obstacle for companies. According to the 2017 DIHK Innovation Report (DIHK, 2017), 82 % of businesses report shortages of skilled people as an obstacle to their innovation activities. This is a particular problem for SMEs. According to the DIHK report, other obstacles to business innovation include the administrative burden (for approval procedures or the development and use of chemicals, for example) and the lack of broadband internet, an obstacle reported by 65 % and 58 % of businesses respectively.

Digital economy

German businesses, particularly SMEs, are adapting slowly to digitisation. Any business missing out on digital opportunities will be unable to sustain the competitive pressure from more highly digitalised rivals. ‘*Industrie 4.0*’ is a national strategic initiative introduced by the German government. It aims to drive digital manufacturing forward, brings together all relevant stakeholders and provides policy recommendations and practical guidance to further support and accelerate the adoption of technology at company level. Digital economy business models frequently provide a starting point for innovative start-ups. Medium-sized companies (with 10-249 employees) are, however, slow adopters, and 29 % of them have a low level of digitisation. Only 5.3 % of German SMEs, for example, use big data analytics, compared with almost 10 % of European SMEs (European Commission, 2017h). Some sectors are a long way behind with digitisation, particularly the health sector. Many firms are unaware of the potential benefits of digitisation (Federal Ministry for Economic Affairs and Energy, 2017c). Another reason why businesses do not invest more in new digital business models is the lack of skilled personnel. In 2016 SMEs were asked what was preventing them from digitalising their business. 67 % replied that there was a lack of ICT skills in their workforce, while 55 %

replied that they lacked skilled employees. There were 55 000 open ICT positions in October 2017 (BITKOM, 2017). Skills shortages have become a major obstacle to the digitisation of the economy.

To help SMEs catch up with digitisation, the government is extending a network of SME competence centres. The main purpose of the centres is to inform SMEs about the potential that digitisation offers. The centres support SMEs in testing advanced technologies and in training staff. Since July 2017, the support programme ‘go digital’ has been providing consultancy services to SMEs all over the country. Digital hubs are promoting closer cooperation between start-ups, SMEs, industry, science and administration.

Competition in product and services markets*

There is still a high level of regulatory restrictiveness in Germany, especially as regards business services and administrative formalities for cross-border provision of services. Churn rates in key business services sectors such as legal, accounting, architectural and engineering activities in Germany are below the EU average, while gross operating rates in these sectors are above the EU average, suggesting lower competitive pressures. Because of services’ role as intermediate inputs, lower regulation of services increases productivity in downstream service-intensive industries. In Germany, this applies particularly to manufacturing, where the share of services in the value chain is estimated at 35.9 %. So far, no far-reaching reform measures have been taken to stimulate competition in business services. Germany introduced two limited legislative changes in 2017. First, after expiry of the transposition period for Directive 2013/55/EU, Germany adopted a law to transpose these rules for patent agents as well. Secondly, the law on tax advisors (‘*Steuerberatungsgesetz*’) was amended in line with the ECJ ruling in case C-342/14 to ensure transparency and legal certainty, especially as regards the provision of tax consultancy services by companies established in another Member State.

Providers of collaborative economy services face uncertainty in Germany. The absence of a federal policy strategy, the divergent policies taken by the German *Länder* and multiple court rulings lead to legal uncertainty for actors in the

collaborative economy (see Box 4.6.1 for further details). For example, the Berlin legislation on short-term accommodation services has been challenged in several (partly) pending court proceedings. This has caused doubt on whether and how to apply the rules. In the passenger transport sector, certain services were prohibited by court decisions; but appeals were brought before the Federal Court which requested a preliminary ruling regarding compliance with Union law.

Germany displays a high level of regulatory restrictiveness as regards both retail establishments and retailers' daily operations. Restrictive spatial planning rules in some *Länder* are having a negative impact on retail market dynamics, hampering the establishment of certain retail formats which offer a wider range of complementary products (Holland van Gijzen Advocaten, 2016).

Railways

The market share of new entrants in the long-distance passenger train services market remains below 1 %. One of the key factors hindering market entry is the restricted access to ticket distribution channels. The German Monopolies Commission recommends that, since using the distribution channels of Deutsche Bahn AG is crucial for its competitors, the company should not be allowed to refuse unilaterally to cooperate on tariffs and ticket sales (German Monopolies Commission, 2017). In addition, high track access charges result in very high operating costs of railway undertakings.

The existing legal framework may also be impeding competition. In June 2017, the European Court of Justice found that Deutsche Bahn's accounting rules are such that it is impossible to monitor compliance with the prohibition on transferring public funds earmarked for infrastructure management to the branch of

Deutsche Bahn offering transport services. The Court underlined the need for these accounts to be published, to ensure external transparency in the use of public funds.

Energy, resources and climate change*

The adaptation of electricity networks to renewables production in Germany is progressing, but at a slow pace, and significant investment in transmission and distribution grids remains outstanding. Substantial delays in carrying out many projects have occurred due to delays in planning procedures, the need to further promote the synchronisation of network and renewables development, as well as outstanding decisions in relation to network development and investment expected to be made with the network development plan in 2019. These delays have resulted in considerable costs for German and European electricity networks and electricity markets. Market intervention by system operators remains significant, although both redispatch costs and feed-in management measures (curtailment of renewable generation) decreased in 2016 compared to 2015: EUR 220 million redispatch costs (2015: EUR 412 million), EUR 373 million for feed-in management measures (2015: EUR 478 million).

The lack or shortage of north-south internal lines constrain the trade in electricity with neighbouring countries, as cross-border relevant domestic congestions tend to be pushed to the borders. The current congestion management and price-zone definition in Germany and in Central Europe do not always address congestion appropriately, thus limiting cross-border flows of electricity. While the bilateral agreement between Germany and Austria and Germany and Denmark, respectively, on an interim solution to this problem is a step in the right direction, further discussions with neighbouring countries are needed if the agreement is to be implemented smoothly.

Box 4.6.1: Collaborative economy

The German government encourages a broad discussion on digital economy and platforms. It launched a 'Digital Strategy 2025' in 2016, and in 2017 published a 'White Book on Digital Platforms', which presents practical proposals for "digital governance". Although a number of measures and projects have been initiated, these efforts have not yet translated into a strategy on the collaborative economy, which could generate opportunities for citizens, as users of new and innovative services or as micro entrepreneurs, as well as for traditional service providers in terms of new business channels.

Currently, policy and regulation differ because of the federal system considerably across regions and cities, for example regarding short-term accommodation and passenger transport. In Berlin, regional legislation de facto prohibits all use of residential property for any other purposes than long-term housing. As of the second time, renting out more than 50% of a property for a period of less than two months is subject to prior authorisation. Exceptions are possible but are subject to strict criteria (e.g. an equivalent property has to be made newly available to the property market or the host's personal livelihood is directly at risk). Also in Munich, short-term rental of entire properties is subject to authorisation, namely where more than 50% of the main residence is rented out, or the property is rented out for longer than eight weeks in a calendar year. This could be the case where less than 50% of the property is rented out for a maximum period of eight weeks per year. In the field of passenger transport, services may only be provided as 1) traditional taxi, 2) hire cars with drivers, or 3) non-profit ridesharing. Due to the level of restrictiveness in the first category, collaborative economy services would mostly be offered as hire cars with drivers. There is no maximum number of licences. However, even if all criteria are met, local authorities can still deny the license on various grounds (including the protection of local taxi trade).

The German Monopoly Commission already in 2014 expected particular economic and efficiency gains in the taxi market. A recent Commission Study on passenger transport (European Commission, 2016a) suggests that so far only 2-3 % of mediated taxi rides were set up via smart-phone apps. This represents only 0.4 % on the entire taxi market and indicates further potential.

Retail electricity prices in Germany remain among the highest in the EU, despite competitive wholesale markets and falling wholesale prices.

Although wholesale prices are relatively low (about 25 % below the EU average) and falling (-23.4 % between 2013 and 2016), and despite competitive retail markets with high switching rates, household electricity prices rose in the same period by 1.9 %, to 29.8 cents/kwh. This is about 45 % above the EU average. Prices on wholesale markets fell by 3 % on spot markets and by 12 % on future markets. The decoupling of developments on the German wholesale and retail markets could hamper active consumer participation through demand-side flexibility, e.g. through more real-time electricity contracts. The activation of such services requires price signals from the wholesale market to be passed on to consumers, to incentivise them to react to scarcities in the market.

The huge discrepancy between developments in the wholesale and the retail sector can be explained by the large shares of taxes and levies, with exemptions of some sectors, for

example from the renewable surcharge. At 53.6 % of the household electricity price, taxes and levies are substantially higher than the EU average (36 %) imposing on households both the costs resulting from support schemes for generation capacity and the exemptions of energy intensive sectors.

Germany is not on track to reach its national indicative energy efficiency targets by 2020. Up to 2015, energy-intensity decreased in parallel with the EU average. However, there appears to be a considerable risk that Germany will not meet its target. It needs to make considerable further efforts to reduce energy consumption in the run-up to 2020.

While the German Federal Government adopted a National Action Plan on Energy Efficiency, further measures to improve energy efficiency in transport have untapped potential.

Germany's efficiency policies are subject to continuous review, also in the light of the development of a national energy and climate plan on which Germany is advanced. Germany has

launched a ‘green paper’ process, designed to establish the ‘efficiency first’ principle, and involving stakeholders. Given the increased urbanisation and population density of urban areas in Germany, and since the share of collective passenger transport has increased only slightly, measures to promote public transport - as opposed to individual, fossil-fuelled transport - could represent a fresh opportunity for more energy-efficient transport.

Germany has made substantial efforts to make its building stock more energy-efficient. Since the political push to decarbonise the economy, Germany has set a comprehensive regulatory and policy framework. Between 2006 and 2016, 4.6 million dwellings were either refurbished, or designed and built to be energy-efficient.

Germany appears on track to meet its Europe2020 renewable energy target. With a renewables share in final energy consumption of 14.8 % in 2016, Germany was above its indicative trajectory of 11.3 % for 2015-2016 and 3.2 percentage points below its 2020 target of 18 %. Germany aims to increase the proportion of electricity from renewable sources in its energy mix from 32.2 % in 2016 to 40-45 % in 2025 and 55-60 % in 2035. A revised renewable energy sources act adopted in July 2016 (*Erneuerbare Energien Gesetz, EEG 2017*) governs the support system for most renewable electricity generation in Germany. Among other things, the new law stipulates that levels of support for more renewable energy projects must be determined by competitive auctions.

Germany is expected to miss its nationally set emissions reduction target for 2020 by 4 pps. Germany has set itself the target of cutting greenhouse gas emissions by 40 % between 1990 and 2020. Thus, the Climate Action Programme 2020 and the NAPE were developed. In 2016, emissions were estimated at 27.3 % below 1990 levels. A projection report submitted under the Monitoring Mechanism Regulation (*Projektionsbericht 2017*) concluded that current (as of July 2016) and planned policies do not yield the required additional emissions reduction by 2020, as the results of the planned measures are expected to materialise only after 2025. As a result, emissions in 2020 are expected to be 36 % below 1990 levels.

Germany is expected to miss its EU 2020 Effort Sharing Decision (ESD) target. EU law requires a reduction in greenhouse gas emissions in sectors that are not covered by the EU Emission Trading System (e.g. the agricultural, residential, commercial, transport, and waste management sectors) by 14 % between 2005 and 2020. Preliminary data indicates that Germany reached its Effort Sharing Decision target for 2016. However, Germany’s projection report indicates that, under current policies, the 2020 ESD emission reduction target will be missed by a margin of 3.3 pps.

The transport sector is expected to achieve relatively limited emission reductions. Under current policies, Germany’s projection report concludes that emissions in the transport sector are expected to fall by 1 % between 2005 and 2020. As total emissions in Germany are expected to fall faster over the same period, transport sector emissions as a proportion of total emissions in Germany are expected to rise to 20 % (an increase of 3 pps.) Despite efforts to support and increase the use of electric vehicles in Germany, the target of 1 million electric cars on German roads by 2020 is unlikely to be met.

Despite an ambitious policy approach and the various measures already in place, there is a risk that Germany will miss its own resource productivity objectives. As early as 2002, the Federal Government adopted a sustainable development strategy which included the objective of doubling German resource productivity by 2020, compared with 1994. The latest figures show that improvements in resource productivity during the last five years suggest that the indicator will just reach 60 % of the set goal (Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety, 2015).

Emissions of several air pollutants are above legal limits and water pollution remains a serious concern. Despite significant emission reductions in recent years, total emissions for nitrogen oxides, volatile organic compounds and ammonia are above the current ceilings for acceptable levels. Nitrogen oxide limits are being exceeded partly as a result of pollutants emitted by diesel vehicles. Over the last years, newly-registered diesel passenger cars did not perform as aimed at by regulators as some of them were

equipped with software that deactivated built-in powerful emission-reduction technologies while the cars were in normal use. The economic costs related to air pollution are estimated to include 27 million working days lost each year because of illness, with associated costs to employers of EUR 3 500 million/year, and healthcare costs of above EUR 240-466 million/year (European Commission, 2017i). There is evidence of significant unsolved water pollution problems caused by nitrates, especially in areas with intensive farming. In the long term this will lead to higher costs for water treatment. Experts estimate that the consumer price will rise by at least 32 % per year to ensure that drinking water meets sufficiently high quality standards (Umweltbundesamt, 2017).

ANNEX A

OVERVIEW TABLE

Commitments	Summary assessment ⁽⁵²⁾
2017 country-specific recommendations (CSRs)	
<p>CSRI: While respecting the medium-term objective, use fiscal and structural policies to support potential growth and domestic demand as well as to achieve a sustained upward trend in investment. Accelerate public investment at all levels of government, especially in education, research and innovation, and address capacity and planning constraints for infrastructure investments. Further improve the efficiency and investment-friendliness of the tax system. Stimulate competition in business services and regulated professions.</p> <p>...use fiscal and structural policies to support potential growth and domestic demand as well as to achieve a sustained upward trend in investment.</p>	<p>Germany has made limited progress in addressing CSR 1 (this overall assessment of CSR 1 does not include an assessment of compliance with the Stability and Growth Pact):</p> <ul style="list-style-type: none"> • Limited progress has been made in achieving a sustained upward trend in investment. The public investment share of GDP for 2017 remained largely unchanged compared to the two years before. • June 2017: The federal government decided to invest additional funds in transport infrastructure in 2018.

⁽⁵²⁾ 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.

<p>Accelerate public investment at all levels of government, especially in education ...</p>	<ul style="list-style-type: none"> • August 2017: Additional funding of the Municipal Investment Promotion Fund for modernizing school buildings including digital infrastructure. • Limited progress has been made in increasing public expenditure on education and no additional measures have been taken in this regard. Despite more spending by the Federal Government, expenditure on education as a proportion of GDP at the level of general government has remained stable in recent years and well below the EU average. Overall public and private education and research expenditure has increased only slightly in recent years and may have fallen short of the national target of 10 % of GDP. • The reallocation of financial responsibilities between the state and the federal levels can somewhat improve the availability of funding at the state level where direct responsibility for investment lies. • June 2017: The base law was modified to adjust the allocation of responsibilities and funding between the state vs the federal level, from 2020.
<p>...research and innovation,</p> <p>... and address capacity and planning constraints for infrastructure investments.</p> <p>Further improve the efficiency and investment-friendliness of the tax system.</p>	<ul style="list-style-type: none"> • Limited progress has been made in increasing public expenditure on research and innovation and no additional measures have been taken in this regard. Despite some nominal increases, public expenditure on R&D has remained at around 0.9 % of GDP in recent years and total public and private expenditure remained at around 2.9 % of GDP in 2015 and 2016. • Some progress has been made: • Spring 2017: To support public investment on municipal level, the service agency ("Partnerschaft Deutschland – Berater der öffentlichen Hand GmbH") did take up its operational work in 2017. • No progress. No additional measures have been taken to improve the efficiency and investment-friendliness of the tax system. Implementation of measures taken in the past is on-going. On 1 January 2017 most provisions of the Act on the Modernisation of Taxation Procedures became

<p>Stimulate competition in business services and regulated professions</p>	<p>effective (Federal Law Gazette I 2016 no. 35, p. 1679). It has the potential to enhance the role of IT and automated procedures relieving administrative and compliance burden of tax administrations and taxpayers. It is too early to assess the actual impact of the new law. Its full roll-out will stretch over a period of six years.</p> <ul style="list-style-type: none"> • Limited progress has been made regarding measures to stimulate competition in business services and regulated professions.
<p>CSR2: Reduce disincentives to work for second earners and facilitate transitions to standard employment. Reduce the high tax wedge for low-wage earners. Create conditions to promote higher real wage growth, respecting the role of the social partners.</p> <p>Reduce disincentives to work for second earners</p> <p>...facilitate transitions to standard employment</p> <p>Reduce the high tax wedge for low-wage earners</p>	<p>Germany has made limited progress in addressing CSR 2:</p> <ul style="list-style-type: none"> • Limited progress has been made in reducing disincentives to work for second earners and facilitate transition to standard employment. The Act for Combating Tax Avoidance was adopted in June 2017 and entered into force as of 1 January 2018 (Federal Law Gazette I p. 1682). Tax brackets IV/IV become the standard tax bracket for married couples. Further work is also done to raise awareness of the factor-based method. • Limited progress. No further measures were taken - though the law on temporary agency work and work contracts entered into force in April 2017, after its adoption autumn 2016. This provides equal pay after nine months of working in the sector and the introduction of a maximum transitional period of 18 months after which temporary agency workers must be hired by the company • Limited progress has been made with reducing the high tax wedge for low-wage earners, that was due to the good economic situation, without further specific action. In October 2017, it was decided to reduce the supplementary contribution rate to the regular health insurance system by 0.1 pp to 1.0 %, from 2018. In November 2017, it was decided to reduce employee's pension

<p>Create conditions to promote higher real wage growth, respecting the role of the social partners.</p>	<p>contributions by 0.1 pp to 18.6 % from 2018, a small decrease due to higher revenues in the currently good economic situation, not a structural change. Measures reducing the tax wedge in general were adopted in 2016 and entered into force on 1 January 2017 and 1 January 2018. These comprise successive increases in the tax-free basic and child allowances, the child benefit and the supplementary child allowance, as well as measures to contain the fiscal drag, from which low wage earner benefit below average.</p> <ul style="list-style-type: none"> • Limited progress regarding promoting real wage growth. • May 2017: The federal government adopted an ordinance, setting out minimum wages for agency workers, following up on earlier rules, with entry into force from June 2017. • July 2017: The federal government adopted an ordinance setting out minimum working conditions including minimum wages in the long term care sector, updating the existing regulation, with entry into force from November 2017.
<p>Europe 2020 (national targets and progress)</p>	
<p>Employment rate of the population aged 20-64 years: 77 %</p>	<p>79.1 % in the year ending September 2017.</p>
<p>Employment rate of the population aged 55-64 years: 60 %</p>	<p>69.7 % in the year ending September 2017.</p>
<p>Employment rate of women: 73 %</p>	<p>75.0 % in the year ending September 2017.</p>
<p>R&D target: 3.0 % of GDP</p>	<p>2.94 % (2016)</p> <p>Germany is close to reaching its target, but only small progress in 2016: R&D intensity increased slightly from 2.92 % of GDP in 2015 to 2.94 % in 2016 (the third highest in the EU). In 2016 R&D intensity in Germany was composed of 0.94 % public expenditure and 2 % business expenditure.</p>
<p>National greenhouse gas emissions (GHG) target: -14 % in 2020 compared to 2005 (in sectors not</p>	<p>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</p>

included in the EU emissions trading scheme)	10.7 %. This means that the target is expected to be missed by a margin of 3.3 pps.
2020 renewable energy target in gross final energy consumption: 18 %	With a share of energy from renewable sources in gross final energy consumption of 14.8 % in 2016, Germany is on track to meet its 2020 renewable energy target.
2020 Energy efficiency, indicative national 2020 targets: <ul style="list-style-type: none"> • 276.6 Mtoe (primary energy consumption); • 194.3 Mtoe (final energy consumption). 	<p>Since 2005, Germany decreased its primary energy consumption by 6.8% to 296 Mtoe in 2016.</p> <p>Over the same period, final energy consumption decreased by 1.1% to 216 Mtoe in 2016.</p>
Early school leaving target: <10 %.	At 10.2 % in 2016, Germany is close to the European target and to the national target and below the EU average of 10.7 %.
Tertiary education target: 40 % (EU 2020) or 42 % (national target).	Germany is continuing to increase tertiary attainment which now stands at 33.2 % but remains below the EU average of 39.1 % and the EU target of 40%. The national target of 42% includes contrary to EU target ISCED level 4 and has thus been met.
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).	<p>The number of long-term unemployed people (LFS definition) was 723 000 in 2016, this represents a reduction of 923 000, around 57%, since 2008.</p> <p>Germany has already met the national Europe 2020 poverty target.</p>

ANNEX B

MACROECONOMIC IMBALANCES PROCEDURE SCOREBOARD

Table B.1: The MIP Scoreboard for Germany (AMR 2018)

			Thresholds	2011	2012	2013	2014	2015	2016
External imbalances and competitiveness	Current account balance, % of GDP	3 year average	-4%/6%	5.8	6.2	6.6	7.1	7.6	8.1
	Net international investment position	% of GDP	-35%	23.2	28.5	34.5	40.9	48.6	54.4
	Real effective exchange rate - 42 trading partners, HICP deflator	3 year % change	±5% (EA) ±11% (Non-EA)	-4.8	-9.0	-1.8	-0.4	-2.1	-2.6
	Export market share - % of world exports	5 year % change	-6%	-9.0	-16.2	-12.1	-8.6	-2.5	2.8
	Nominal unit labour cost index (2010=100)	3 year % change	9% (EA) 12% (Non-EA)	5.7	2.7	5.9	7.0	5.6	5.2
Internal imbalances	House price index (2015=100), deflated	1 year % change	6%	1.4	1.9	2.1	2.2	4.1	5.4
	Private sector credit flow, consolidated	% of GDP	14%	1.6	1.3	2.0	0.5	3.0	3.8
	Private sector debt, consolidated	% of GDP	133%	102.5	101.8	102.9	99.4	98.7	99.3
	General government gross debt	% of GDP	60%	78.6	79.8	77.4	74.6	70.9	68.1
	Unemployment rate	3 year average	10%	6.8	6.1	5.5	5.2	4.9	4.6
	Total financial sector liabilities, non-consolidated	1 year % change	16.5%	2.9	3.3	-6.2	4.5	2.9	5.2
Employment indicators	Activity rate - % of total population aged 15-64	3 year change in pp	-0.2 pp	1.4b	0.9	0.9b	0.4b	0.4	0.3
	Long-term unemployment rate - % of active population aged 15-74	3 year change in pp	0.5 pp	-1.1b	-1.1	-1.0	-0.6	-0.4	-0.6
	Youth unemployment rate - % of active population aged 15-24	3 year change in pp	2 pp	-1.9	-3.1	-2.0	-0.8	-0.8	-0.7

Flags: b: Break in series.

1) This table provides data as published under the Alert Mechanism Report 2018, which reports data as of 24 Oct 2017. Please note that figures reported in this table may therefore differ from more recent data elsewhere in this document. 2) Figures highlighted are those falling outside the threshold established in the European Commission's Alert Mechanism Report.

Source: European Commission 2017, Statistical Annex to the Alert Mechanism Report 2018, SWD(2017) 661.

ANNEX C

STANDARD TABLES

Table C.1: Financial market indicators

	2012	2013	2014	2015	2016	2017
Total assets of the banking sector (% of GDP) ⁽¹⁾	298.3	266.4	266.1	251.8	247.9	239.7
Share of assets of the five largest banks (% of total assets)	33.0	30.6	32.1	30.6	31.4	-
Foreign ownership of banking system (% of total assets) ⁽²⁾	4.1	4.1	4.4	4.4	7.1	7.1
Financial soundness indicators: ⁽²⁾						
- non-performing loans (% of total loans) ⁽³⁾	1.7	1.8	2.5	2.0	1.8	1.6
- capital adequacy ratio (%)	17.4	18.7	17.3	17.9	18.1	18.4
- return on equity (%) ⁽⁴⁾	1.1	1.3	2.5	1.7	2.2	0.9
Bank loans to the private sector (year-on-year % change) ⁽¹⁾	1.1	0.5	1.3	2.3	3.7	4.1
Lending for house purchase (year-on-year % change) ⁽¹⁾	1.9	2.0	2.4	3.5	3.7	3.9
Loan to deposit ratio ⁽¹⁾	82.5	80.1	79.2	78.4	78.5	79.1
Central Bank liquidity as % of liabilities	-	-	1.1	1.0	1.1	1.6
Private debt (% of GDP)	101.8	102.9	99.4	98.7	99.3	-
Gross external debt (% of GDP) ⁽²⁾ - public	49.7	45.8	48.8	42.6	38.3	34.8
- private	41.4	41.1	41.1	41.9	41.1	40.7
Long-term interest rate spread versus Bund (basis points)*	0.0	0.0	0.0	0.0	0.0	0.0
Credit default swap spreads for sovereign securities (5-year)*	32.7	14.9	12.7	7.7	11.5	8.1

1) Latest data Q3 2017.. Includes not only banks but all monetary financial institutions excluding central banks

2) Latest data Q2 2017.

3) As per ECB definition of gross non-performing debt instruments

4) Quarterly values are not 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**

	2012	2013	2014	2015	2016	2017 ⁵
Equal opportunities and access to the labour market						
Early leavers from education and training (% of population aged 18-24)	10.5	9.8	9.5	10.1	10.3	:
Gender employment gap (pps)	10.5	9.6	9.1	8.7	8.2	8.0
Income inequality, measured as quintile share ratio (S80/S20)	4.3	4.6	5.1	4.8	4.6	:
At-risk-of-poverty or social exclusion rate ¹ (AROPE)	19.6	20.3	20.6	20.0	19.7	:
Young people neither in employment nor in education and training (% of population aged 15-24)	7.1	6.3	6.4	6.2	6.7	:
Dynamic labour markets and fair working conditions[†]						
Employment rate (20-64 years)	76.9	77.3	77.7	78.0	78.6	79.0
Unemployment rate ² (15-74 years)	5.4	5.2	5.0	4.6	4.1	3.8
Gross disposable income of households in real terms per capita ³ (Index 2008=100)	:	:	104.1	105.2	106.7	:
Public support / Social protection and inclusion						
Impact of social transfers (excluding pensions) on poverty reduction ⁴	33.7	34.0	33.2	33.5	34.8	:
Children aged less than 3 years in formal childcare	24.0	28.0	27.5	25.9	32.6	:
Self-reported unmet need for medical care	1.6	1.6	1.6	0.5	0.3	:
Individuals who have basic or above basic overall digital skills (% of population aged 16-74)	:	:	:	67.0	68.0	68.0

The Social Scoreboard includes 14 headline indicators, of which 12 are currently used to compare Member States performance. The indicators "participants in active labour market policies per 100 persons wanting to work" and "compensation of employees per hour worked (in EUR)" are not used due to technical concerns by Member States. Possible alternatives will be discussed in the relevant Committees.

(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) Gross disposable household income is defined in unadjusted terms, according to the draft Joint Employment Report 2018.

(4) 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).

(5) Average of first three quarters of 2017 for the employment rate and gender employment gap.

Source: Eurostat

Table C.3: Labour market and education indicators

Labour market indicators	2012	2013	2014	2015	2016	2017 ⁵
Activity rate (15-64)	77.2	77.6	77.7	77.6	77.9	:
Employment in current job by duration						
<i>From 0 to 11 months</i>	12.9	12.1	12.0	12.2	12.4	:
<i>From 12 to 23 months</i>	9.0	9.2	8.8	8.9	9.0	:
<i>From 24 to 59 months</i>	15.3	15.5	16.2	15.9	15.3	:
<i>60 months or over</i>	60.4	60.8	60.7	60.6	59.9	:
Employment growth*						
(% change from previous year)	1.2	0.6	0.8	0.9	1.3	1.5
Employment rate of women						
(% of female population aged 20-64)	71.6	72.5	73.1	73.6	74.5	75.0
Employment rate of men						
(% of male population aged 20-64)	82.1	82.1	82.2	82.3	82.7	83.0
Employment rate of older workers*						
(% of population aged 55-64)	61.6	63.6	65.6	66.2	68.6	69.8
Part-time employment*						
(% of total employment, aged 15-64)	25.8	26.6	26.5	26.8	26.7	26.7
Fixed-term employment*						
(% of employees with a fixed term contract, aged 15-64)	13.8	13.4	13.1	13.2	13.2	12.8
Transition rate from temporary to permanent employment (3-year average)	40.6	36.1	32.9	29.1	:	:
Long-term unemployment rate ¹ (% of labour force)	2.4	2.3	2.2	2.0	1.7	1.6
Youth unemployment rate						
(% active population aged 15-24)	8.0	7.8	7.7	7.2	7.1	6.8
Gender gap in part-time employment	36.4	37.6	37.1	37.3	37.1	36.7
Gender pay gap ² (in undadjusted form)	22.7	22.1	22.3	22.0	:	:
Education and training indicators	2012	2013	2014	2015	2016	2017
Adult participation in learning (% of people aged 25-64 participating in education and training)	7.9	7.9	8.0	8.1	8.5	:
Underachievement in education ³	17.7	:	:	17.2	:	:
Tertiary educational attainment (% of population aged 30-34 having successfully completed tertiary education)	31.8	32.9	31.4	32.3	33.2	:
Variation in performance explained by students' socio-economic status ⁴	16.9	:	:	15.8	:	:

* Non-scoreboard indicator

(1) Long-term unemployed are people who have been unemployed for at least 12 months.

(2) 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.

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

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

(5) Average of first three quarters of 2017, unless for the youth unemployment rate (annual figure).

Source: Eurostat, OECD

Table C.4: Social inclusion and health indicators

	2012	2013	2014	2015	2016	2017
Expenditure on social protection benefits* (% of GDP)						
<i>Sickness/healthcare</i>	9.3	9.5	9.6	9.7	:	:
<i>Disability</i>	2.2	2.2	2.2	2.3	:	:
<i>Old age and survivors</i>	11.0	10.9	10.9	10.9	:	:
<i>Family/children</i>	3.1	3.1	3.1	3.2	:	:
<i>Unemployment</i>	1.1	1.1	1.1	1.0	:	:
<i>Housing</i>	0.6	0.6	0.6	0.6	:	:
<i>Social exclusion n.e.c.</i>	0.2	0.2	0.2	0.3	:	:
Total	27.4	27.7	27.7	27.9	:	:
<i>of which: means-tested benefits</i>	3.3	3.3	3.4	3.5	:	:
General government expenditure by function (% of GDP, COFOG)						
<i>Social protection</i>	18.8	18.9	18.7	18.9	:	:
<i>Health</i>	6.8	7.0	7.1	7.1	:	:
<i>Education</i>	4.2	4.3	4.2	4.2	:	:
Out-of-pocket expenditure on healthcare (% of total health expenditure)	13.9	13.2	12.7	12.5	:	:
Children at risk of poverty or social exclusion (% of people aged 0-17)*	18.4	19.4	19.6	18.5	19.3	:
At-risk-of-poverty rate ¹ (% of total population)	16.1	16.1	16.7	16.7	16.5	:
In-work at-risk-of-poverty rate (% of persons employed)	7.8	8.6	9.9	9.7	9.5	:
Severe material deprivation rate ² (% of total population)	4.9	5.4	5.0	4.4	3.7	:
Severe housing deprivation rate ³ , by tenure status						
<i>Owner, with mortgage or loan</i>	0.5	0.5	0.3	0.7	0.2	:
<i>Tenant, rent at market price</i>	3.5	3.0	3.6	3.2	3.8	:
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	:
Poverty thresholds, expressed in national currency at constant prices*	10772	10544	10454	10862	11169	:
Healthy life years (at the age of 65)						
<i>Females</i>	6.9	7.0	6.7	12.3	:	:
<i>Males</i>	6.7	7.0	6.8	11.4	:	:
Aggregate replacement ratio for pensions ⁵ (at the age of 65)	0.5	0.5	0.5	0.5	0.5	:
Connectivity dimension of the Digital Economy and Society Index (DESI) ⁶	:	:	62.1	66.9	69.1	71.5
GINI coefficient before taxes and transfers*	50.5	51.7	51.6	:	50.8	:
GINI coefficient after taxes and transfers*	28.5	29.7	30.7	:	29.5	:

* 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	2010	2011	2012	2013	2014	2015	2016
Labour productivity (real, per person employed, year-on-year % change)							
Labour productivity in industry	12.57	1.83	-0.34	-1.11	3.88	1.52	2.53
Labour productivity in construction	5.60	2.10	-0.98	-1.16	1.90	0.45	1.44
Labour productivity in market services	-0.61	1.85	2.53	1.47	0.44	0.08	1.33
Unit labour costs (ULC) (whole economy, year-on-year % change)							
ULC in industry	-11.80	-0.34	3.63	4.00	-2.12	0.88	0.43
ULC in construction	-5.20	0.79	4.67	2.82	0.75	3.26	1.46
ULC in market services	2.38	1.11	2.65	0.91	3.14	3.20	1.77
Business environment	2010	2011	2012	2013	2014	2015	2016
Time needed to enforce contracts ⁽¹⁾ (days)	394.0	394.0	394.0	394.0	459.0	479.0	499.0
Time needed to start a business ⁽¹⁾ (days)	14.5	14.5	14.5	14.5	14.5	10.5	10.5
Outcome of applications by SMEs for bank loans ⁽²⁾	0.55	0.49	0.28	0.17	0.58	0.35	0.38
Research and innovation	2010	2011	2012	2013	2014	2015	2016
R&D intensity	2.71	2.80	2.87	2.82	2.87	2.92	2.94
General government expenditure on education as % of GDP	4.40	4.30	4.20	4.30	4.20	4.20	na
Persons with tertiary education and/or employed in science and technology as % of total employment	42	41	43	43	44	44	45
Population having completed tertiary education ⁽³⁾	23	24	25	25	23	24	24
Young people with upper secondary level education ⁽⁴⁾	75	76	76	77	77	77	78
Trade balance of high technology products as % of GDP	0.35	0.59	1.05	1.05	0.90	0.97	na
Product and service markets and competition					2003	2008	2013
OECD product market regulation (PMR) ⁽⁵⁾ , overall					1.80	1.41	1.29
OECD PMR ⁽⁵⁾ , retail					3.38	2.88	2.71
OECD PMR ⁽⁵⁾ , professional services					3.03	2.82	2.65
OECD PMR ⁽⁵⁾ , network industries ⁽⁶⁾					1.87	1.33	1.27

(1) The methodologies, including the assumptions, for this indicator are shown in detail at:

<http://www.doingbusiness.org/methodology>.

(2) 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.

(3) Percentage population aged 15-64 having completed tertiary education.

(4) Percentage population aged 20-24 having attained at least upper secondary education.

(5) 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>

(6) 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		2011	2012	2013	2014	2015	2016
Macroeconomic							
Energy intensity	kgoe / €	0.12	0.12	0.12	0.11	0.11	0.11
Carbon intensity	kg / €	0.34	0.34	0.35	0.33	0.32	-
Resource intensity (reciprocal of resource productivity)	kg / €	0.51	0.49	0.49	0.49	0.46	0.45
Waste intensity	kg / €	-	0.14	-	0.14	-	-
Energy balance of trade	% GDP	-3.6	-3.6	-3.4	-2.8	-2.0	-
Weighting of energy in HICP	%	12.30	12.55	12.40	11.94	11.78	10.36
Difference between energy price change and inflation	%	7.0	3.6	3.2	-1.6	-5.5	-5.0
Real unit of energy cost	% of value added	10.5	10.4	9.9	9.9	-	-
Ratio of environmental taxes to labour taxes	ratio	0.10	0.10	0.09	0.09	0.09	-
Environmental taxes	% GDP	2.2	2.1	2.1	2.0	1.9	1.9
Sectoral							
Industry energy intensity	kgoe / €	0.10	0.10	0.10	0.09	0.09	0.09
Real unit energy cost for manufacturing industry excl. refining	% of value added	12.9	12.8	12.4	12.2	-	-
Share of energy-intensive industries in the economy	% GDP	10.45	10.61	10.45	10.50	10.38	-
Electricity prices for medium-sized industrial users	€/ kWh	0.12	0.13	0.14	0.16	0.15	0.15
Gas prices for medium-sized industrial users	€/ kWh	0.04	0.04	0.05	0.04	0.04	0.03
Public R&D for energy	% GDP	0.03	0.04	0.05	0.05	0.04	0.04
Public R&D for environmental protection	% GDP	0.02	0.02	0.03	0.03	0.03	0.03
Municipal waste recycling rate	%	63.0	65.2	63.8	65.6	66.7	66.1
Share of GHG emissions covered by ETS*	%	51.6	51.5	51.1	51.4	50.3	50.0
Transport energy intensity	kgoe / €	0.56	0.56	0.55	0.57	0.59	0.60
Transport carbon intensity	kg / €	1.42	1.40	1.41	1.44	1.51	-
Security of energy supply							
Energy import dependency	%	61.9	61.5	62.7	61.8	61.9	63.5
Aggregated supplier concentration index	HHI	13.9	13.8	15.0	15.2	18.1	-
Diversification of energy mix	HHI	0.24	0.24	0.25	0.24	0.24	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 (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 % of total value added for the economy

Industry energy intensity: final energy consumption of industry (in kgoe) divided by gross value added of industry (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 500–20 000 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 for these categories as % of GDP

Proportion of GHG emissions covered by EU emissions trading system (ETS) (excluding aviation): based on GHG emissions (excl land use, land use change and forestry) as reported by Member States to the European Environment Agency.

Transport energy intensity: final energy consumption of transport activity (kgoe) divided by transport industry gross value added (in 2010 EUR)

Transport carbon intensity: GHG emissions in transport activity divided by gross value added of the transport sector

Energy import dependency: net energy imports divided by gross inland energy consumption incl. consumption of international bunker fuels

Aggregated supplier concentration index: covers oil, gas and coal. Smaller values indicate larger diversification and hence lower risk.

Diversification of the energy mix: Herfindahl index covering natural gas, total petrol products, nuclear heat, renewable energies and solid fuels

* 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 and GDP); Eurostat (all other indicators)

REFERENCES

- Albig, H., Clemens, M., Fichtner, F., Gebauer, S., Junker, S. and Kholodilin, K. (2017), *How rising income inequality influenced economic growth in Germany*, DIW Economic Bulletin 10.2017, Deutsches Institut für Wirtschaftsforschung e.V. (DIW Berlin), Berlin
- Ando, A. and Modigliani, F. (1963), *The "Life Cycle" Hypothesis of Saving: Aggregate Implications and Tests*, The American Economic Review, Vol. 53, No. 1, Part 1 (Mar., 1963), pp. 55-84
- Bäcker, G. (2014), *Niedrigrenten, Arbeitsmarkt und Rentenversicherung: Erfordernis einer integrierten Ursachenanalyse und Reformstrategie*, in: Kistler, Ernst, Trischler, Falko (Hrsg.), *Reformen auf dem Arbeitsmarkt und in der Alterssicherung – Folgen für die Einkunftsfrage im Alter*. Düsseldorf.
- Bähr, S.; Beste, J. and Wenzig, C. (2017), *Arbeitsmarktintegration von Geflüchteten im SGB II: Hemmnisse abbauen und Potenziale nutzen*, IAB-Kurzbericht, 23/2017, Institute for Employment Research, Nürnberg.
- Barro, R. and Sala-i-Martin, X. (2003), *Economic Growth*, 2nd Edition, The MIT Press Cambridge, Mass., USA.
- BDK (2017), *Pressemitteilung zur Lehrerversorgung an den deutschen Schulen*, Bundesdirektorenkonferenz.
- Bach, S. and Thiemann, A. (2016), *Inheritance Tax Revenue Low Despite Surge in Inheritances*, DIW Economic Bulletin 4+5 2016, The German Economic Research Institute (DIW Berlin), Berlin.
- Belitz H., Eickelpasch A., Le Mouel M., and Schiersch A. (2017), *Wissensbasiertes Kapital in Deutschland: Analyse zu Produktivitäts- und Wachstumseffekten und Erstellung eines Indikatorsystems*, The German Economic Research Institute (DIW Berlin), Berlin.
- Belke, A., Dreger, C. and Ochmann, R., (2015), *Do wealthier households save more? The impact of the demographic factor*, International Economics and Economic Policy, 12(2), pp.163-173.
- Bitkom (2017), *55.000 Jobs für IT-Spezialisten sind unbesetzt*, Presseinformation, 07.11.2015, Berlin.
- Bloom, D., Canning, D., Mansfield, R. and Moore, M. (2007), *Demographic change, social security systems, and savings*, Journal of Monetary Economics, Volume 54, Issue 1, pp 92-114.
- Börsch-Supan, A., Ludwig, A. and Winter, J. (2002), *Ageing and international capital flows*, In Ageing, financial markets and monetary policy (pp. 55-83) , Springer, Berlin, Heidelberg.
- Boll, C., Leppin, J., Rossen, A., and Wolf, A. (2016), *Magnitude and impact factors of the gender pay gap in EU countries*, Report prepared for and financed by the European Commission–Directorate–General for Justice, European Union (ed.).
- Brenke, K. and Wagner, G. G. (2013), *Ungleiche Verteilung der Einkommen bremst das Wirtschaftswachstum*, Wirtschaftsdienst, 93(2).
- Breitbandatlas (2017), *Aktuelle Breitbandverfügbarkeit in Deutschland – Stand Mitte 2017*, Federal Ministry of Transport and Infrastructure, Berlin.
- Brettschneider, A. and Klammer, U. (2016), *Lebenswege in die Altersarmut*, Biografische Analysen und sozialpolitische Perspektiven, Duncker & Humblot, Berlin.

- Buiter, W.H. (1981), *Time preference and international lending and borrowing in an overlapping-generations model*, Journal of political economy, 89(4), pp.769-797.
- Burauel, P. (2017), *Mindestlohn noch längst nicht für alle – Zur Entlohnung anspruchsberechtigter Erwerbstätiger vor und nach der Mindestlohnreform aus der Perspektive Beschäftigter*, DIW Berlin Wochenbericht Nr. 2017/49, Deutsches Institut für Wirtschaftsforschung e.V. (DIW Berlin), Berlin.
- Busl, C., Jokisch, S. and Schleer, F. (2012), *Sparen und Investieren vor dem Hintergrund des demografischen Wandels*, ZEW Wachstums- und Konjunkturanalysen, 15(3), 6-7.
- Busse, R., Blümel, M., Knieps, F. and Bärnighausen, T. (2017), *Statutory health insurance in Germany: a health system shaped by 135 years of solidarity, self-governance and competition*, The Lancet, Volume 390, Issue 10097, pp 882 - 897.
- Chinn, M.D. and E.S. Prasad (2003), *Medium-term determinants of current accounts in industrial and developing countries: an empirical exploration*, Journal of International Economics 59(1), pp. 47-76.
- Cingano, F. (2014), *Trends in income inequality and its impact on economic growth*, OECD Social, Employment and Migration Working Papers, No. 163, OECD Publishing, Paris.
- Cologne Institute for Economic Research, (2017), *Investieren Staat und Unternehmen in Deutschland zu wenig? – Bestandsaufnahme und Handlungsbedarf*, IW-Analysen Nr. 118, Institut der deutschen Wirtschaft, Köln.
- Dahl, J. and Goralczyk, M. (2017), *Recent Supply and Demand Developments in the German Housing Market*, European Economy, Economic Brief 025, May 2017, European Commission, Brussels.
- Destatis (2017), *Verdiensterhebung 2016 - Erhebung über die Wirkung des gesetzlichen Mindestlohns auf die Verdienste und Arbeitszeiten der abhängig Beschäftigten*, Statistisches Bundesamt (Destatis).
- Digital Scoreboard (2017), <https://ec.europa.eu/digital-single-market/en/scoreboard/germany>,
- DIHK (2017), *DIHK-Innovationsreport 2017 - Innovationsdynamik rückläufig - Ergebnisse einer Befragung der IHK-Organisation bei 1.700 Unternehmen*, German Chambers of Industry and Commerce, Berlin.
- DIHK (2018), *DIHK-Konjunkturumfrage zu Jahresbeginn 2018*, German Chambers of Industry and Commerce, Berlin.
- Ebert, J. and Heublein, U. (2017), *Ursachen des Studienabbruchs bei Studierenden mit Migrationshintergrund*, Deutsches Zentrum für Hochschul- und Wissenschaftsforschung GmbH and Stiftung Mercator, Hannover.
- EFI (2017), *Report on research, innovation and technological performance in Germany 2017*, Commission of Experts for Research and Innovation (EFI), Berlin.
- European Commission (2013), *Benchmarking Deployment of eHealth Among General Practitioners*, Final Report, European Commission, Brussels.
- European Commission (2014a), *Macroeconomic imbalances Germany 2014*, European Economy, Occasional Papers 174, European Commission, Brussels.

- European Commission (2014b), *European Hospital Survey: Benchmarking Deployment of eHealth Services*, Publications Office of the European Union, Luxembourg.
- European Commission (2015a), *Macroeconomic imbalances Country Report Germany 2015*, European Economy, Occasional Papers 214, European Commission, Brussels.
- European Commission (2015b), *Challenges to Member States Investment Environments*, Commission Staff Working Document (2015) 400, Publications Office of the European Union, Luxembourg.
- European Commission (2015c), *A Single Market Strategy for Europe – analysis and evidence*, SWD(2015) 202 final, European Commission, Brussels.
- European Commission (2016a), *Study on passenger transport by taxi, hire car with driver and ridesharing in the EU*, European Commission, Brussels.
- European Commission (2016b), *Country Report Germany 2016 - Including an In-Depth Review on the prevention and correction of macroeconomic imbalances*, SWD(2016) 75, European Commission, Brussels.
- European Commission (2016c), *PISA 2015, EU performance and initial conclusions regarding education policies in Europe*, European Commission, Brussels.
- European Commission (2016d), *COUNCIL RECOMMENDATION of 19 December 2016 on Upskilling Pathways: New Opportunities for Adults*, 2016/C 484/01, European Commission, Brussels.
- European Commission (2016e), *Report on Public Finances in EMU 201*, European Commission, Brussels, Belgium.
- European Commission (2017a), *Empirical current account benchmarks: modelling the impact of demographic variables*, LIME Working Group, 24 April 2017
- European Commission (2017b), *European Economic Forecast, Autumn 2017*, European Economy, Institutional Paper 063, November 2017, European Commission, Brussels.
- European Commission (2017c), *Country Report Germany 2017 - Including an In-Depth Review on the prevention and correction of macroeconomic imbalances*, SWD(2017) 71, European Commission, Brussels.
- European Commission (2017d), *COMMISSION OPINION of 22.11.2017 on the Draft Budgetary Plan of Germany*, SWD(2017) 513 final, European Commission, Brussels.
- European Commission (2017e), *Employment and Social Developments in Europe 2017*, European Commission, Brussels.
- European Commission (2017f), *2017 SBA Factsheet Germany*, European Commission, Brussels.
- European Commission (2017g), *Attitudes towards the impact of digitisation and automation on daily life-Special Eurobarometer 460*, European Commission, Brussels.
- European Commission (2017h), *Digital Scoreboard 2017*, European Commission, Brussels.
- European Commission (2017i), *The EU Environmental Implementation Review Country Report – GERMANY*, SWD(2017) 38 final

- European Commission (2018), *2018 Ageing Report: Economic and Budgetary Projections for the EU Member States (2016-2070)*, European Commission (DG ECFIN) – Economic Policy Committee (AWG), (forthcoming).
- Federal Ministry for Economic Affairs and Energy (2017a), *Nationales Reformprogramm 2017*, Federal Ministry for Economic Affairs and Energy, Berlin.
- Federal Ministry for Economic Affairs and Energy (2017b), *Ökonomische Bewertung verschiedener Vermögensteuerkonzepte*, Project-Number 012/17, Expertise for the Federal Ministry for Economic Affairs and Energy prepared by Ernst & Young GmbH and ifo Institut.
- Federal Ministry for Economic Affairs and Energy (2017c), *Monitoring-Report Kompakt Wirtschaft DIGITAL 2017*, Federal Ministry for Economic Affairs and Energy, Berlin.
- Federal Ministry for Labour and Social Affairs (BMAS) (2017a), *Lebenslagen in Deutschland, der Fünfte Armuts- und Reichtumsbericht der Bundesregierung*, Federal Ministry for Labour and Social Affairs, Berlin.
- Federal Ministry for Labour and Social Affairs (BMAS) (2017b), *Verzeichnis der für allgemeinverbindlich erklärten Tarifverträge*, Stand: 1. Juli 2017, Federal Ministry for Labour and Social Affairs, Berlin.
- Federal Ministry for Labour and Social Affairs (BMAS) (2017c), *Lebenslagen in Deutschland. Der Fünfte Armuts- und Reichtumsberichterstattung der Bundesregierung*, Federal Ministry for Labour and Social Affairs, Berlin.
- Federal Ministry of Education and Research (2017), *Report on Vocational Education and Training 2017*, Federal Ministry of Education and Research, Berlin.
- Federal Ministry of Transport and Infrastructure (2017), *Breitbandatlas - Aktuelle Breitbandverfügbarkeit in Deutschland (Stand Mitte 2017)*, Federal Ministry of Transport and Infrastructure, Berlin.
- Federal Office for Migration and Refugees (2018), *Aktuelle Zahlen zu Asyl (12/2017)*, Federal Office for Migration and Refugees, Berlin.
- Felbermayr, G., Battisti, M. and Lehwald, S. (2016), *Einkommensungleichheit in Deutschland, Teil 1: Gibt es eine Trendumkehr?*, ifo Schnelldienst, Vol. 69, Issue 13, pages 28–37.
- Frick, J. and Grabka, M. (2010), *Old-age pension entitlements mitigate inequality—but concentration of wealth remains high*, DIW Berlin Weekly Report, No. 8/2010, Volume 6, Deutsches Institut für Wirtschaftsforschung e.V. (DIW Berlin), Berlin.
- German Youth Institute, DJI (2017), *Plätze. Personal. Finanzen – der Kita-Ausbau geht weiter. Zukunftsszenarien zur Kindertages- und Grundschulbetreuung in Deutschland*, Version 2-2017.
- Galor, O. and Zeira, J. (1993), *Income distribution and macroeconomics*, The review of economic studies, Volume 60, Issue 1, pp 35-52.
- Galassi, G. (2016), *The German Mini-Job Reform: Intended and Unintended Consequences*, European University Institute, February 15, 2016, San Domenico di Fiesole.
- German Central Bank (2017), *Results of the 2017 low-interest-rate survey*, Press release, 30.08.2017, German Central Bank, Frankfurt am Main.

German Monopolies Commission (2017), *Bahn 2017: Wettbewerbspolitische Baustellen*, Sondergutachten 76, p. 90. See also: <http://www.monopolkommission.de/index.php/en/press-releases/64-railways-2017>

German Savings Banks Association (DSGV) (2018), *Diagnose Mittelstand 2018*. Forthcoming on 18 May 2018, related press release published on 18 December, 2017 (https://www.dsgv.de/de/presse/pressemitteilungen/171218_PM_Diagnose-Mittelstand_64.html)

German Trade Union Confederation (2017), *Bildungsgipfel-Bilanz. Studie zur Wirkung des Dresdner Bildungsgipfels vom 22. Oktober 2008*, Deutscher Gewerkschaftsbund, Berlin.

Geyer, J.(2014), *Zukünftige Altersarmut*, DIW Roundup Politik im Fokus, No. 25, Berlin.

Gornig, M. and Michelsen C. (2017a), *Kommunale Investitionsschwäche: Engpässe bei Planungs- und Baukapazitäten bremsen Städte und Gemeinden aus*, DIW Wochenbericht Nr. 11.2017, The German Economic Research Institute (DIW Berlin), Berlin.

Gornig, M. and Michelsen, C. (2017b), *Bauwirtschaft: volle Auftragsbücher und gute Wachstumsaussichten*, DIW Wochenbericht Nr. 1+2.2017, The German Economic Research Institute (DIW Berlin), Berlin.

Grabka M. and J. Goebel (2017), *Real income rose significantly between 1991 and 2014 – first indication of return to increased income inequality*, DIW Economic Bulletin 5.2017, Deutsches Institut für Wirtschaftsforschung e.V. (DIW Berlin), Berlin.

Grotlüschen, A. (2016), *UNESCO country profiles of formal and nonformal adult education opportunities in literacy, numeracy and other skills: Germany*, ED/GEMR/MRT/2016/P1/35, Paper commissioned for the Global Education Monitoring Report 2016, Education for people and planet: Creating sustainable futures for all.

Gruber, J. W. and Kamin, S. B. (2007). *Explaining the global pattern of current account imbalances*. Journal of International Money and Finance, 26(4), 500-522.

Gürtzgen, N., Kubis, A. and Rebien, M. (2017), *IAB-Stellenerhebung: Geflüchtete kommen mehr und mehr am Arbeitsmarkt an*, IAB-Kurzbericht, 14/2017, Institute for Employment Research, Nürnberg

Holland van Gijzen Advocaten (2016), *Legal study on retail establishment through the 28 Member States: Restrictions and freedom of establishment carried out for the European Commission*, <http://ec.europa.eu/DocsRoom/documents/16127>.

Ifo Institute (2017), *Ifo Konjunkturperspektiven 06/2017*, ifo Institut, München.

IHS and Point Topic (2018), *Broadband coverage in Europe in 2017 - Mapping progress towards the coverage objectives of the Digital Agenda*, forthcoming study prepared for the European Commission, DG Communications Networks, Content and Technology by IHS Markit and Point Topic, European Commission, Brussels.

IMF (2017a), *Staff Report For The 2017 Article IV Consultation*, International Monetary Fund, Washington D.C.

IMF (2017b), *2017 External Sector Report*, IMF policy paper, International Monetary Fund, Washington D.C.

Initiative D21 (2017), *eGovernment MONITOR 2017 - Nutzung und Akzeptanz digitaler Verwaltungsangebote – Deutschland, Österreich und Schweiz im Vergleich*, Initiative D21 e. V. and fortiss GmbH, Berlin and Muenchen.

INSM (2017), *Bildungsmonitor 2017 – Eine Bildungsagenda für mehr Wachstum und Gerechtigkeit*, Study commissioned by Initiative Neue Soziale Marktwirtschaft, Cologne.

Institute for Educational Quality Improvement (IQB) (2017), *IQB-Bildungstrend 2016*. Institute for Educational Quality Improvement, Berlin.

IW Köln (2017), *Reform der Grunderwerbsteuer – Studie fuer die FDP Fraktionsvorsitzendenkonferenz*, Institut der deutschen Wirtschaft, Köln.

Kalina, T. and Weinkopf, C. (2017), *Niedriglohn Beschäftigung 2015 - bislang kein Rückgang im Zuge der Mindestlohneinführung*, IAQ-Report, University Duisburg Essen.

KfW (2017a), *KfW-Kommunalpanel 2017*, KfW Bankengruppe, Frankfurt am Main.

KfW (2017b), *KfW-Mittelstandspanel 2017. Rekordjagd im Inland geht ungebremst weiter – neue Herausforderungen durch sektoralen Wandel*, KfW Bankengruppe, Frankfurt am Main.

KfW (2017c), *KfW-Innovationsbericht Mittelstand 2016: Innovationen konzentrieren sich auf immer weniger Unternehmen*, KfW Bankengruppe, Frankfurt am Main.

Klemm, K. and Zorn, D. (2017), *Demographische Rendite adé - Aktuelle Bevölkerungsentwicklung und Folgen für die allgemeinbildenden Schulen*, Bertelsmann Foundation, Gütersloh.

Krebs, T. and Scheffel, M. (2016), *Quantifizierung der gesamtwirtschaftlichen und fiskalischen Effekte ausgewählter Infrastruktur- und Bildungsinvestitionen in Deutschland*, Studie im Auftrag des Bundesministeriums für Wirtschaft und Energie (BMWi).

Lane, P. R., and Milesi-Ferretti, G. M. (2012), *External adjustment and the global crisis*, Journal of International Economics, 88(2), 252-265.

Lazear, P. and Rosen. S. (1981), *Rank-Order Tournaments as Optimum Labor Contracts*, Journal of Political Economy, Vol. 89, No. 5, pp 841-64

Lee, J., J. D. Ostry, G.M. Milesi-Ferretti, L.A. Ricci and A. Prati (2008), *Exchange rate assessments: CGER methodologies*, International Monetary Fund, Washington D.C.

McGowan M. A., Andrews D. and Millot V. (2017), *The walking dead? Zombie firms and productivity performance in OECD countries*, OECD Economics Department, Working Papers No. 1372, OECD, Paris.

Mirrlees, J. (1971), *An Exploration in the Theory of Optimum Income Taxation*, The Review of Economic Studies, Vol. 38, No. 2, pp. 175-208.

Neves, P.C., Afonso, O. and Silva, S. T. (2016), *A Meta-Analytic Reassessment of the Effects of Inequality on Growth*, World Development, Volume 78, 2016.

Obstfeld, M. and Rogoff, K. (1995), *The intertemporal approach to the current account*, Handbook of international economics, 3, pp.1731-1799.

- OECD (2015), *In it together: Why less inequality benefits all*, OECD Publishing, Paris.
- OECD (2016a), *PISA 2015, Country Note Germany*, OECD Publishing, Paris.
- OECD (2016b), *Education at a Glance 2016: OECD Indicators*, OECD Publishing, Paris.
- OECD (2016c), *OECD Economic Surveys: Germany 2016*, OECD Publishing, Paris.
- OECD (2016d), *Regions at a Glance 2016*, OECD Publishing, Paris.
- OECD and European Observatory on Health Systems and Policies (2017), *Germany: Country Health Profile 2017, State of Health in the EU*, OECD Publishing, Paris/European Observatory on Health Systems and Policies, Brussels.
- Phillips, S., L. Catão, L. Ricci, R. Bems, M. Das, J. Di Giovanni, F. Unsal, M. Castillo, J. Lee, J. Rodriguez, and M. Vargas (2013), *The External Balance Assessment (EBA) methodology*, IMF Working Paper, WP/13/272, IMF, Washington, D.C..
- Pomerlo, K. (2017), *International Tax Competitiveness Index 2016*, Tax Foundation, Washington, D.C..Pusch, T., and Rehm, M. (2017), *Positive Effects of the German Minimum Wage on Job Quality and Employee Job Satisfaction*, *Wirtschaftsdienst*, 97(6), 409-414.
- PWC and IHS (2017), *Effectiveness of tax incentives for venture capital and business angels to foster the investment of SMEs and start-ups – Final report*, PricewaterhouseCoopers LLP and Institute for Advanced Studies (HIS), Study for the European Commission, TAXUD/2015/DE/330, European Commission, Brussels.
- Salto, M. and Turrini, A. (2010), *Comparing alternative methodologies for real exchange rate assessment*, European Commission, Directorate-General for Economic and Financial Affairs, European Commission, Brussels.
- Schwabe, U. et al (eds.) (2017), *Arzneimittelverordnungsreport 2017*, Springer, Berlin, Heidelberg
- Stability Council (2017), *Eighth Statement on compliance with the upper limit for the structural general government budget deficit pursuant to Section 51 (2) of the Budgetary Principles Act (HGrG)*, Stabilitätsrat, December 2017, Berlin.
- Standing Conference of the Ministers of Education and Cultural Affairs (2013), *Lehrereinstellungsbedarf- und angebot in der Bundesrepublik Deutschland, Modellrechnung 2012-2025*, Statistische Veröffentlichungen der Kultusministerkonferenz, Dokumentation Nr. 201 – Juni 2013, Berlin.
- Standing Conference of the Ministers of Education and Cultural Affairs (2016), *Allgemeinbildende Schulen in Ganztagsform in den Ländern in der Bundesrepublik Deutschland, Statistik 2011 bis 2015*.
- Thum-Thysen, A., Voigt, P., Bilbao, B., Maier, C. and Ognyanova, D. (2017), *Unlocking investment in Intangible Assets*, Discussion paper 047. May 2017. Brussels
- Umweltbundesamt, (2017), *Quantifizierung der landwirtschaftlich verursachten Kosten zur Sicherung der Trinkwasserbereitstellung*, Dessau-Roßlau.
- WIK-Consult (2017), *Ansätze zur Glasfaser-Erschließung unterversorgter Gebiete*, Studie für den DIHK, WIK-Consult GmbH, Bad Honnef.

World Bank (2017), *Doing Business 2018 - Reforming to Create Jobs*, A World Bank Group Flagship Report, International Bank for Reconstruction and Development / The World Bank, Washington DC, USA.

ZEW (2017a), *Effective Tax Levels Using the Devereux/Griffith Methodology – Final report 2016*, Project for the European Commission, TAXUD/2013/CC/120, Centre for European Economic Research, Mannheim.

ZEW (2017b), *Steuerlicher Digitalisierungsindex*, ZEW (Centre for European Economic Research), University of Mannheim and PWC.

ZEW (2017c), *Innovationsverhalten der deutschen Wirtschaft: Indikatorenbericht zur Innovationserhebung 2016*, Centre for European Economic Research (ZEW), Mannheim.