



Council of the
European Union

Brussels, 22 February 2017
(OR. en)

6552/17

ECOFIN 137
UEM 50
SOC 136
EMPL 103
COMPET 135
ENV 179
EDUC 85
RECH 74
ENER 79
JAI 152

COVER NOTE

From: Secretary-General of the European Commission,
signed by Mr Jordi AYET PUIGARNAU, Director

date of receipt: 22 February 2017

To: Mr Jeppe TRANHOLM-MIKKELSEN, Secretary-General of the Council of
the European Union

No. Cion doc.: SWD(2017) 71 final

Subject: COMMISSION STAFF WORKING DOCUMENT Country Report Germany
2017 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 2017 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(2017) 90 final} {SWD(2017) 67 final to SWD(2017) 93
final}

Delegations will find attached document SWD(2017) 71 final.

Encl.: SWD(2017) 71 final



Brussels, 22.2.2017
SWD(2017) 71 final

COMMISSION STAFF WORKING DOCUMENT

**Country Report Germany 2017
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**

**2017 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(2017) 90 final}
{SWD(2017) 67 final to SWD(2017) 93 final}**

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EXECUTIVE SUMMARY

This report assesses Germany's economy in the light of the European Commission's Annual Growth Survey published on 16 November 2016. In the survey the Commission calls on EU Member States to redouble their efforts on the three elements of the virtuous triangle of economic policy – boosting investment, pursuing structural reforms and ensuring responsible fiscal policies. In so doing, Member States should focus on enhancing social fairness to deliver more inclusive growth. At the same time, the Commission published the Alert Mechanism Report (AMR) that initiated the sixth round of the macroeconomic imbalance procedure. The in-depth review, which the 2017 AMR concluded should be undertaken for the German economy, is presented in this report.

Economic growth was robust in 2014-2016, driven by domestic demand. Real GDP growth stood at 1.7 % in 2015 and 1.9 % in 2016. Private consumption in 2016 grew for the second time in a row by 2.0 %, supported by a substantial rise in real disposable income. The unemployment rate fell to a post-reunification low of 3.9 % by the fourth quarter of 2016, despite a growing workforce.

Business investment activity has been uneven and is expected to pick up only moderately in the near future. Germany's investment ratio has remained at around 20 % of GDP. While housing investment has been on an upward trend since the crisis, non-residential construction investment has stayed relatively flat. Importantly, investment in machinery and equipment has remained restrained and has still not caught up with pre-crisis levels. This is despite supportive financing conditions, strong corporate profits and continued export growth that traditionally drives this type of investment. Overall, this subdued investment growth has resulted a much slower expansion of the capital stock and a relatively low contribution of capital accumulation to potential growth compared with other large advanced economies.

It appears likely that Germany's economic growth momentum will be maintained. With energy prices no longer declining, real household consumption is forecast to slow down somewhat, but to remain relatively strong owing to rising employment and real labour income. The latter will also be boosted by an increase in the

minimum wage in 2017. Financing conditions are expected to remain supportive of investment. Bolstered by domestic demand, GDP is expected to grow by 1.6 % in 2017 – slowing significantly on account of a fall in the number of working days – and by 1.8 % in 2018.

However, major factors behind restrained domestic investment are still in place, which have increased the savings-investment imbalance and contributed to the current account surplus. These relate mainly to continued subdued growth in domestic and EU markets and the higher rates of return for capacity expansion abroad. A high degree of uncertainty, including with regard to technological change, adds to companies' reticence to invest. Obstacles to more dynamic private investment also result from restrictions in the services sector, some unfavourable corporate taxation features and delayed investment in transport, energy and telecommunications infrastructure. Recent efforts to facilitate and stimulate public investment, notably at municipal level, have so far had limited effects.

Public finances remain in a sound position. General government budget surpluses were recorded in 2015 and 2016. The budget is expected to remain in surplus in headline and structural terms in 2017 and 2018, and the gross debt-to-GDP ratio is set to decrease further.

Due to its economic importance and strong integration in the value chains in the EU, Germany is a source of potential spillovers to other Member States. Further strengthened domestic demand, including higher public investment, would increase Germany's actual and potential growth, and would also stimulate demand and GDP growth in other EU countries, including those with deleveraging needs. It would have a positive impact on average inflation, not least in the context of the current expansionary monetary policy.

Overall, Germany has made limited progress in addressing the 2016 country-specific recommendations. Some progress has been made towards achieving a sustainable upward trend in public investment. This is notably done by increased infrastructure investment and by improving the design of federal fiscal relations in

support of higher and accelerated public investment at all levels of government. At the same time, progress has remained limited on increasing public expenditure on education, research and innovation. Limited progress has also been made in reducing inefficiencies in the tax system, modernising tax administration, and stimulating competition in the services sector. Some progress has been made in reviewing the regulatory framework for venture capital. Limited progress has been made in increasing incentives for later retirement and reducing the high tax wedge for low-wage earners. No progress has been made in reducing disincentives to work for second earners and facilitating the transition from mini-jobs to standard employment.

Regarding progress in reaching the national targets under the Europe 2020 strategy, Germany is performing well on the employment rate, reducing early school leaving and poverty, increasing tertiary education attainment, investment in research and development (R&D), and the share of renewable energy. On the other hand, uncertainty remains in terms of achieving greenhouse gas emissions and energy efficiency targets.

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

- **The persistently high current account surplus grew further in 2016 and is projected to remain above 8 % of GDP until 2018.** The German current account and trade surpluses make up about three quarters of the euro area surpluses and are the highest among large advanced economies. Falling prices of oil and other raw materials and the depreciation of the euro explain a substantial part of this increase in 2015-2016. Yet, the high level and persistence of the surpluses reflect an excess of savings over investment relating to a number of structural, regulatory and fiscal factors.
- **Private domestic investment continues to face headwinds.** These are owing to sluggish growth in domestic markets, increased geopolitical uncertainty and inefficiencies in corporate taxation system and business environment. By contrast, private consumption is at the root of the ongoing shift towards more domestic demand-driven growth. The trade and current account surpluses are expected to remain at historically high levels and to fall only gradually over the medium term as domestic demand strengthens further.
- **Germany is emerging only slowly from a decade of weak public investment following the post-unification boom.** Recent measures aimed at increasing infrastructure investment have not yet resulted in a clear upward trend in public investment as a proportion of GDP. Moreover, net investment remained negative at municipal level until 2015. The favourable budgetary position indicates available fiscal space, *inter alia* for providing additional funds – in addition to what has been provided so far – to increase public investment at all levels of government.
- **Taxation still tends to impede private consumption and investment.** Household income and consumption continue to be restrained by the high tax wedge on labour, especially for low-wage earners. Measures taken to adjust personal income tax rates and to compensate for fiscal drag can be expected to have only a limited impact on lowering the tax wedge. Corporate taxation continues to be high overall, and there is still inefficiency in tax administration.
- **Various challenges will impact on the economy's future growth potential.** The expected impact of the ageing society, shifts in technology, in particular the digital revolution, and – partially policy driven – demand change, including in the energy and transport sector, have major implications for the economy's production capacity and productivity. Tackling these challenges is a prerequisite to maintain Germany's high living standards and to cope with increasing globalisation and digitisation.
- **In the financial sector,** improving efficiency and profitability remains the biggest challenge for German banks, which is further accentuated by the digital transformation of financial services. Although the German housing market is currently buoyant, available data suggests that it does not constitute a risk to financial stability. Venture capital investment has

increased, but the market is still underdeveloped by international standards.

- **The strong labour market performance has only been partly mirrored in full-time employment and wage growth.** Employment has continued to rise and unemployment has fallen to historically low levels. This reflects the supportive economic situation, but also results from a well-performing apprenticeship system, company-internal flexibility and a culture of co-determination. However, the increase in employment has been partly due to an increase of part-time work, in particular among women. The labour market potential of certain groups remains underused and disincentives to work remain in place, particularly for second earners. Challenges for the labour market, social policy and the education system in the medium to long term result from a shrinking and ageing population that may lead to labour and skills shortages. Wage growth remains moderate.
- **Private investment appears particularly restrained in certain sectors, pointing to specific investment barriers.** While large technology-intensive corporations are investing strongly in equipment and knowledge, the services sector and small and-medium-sized enterprises (SMEs) are lagging behind compared to other advanced economies. There is also evidence that the share of SMEs investing in R&D has been gradually declining in recent years. A high level of regulatory restrictiveness in the services sector, notably in business services, affects business dynamics and investment in this sector, but also has repercussions on the manufacturing industry.

Other key economic issues analysed in this report which point to particular challenges facing Germany's economy are as follows:

- **Not all members of society have benefited equally from the overall positive economic and labour market developments of the last few years.** After a period of increases, income inequality moderated only recently. Moreover, the good labour market performance of recent years has not led to a decline in the risk of poverty. Although severe material deprivation

has remained broadly stable, various indicators of relative poverty and social exclusion are on the increase. Pension adequacy is also expected to further deteriorate.

- **Immigration in recent years is both a key challenge and an opportunity.** Germany has made considerable efforts to accommodate asylum seekers and integrate refugees. However, people with a migrant background generally continue to be less integrated in the labour market. The employment rate of non-EU nationals is only at the EU average and significantly below the employment rate of German nationals. There are still institutional barriers to the recognition of qualifications, and the achievement gap in education between immigrants and non-immigrants remains wide. On the other hand, immigrants are currently setting up almost half of all new businesses.
- **Sizeable investment is still needed to adapt electricity networks to the increasing share of renewable energy.** Planned investment in internal electricity infrastructure is significantly delayed, owing partly to public opposition. The political decision in favour of underground cables may accelerate investment, though at a considerably higher cost. Covering the rising level of weather-dependent renewable energy power flows also hinges on significant investment in electricity distribution networks. Moreover, the lack of sufficient cross-border interconnections is still constraining the trade in electricity with neighbouring countries and impairing the security of supply.
- **There are barriers to reaping the full benefits of digitisation.** Germany is lagging behind in the availability of high-speed broadband connections, in particular in semi-urban and rural regions. Computers usage by young Germans is comparatively low and many schools lack broadband access. Performance in digital public services is below average.

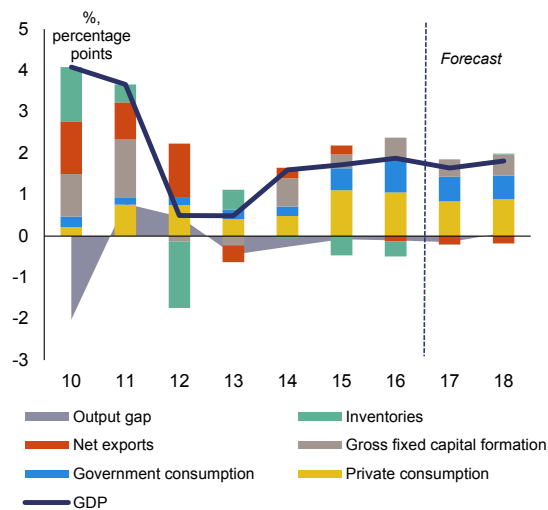
1. ECONOMIC SITUATION AND OUTLOOK

GDP growth

Economic growth strengthened further in 2016.

GDP increased by 1.9 % from 1.7 % in 2015. This is the highest growth rate since 2011 and is about 0.5 pps above the long-term average. Growth was mainly driven by private consumption (Graph 1.1), which for the second time in a row increased strongly at 2 % or 1 pp. above its long-term growth. Public consumption and investment accelerated markedly, driven importantly, but not exclusively, by expenditure on refugees. Private investment growth was mainly driven by very dynamic housing investment.

Graph 1.1: Demand components of GDP growth



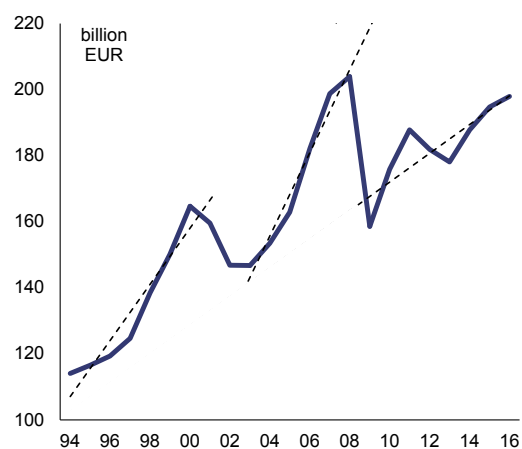
(1) Note: GDP growth and contributions to annual growth
Source: European Commission

Economic growth momentum is expected to be maintained, though export and investment prospects are subject to sizeable downside risks.

With energy prices no longer declining, real household consumption is forecast to slow down somewhat, but to remain relatively strong thanks to the continued rise in employment and real labour incomes. The latter will also be supported by an increase in the minimum wage next year. Financing conditions are expected to remain supportive of investment. Further boosted by domestic demand, the growth rate is expected to be 1.6 % for 2017 – slowing largely on account of fewer work days – and 1.8 % for 2018. All in all, the output gap has essentially closed and the economy is expected to operate at close to full

capacity in 2017 and 2018. However, uncertainty on the outcome of the ‘Brexit’ negotiations, the trade policy stance of the new US administration, cyclical trends in the Chinese economy and geopolitical risks could weigh on foreign trade and investment prospects. On the other hand, the depreciating euro will improve German price competitiveness in non-EU markets.

Graph 1.2: Investment in machinery and equipment



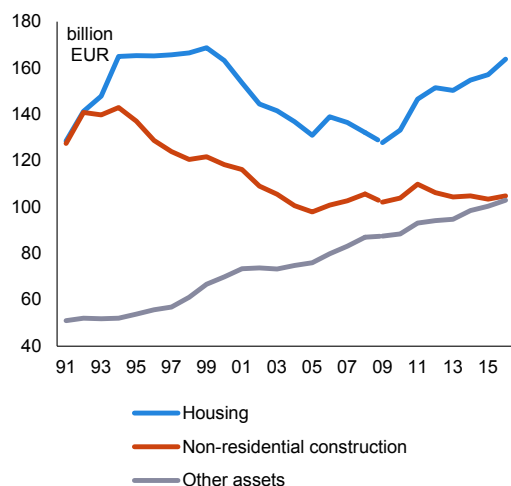
Note: Chain-linked volumes, reference year 2010
Source: European Commission

Investment

Business and infrastructure investment activity remains subdued and is likely to increase only moderately in the near future.

Machinery and equipment investment has not yet recovered from the setback during the financial market crisis of 2008-2009. It suffered a much more pronounced setback than after the bursting of the internet bubble and has been recovering much more slowly, with the sum of the two setbacks corresponding to about 2 % of GDP (Graph 1.2). Non-residential construction investment has been largely stagnant for more than a decade (Graph 1.3). This possibly still rests on the massive post-unification investment effort, but also gradually exposes capacity shortages in essential infrastructure and negative net investment at municipal level (see Section 4.4) (European Commission, 2014).

Graph 1.3: Investment in other assets



Note: Chain-linked volumes, reference year 2010
 Source: European Commission

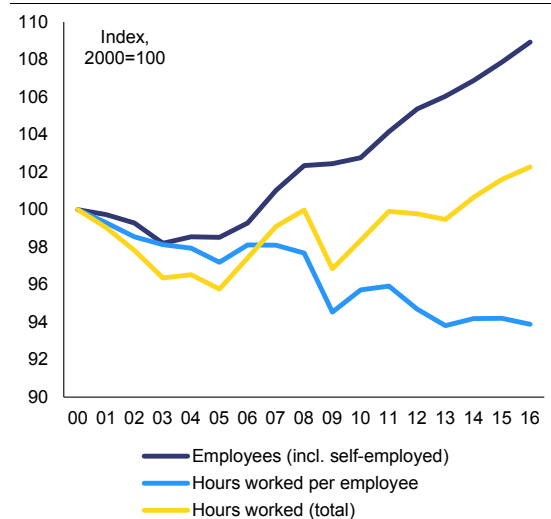
Despite increases in 2015 and 2016, public investment is still relatively low. Following an increase of 4.9 % in 2015, public investment strengthened further in 2016, rising to about 6.9 % in nominal and 5.8 % in real terms. This was driven by strong growth in machinery and equipment investment and construction investment. However, at 2.2 % of GDP in 2016, overall public investment has remained largely constant in recent years and is still relatively low compared with the euro area (2.8 % of GDP without Germany), despite a downward euro area trend since 2009. These developments may be partly explained by various factors that are country-specific to Germany (see Section 4.4). A public investment backlog persists in particular at municipal level, where net investment remained negative in 2015.

Labour market

Unemployment has again reached record lows and employment record highs, though this is not reflected to the same extent in full-time employment. The unemployment rate declined to a historic low of 3.9 % by the fourth quarter of 2016 (down from 4.6 % in 2015), whereas the employment rate of the population aged 20-64 increased to 78.9 % by the third quarter of 2016. However, since the crisis employment has increased more strongly than total hours worked,

and hours worked per employee have been on a downward trend for some time (Graph 1.4).

Graph 1.4: Employees, hours worked and hours worked per employee (total economy)



Source: Destatis

Wage developments have benefited only to a limited extent from the strong labour market performance. Due to undershooting inflation, real wages⁽¹⁾ increased by 1.9 % in 2016. This is welcome in view of the strong labour market performance and the need to strengthen domestic sources of growth, while the social partners do not appear to be making full use of the existing scope for sustained wage increases (European Commission, 2016a).

The population in Germany has been increasing in recent years, with immigration peaking in 2015. While the population in Germany shrank between 2002 and 2010, this trend has reversed over the last six years, with cumulative positive net immigration of 2.9 million people. In 2015, 2.1 million people migrated to Germany, while 1 million emigrated resulting in a net migration of 1.1 million people (1.4 % of total population), the highest annual inflow since the 1950s. Following the EU-Turkey agreement and the closing of the Balkans-route, the inflow of asylum seekers fell sharply from around 890 000 in 2015 to around 280 000 in 2016 (Federal Ministry of the Interior, 2016).

(1) Wages and salaries per employee deflated with the private consumption deflator.

Social developments

Despite overall positive economic and labour market developments in the last few years, income inequality has increased and moderated only recently, while wealth inequality remains among the highest in the euro area. Income inequality according to the S80/S20 indicator ⁽²⁾ rose until 2007 to 4.8 in the wake of an unfavourable labour market and the increasing weight of capital income compared to labour income. It fell to 4.3 in 2012 and rose again to 5.1 in 2014. While remaining slightly below the EU average, this was the highest recorded level. The same pattern can be observed with the Gini index. ⁽³⁾ The larger low-wage sector has created new employment possibilities but also tends to accentuate wage inequality and in-work poverty. Low upward mobility due to a relatively strong link between socioeconomic background and education outcomes also contributes to inequality (Section 4.3). In 2015, inequality according to the S80/S20 indicator fell again to 4.8, which however remains above the long-term average. While both the distribution of wealth and the composition of household wealth have remained stable over time, wealth is distributed relatively unequally compared to other European countries, owing partly to low rates of home ownership (Deutsche Bundesbank, 2016a). Net wealth inequality was among the highest in the EU (European Central Bank, 2016a).

In addition, the effectiveness of redistribution policies in reducing both inequality and poverty has declined. In 2008-2014, Germany stood out for large poverty-increasing policy effects, reflecting the fact that levels of means-tested benefits fell in real terms and relative to market income growth (European Commission, 2016b). A number of previous changes in taxation and social contributions may also have played a role in reducing the effectiveness of redistribution policies. The suspension of the wealth tax in 1997,

⁽²⁾ The S80/S20 indicator – or income quintile share – measures the disposable equivalised incomes of the richest 20 % of households as a ratio of the poorest 20 %. The EU average was 5.2 for 2015 data, meaning the richest fifth of households have 5.2 times as much income as the poorest fifth.

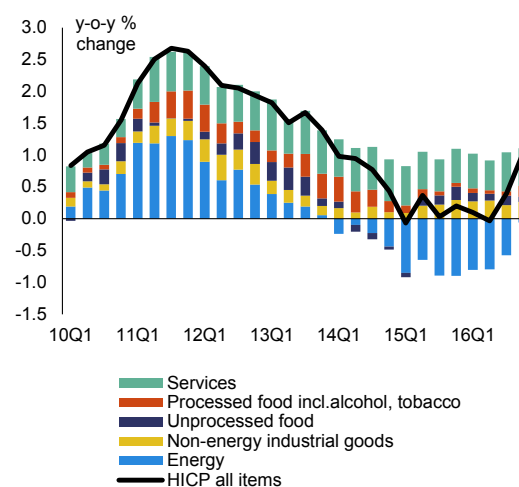
⁽³⁾ The Gini coefficient of equivalised disposable income takes values between 0 and 1 and is a measure for equal or unequal distribution with higher values indicating a higher degree of inequality.

the reduction in the top income tax rate from 53 % in 2000 to 42 % in 2004, the flat rate taxation of capital gains since 2009 and the increases in social contributions since the beginning of the 1990s have all contributed to making the tax system less progressive and possibly to rising income inequality (European Commission, 2014).

Inflation

Core and headline inflation are set to pick up. Headline inflation has shot up to 1.7 % y-o-y in December on the back of a base effect and rising energy prices (Graph 1.5). After averaging 1 % over most of 2015-2016 core inflation increased to 1.5 % in December 2016. With the increase in oil prices, headline inflation is projected to pick up in 2017 (1.9 %). Firming domestic demand and wage growth should ensure that core inflation rises in both 2017 and 2018.

Graph 1.5: Contributions to headline inflation



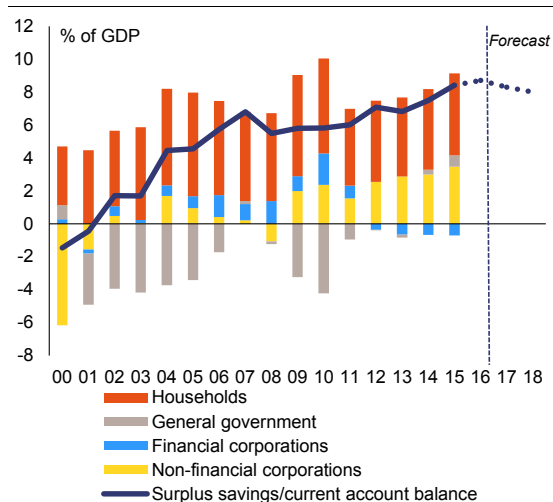
Source: European Commission

Sectoral balances

The current account surplus has increased further in 2015 and 2016, reaching a new historical high of 8.7 % of GDP. When analysed from the perspective of domestic economy, further current account widening was driven by the excess of national savings to investment (Graph 1.6). Although private borrowing picked up significantly in 2015, it remains below GDP growth and the trend of net financial asset accumulation by the private sector has continued.

Nominal corporate investment fell in 2015 and most likely also fell in 2016. Meanwhile, corporate savings increased as a share of GDP. As a result, corporations, whose indebtedness is, on aggregate, already the lowest in the euro area, continued deleveraging. This was the biggest contributing factor to the widening of the savings surplus. The household savings rate rose further in 2015 and is estimated at 17.1 % for 2016, one of the highest household savings rates in the euro area (average at 12.5 % in 2015). In 2015, household investment growth continued to lag behind savings growth, while in 2016 housing investment picked up and the net lending position of households weakened marginally.

Graph 1.6: **Sectoral net lending and current account balance**



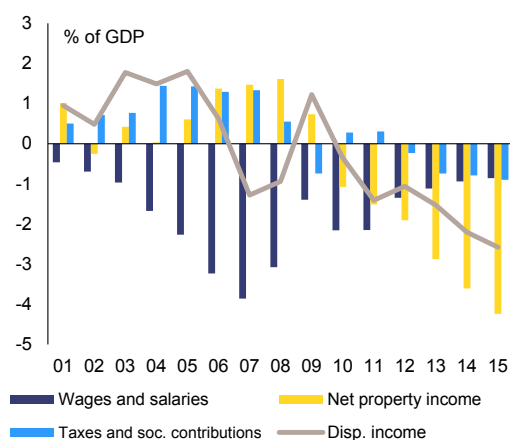
Source: European Commission

The deleveraging of non-financial corporations combined with investment restraint is a key driver of economy-wide excess savings. Companies have been raising their equity ratio and striving to rebuild their financial autonomy by scaling down debt and squeezing dividend pay-outs to owners (see Section 4.4). This has dented household incomes and the private consumption share of GDP, while the percentage of household savings in GDP has remained stable. At the same time, the GDP share of investment by nonfinancial corporations has remained low for over a decade despite the accumulation of financial buffers and favourable financing conditions. Since the swift improvement in 2010-2011, the assessment of the investment climate by enterprises has generally

been deteriorating, especially demand and financing factors. As a result, original investment plans have been carried out only partially, leaving earmarked funding unused.

The consumption share of GDP remains relatively low as the household sector has tended to stabilise saving. The share of labour income has increased since 2011, but so have the shares of income tax and social security deductions (Graph 1.7). The share of property income has been falling as a result of less generous dividend pay-outs by corporations. The saving rate has nevertheless remained stable, while consumption has declined in parallel with household disposable income as a proportion of GDP. This has not prevented an increase in real consumption as purchasing power was boosted by low inflation. Even so, the consumption share of GDP (53.5% in 2016) remains low from an historical perspective.

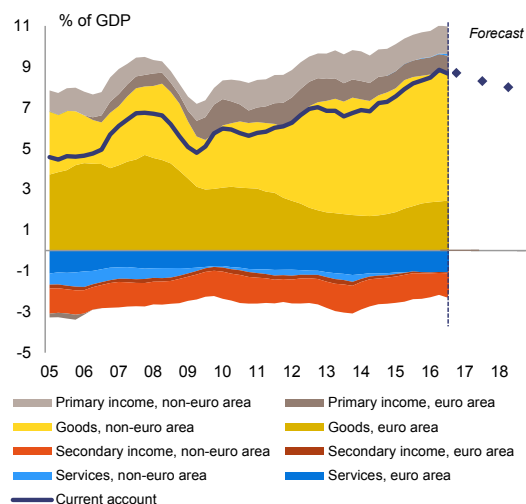
Graph 1.7: **Determinants of household disposable income**



Note: Contribution to cumulated change in disposable income since 2000

Source: European Commission

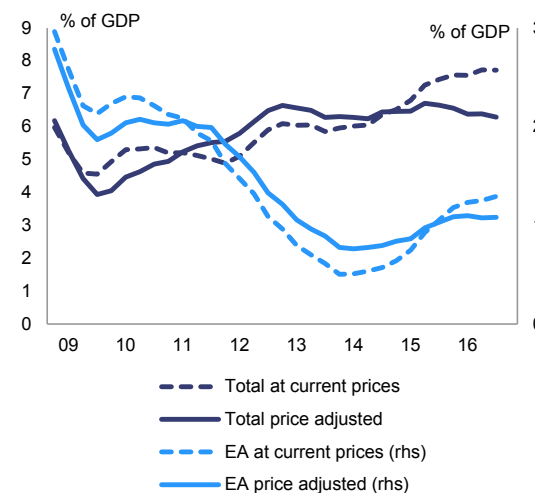
Graph 1.8: Current account and component balances



Note: four quarter moving average

Source: Bundesbank, European Commission

Graph 1.9: External balance of goods and services



(1) Four quarter moving averages

(2) Data according to European System of Accounts 2010

(3) Price adjusted balances based on chain-linked volumes with reference year 2010

Source: European Commission

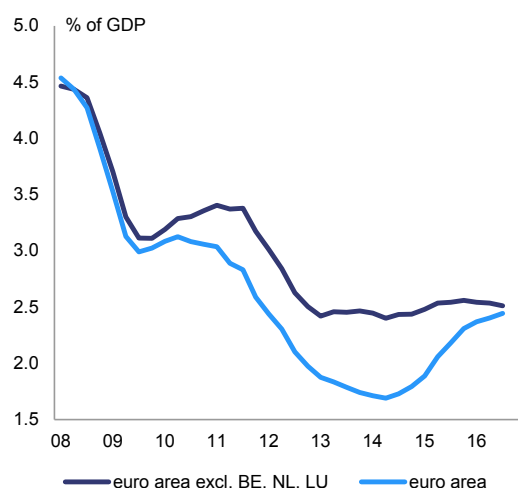
External position

The current account surplus has edged up further from a historically high level and is expected to decline only slowly in the coming years. In 2016, it increased to 8.7 % of GDP, from 8.5 % in 2015 and 7.5 % in 2014. The trade surplus is behind the level and dynamics of the current account surplus (Graph 1.8). It has increased to 8.9 %, from 8.7 % in 2015 and 7.7 % in 2014. Terms-of-trade effects, largely due to cheaper energy and other commodity prices, have accounted almost entirely⁽⁴⁾ for the widening of the trade balance by 2 pps of GDP since 2013 (Graph 1.9). Over the course of 2017, exports are forecast to pick up again as foreign demand is expected to increase, if significant downside risks are disregarded. Improved income expectations should spur domestic demand and import growth. Overall, net trade is therefore expected to detract slightly from growth over this year and next. The positive terms-of-trade effects from low oil prices are also set to fade. As a result, Germany's trade surplus could start to narrow. Nevertheless, the current account surplus is expected to remain very high and to decline only gradually over the medium term.

⁽⁴⁾ The effect of the depreciation of the euro have been assumed to be limited due to the high non-price competitiveness of German export (European Commission 2016a).

The narrowing of the current account surplus with respect to rest of the euro area observed since 2008 halted and started to reverse in 2014. The reversal mostly affected the Netherlands, Belgium and Luxembourg and was probably linked to price effects in the trade in petroleum products and other fuels (Graph 1.10). The countries with deleveraging pressures like Italy, Spain and Portugal have been less affected by this reversal, as imports originating from these countries have grown roughly in line with German GDP. In the first three quarters of 2016, the year-on-year real growth of imports originating from the euro area was higher than that of imports from outside the EU.

Germany's widening current account surplus in recent years has been driven by surpluses vis-à-vis non-euro area countries. Although widening again since 2014, the share of the surplus in relation to the rest of euro area has remained roughly stable at 20 % of the total in 2013-2016. In the pre-crisis period 2005-2009, this share averaged 60 %.

Graph 1.10: **Goods balance vis-à-vis the rest of the euro area**

Note: four quarter moving average

Source: Bundesbank, European Commission

Germany remains the most open large economy in the world with respect to both exports and imports.

German exports of goods correspond to about 47 % of its GDP. This compares to 44 % for the EU, 46 % for the euro area, about 30 % for France, Spain, Italy, the UK or Russia and as little as 18 % for Japan and 12 % for the US. However, what holds for exports also holds – albeit to a lesser extent – for imports, which correspond to about 40 % of GDP for Germany, the EU and the euro area, about 30 % for Spain, France, Italy and the UK, 21 % for Russia, 18 % for Japan and 15 % for the US.

German industries have consistently maintained positive external balances of goods and services.

In manufacturing, for instance, the share of exported output rose from 47 to 56 % between 2005 and 2014, which is about 10 pps more than for the economy as a whole. The key sectors driving this surplus are machine-building, accounting for almost half of the current account surplus, and chemicals (Table 1.1). Market services have also become increasingly internationalised. Germany's integration in the global value chain is a structural feature of its economy which is also showing up in the export content of imports. Together with the US and China, Germany is one of the few economies whose imported final products contain more than 10 % domestic input, due to their key position in the global technology chains. Nevertheless, the

share of import content in gross output and domestic demand has been stable or rising across all major sectors and demand categories over the last decade (Table 1.2).

Table 1.1: **External balance of goods and services by type of activity**

% of GDP	2005	2014
Total	5.9	6.7
Surplus sectors	6.8	8.0
Manufacturing	5.4	6.1
of which		
Automotive industry	1.4	1.6
Other equipment	2.2	2.4
Chemicals	0.8	1.0
Services	0.6	0.9
of which market services	0.9	1.2
Deficit sectors	-0.9	-1.4
of which		
Energy	-0.2	-0.5
Construction	-0.2	-0.3
Non-market services	-0.3	-0.3

Source: Stehrer et al., 2016, European Commission

Table 1.2: **Import content of outputs/products**

	05	10	14
Private consumption	10.6	11.2	12.3
Public consumption	2.6	2.8	1.6
Gross fixed capital formation	18.9	21.0	21.6
Construction	9.5	11.4	12.2
Machinery and equipment and other	26.7	29.7	30.8
Domestic demand	11.2	11.9	12.4
Exports	16.5	19.3	20.1
Gross output	9.7	11.3	12.0
Manufacturing	18.9	22.5	23.6
Services	4.2	4.7	5.0

Note: % imported inputs in value of output/products

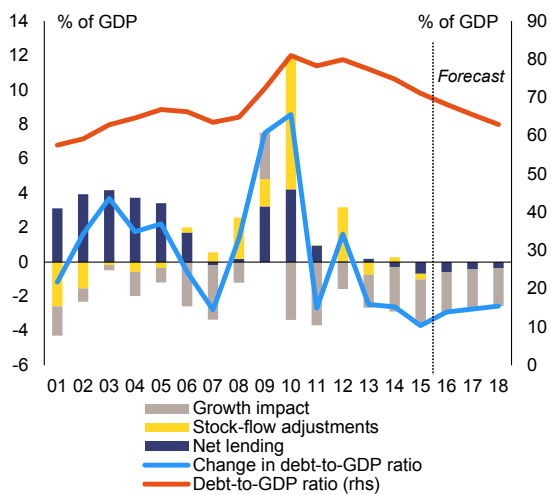
Source: Stehrer et al., 2016, European Commission

Public finances

The fiscal situation remains favourable and fiscal space available. The general government budget surplus amounted to 0.6 % of gross domestic product in 2016. In 2017-2018, total revenue is expected to stay flat as a percentage of GDP, although increases in the minimum personal income tax allowance and child allowances and an adjustment of income tax brackets (to offset the impact of fiscal drag) will weigh on revenue growth. At the same time, expenditure continues to benefit from declining interest expenditure. Real public investment is expected to grow slightly as a result of additional funds earmarked for infrastructure investment and social housing. Overall, the headline balance, though decreasing, is expected to remain in surplus over the forecast

period. The structural surplus is projected at around 0.4 % of GDP in 2017 and 0.3 % of GDP in 2018, hence about 1 percentage point of GDP above the medium-term objective of a structural deficit of 0.5 % of GDP. The gross debt-to-GDP ratio is set to fall from 71.2 % in 2015 to around 63 % in 2018 (Graph 1.11).

Graph 1.11: **Fiscal and debt developments**



Source: European Commission

Table 1.3: Key economic, financial and social indicators – Germany

	2004-2008	2009	2010	2011	2012	2013	2014	2015	forecast		
									2016	2017	2018
Real GDP (y-o-y)	2.0	-5.6	4.1	3.7	0.5	0.5	1.6	1.7	1.9	1.6	1.8
Private consumption (y-o-y)	0.7	0.2	0.4	1.4	1.3	0.7	0.9	2.0	2.0	1.6	1.7
Public consumption (y-o-y)	1.1	3.0	1.3	0.9	1.1	1.2	1.2	2.7	4.2	3.0	2.8
Gross fixed capital formation (y-o-y)	2.8	-10.1	5.4	7.2	-0.7	-1.1	3.4	1.7	2.5	2.1	2.5
Exports of goods and services (y-o-y)	8.3	-14.3	14.5	8.3	2.8	1.9	4.1	5.2	2.5	2.9	3.2
Imports of goods and services (y-o-y)	6.7	-9.6	12.9	7.0	-0.1	3.1	4.0	5.5	3.4	4.1	4.3
Output gap	-0.1	-4.8	-2.0	0.8	0.5	-0.4	-0.3	-0.1	-0.1	-0.1	0.1
Potential growth (y-o-y)	1.3	0.8	1.1	0.8	0.8	1.4	1.4	1.5	1.9	1.7	1.6
Contribution to GDP growth:											
Domestic demand (y-o-y)	1.1	-1.4	1.5	2.3	0.8	0.4	1.4	2.0	2.4	1.9	2.0
Inventories (y-o-y)	-0.1	-1.6	1.3	0.4	-1.6	0.5	-0.1	-0.5	-0.4	0.0	0.0
Net exports (y-o-y)	0.9	-2.6	1.3	0.9	1.3	-0.4	0.3	0.2	-0.1	-0.2	-0.2
Contribution to potential GDP growth:											
Total Labour (hours) (y-o-y)	0.1	0.1	0.2	-0.2	-0.1	0.5	0.4	0.5	0.8	0.5	0.3
Capital accumulation (y-o-y)	0.3	0.1	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.4
Total factor productivity (y-o-y)	0.8	0.6	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.9
Current account balance (% of GDP), balance of payments	5.4	5.7	5.6	6.1	7.0	6.7	7.3	8.3	.	.	.
Trade balance (% of GDP), balance of payments	5.6	4.9	5.2	4.8	6.1	6.0	6.5	7.5	.	.	.
Terms of trade of goods and services (y-o-y)	-0.9	4.6	-2.3	-2.7	-0.2	1.1	1.3	2.6	1.6	-0.2	0.0
Capital account balance (% of GDP)	-0.1	-0.1	0.0	0.1	0.0	0.0	0.0	0.0	.	.	.
Net international investment position (% of GDP)	14.9	25.0	25.7	23.2	28.0	33.8	40.2	48.7	.	.	.
Net marketable external debt (% of GDP) (1)	8.2*	20.1*	19.8*	17.1*	13.3	19.2	20.8	24.6	.	.	.
Gross marketable external debt (% of GDP) (1)	126.3	135.7	142.9	143.8	143.1	126.9	131.1	125.2	.	.	.
Export performance vs. advanced countries (% change over 5 years)	13.1	1.2	-0.2	-0.9	-6.6	-4.1	-2.0	-0.95	.	.	.
Export market share, goods and services (y-o-y)	-0.9	-1.3	-6.2	-2.0	-4.3	1.5	2.1	0.0	.	.	.
Net FDI flows (% of GDP)	1.7	1.3	1.8	0.3	1.0	0.8	2.7	1.9	.	.	.
Savings rate of households (net saving as percentage of net disposable income)	10.2	10.0	10.0	9.6	9.3	9.0	9.4	9.7	.	.	.
Private credit flow, consolidated (% of GDP)	0.3	-0.9	0.0	1.6	1.3	1.7	0.2	3.0	.	.	.
Private sector debt, consolidated (% of GDP)	114.2	113.1	106.6	102.7	102.1	102.8	99.5	99.0	.	.	.
of which household debt, consolidated (% of GDP)	64.3	61.7	59.0	56.9	56.3	55.4	54.2	53.5	.	.	.
of which non-financial corporate debt, consolidated (% of GDP)	49.8	51.4	47.6	45.8	45.8	47.4	45.3	45.5	.	.	.
Corporations, net lending (+) or net borrowing (-) (% of GDP)	1.4	2.9	4.3	2.3	2.2	2.2	2.3	2.7	3.4	3.5	3.9
Corporations, gross operating surplus (% of GDP)	26.9	25.2	26.3	25.9	24.9	24.7	25.0	25.0	25.2	25.1	25.3
Households, net lending (+) or net borrowing (-) (% of GDP)	5.7	6.2	5.8	4.7	4.9	4.8	4.9	5.0	4.9	4.7	4.2
Deflated house price index (y-o-y)	-1.6	1.2	-0.9	1.4	2.0	2.0	2.2	4.1	.	.	.
Residential investment (% of GDP)	5.1	5.1	5.2	5.6	5.8	5.8	5.9	5.9	6.0	.	.
GDP deflator (y-o-y)	0.9	1.8	0.8	1.1	1.5	2.0	1.8	2.0	1.4	1.8	1.6
Harmonised index of consumer prices (HICP, y-o-y)	2.1	0.2	1.1	2.5	2.1	1.6	0.8	0.1	0.4	1.9	1.5
Nominal compensation per employee (y-o-y)	0.9	0.2	2.6	3.0	2.5	1.8	2.8	2.4	2.3	2.7	2.8
Labour productivity (real, person employed, y-o-y)	1.1	-5.7	3.8	2.3	-0.7	-0.1	0.8	0.8	0.9	.	.
Unit labour costs (ULC, whole economy, y-o-y)	-0.2	6.3	-1.2	0.7	3.2	1.9	2.0	1.6	1.5	1.8	1.7
Real unit labour costs (y-o-y)	-1.1	4.4	-1.9	-0.4	1.6	0.0	0.2	-0.3	0.0	0.0	0.0
Real effective exchange rate (ULC, y-o-y)	-1.6	4.2	-4.6	-0.3	-1.1	4.1	2.0	-2.9	1.3	0.9	-0.1
Real effective exchange rate (HICP, y-o-y)	0.1	1.0	-5.2	-0.7	-3.3	2.1	0.8	-4.3	1.6	-1.0	.
Tax rate for a single person earning the average wage (%)	42.2	41.3	39.2	39.9	39.8	39.4	39.5	39.7	.	.	.
Tax rate for a single person earning 50% of the average wage (%)	31.8*	31.1	30.4	31.2	31.1	30.8	30.8	31.0	.	.	.
Total Financial sector liabilities, non-consolidated (y-o-y)	5.5	-4.8	-0.3	2.6	3.7	-5.6	5.6	2.5	.	.	.
Tier 1 ratio (%) (2)	.	10.2	11.3	11.6	13.8	15.2	14.6	15.3	.	.	.
Return on equity (%) (3)	.	-2.7	2.3	2.3	1.3	1.3	2.5	1.7	.	.	.
Gross non-performing debt (% of total debt instruments and total loans and advances) (4)	.	2.7	2.4	1.6	1.7	1.8	2.5	2.0	.	.	.
Unemployment rate	9.5	7.6	7.0	5.8	5.4	5.2	5.0	4.6	4.1	4.1	4.1
Long-term unemployment rate (% of active population)	5.2	3.5	3.3	2.8	2.4	2.3	2.2	2.0	.	.	.
Youth unemployment rate (% of active population in the same age group)	13.0	11.1	9.8	8.5	8.0	7.8	7.7	7.2	7.0	.	.
Activity rate (15-64 year-olds)	74.5	76.3	76.7	77.3	77.2	77.6	77.7	77.6	.	.	.
People at risk of poverty or social exclusion (% total population)	19.8	20.0	19.7	19.9	19.6	20.3	20.6	20.0	.	.	.
Persons living in households with very low work intensity (% of total population aged below 60)	12.2	10.9	11.2	11.2	9.9	9.9	10.0	9.8	.	.	.
General government balance (% of GDP)	-1.8	-3.2	-4.2	-1.0	0.0	-0.2	0.3	0.7	0.6	0.4	0.4
Tax-to-GDP ratio (%)	38.8	39.6	38.2	38.7	39.3	39.6	39.7	40.0	40.2	40.2	40.3
Structural budget balance (% of GDP)	.	.	-1.9	-1.2	-0.2	0.1	0.7	0.7	0.7	0.4	0.3
General government gross debt (% of GDP)	65.3	72.4	81.0	78.3	79.9	77.5	74.9	71.2	68.2	65.5	62.9

(1) Sum of portfolio debt instruments, other investment and reserve assets.

(2) Domestic banking groups and standalone banks.

(3) Domestic banking groups and standalone banks, foreign-controlled (EU and non-EU) subsidiaries and foreign-controlled (EU and non-EU) branches.

(*) Indicates BPM5 and/or ESA95

Source: European Commission, ECB

2. PROGRESS WITH COUNTRY-SPECIFIC RECOMMENDATIONS

Progress with the implementation of the recommendations addressed to Germany in 2016 has to be seen in a longer term perspective since the introduction of the European Semester in 2011. ⁽⁵⁾

In recent years, the Federal Government has taken a number of measures to strengthen its own investment spending and to support public investment at the level of federal states and municipalities. However, this has not yet produced a clear upward trend in the public investment-to-GDP ratio at general government level (see Section 4.4). Public spending on education and R&D as a proportion of GDP at general government level has remained stable in recent years. Multiannual progress has been limited in other policy fields. Reform efforts to improve the efficiency of the tax system and modernise tax administration have remained limited in scope, and no measures have yet been taken to comprehensively review corporate taxation and the local trade tax. To date, there is no strategy to substantially modernise the regulated professions and to strengthen competition in the services sector beyond minor adjustments. First steps have been taken to improve incentives to retire later after the pension reform 2014 facilitated earlier retirement. Measures to reduce the high tax wedge for low-wage earners have been limited to the regular adjustments of the minimum personal income tax allowances and tax rates to account for changes in the subsistence level or the impact of fiscal drag. To date, no initiatives have been taken regarding second earners and mini-jobs, in particular with a view to incentivising women to take up full-time jobs.

Overall, Germany has made limited progress in addressing the 2016 country-specific recommendations (CSRs). ⁽⁶⁾ Some progress has been made in increasing public investment in line with CSR 1. The Federal Government has further relieved federal states and municipalities of social expenditure, and a reform of federal fiscal relations has been agreed (Box 4.4.3). At the same time, education and research expenditure as a proportion

of GDP has remained largely stable in recent years. Only limited progress has been made on CSRs 2 and 3. While some simplification in certain areas of taxation and better conditions for venture capital can be expected, there have been no initiatives to review business taxation. Moreover, a strategy to substantially improve competition in the services sector, beyond minor adjustments, is lacking. The measures taken or announced to make the transition of older workers into retirement more flexible and to adjust personal income tax rates and allowances can be expected to have only a limited impact on improving incentives to work.

⁽⁵⁾ For the assessment of other reforms implemented in the past, see Section 4.

⁽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 (SGP).

Table 2.1: Summary table on 2016 CSR assessment

Germany	Overall assessment of progress with 2016 CSRs: Limited
<p>CSR 1: <i>Achieve a sustained upward trend in public investment, especially in infrastructure, education, research and innovation, while respecting the medium term objective. Improve the design of federal fiscal relations with a view to increasing public investment, especially at municipal level. (MIP relevant)</i></p>	<p>Some progress</p> <ul style="list-style-type: none"> • Some progress in increasing infrastructure investment. • Limited progress in raising public expenditure on education. • Limited progress in increasing public expenditure on research and innovation. • Some progress in improving the conditions for public investment at all levels of government.
<p>CSR 2: <i>Reduce inefficiencies in the tax system, in particular by reviewing corporate taxation and the local trade tax, modernise the tax administration and review the regulatory framework for venture capital. Step up measures to stimulate competition in the services sector, in particular in business services and regulated professions. (MIP relevant)</i></p>	<p>Limited progress</p> <ul style="list-style-type: none"> • Limited progress in reducing inefficiencies in the tax system. • Limited progress in modernising the tax administration. • Some progress in reviewing the regulatory framework for venture capital. • Limited progress in stimulating competition in the services sector.
<p>CSR 3: <i>Increase incentives for later retirement and reduce disincentives to work for second earners. Reduce the high tax wedge for low wage earners and facilitate the transition from mini-jobs to standard employment. (MIP relevant)</i></p>	<p>Limited progress</p> <ul style="list-style-type: none"> • Limited progress in increasing incentives for later retirement. • No progress in reducing disincentives to work for second earners. • Limited progress in reducing the high tax wedge for low wage earners. • No progress in facilitating the transition from mini-jobs to standard employment.

Source: European Commission

Box 2.1: Contribution of the EU budget to structural change

Germany is a beneficiary of European Structural and Investment Funds (ESI Funds) support and will receive up to EUR 27.9 billion for the period 2014-2020. This is equivalent to 4 % of national public investment. ⁽¹⁾ Of the EU financing EUR 1.2 billion is planned to be delivered via financial instruments (an increase by 18 % in comparison with the 2007-2013). By 31 December 2016, an estimated EUR 10.1 billion, which represents about 36 % of the total allocation for ESI Funds, have already been allocated to concrete projects.

Financing under the European Fund for Strategic Investments, Horizon 2020, the Connecting Europe Facility (CEF) and other directly managed EU funds is additional to the ESI Funds. By end 2016, Germany has signed agreements for EUR 1.9 billion for projects under the Connecting Europe Facility. The EIB Group approved financing under EFSI amounts to EUR 3.1 billion, which is expected to trigger over EUR 15 billion in total investments (as of end 2016).

All necessary reforms and strategies have been put in place in order to fulfil ex-ante conditionalities ⁽²⁾ in those areas which benefit from the Funds in order to ensure successful investments.

All relevant CSRs were taken into account when designing the 2014-2020 programmes. These included in particular increased investments in R&D and measures to enhance participation and integration in the labour market, especially for the long-term unemployed. The ESI Funds play a role in strengthening job creation, boosting a strong Research and Innovation environment in order to enhance the cooperation between research institutions and enterprises, increase firms' ability to bring their products to market and further improve innovation. The funds also support local and regional development.

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

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

⁽²⁾ At the adoption of programmes, Member States are required to comply with a number of ex-ante conditionalities, which aim at improving framework and investment conditions for the majority of areas of public investments. For Members States that do not fulfil all the ex-ante conditionalities by the end 2016, the Commission has the possibility to propose the temporary suspension of all or part of interim payments.

3. SUMMARY OF THE MAIN FINDINGS FROM THE MIP IN-DEPTH REVIEW

The Alert Mechanism Report 2017 called for further in-depth analysis to monitor progress in unwinding the imbalances identified in the 2016 macroeconomic imbalance procedure (MIP). The macroeconomic imbalances relate to Germany's very large and increasing current account surplus and strong reliance on external demand, which expose growth risks and underline the need for continued rebalancing towards domestic sources.

Analysis integrated into this report provides an in-depth review (IDR) of how the imbalances identified have developed. In particular IDR relevant analysis is found in the following Sections: public finances, fiscal frameworks and taxation in Section 4.1, issues relating to the banking sector and housing market in Section 4.2, labour market, education and social policies in Section 4.3, investment in Section 4.4, and sectoral policies in Section 4.5.

3.1. Imbalances and their gravity

The very large current account surplus reflects not only the successful export orientation of Germany's manufacturing sector, but also an accumulated excess of national savings to investment. In principle, a current account surplus is in line with the structural characteristics of the German economy. However, the pace at which it has been accumulated and its persistence cannot be explained by fundamental factors alone. ⁽⁷⁾ Rather, the surplus is the result of the interplay between various domestic and external factors, including the two negative private investment shocks after the bursting of the internet and the financial market bubbles and, more recently, a significant positive terms-of-trade effect despite the depreciation of the euro. ⁽⁸⁾ These factors have over time pushed up

net savings across all sectors of the economy, while at the same time restraining private consumption and private and public investment. Overcoming investment weakness is also seen as a key factor in boosting potential GDP in Germany, thereby preparing the economy for demographic change.

Private investment has remained restrained despite the low interest rate environment. Private investment constitutes around 90 % of total investment. Although private investment has largely bounced back to pre-crisis levels after 2009, investment in machinery and equipment, in particular, has not matched pre-crisis growth and non-residential construction investment has stagnated after years of decline prior to the crisis (see Graphs 1.2 and 1.3). Uncertainty over business prospects may have contributed to investment restraint in recent years. However, a more forceful pick-up could still have been possible in view of favourable financing conditions and low interest rates. This suggests it may be useful to review potential obstacles to private investment beyond uncertainty. This includes inefficiency in corporate taxation, the administrative burden, the underdeveloped venture capital market, regulatory restrictiveness in the services sector, and implementation delays in electricity and broadband infrastructure projects.

Public investment has been subdued and consistently below the euro area average for a long time. This reflects a gradual scaling back of investment in maintenance and expansion of public infrastructure. 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. The 2014 in-depth review identified an additional annual public investment requirement of ½ to 1 % of GDP (about EUR 15-30 billion) over the coming years to

⁽⁷⁾ European Commission (2014), European Commission (2016a) and IMF (2016) among others can only partly explain the high level of the current account by models that try to identify fundamental factors, such as manufacturing intensity and ageing.

⁽⁸⁾ See European Commission (2014) for an overview of various external factors that contributed to Germany's high current account surplus. In particular, the increase in the German current account surplus coincided with the introduction of the euro, which reduced sovereign risk premia across the euro area. It has also been supported by the increase in the size of the single market due to EU

enlargement and the expansion in world trade, with the German manufacturing sector successfully reaping the benefits of globalisation through global value chains both on the export and the import side. Although these reasons go some way to explaining the strength of Germany's exports, the relatively subdued import growth has also contributed to the size and persistence of the country's trade surplus.

maintain and modernise Germany's public infrastructure and remove specific bottlenecks. (European Commission, 2014) The design of federal fiscal relations may have contributed to protracted underinvestment, especially at municipal level, where net investment has been markedly negative over several years until 2015.

Sluggish consumption growth also contributed to subdued domestic demand and 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. Wage growth has accelerated since 2008, but not to the extent the tightening labour market situation and unit labour costs in relation to the euro area average would suggest. In addition, disincentives to work for certain groups are reducing labour supply, disposable income and consumption opportunities. These include a high tax wedge, especially for low wage earners, disincentives for second earners to increase working hours and the favourable fiscal treatment of mini-jobs.

3.2. Evolution, prospects, and policy responses

The current account surplus has continued to grow and is likely to remain high. While terms-of-trade effects account for a significant part of the recent increase in the external surplus, economy wide deleveraging has resulted in a further widening of the domestic saving-investment balance. The current account surplus is expected to remain very high, above the MIP threshold, and to decline only gradually over the medium term (see Section 1).

The private investment-to-GDP ratio has remained unchanged. Non-financial corporations have continued accumulating equity buffers and scaling down debt financing. They have not used the additional savings or tapped the liquid bank credit market to increase domestic investment spending, which has grown more slowly than before the crisis. The continued weakness of business investment in recent years remains at odds with highly supportive conditions for capital formation, such as healthy corporate balance sheets, very low interest rates and a stronger cyclical position. While some steps have been taken to improve the regulatory framework for

venture capital, limited progress has been made in improving the efficiency of corporate taxation and stimulating competition in the services sector.

There is still no clear upward trend in the public investment-to-GDP ratio. Public investment as a proportion of GDP has remained largely constant and is below the euro area average (see Section 4.4). This is despite the measures taken over the last few years and strong increases in public investment at general government level in 2015 and 2016. Net investment remained negative at municipal level in 2015. Additional measures were taken in 2016 which should increase the scope for public investment, including at federal state and municipal level, such as a reform of federal fiscal relations. A planned federal transport infrastructure company and an infrastructure investment consulting service for municipalities could help break down important barriers to public investment (see Section 4.4). This could also contribute to wider benefits of EU funding instruments.

While the recovery in private consumption has continued, household savings have reached record high levels. The low interest rate environment may have exacerbated households' propensity to save instead of incentivising investment or consumption. Real wages increased more dynamically in 2016, but this reflects undershooting inflation rather than more ambitious wage agreements. Moreover, an increase in the wage share has been offset by higher income taxes and social contributions. In fact, tax revenue as a proportion of GDP has increased owing to the favourable economic and labour market situation (see Section 4.1). Measures to limit the tax burden on labour have remained modest, while disincentives to increase hours worked remain in place for second earners and mini-job holders.

3.3. Overall assessment

Germany runs a persistently large current account surplus, which reflects an excess of saving over investment, but also a highly competitive manufacturing sector. The size and persistence of the surplus can only be partly explained by the industrial structure and other characteristics of the German economy. In fact, 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. By contrast, private consumption is at the root of the ongoing shift towards more domestic demand-driven robust growth. At the same time, consumption and investment have remained at relatively low levels in light of the favourable cyclical, labour market and financing conditions and infrastructure investment needs.

Continued relatively weak investment also undermines Germany's future growth potential. Private consumption has strengthened somewhat and is expected to continue doing so. At the same time, private investment has remained restrained, despite the favourable financing conditions. Public investment has picked up, though budget projections indicate scope under EU and national fiscal rules for increasing public investment further. Persistently low investment could hamper Germany's economic growth in the long term. Stronger capital accumulation would be needed to increase potential growth in the future, especially if immigration slows down and population ageing intensifies.

Given the German economy's size and strong trade and financial linkages with the rest of the euro area, further strengthening its domestic demand would also lend support to the euro area aggregate demand and inflation. Existing economic challenges for the German economy also have wider implications for the euro area. This is of particular relevance in a context of low growth and low core inflation. Even more dynamic domestic demand in Germany could help firm up the ongoing euro area recovery, overcome the risk of a 'low growth, low inflation' trap and ease deleveraging needs faced by highly indebted Member States. For illustrative purposes, the effects of an increase in public investment and a reduction in the personal income tax on domestic and foreign GDP are presented in Box 3.1.

Overall, the policy response to address the imbalances has so far remained limited. Although relieving municipalities of certain social spending obligations and the agreed reform of federal fiscal relations will strengthen the fiscal

position of the federal states and municipalities, it still remains to be seen to what extent this additional fiscal space will actually be used for additional public investment. A federal transport infrastructure company can be expected to accelerate public investment. On the other hand, the reform falls short of increasing the tax autonomy of the federal states 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-wage earners and disincentives to work for second earners with a view to supporting, labour market participation, disposable income and consumption.

Box 3.1: Euro area spillovers

The very large size and the close economic and financial integration of the German economy with the rest of the EU make it a potentially important source of spill-overs to other Member States along the trade and financial channels. The three Member States most exposed to Germany via gross trade channels are the Czech Republic, Hungary and Slovakia although six other Member States show large trade exposures worth more than 10 % of domestic GDP. ⁽¹⁾ Overall, Germany-bound gross exports are worth approximately 6 % of GDP of the rest of the euro area (EA). Excluding Luxembourg, financial exposures to Germany are particularly large for Ireland and the Netherlands, where they are worth more than 60 % and 70 % of local GDP, respectively. ⁽²⁾ Overall, the euro area shows total financial exposures to Germany worth more than 25 % of GDP, mostly through the form of debt.

Based on the European Commission's QUEST ⁽³⁾ model, this box compares the effect of an increase in public investment and a reduction in personal income tax on domestic and foreign economic activity. For illustrative purposes, both these fiscal shocks are normalised at 1 % of GDP, remain active for 10 years and are afterwards gradually decreasing. On impact, this implies an increase of public investment by about 50 % in the investment scenario and an increase in disposable income of about EUR 30 billion in the tax scenario. There are no compensating fiscal measures over the same period. Furthermore, to mimic a monetary policy that is constrained at the zero lower bound, the scenarios assume unchanged monetary policy rates in the first two years despite the demand stimulus.

The domestic GDP multiplier is larger in the investment scenario than in the tax scenario (Graph 1). Increasing investment raises real GDP in Germany by 1 % on impact. As investment is productive, the GDP multiplier increases over time, stimulating private investment as well as employment and wage growth. ⁽⁴⁾ In turn, the tax reduction raises real GDP by 0.2 % on impact. Consumption smoothing implies that higher household disposable income is only partially spent, leading to a lower domestic demand increase on impact and lower GDP multiplier over time. The lower tax wedge on labour triggers higher employment and aggregate supply and increases the tax multiplier, and an assumed delayed decline in prices. ⁽⁵⁾

Spillovers to other euro area countries are larger in the event of an investment increase. Stronger German import demand increases real GDP by around 0.4 % in the Netherlands, France, Italy, Spain, and the rest of the euro area, when high investment efficiency and no monetary reaction for two years is assumed. This goes hand in hand with a decrease in the German current account balance, while the current account balance of other euro area Member States increases on impact and before converging towards zero. In addition, the effect on inflation is positive, thus causing a stronger impact on nominal GDP. In turn, the tax scenario triggers slightly negative spillovers. The smaller immediate effect on domestic demand implies lower import growth than in the public investment scenario, while an increase in German cost competitiveness due to lower wage claims and labour costs contributes negatively to the export performance and, thus, GDP in other euro area countries. Consequently, the decrease in the current account balance is smaller. The effect on inflation is negative. ⁽⁶⁾

⁽¹⁾ Based on UN data for 2014.

⁽²⁾ European Commission bilateral data for 2014 covering all economic sectors, based on Hobza and Zeugner (2014).

⁽³⁾ Detailed information on the QUEST model and applications are available at: http://ec.europa.eu/economy_finance/research/macroeconomic_models_en.htm.

⁽⁴⁾ The investment shock raises the stock of public capital that enters the production function of the economy. The parameter determining the productivity of public capital in the production function is set to estimates for the productivity impact of public infrastructure. A detailed discussion can be found in in't Veld (2016).

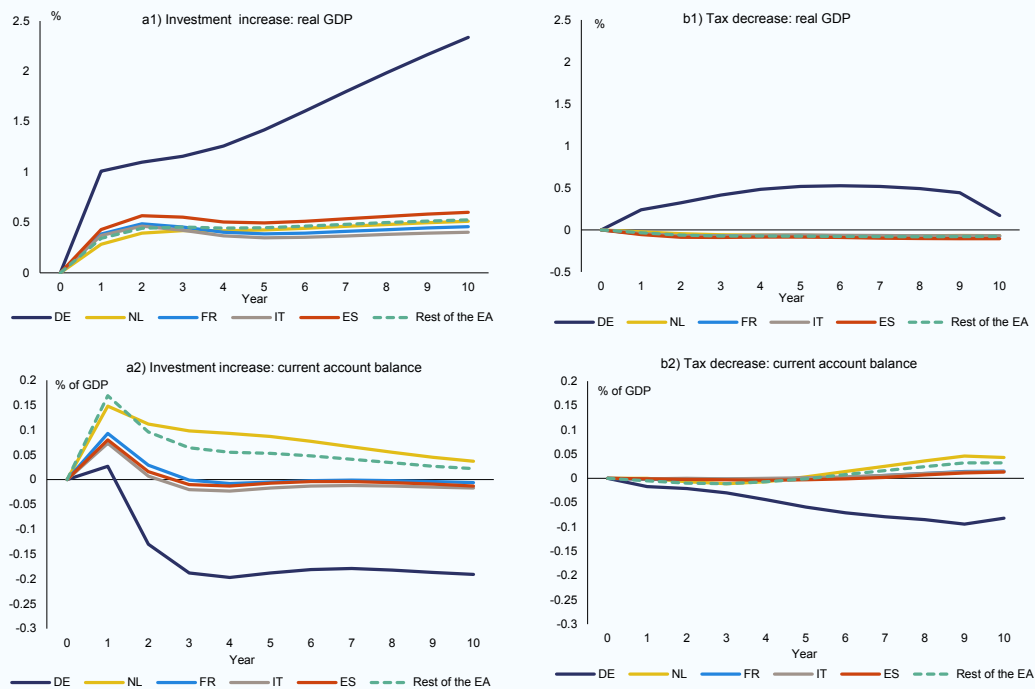
⁽⁵⁾ The domestic GDP multiplier of the tax decrease would be larger if the measure explicitly targeted low-wage earners. It would decrease the impact of consumption smoothing as low-wage earners have a high propensity to consume. If the increase in disposable income is spent fully, the domestic GDP multiplier increases to 0.6 % on impact. At the same time, it would reduce the current account balance more significantly due to stronger import demand.

⁽⁶⁾ While the analysis of this box focuses on stand-alone scenarios for Germany, estimations based on the QUEST model suggest a higher GDP multiplier if the current scenarios were complemented by the simultaneous implementation of structural reforms in other EU Member States (see Varga and in't Veld, 2014), pointing also to the importance of inward spillovers to Germany from the rest of EU.

(Continued on the next page)

Box (continued)

Graph 1: Fiscal expansion in Germany with monetary accommodation



Source: European Commission

Increasing interest rates in response to rising demand and higher inflation affects the size of fiscal shocks. The short-to-medium term domestic GDP multiplier in the investment scenario decreases, as interest sensitive private demand is crowded out. Spillovers are also reduced due to lower import demand and a negative response of interest-sensitive demand in other euro area countries. In turn, the domestic GDP multiplier in the tax scenario increases slightly. The monetary policy rate is reduced by wage moderation and falling prices, stimulating interest-sensitive private demand in all euro area countries. Spillovers move from slightly negative to zero.

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 reached close to 9 % of GDP in 2016. Accumulated surpluses have resulted in a large positive net international investment position, which reached 48.7 % 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>While euro area partners benefit from supply chain integration with Germany, weak domestic investment and the reliance on weakening external demand pose risks to Germany's potential growth and amplify the euro area demand shortfall.</p> <p>As deleveraging pressures still weigh on EU growth, strengthening domestic demand in Germany would benefit both Germany and its euro area and EU partners in particular now in view of the zero lower bound at which monetary policy operates (see Section 3.3).</p>	<p>The German surplus is projected to persist at more than 8 % of GDP in the medium term. Low energy prices and exchange rate developments partly explain the further increase in 2014-2016, in particular a decline in the import ratio (see Section 1). The uncertain external environment and a still fragile euro area recovery point to continuing risks concerning the implications of existing German imbalances for euro area growth.</p> <p>Real private consumption has strengthened, by 1.1 % in 2015, but declined as a share of GDP. 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 remains sluggish at 17.8 % of GDP. Investment in equipment is weak and remains below pre-crisis levels despite supportive growth and funding conditions, including a strengthening equity position.</p> <p>Public investment picked up in 2015 and 2016, but the public capital stock is still declining. Until 2015, there has been no reversal of the markedly negative net investment at municipal level. Current federal fiscal relations have not ensured adequate public investment at the level of municipalities.</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 (see Section 4.4).</p> <p>Germany has used its available fiscal space only to a limited extent and has not taken advantage of exceptionally favourable financing conditions to meet its investment needs and improve conditions for private investment (see Section 4.1).</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 may alleviate administrative constraints on public infrastructure investment.</p> <p>Limited efforts have been made to stimulate competition in the services sector, improve the efficiency of the tax system or reduce the high tax wedge, especially for low wage earners. No measures have been taken to reduce disincentives for second earners or facilitate the transition from mini-jobs to standard employment.</p>
Conclusions from IDR analysis			
	<ul style="list-style-type: none"> Germany is running a persistently large current account surplus reflecting saving in excess of investment in both the private and public sector. Persistently weak domestic investment could constrain potential growth in the long term. Combined with the reliance on external demand, this could entail macroeconomic risks and affect the rebalancing and growth prospects of the rest of the euro area, given its aggregate demand shortfall. While private consumption has strengthened somewhat, private investment has remained restrained, despite the favourable financing conditions. Private consumption is hampered by continued wage moderation despite a rather tight labour market, a rising 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 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. 		

(*) The first column summarises 'gravity' issues which aim at providing an order of magnitude of the level of imbalances. The second column reports findings concerning the 'evolution and prospects' of imbalances. The third column reports recent and planned measures to address these. Findings are reported for each source of imbalance and adjustment issue. The final three paragraphs of the matrix summarise the overall challenges in terms of their gravity, developments and prospects and policy response.

Source: European Commission

4. REFORM PRIORITIES

4.1. PUBLIC FINANCES, FISCAL FRAMEWORKS AND TAXATION* (9)

Budget projections indicate scope under EU fiscal rules, while the leeway under national fiscal rules appears more limited. The Commission 2017 winter forecast, which covers the period 2017-2018, projects that the structural balance will stay about 1 % of GDP above the medium-term objective and that the debt ratio will remain on a firm downward path beyond the requirement of the debt rule. This is also due to the very low interest rate environment and the ‘safe haven’ status of German public debt. There is less scope for increasing public investment under the national ‘debt brake’ that has set a structural deficit limit of 0.35 % of GDP for the federal budget since 2016. However, a structural balance of around 0 % of GDP in 2017 and 2018 (as projected by the 2016 Stability Programme) suggests that some space may be available in the federal budget (Table 4.1.1).

Table 4.1.1: **Budgetary projections for Germany compared to European and national deficit ceilings**

(% of GDP)	2015	2016	2017	2018
General government balance (1)	0.7	0.6	0.4	0.4
Deficit ceiling	-3	-3	-3	-3
Difference	3.7	3.6	3.4	3.4
Structural balance (1)	0.7	0.7	0.4	0.3
Medium-term objective	-0.5	-0.5	-0.5	-0.5
Difference	1.2	1.2	0.9	0.8
<i>National debt brake for the federal budget</i>				
Structural balance (2)	0.1	-0.2	-0.1	0.0
Structural deficit ceiling	-0.4	-0.4	-0.4	-0.4
Difference	0.5	0.2	0.3	0.3
Debt gap (negative value means compliance) (3)	-5.3	-4.7	-4.8	-4.5

(1) European Commission Winter Forecast 2017

(2) German Stability Programme 2016

(3) Commission calculations

Source: European Commission, European Commission 2017, Federal Ministry of Finance, 2016a

Tax revenue continues a favourable path. Tax revenue took a hit after the financial crisis, but has regained strength since 2010 and increased by about 1.7 percentage points of GDP in the period until 2015. The Commission’s 2017 winter forecast projects the tax ratio to stay flat over the period 2016-2018. Notably, the latest projection of

tax revenue undertaken by the Ministry of Finance suggests that tax revenue is projected to rise over 2016-2020 by about 0.6 % of GDP. Assuming a largely constant expenditure-to-GDP ratio, and that the revenue-to-GDP ratio is kept constant, this suggests room of about EUR 19 billion that could be used for a targeted reduction in labour taxes.

The tax wedge for low income workers is still among the highest in the EU and disincentives for second-earners persist. In 2015 the tax wedge amounted to 45.3 %, among the highest in the EU-28, reducing take-home pay and consumption opportunities.⁽¹⁰⁾ To ensure that the subsistence level remains tax-free and to offset the impact of fiscal drag, the minimum personal income tax allowance and child allowances have been increased and income tax brackets have been adjusted. These measures tend to benefit low and middle income groups because they are affected by fiscal drag relatively stronger than high income groups. However, their impact on the tax wedge will be limited. In addition, joint taxation of income for married couples (*Ehegattensplitting*), in addition to other non-tax related factors (see Section 4.3.1) remain disincentives to work for second earners – in many cases women (European Commission, 2016a and Böhmer *et al.*, 2014).

Several options are being discussed to reduce the tax burden on labour for low-wage earners, as has been consistently included in the country-specific recommendations to Germany.

The current political debate focusses partly on possible scenarios to reduce or remove the steep increase in the marginal tax rate for middle and low income groups in personal income taxation (*‘Mittelstandsbauch’*). Other reform scenarios to relieve middle and low income groups from taxation that are currently under discussion include a reduction or abolition of the solidarity surcharge and reductions in social contributions for low-wage earners. Such reforms are likely to also

(9) An asterisk indicates 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).

(10) In a recent paper focussing on Austria, Belgium, Germany and Italy, Attinasi *et al.* (2016) show that a budget-neutral reduction of the tax wedge could positively affect private consumption and reduce unemployment, provided the measures taken to ensure budget neutrality do not negatively affect private sector productivity or investment.

impact on the high tax wedge for low-wage earners. Box 4.1.1 analyses the distributional and fiscal effects of certain reform scenarios to relieve middle and low-wage earners from taxation.

The overall income tax burden on corporations remains high, while the tax system is complex and includes inefficiencies. When accounting for the local trade tax (*Gewerbesteuer*) and the solidarity surcharge, the top statutory tax rate on corporate income reached 30.2 % in 2016.⁽¹¹⁾ This was substantially above the non-weighted EU average of 22.8 %. The effective average tax rate is 28.2 % compared with a non-weighted average of 21.1 % for the EU. The debt bias, which arises from a differential tax treatment of equity and debt, was the eighth highest in the EU in 2016. The corporate tax reforms of 2001 and 2008 have increased the relative attractiveness of retained earnings as a source of funding, but have not eliminated the debt bias. In addition, the local trade tax is prone to inefficiencies due to the inclusion of non-profit elements in the tax base.⁽¹²⁾ In addition to the high level of corporate taxation, the tax system is complex and tax administration costs are high (see Section 4.4.2).

The planned strengthened competence of the Federal Government in the area of tax administration could help optimise the administration's performance. If implemented effectively, additional general and IT-specific functional authority of the federal tax administration in relation to the states' tax administrations as agreed as part of the reform of federal fiscal relations could facilitate an accelerated modernisation of the tax administration. The fight against tax fraud and evasion, both at national and international level, could benefit from such modernisation. For instance, modernisation could pave the way for addressing the currently strictly limited exchange of data between the different tax administrations

⁽¹¹⁾ Based on the Berlin rate for the trade tax of 14.35 %. In 2012, the average trade tax rate for Western Germany was 13.29 % and for Eastern Germany 12.99 %.

⁽¹²⁾ On the other hand, the inclusion of non-profit elements reduces the cyclical nature of the tax base. The local trade tax is the most significant tax for which municipalities can autonomously set the tax rate. It appears to be rather unsuitable for the local level, however, since its tax base is mobile, strongly cyclical and unequally distributed across municipalities and federal states (see European Commission, 2016a).

and for involving the federal states in cooperation with other Member States at EU level.

Several additional measures to curb tax evasion and avoidance have been proposed by the Federal Government. The measures partly respond to new EU transparency rules. Moreover, the Federal Government put in place, among other things, new requirements for electronic cash registers to curb the manipulation of sales information. On 21 December 2016, the Federal Government adopted a bill to fight tax evasion and to amend other tax provisions. This draft law contains national provisions for greater transparency, including the abolition of bank secrecy for tax purposes and the introduction of reporting requirements for financial institutions on letterbox companies.

The Federal Government has adopted legislation defining the preparation and endorsement process for the macroeconomic forecasts that underpin budgetary projections. The Commission Opinion on Germany's Draft Budgetary Plans for 2015 and 2016 (European Commission, 2016c), among others, has pointed out that no independent body in charge of producing or endorsing macroeconomic forecasts has been put in place within the meaning of Regulation (EU) No 473/2013. In response, the Federal Government has adopted a draft law that defines the preparation and endorsement process for macroeconomic forecasts. It will be complemented by implementing provisions appointing the institution responsible for the forecast endorsement.

The Federal Ministry of Finance has in the 2015/2016 cycle carried out spending reviews with a view to improving the effectiveness of federal budget spending. The first cycle of spending reviews focussed on smaller policy programmes ('support of combined traffic'⁽¹³⁾ and 'support of professional mobility of young people seeking vocational training in Germany'), with a view to setting up the assessment framework and

⁽¹³⁾ 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 loading units from the loading and unloading points. The aim of combined traffic is to strengthen environmentally friendly means of transport.

procedures. For the 2016/2017 cycle, further spending reviews are foreseen, with a focus on programmes from the policy fields ‘housing’ and ‘energy and climate’.

Box 4.1.1: Scenarios for labour taxation reforms: distributional and fiscal effects

Germany has been recommended to reduce the high tax-wedge for low wage earners. This box analyses the distributional and fiscal effects of several reform scenarios to relieve middle and low-income earners from taxation, namely (1) a flattening of the personal income tax tariff, (2) a removal of the solidarity surcharge, and (3) a combination of (1) and (2).⁽¹⁾

Reform scenario (1) addresses the steep increase in the marginal tax rate for middle and low-income earners in the current personal income tax tariff (Tariff 2016 in Table 1). The tariff includes a basic tax free allowance until an income of EUR 8 652, as well as linear increases in the marginal tax rate from 14 % to 24 % in the second tax bracket and from 24 % to 42 % in the third tax bracket. Table 1 compares the current personal income tax tariff with a reform scenario that flattens out the steep increase in the marginal tax rate for middle and low-income earners (*'Mittelstandsbauch'*).

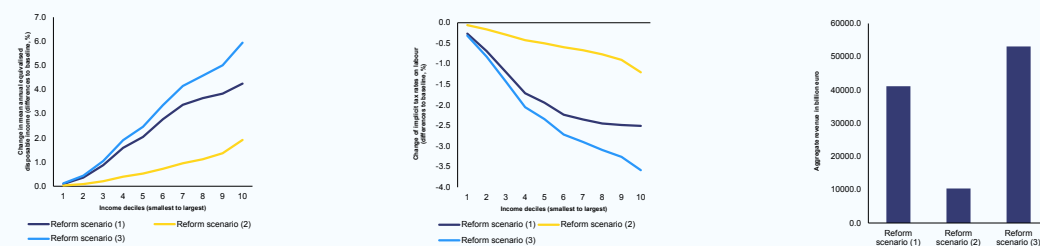
Table 1: **Reform scenario (1): current personal income tax tariff and reform scenario**

	Basic allowance	Interval 1	Interval 2	Interval 3	Interval 4
Tariff 2016	8,652	8,652	13,669	53,665	254,446
Tax rates	0	14	24	42	45
Reform scenario	8,652	8,652	53,665	254,446	
Tax rates	0	14	42	45	

Source: European Commission

Simulations based on EUROMOD⁽²⁾ show a relief of middle and low-incomes across three reform scenarios. For reform scenario (1), the estimated average increase in annual equivalised disposable income amounts to 2.9 %, with a positive effect for all income deciles. Removing of the solidarity surcharge as foreseen in reform scenario (2), in turn, would result in an average increase in mean disposable income of 1 %, while the effect of reform scenario (3) would amount to about 3.7 %. The effect on the tax wedge measured by implicit tax rates on labour would be similar (Graph 1).⁽³⁾ The fiscal costs amount to EUR 41 billion for reform scenario (1), 10 billion for reform scenario (2)⁽⁴⁾ and 53 billion for reform scenario (3).

Graph 1: **Distributional and fiscal effects of reform scenarios**



Source: European Commission, Joint Research Centre based on the EUROMOD model

- ⁽¹⁾ These are stylized scenarios, with the mere purpose of illustrating the potential fiscal and distributional impacts.
- ⁽²⁾ Simulations were conducted by the European Commissions' Joint Research Centre. EUROMOD simulates the benefit entitlements and tax liabilities (including social security contributions) of individual and households according to the tax-benefit rules in place in each Member State. The simulations are based on representative survey data from the European Statistics on Income and Living Conditions (EU-SILC) and cover the main elements of direct taxation and social contributions as well as non-contributory benefits.
- ⁽³⁾ The implicit tax rate on labour measures the effective average tax burden on employed labour income. It is defined as the 'sum of all direct and indirect taxes and employees' and employers' social contributions levied on employed labour income divided by the total compensation of employees working in the economic territory increased by taxes on wage bill and payroll.
- ⁽⁴⁾ While EUROMOD uses the EU Survey on Income and Living Conditions (EU-SILC), actual revenue data from the Ministry of Finance for 2016 suggest that the fiscal effect of abolishing the solidarity surcharge could amount to about EUR 16.6 bn.

4.2. FINANCIAL SECTOR

4.2.1. BANKING SECTOR

The German banking sector is medium-sized and relatively well capitalised. With assets equal to about 252 % of GDP the sector is significantly smaller compared with the banking sectors e.g. in France (386 %) or the Netherlands (379 %). The German financial sector has relatively strong cooperative and public bank pillars with a relatively low concentration of banks. It has increased its resilience, including by increasing its core capital ratio (CAR) Tier 1 somewhat above the euro area average of 14.3 % (Table 4.2.1).⁽¹⁴⁾⁽¹⁵⁾ The main contribution came from the reduction in risk-weighted assets over time, but raising capital from retained earnings is more challenging. In 2015, German banks transferred EUR 9.7 billion of their profits to capital, which is 37 % of total profits before tax (Deutsche Bundesbank, 2016b).

Table 4.2.1: **Financial soundness indicators, all banks in Germany**

(%)	2010	2011	2012	2013	2014	2015	2016Q2
Non-performing loans	2.4	1.6	1.7	1.8	2.5	2.0	1.9
Coverage ratio	35.0	40.1	38.3	42.8	39.1	41.6	42.4
Loan-to-deposit ratio*	84.7	83.4	82.5	80.1	79.2	78.4	78.7
Tier 1 ratio	11.4	11.7	13.8	15.2	14.8	15.4	15.4
Return on equity	1.9	2.2	1.1	1.3	2.5	1.7	-
Return on assets	0.1	0.1	0.0	0.1	0.1	0.1	-

* ECB aggregated balance sheet: loans excluding to government and monetary financial institutions (MFI)/deposits excluding from government and MFI

Source: European Central Bank

Sustaining profitability remains the biggest challenge for the business models of German banks. A return on equity of 0.8 % in June 2016⁽¹⁶⁾ – among the lowest in the EU – and a further deteriorated cost/income ratio of 70.4 % at the end of 2015 (Deutsche Bundesbank, 2016b) raise questions on the viability of the German bank's business models and indicate a need for cost reductions. In 2015, profits were supported by an all-time low of net additions to risk provisions, due to the favourable operating environment and

⁽¹⁴⁾ Tier 1 capital is considered to be the going concern capital – it allows an institution to continue its activities and helps to prevent insolvency. The purest form is Common Equity Tier 1 (CET1) capital which includes e.g. ordinary shares.

⁽¹⁵⁾ European Central Bank (ECB) data including foreign-controlled subsidiaries and branches; if foreign-controlled subsidiaries and branches are excluded, the ratio is 15.2 %.

⁽¹⁶⁾ European Central Bank (ECB) data including foreign-controlled subsidiaries and branches; if foreign-controlled subsidiaries and branches are excluded, the ratio is 0.9 %.

improved asset quality. Should economic conditions weaken, provisioning would have to rise to normal levels again, leading to declining profitability and more challenging generic capital increases.

German credit institutions still rely strongly on the traditional interest business. In 2015, German banks partly increased interest rate and liquidity risk to limit the decline in net income from the interest business to EUR 0.9 billion. Banks issue loans with longer maturities, while maturities on the liability side remain rather short (e.g. overnight deposits). This makes the sector, in particular cooperative banks and savings banks, more vulnerable to a potential increase in interest rates, especially if it were to occur suddenly.⁽¹⁷⁾

Further efficiency improvements and cost cutting efforts appear necessary to strengthen profitability. In 2015, German banks increased net fee and commission income by EUR 1.2 billion to counter headwinds on generating net interest income. Banks have also undertaken a number of measures to reduce costs. This is reflected in the number of branches which declined by about 3.5 % in 2015 (Deutsche Bundesbank, 2016b). Consolidation is ongoing within the savings and cooperative banking sectors (e.g. by closing unprofitable branches) and is expected to start also in larger banks in the light of announced consolidation measures. Nevertheless, without further cost-cutting measures, the ability to increase profitability and thus to build up more capital seems limited. This however would be necessary to hedge against the increased exposure to interest rate risks and a possible weakening of the banks' operating environment, and to better face the challenges of digitisation.

The digital transformation of financial services has strongly affected the German banking sector in the last few years. It is estimated that by 2020 almost half of all German bank customers will use a digital bank account (Drummer *et al.*, 2016), and financial technology (FinTech) companies will jeopardise between 29 % to 35 % of all bank revenues. Overall, Germany is the

⁽¹⁷⁾ For a recent analysis on different interest rate scenarios and the extent to which they can cause a further narrowing of the interest rate margin of German banks, see Dombret, Gündüz, and Rocholl, (2017)

second largest FinTech market in Europe, after the UK, with the total market volume of FinTech businesses in the financing and wealth management sectors accounting to EUR 2.2 billion in 2015.

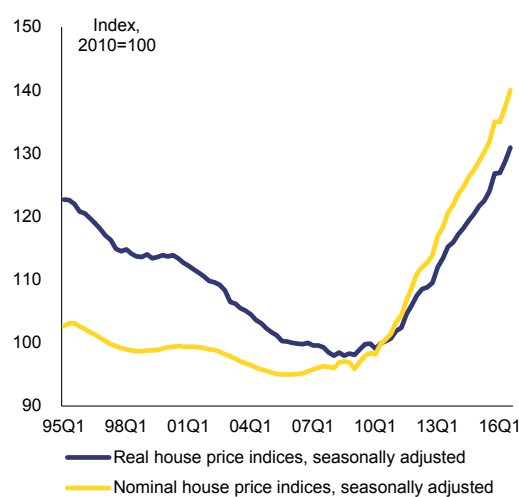
Almost 87 % of surveyed German financial institutions currently cooperate or plan to participate in a FinTech business in the future (Dorfleitner and Hornuf, 2016). Digital transformation is bringing new products and processes developed either by traditional banks or new players – often technology companies – which enter the financial services market and place major competitive pressure on existing financial institutions. For instance, in 2016 the FinTech market for payment solutions already reached a transaction volume of EUR 17 billion. As a result, banks are already implementing a major technological change of the entire value chain. This results for example in lower operational costs and innovative products and services. Compared to new players (i.e. FinTech firms), they can count on a vast customer base, broad product portfolio, strong brands and the funds necessary for the transformation. However, some smaller banks, operating on a more limited geographical area with fewer products, appear to be catching up more slowly with innovations in financial services. Therefore, their business models and profitability may be challenged by the new FinTech competitors.

4.2.2. HOUSING MARKET*

Following a prolonged contraction period, the German housing market is currently in a dynamic phase.⁽¹⁸⁾ Recent upward dynamics in real estate prices in Germany result from strong housing demand and insufficient housing supply. As a result, house prices have accelerated noticeably in real and nominal terms since 2010 (Graph 4.2.1). In 2015, house prices increased by around 4.5 % and continued to grow even more strongly in 2016. On the one hand, strong demand for houses has been supported by the growing number of households, positive income prospects, and low nominal interest rates that create

favourable loan and investment conditions. On the other hand, insufficient and relatively inelastic supply was exacerbated by structural factors such as regulatory hurdles (i.e. regulations for construction land as well as environmental and energy efficiency standards) (Deutsche Bank Research, 2016). Reducing constraints to building supply would help to alleviate existing price pressures. It would also strengthen private investment.

Graph 4.2.1: House price trends in Germany



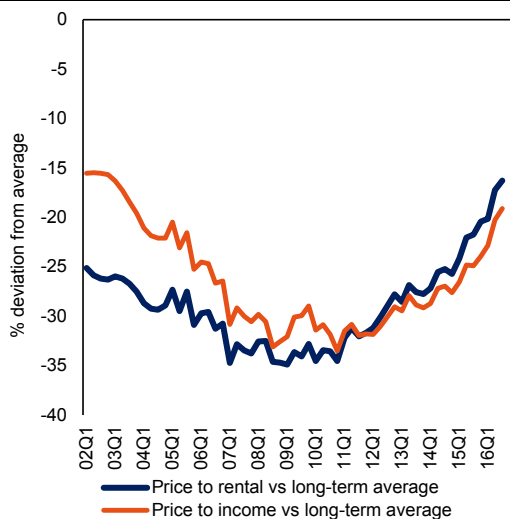
Note: Nominal house prices deflated using the private consumption deflator from the national account statistics. Data from 1995 first quarter to 2016 third quarter.

Source: OECD

In contrast to regional price developments, aggregate house prices in Germany appear to be developing in line with their underlying fundamentals. European Commission calculations do not suggest a potential overvaluation on a national scale as house prices appear to be around a fair value. Though aggregate house prices in Germany still appear to be in line with the underlying fundamentals (e.g. measured by affordability indicators such as price-to-income and price-to-rent ratios) (Graph 4.2.2), these aggregate figures mask significant regional differences in housing market dynamics.

⁽¹⁸⁾ For previous in-depth analyses of the German housing market please see European Commission (2014), p. 46 and European Commission (2015a), p. 46.

Graph 4.2.2: Price-to-income and price-to-rent ratios



Source: OECD, ECB, BIS, European Commission

Upward dynamics in property prices are concentrated in agglomerations, where demand is expected to increase further in the future. ⁽¹⁹⁾

In 2015, upward dynamics in real estate prices were most pronounced in large cities (6% compared with 3% to 4% economy-wide) (Graph 4.2.3). In these areas, overvaluations of residential properties amounted to 10% to 20% suggesting that prices decoupled from their underlying fundamentals (Deutsche Bundesbank, 2016c and 2016d). ⁽²⁰⁾ Although accommodation in cities tends to prove more expensive for immigrants, metropolitan areas seem to be particularly attractive owing to job opportunities, personal connections, available public infrastructure as well as lower linguistic and cultural barriers (Federal Statistical Office, 2016a). ⁽²¹⁾ ⁽²²⁾ Large cities attract primarily not only young people and foreigners but also elderly people who prefer urban areas to rural ones because of infrastructure advantages. If growing population and urbanisation trends prevail in the future, it may further increase house prices. This could have social implications as socially vulnerable people

⁽¹⁹⁾ See Deutsche Bank Research (2017) for an outlook on price developments in the five major cities in Germany.

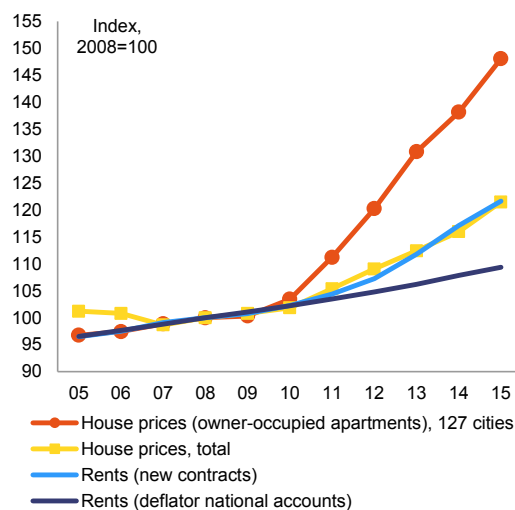
⁽²⁰⁾ According to the Global Real Estate Bubble Index 2016, Munich is prone to "bubble risk" while Frankfurt am Main is categorised as "overvalued" (UBS, 2016).

⁽²¹⁾ Network effects are the main driver of immigration to urban regions, where the share of foreign nationals is much higher (around 12%) than in rural regions (almost 5%).

⁽²²⁾ See Geis, Placke, and Plünnecke (2016) for an expert report on the employment development and a proposal for the regional distribution of refugees.

may be crowded out of the cities to peripheral areas.

Graph 4.2.3: Rents versus house prices



Source: European Commission calculations; Association of German Pfandbrief Banks (vdp); Federal Statistical Office; Deutsche Bundesbank

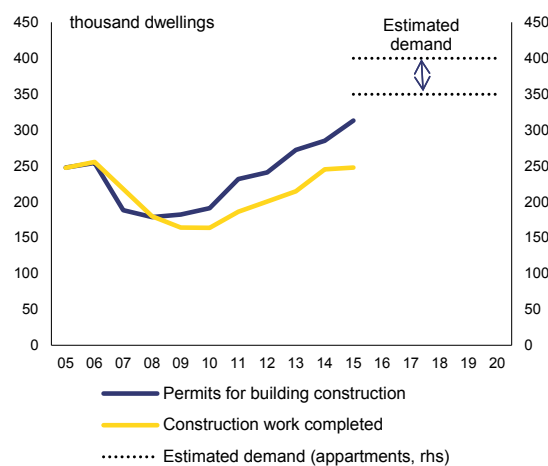
Purchasing prices for houses have grown faster than rents but new rents have started to catch up since 2013.

In the period 2010-2016 rent indices that refer to Germany as a whole, including also rural areas, rose by 7.6% (in Berlin by 10.2%). The real rent index, which is adjusted for consumer price inflation, grew by 0.3% (in Berlin by 2%). Comparing rent and price trends indicates whether the actual real estate price development is fundamentally justified. Over the same period, new rents – expressed as a percentage of rents and prices – increased economy-wide by around 20% (in Berlin by 46.4%). This was significantly less than purchase prices over the same time (52.4% and 79.5%, respectively). New rental contracts reflect the price hike as landlords are passing higher purchasing prices to tenants. As a consequence, new rents have drifted apart from the overall rent index since 2011 (Graph 4.2.3). A rental price brake introduced in Germany in 2015, applies to property markets experiencing significant price pressures and aims at curbing rent hikes on new tenancies to 10% above existing rental benchmarks. ⁽²³⁾

⁽²³⁾ The rental price brake applies in 12 federal states, i.e. in whole or in part in Berlin, Cologne, Düsseldorf, Frankfurt am Main, Munich and Stuttgart as well as in many small and medium-sized towns and municipalities. Brandenburg

In spite of strong growth in construction, the expansion of housing supply seems insufficient to match demand. In response to accelerating house prices, German construction investment rose on average by 1.9 % between 2010 and 2016. Prices for building land picked up with a time lag of around four years and have been growing at an accelerated pace since then. Between 2010 and 2014 the average annual growth rate of construction completions was 11 %. Yet, it slowed to 1 % in 2015. Completions amounted only to 248 000 in 2015, although projected demand – taking immigration into account – is estimated at 350 000 annually until 2020 (Graph 4.2.4) (Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety, 2016).⁽²⁴⁾ Moreover, only around 57 000 social dwellings were finished between 2010 and 2016 (German Bundestag, 2016). With an increase of 23 % (year-on-year) during the first 11 months of 2016, the number of building permits indicated the strongest increase in scheduled building activity for 17 years.⁽²⁵⁾ Permits for dwellings in residential homes showed the highest increase (125.4 %, year-on-year) largely due to the construction of shelters for asylum seekers and refugees and temporary homes (Federal Statistical Office, 2017).

Graph 4.2.4: Building permits and construction work completed for dwellings



Note: Permits and construction completed refers to the number of dwellings in the construction of new buildings and work on existing buildings; estimated demand refers to the level of annual demand estimated by the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety.

Sources: European Commission calculations; Federal Statistical Office

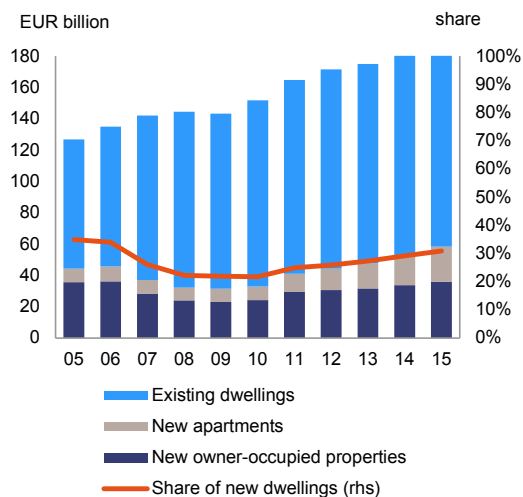
Investment in new dwellings picked up after 2010 but most of the housing investment corresponds to renovating existing properties. Investment in new dwellings had touched bottom in Germany in 2008/2009 before rebounding noticeably after 2010. Despite a pick-up of investment in new owner-occupied properties and new apartments, most expenditure, with a constant share of around 70 %, is used for renovating and modernising existing dwellings. In 2015, almost 28 % (EUR 36.4 billion of total EUR 130.8 billion) of investments in existing dwelling have been used for energy related investments while the share of investments in energy-saving measures was around 32 % in 2010 (EUR 38.6 billion of total EUR 118.9 billion) (Graph 4.2.5). In contrast, during the mid-1990s refurbishment and new investment were almost balanced (Gornig *et al.*, 2016).

and Thuringia implemented the rental brake in 2016. In 313 municipalities it affects around 28 % of the overall population in Germany. See Federal Ministry of Justice and Consumer Protection (2015), Kholodilin, Mense and Michelsen (2016), the Federal Institute for Research on Building, Urban Affairs, and Spatial Development (2016).

⁽²⁴⁾ See Federal Institute for Research on Building, Urban Affairs, and Spatial Development (2015). The sum of 350 000 new dwellings assumes 100 000 owner-occupied flats/houses, 170 000 rental flats in mansion blocks as well as 80 000 social dwellings (flats).

⁽²⁵⁾ Part of the surge in overall permits might be related to temporary factors such as the introduction of the new laws on energy efficiency that entered into force in 2016 (Deutsche Bundesbank, 2016e) and which may have led investors to being forward some permit applications.

Graph 4.2.5: Structure of housing investment



Source: European Commission; Bundesministerium für Verkehr, Bau und Stadtentwicklung (BMVBS); Deutsches Institut für Wirtschaftsforschung (DIW)

The refugee inflow is estimated to have a limited positive effect on real estate prices and rents. According to Deutsche Bundesbank (2016c), the effect of the inflow of refugees on rents and house prices could amount to a ½-1 percentage point increase over the next two years. Simulations using the European Commission's QUEST model give similar values. Higher demand for housing in response to the refugee inflow raises the price of housing in the economy. Increased housing demand also leads to additional housing investment, which is, however, subject to supply constraints on land and in the construction sector. The simulation results suggest a price increase for housing of around ½ % over a two-year period and around 1½ % over ten years.

In spite of recent price dynamics, available data suggest that the housing market does not constitute a risk to financial stability. Since 2010 there has been no indication of falling borrowing standards for mortgages (European Central Bank, 2016b). Though increasing, credit volume for housing purposes has remained at a moderate level (3.7 % in November 2016, year-on-year) compared with the 1980s and 1990s. The overall outstanding stock of mortgages increased nominally by 12.5 % between November 2012 and November 2016. At the same time, the overall indebtedness of private households (as a percentage of GDP and of disposable income) fell steadily from the early 2000s. The share of new

mortgage loans for housing purposes with a long-term fixed interest rate for 10 years increased from around 30 % in 2010-2014 to around 45 % in early 2015 (Deutsche Bundesbank, 2016d). ⁽²⁶⁾

Draft legislation has been adopted to reinforce macroprudential policies ensuring financial stability. In response to the recommendation by the Financial Stability Committee, the Federal Government put forward a draft law to introduce counteractive measures. ⁽²⁷⁾ The law provides the necessary legal basis to allow the Federal Financial Supervisory Authority (*Bundesanstalt für Finanzdienstleistungsaufsicht*) to introduce minimum requirements for the credit-based financing of residential property purchases (e.g. caps on loan-to-value ratios, debt-to-income ratios, debt-service-to-income ratios, debt-service-coverage ratios and amortisation requirements). The use of these instruments will depend on the assessment of potential risks to financial stability arising from excessive debt and price bubbles on the real estate market.

⁽²⁶⁾ Fixing interest rates for at least 10 years is the common practice in mortgage-based borrowing in Germany. On the one hand, this limits the flexibility to benefit from the low interest rate environment since re-mortgaging is disincentivised by comparatively high refinancing costs (European Commission, 2016a). On the other hand, from a financial stability perspective the comparatively long fixation terms minimize the vulnerability of borrowers to interest rate shocks.

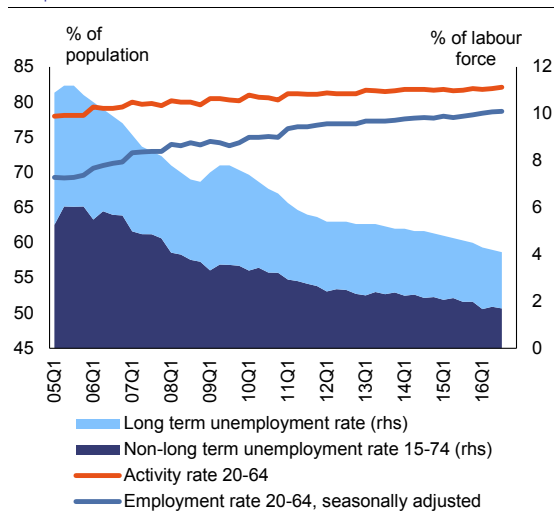
⁽²⁷⁾ Legislative proposal for the amendment of the financial services supervision law. Respective legal bases are introduced as regards relevant loans provided by credit institutions, alternative investment funds (AIFs) and insurance enterprises. The draft law provides for corresponding amendments to the German Banking Act (KWG), the Insurance Supervision Act (VAG) and the German Capital Investment Code (KAGB)

4.3. LABOUR MARKET, EDUCATION AND SOCIAL POLICIES

4.3.1. LABOUR MARKET*

The German labour market is performing well but given population ageing looming there are additional risks of labour and skills shortages. The employment rate reached 78.9 % in the third quarter of 2016 (age 20-64). Employment grew particularly in services attached to businesses, public services, education and the health sector. Unemployment decreased to 3.9 % by the fourth quarter of 2016 (Graph 4.3.1). In this context, there is a scope for tapping the considerable potential for the employment of women, older workers and migrants.

Graph 4.3.1: Labour force indicators



Note: Data from 2005 first quarter to 2016 third quarter.
Source: European Commission

Wage growth decelerated in 2016. The low level of unemployment helped to support nominal wages that increased by 2.5 % in 2016, following an increase of 2.7 % in 2015⁽²⁸⁾. Nominal wage growth continued to slightly outpace increases in negotiated wages. This reflects good labour market conditions and possibly still some effects of the

⁽²⁸⁾ Wage developments play a major role in influencing household savings and consumption decisions. Thus, through their impact on domestic demand, wage dynamics also have an influence on the high and persistent current account surplus in Germany. For a description of wage developments in Germany see European Commission (2016a).

introduction of the statutory general minimum wage.⁽²⁹⁾

Disincentives to work and the widespread part-time work are hampering the full use of the labour market potential (European Commission, 2016a). Owing to a high share (47 %) of part-time work, Germany ranks in the bottom third of Member States in terms of its full-time equivalent (FTE) employment rate of women (57.1 % in 2015). Women with a migrant background and women with caring responsibilities are particularly affected.⁽³⁰⁾ Better provision of quality full-time childcare, all-day schools and long-term-care is a crucial lever for increasing woman's participation in the workforce. Moreover, this lower attachment to the labour market is combined with a high gender pay gap (22.3 % compared to an EU-average of 16.7 % in 2014).⁽³¹⁾ The tax treatment of second earners (mostly women) is another important driver hampering female full-time employment (see Section 4.1). Moreover, disincentives to work resulting from the tax system also affect low-wage earners (see Section 4.1 and Section 4.3.3). Mini-jobs remain widespread, with about 4.8 million people having a mini-job as their only job in September 2016, which represents only a 1 % reduction in a year. According to Pusch and Seifert (2017), a significant share of mini-jobbers earns hourly wages below the general minimum. This leaves former assessments by the Commission still valid (European Commission, 2016a). In this regard, researchers do not expect a major reduction without additional measures to favour transitions to standard employment (IAB, 2016a).

Labour market outcomes of people with a migrant background continue to be below average. At 57 %, the employment rate of non-EU nationals was only at the EU average in 2015, in spite of better labour market conditions and around

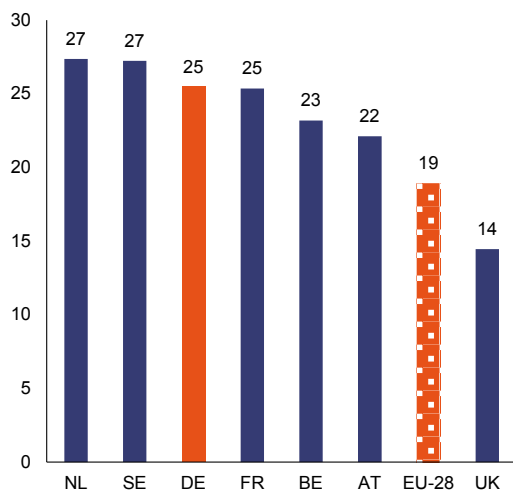
⁽²⁹⁾ For an analysis of price competitiveness in Germany, see European Commission (2014).

⁽³⁰⁾ Between 2006-2014, the total number of children under three years in early childhood education and care has more than doubled with an increase from 13.6% to around 33%, but according to recent estimations there are still 165 000 places missing. See European Commission (2016a) and Bertelsmann Foundation (2015a).

⁽³¹⁾ There is strong gender difference across sectors and occupations and after controlling for socio-demographic and job characteristics approx. one third of the gender pay gap remains unexplained (Boll *et al.*, 2016).

23 pps lower than for German citizens. Particularly affected are women with a non-EU nationality with an employment rate of 45.6 %. This was around 30 pps points below the level of female German citizens. Not only does the share of low-skilled people among non-EU nationals of working age (50.5 %) exceed the EU average (45.7 %). It is also much higher than the share of low-skilled people among German citizens (16.8 %). In addition, non-EU nationals have a lower employment rate at every skills level. The gap (25 pps) is particularly high for those with a tertiary level of education, representing a potential underuse of skilled labour (Graph 4.3.2). A major obstacle to the transition to the labour market might be the lack of German language proficiency. Only 29 % of migrants who have arrived in the last 10 years have an advanced knowledge of German (European Commission, 2016d).⁽³²⁾ Labour market difficulties persist for the second generation (children of non-EU born immigrants), even if their situation has improved relatively since 2005 (Höhne, 2016).

Graph 4.3.2: **Employment rate difference between tertiary educated nationals and third country citizens (2015)**



Note: Age 20-64

Source: European Commission

⁽³²⁾ For latest policy measures on refugee integration see Box 4.3.1.

Box 4.3.1: **Refugee integration**

In light of recent migration inflows, Germany has taken considerable action to accommodate and integrate refugees. The Act on the Acceleration of Asylum Procedures provides for a certain group of refugees integration courses to start soon after the person's arrival. It also introduced federally-funded classes of German as a second language as well as integration measures for asylum seekers with good prospects of staying in Germany. The latest Integration Act adopted in August 2016 (The Federal Government, 2016), regulates benefits, labour market integration and the residence obligation (*Wohnsitzregelung*). ⁽¹⁾ As a pre-requisite for successful integration, the act creates more legal certainty for asylum-seekers and tolerated persons (*Zustimmung für einen geduldeten Aufenthalt*) who start vocational training in Germany and improves planning certainty for employers. The law allows the Department of Foreigners to determine, for a period of three years, where refugees may settle, either by prohibiting them from settling in certain areas or by allocating them to particular areas. The aim of this provision is to avoid a concentration of migrants in any one area. However, refugees who have found work, a place for training or academic studies are exempt from this rule.

Although the level of educational attainment and qualifications of recent asylum seekers poses a challenge, Germany's vocational training system may prove to be an asset for integration. In 2015, asylum seekers had a mixed educational background: 17 % attended tertiary, 19 % upper secondary, and 31 % lower secondary schools prior to arrival, while 23 % attended only primary education and 8 % had no education at all (IAB, 2016b). The majority of refugees who arrived during the first 10 months of 2016 were under the age of 30 (Federal Office for Migration and Refugees, 2016). In this regard, Germany's tradition of vocational training may have significant potential to provide a pathway into work for many, particularly young, refugees.

For refugees with qualifications there are institutional barriers to having those qualifications recognised. Notwithstanding recent efforts, regulations for the recognition of overseas educational attainments and non-formal qualifications differ between federal states and the process remains costly for applicants (Federal Ministry of Education and Research, 2016). ⁽²⁾ The recognition of foreign qualifications in the German educational system is limited overall and restricted to cases for which qualifications are demonstrated by means of a certificate. This may increase the need to provide adequate reskilling opportunities in the German education system.

Small businesses, especially in the manufacturing and hospitality sector but also in less-regulated sectors and those with no formal language requirements, may play an important role in the labour market integration of refugees (Saliktluk, Giesecke, and Kroh, 2016). ⁽³⁾ The social partners in Germany agree on the need to make a concerted effort to integrating refugees into vocational training and apprenticeship programmes and measures to that end are already under way. At an employer's instigation, young refugees may apply for language support and internships to prepare for an apprenticeship. Moreover, people with a migrant background often set up their own business (see Section 4.5.3) (Bertelsmann Foundation, 2016a).

⁽¹⁾ See also *Flüchtlingsintegrationsmaßnahmen*, in short FIM (a refugee labour market integration programme that provides work opportunities), "KompAS programme" (assessing competences, early activation, acquiring language skills), "Prospects for (young/female) refugees" (enables professional orientation and practical experience in a company to be combined), "Integration through qualification (IQ) support programme", European Social Fund (ESF) integration guidelines of the government focusing on the integration of asylum seekers and refugees (IvAF).

⁽²⁾ For example, the 2012 Recognition Act aimed at addressing the problem of over-qualification of refugees. The introduction of this law increased access to information about the prospects of and opportunities for having foreign qualifications recognized, which has since resulted in a considerable increase in applications.

⁽³⁾ The *IAB-SOEP-Migrationsstichprobe* covers a large sample of refugees and other migrants that arrived in Germany between 1990 and 2010. For details on *IAB-SOEP* data see *Institut für Arbeitsmarkt- und Berufsforschung* (IAB) in cooperation with *Sozio-oekonomisches Panel* (SOEP) of the German Institute for Economic Research (DIW).

Although the employment prospects of older workers have improved considerably, extending working lives remains a challenge, especially in the context of ageing. Extending working lives is only possible if matched with incentives for later retirement and with skills-upgrading measures based on well-targeted relevant types of learning. However, the participation of older adults (55-64 years) in life-long learning was 3.1% in 2015 below the EU average of 6.0%. While the ‘*Flexi-Rente*’ could contribute to a more flexible combination of pensions and additional income during the transition to retirement, it is unclear to what extent this most recent reform may offset the stronger incentives for early retirement introduced by the 2014 pension reform (see Overview table in Annex A).

Despite positive labour market developments, the number of registered long-term unemployed has remained broadly stable at about 1 million (Federal Employment Agency, 2016a). Around 57 % of long-term unemployed people have been in that status for more than two years. A significant proportion of them suffer from multiple employment barriers such as low skills and a lack of language skills, health problems, care obligations or age-related problems. Jobcentres do not seem to sufficiently link active labour market policy (ALMP) measures to follow-up actions. Moreover, the per-capita integration budget for long-term unemployed recipients of unemployed benefit II (*Eingliederungsleistungen*) has been reduced since 2010.

Protection from potential abuses in temporary work and work contracts is improving. The number of temporary agency workers has been increasing (Federal Employment Agency, 2016b). It reached around 1 million (close to 3 % of total employment) in June 2016. Temporary agency workers are often occupied in jobs requiring a relatively low skills level. The majority, in which foreigners are overrepresented, are male, young, and without vocational training. Around 20 % have previously been unemployed for at least a year or have never been employed – evidencing some foothold effects towards employment. However, around 50 % of temporary agency contracts are of very short duration and terminated in under three months. To prevent the abuse from work contracts (i.e. the unnecessary substitution of temporary workers for permanent workers) and downward

pressure on wages of temporary agency workers, a law was adopted in 2016 providing equal pay after nine months of working in the sector and the introduction of a maximum transitional period of 18 months after which these workers must be hired by the company.⁽³³⁾

4.3.2. SOCIAL POLICY (POVERTY AND SOCIAL ASPECTS OF SOCIAL SECURITY SYSTEMS)

The good labour market performance of recent years has not led to a decline in poverty. At the end of 2015, a rising proportion of the total population was receiving one form of minimum income support (9.7 % compared with 9.1 % in 2014, respectively).⁽³⁴⁾ The at-risk-of-poverty rate has stabilised at a relatively high level following earlier increases. Particularly vulnerable are the unemployed, for whom the at-risk-of-poverty rate remains considerable (69.1% in 2015). This stems partly from the proportion of long-term unemployed people who are only eligible for the means-tested basic income support. In-work poverty has steadily increased in Germany in recent years and is above the EU average (in 2015, 9.7 % compared with 9.5 %), which partly relates to the high proportion of part-time employment (see European Commission, 2016a). The at-risk-of-poverty rate in old age (i.e. above 65) is also above the EU average (16.5 % in 2015 compared with 14.1 %) and the number of people at risk of old-age poverty is expected to increase in the coming years. Nevertheless, severe material deprivation has remained broadly stable, hovering just below 5 % (4.6 % in 2005 and 4.4 % in 2015).

Going forward, pension adequacy is expected to deteriorate. Most recent government reports forecast a further decline in the replacement rate of the statutory pension scheme from 47.7 % in 2015 to 44.5 % by 2030 and to 41.7 % by 2045 (Federal Ministry of Labour and Social Affairs, 2016a and 2016b). Moreover, until now the take-up and coverage of second- and third-pillar schemes is too

⁽³³⁾ Gesetz zur Änderung des Arbeitnehmerüberlassungsgesetzes und anderer Gesetze.

⁽³⁴⁾ The minimum income schemes consist in: Basic income support for job seekers (*Hartz IV*), current assistance towards living expenses outside of institutions, needs-based pension supplement in old age and in the event of reduced earning capacity, basic support for refugees, and war victim assistance.

low to fully compensate for the decrease in the replacement rate of the first pillar. Coverage is particularly low among people who are at high risk of insufficient accrual of public pension benefits such as low wage earners, part-time workers or people with atypical jobs or an interrupted employment history (see Section 4.3.1). Accordingly, the long-term net replacement rate is significantly below the OECD average for both low and average wage earners (OECD, 2015a).⁽³⁵⁾ The adequacy of pension incomes is further negatively impacted by the current low level of interest rates, which jeopardises the rate of return of private pension schemes. The gender pension gap in Germany, which compares the average retirement income (i.e. pension) between women and men, is one of the highest in the EU (in 2015, on average 45.7 % compared with 38.3 %, respectively) and older women are at a particularly high risk of poverty.

The agreed measures under the proposed ‘integrated concept’ (*Gesamtkonzept*) for old-age provision could help to alleviate old-age poverty. These measures aim at increasing the take-up of the occupational and private pension schemes, in particular through tax credits for low-wage earners, an increase in basic public allowances and additional incentives for employers offering occupational pension schemes. Furthermore, they also aim at improving the entitlements for recipients of a reduced earning capacity pension, and at introducing allowances for people receiving a means-tested minimum retirement income. However, the Federal Government has not yet presented legislative proposals on a so-called life performance pension (*Lebensleistungsrente*) that recognises the long-standing labour market performance of insured workers, as it was announced in the coalition agreement (The Federal Government, 2013). The income ceilings set for pension payments currently limit contributions to the statutory pension system at a comparatively low level, given the direct link between contributions and entitlements. In addition, capital income is in general exempted from social security contributions. The provision of complete and comprehensive information on total pension entitlements in all three pension pillars is not yet a standard service.

⁽³⁵⁾ The net replacement rate corresponds to the proportion of net income in work that is maintained after retirement.

The family benefits system is not adequately tailored to families and children in need. The at-risk-of-poverty rate for children in Germany remains above pre-crisis levels at 14.6 pps, 2.2 pps above the 2006 level, which is also more than the increase recorded at EU level over the same period (1.1 pps). A key reason for child poverty in Germany is the high at-risk-of-poverty rate of single parents (33.7 % in 2015) including in-work poverty (24.3 % in 2015).⁽³⁶⁾ Some instruments in the current family benefit system such as the tax-free child allowance (*Kinderfreibetrag*) favour middle-and upper-class families as they rise in line with parent's earnings. At the same time, for recipients of means-tested minimum income, the child benefit (*Kindergeld*) is counted as income and thus does not top up the minimum income.⁽³⁷⁾ Other instruments set contradictory incentives. For example, the parental allowance (*Elterngeld Plus*) is intended to increase the labour market participation of parents, whereas the joint taxation of income for married couples (*Ehegattensplitting*) and free health insurance coverage for non-working spouses remain disincentives to work for second earners (see Section 4.3.1).

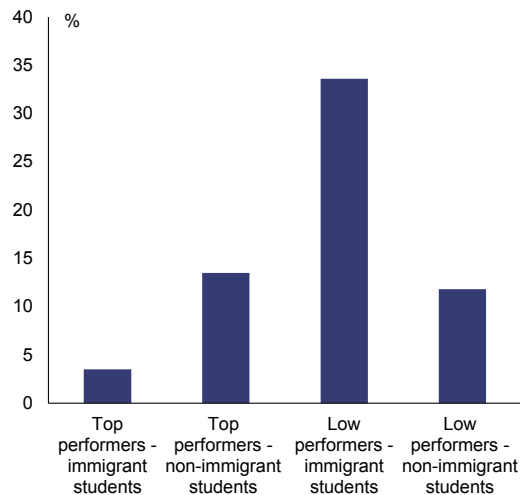
4.3.3. EDUCATION AND SKILLS

German education outcomes are above the EU average. In 2015, education outcomes remained stable for science and mathematics and improved for reading compared to 2012 (OECD, 2016a). In these three subjects, the share of low achievers is significantly below the EU average (17 % in science, 16 % in reading and 17 % in mathematics). However, the share of low achievers in science is noticeably higher for people with an immigrant background (42.5 % for first-generation and 31.1 % for second-generation) than for people without an immigrant background (11.8 %) (Graph 4.3.3) (European Commission, 2016e).

⁽³⁶⁾ According to the *Institut für Arbeitsmarkt und Berufsforschung* (IAB), 19 % of the children and 16 % of the population as a whole are at-risk of poverty (IAB, 2016c). Other studies confirm the above statements (see Bertelsmann Foundation, 2015b and 2016b).

⁽³⁷⁾ Children of low income earners are disadvantaged in the current system as the tax relief through the parental allowance is higher than support for children of low income earners through the child benefit or the supplementary child allowance for people in need (*Kinderzuschlag*).

Graph 4.3.3: PISA performance in science (2015)



Source: OECD

Federal and regional governments have agreed to improve the quality of early childhood education and care (ECEC). The interim report 2016 by the Federal Ministry for Family Affairs, Senior Citizens, Woman and Youth and the respective ministries of the federal states provides details about the agreed aspects of quality such as child-staff ratio, staff training or management, and also identifies substantial estimated costs linked to their implementation (Federal Ministry for Family Affairs, Senior Citizens, Women and Youth, 2016).⁽³⁸⁾ About 60 % of compulsory schools now offer all-day classes, a marked increase compared to 2002, and another means to mitigate the effects of a child's socio-economic background. Only a small proportion of pupils attend (38 %) these all-day classes, however.

The integration challenge will require additional investment in education. Germany's general government expenditure on education remains below the EU average. This is the case both as a proportion of GDP (in 2014, 4.3 % compared with an EU average of 4.9 %) and as a

⁽³⁸⁾ With regard to estimations by the Technical University Dortmund, making early childhood education and care free of charge could cost EUR 3.5 billion. Provided an extra 100 000 places to children under three would require an investment of about EUR 2.6 billion and EU 913 million of operating costs. Additional places for asylum seekers could amount to EUR 320 to 420 million. Improving the teacher-to-child ratio could cost between EUR 5.7 billion and EUR 11.4 billion. Strengthening the management function could amount to EUR 574 million a year.

share of total public expenditure (9.7 % compared with 10.2 %, respectively). However, integrating newcomers into education and training and further expanding early childhood education and care and all-day schools will require additional financial resources of additional annual investment up to EUR 3 billion annually (*Autorengruppe Bildungsberichterstattung*, 2016). The need for additional education resources will increase (around 300 000-390 000 places require around 30 000-40 000 extra teachers/staff). This is particularly the case in the areas of early childhood education and care, compulsory schooling and preparation for vocational education and 'dual training' that are apprenticeships combined with vocational training (*Autorengruppe Bildungsberichterstattung*, 2016).

A number of initiatives are underway to improve digital skills in Germany. Improved digital skills remain crucial to support digital transformation. In 2016, 67.5 % of Germans reported having at least basic digital skills. This compares with 86.1 % in Luxembourg, 77.6 % in Denmark and 73.1 % in Finland and 56.2 % in the EU as a whole (European Commission, 2016d). The use of computers by young Germans has increased between 2009 and 2012, particularly outside school, but in both areas it remains below the OECD average (OECD, 2015b). A significant number of schools do not have broadband access, in particular vocational education and training (VET) schools (Bertelsmann Foundation, 2016c). Work on exploring the future of manufacturing ('Industry 4.0', i.e. digitally-connected manufacturing) has progressed well. Following a consultation process on 'Work 4.0', a draft white paper was presented in late 2016. Education issues are being addressed in the Federal Government's 'Digital Agenda 2014-2017' and in the strategy 'Education in a digital World' adopted by the Conference of Education Ministers of the federal states in early December (2016). The strategy covers education plans and curricula, teacher training, e-governance, education media. The 'DigitalPakt#D' as part of the comprehensive education strategy for the digital knowledge society announced by the Federal Ministry of Education and Research foresees mutual efforts by the Federal Government and the states to improve digital education. Whereas the Federal Government would invest EUR 5 billion over a period of five years in digital infrastructure such as

broadband connections and computers in schools of all education levels, the federal states would commit to investing in digital education, including teacher training (Federal Ministry for Education and Research, 2016).

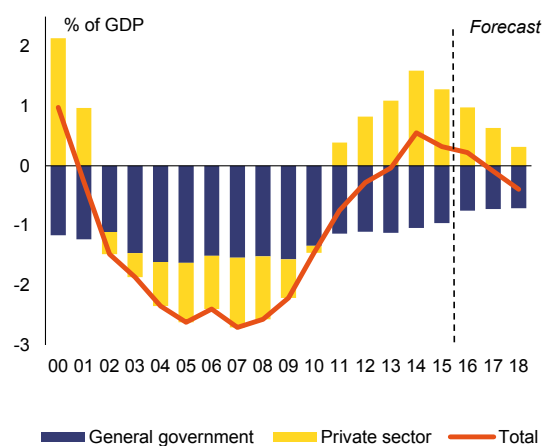
Germany's teaching force is older than that of most other comparable EU countries except Italy. The proportion of teachers aged 50 or older is around 46 % for both academic and vocational schools. The share of those over 60 has increased from 8 % in 2004 to 14 % in 2014. Estimates indicate that until 2025 there is an annual shortage of 1 600 teachers in eastern Germany compared to a surplus of 7 400 teachers in western Germany. The percentage of teachers without recognised training was at 6 % in 2014. Until 2025, teachers are most needed in chemistry, mathematics, physics, English and music (*Autorengruppe Bildungsberichterstattung*, 2016). Motivating enough young students to specialise in science, technology, engineering and mathematics (STEM) will be a challenge. At the same time, this provides an opportunity to upgrade and modernise teaching methods, in particular with respect to digitisation.

4.4. INVESTMENT

Investment as a share of GDP has remained subdued overall in Germany in the last few years, despite strong increases in 2015-2016.

The German economy weathered the crisis well, but investment activity has remained rather subdued since then and has contributed relatively little to potential growth. Germany's capital stock increased much more slowly than that of the USA or even the rest of the EU-15. This may have slowed down potential growth, which is estimated to be 0.3 or 0.7 pps lower than that of the USA or the UK, respectively, in 2015. Although public investment increased strongly in 2015-2016, the public investment-to-GDP ratio has remained largely constant over the last few years (2.2 % of GDP in 2016). It still appears low compared to the euro area (2.8 % of GDP without Germany), despite a downward euro area trend since 2009 (Graph 4.4.1).

Graph 4.4.1: Investment gap with respect to the euro area



Note: Difference in the investment-to-GDP ratio with respect to the rest of the euro area excluding Ireland and Spain
Source: European Commission

While this investment gap can partly be explained by cyclical and structural developments in Germany and other euro area countries, it also reflects a sizeable infrastructure investment backlog. ⁽³⁹⁾ In particular, pronounced negative net

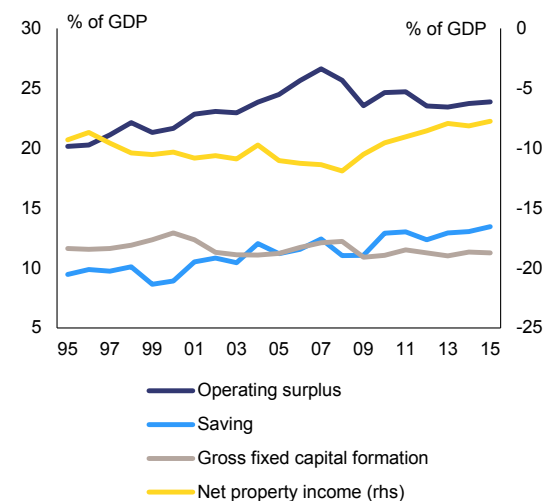
⁽³⁹⁾ In fact, the investment gap can be partly explained by lower relative price increases for investment in Germany, construction booms and bubbles in other countries, the investment-intensive catch-up process in eastern Germany during the 1990s, the allocation of construction and the operation of infrastructure to the private sector, and the privatisation of previously publicly-provided services and infrastructure (European Commission, 2014).

investment over several years until 2015 suggests protracted underinvestment at the municipal level. ⁽⁴⁰⁾

4.4.1. CORPORATE SAVING AND INVESTMENT*

Non-financial corporations (NFCs) have played a key role in increasing the saving-investment surplus prior to and especially after the 2009 crisis. As far back as the early 2000's the sector began accumulating net assets (Graph 4.4.2). On the one hand, this was helped by a declining share of labour costs, while on the other it reflected a fall in the NFC investment ratio in 2001-2002 from 13 % to 11 % of GDP, owing partly to a credit slowdown. In the years that followed, and prior to the global financial crisis, the share of labour costs continued to decline as a result of labour market reforms. This supported an improvement in the operating surplus and a mild recovery in the investment ratio. It also made it possible to raise dividend pay-outs without increasing indebtedness.

Graph 4.4.2: Determinants of the savings-investment balance of non-financial corporations



Source: European Commission

Lower dividend pay-outs helped to rebuild company equity and have driven the increase in corporate saving and net lending. In the aftermath of the crisis, the operating surplus

⁽⁴⁰⁾ While gross fixed capital formation at municipal level decreased from 0.9% of GDP to 0.7% of GDP between 2009 and 2015, depreciation remained largely flat at 1% of GDP, leading to net investment of -0.2% of GDP in 2015.

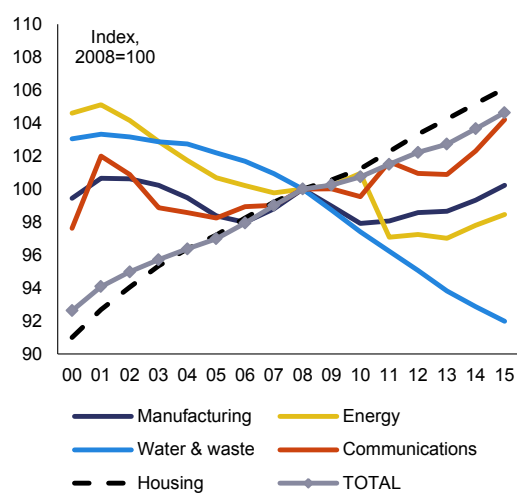
stagnated, while the investment ratio fell (Graph 4.4.2). NFCs focused on rebuilding equity, enabling them to reduce their reliance on external financing. Paradoxically, they became net earners, rather than net payers, of interest. More importantly, dividend pay-outs were reduced, which has turned out to be a key factor in the recent growth in NFCs' net lending. Possibly devised as a temporary response to the crisis, this trend has continued for a number of years. It has usefully freed up some financing space for additional investment. However, the investment ratio recovered only partly and thereafter stabilised at a level just below the long-term average.

The investment share of NFCs has reacted only partially to the availability of freed-up resources and remained roughly stable. There are several possible reasons for the stagnant investment ratio despite available equity and bank liquidity. According to various reports, these range from the risk-aversion of the ageing owners of family businesses or uncertainty in the face of technological change (a 'wait and see' attitude); the rise of less capital-intensive sectors; the increased efficiency and lower cost of equipment; and digitisation and changing consumption patterns.

German manufacturing has focused on its traditional core strengths. The relative weakness in machinery and equipment investment after the crisis (Graph 1.2) and the sluggishness in manufacturing capital stock (Graph 4.4.3) conceal ongoing shifts in the structure of this sector. The sub-sectors that have been expanding capacity consistently are the automotive industry and pharmaceuticals. In comparison to 1995, their capacity (the real value of their capital stock) has grown by over 50%. Other machine building industries have, by and large, maintained the volume of their capital stock. Other industrial sub-sectors – typically the users rather than developers of equipment – have seen their capital stock decline. Typical examples are the low-tech industries with low value-added: food, chemicals, non-metallic mineral products, basic metals and textiles. In these sectors, output has been declining, or increasing at a below-average rate. Owing to increased capital efficiency, even in these sub-sectors, output has either declined less than capacity or increased over time.

Key sectors, in particular network industries, have failed to keep up. Overall, the volume of investment has more than made up for the depreciation in fixed assets, but in certain sectors capital stock has stagnated, possibly creating capacity bottlenecks (Graph 4.4.3). Investment in real estate services (housing) has been consistent and owing to its high share has helped sustain the increase in the aggregate capital stock. It has also driven a rebound in the construction sector's capital stock. However, there are indications that housing construction may still be lagging behind actual needs (see Section 4.2.3). The infrastructure capacity of network industries (energy, water and waste management, transport, communications) has not been expanding in line with the rest of the economy. This may jeopardise the progress towards digitisation and the switch to alternative energy sources.

Graph 4.4.3: Net capital stock by type of economic activity



Source: European Commission calculations

Box 4.4.1: Investment challenges and reforms in Germany

Section 1. Macroeconomic perspective

Total investment in Germany (measured as gross fixed capital formation) proved to be fairly resilient to the crisis. Nevertheless, public and until recently private investment has been below the EU average (see Section 4.4.1). The growth in machinery and equipment investment slowed down and non-residential construction investment stagnated, leaving an accumulated backlog unaddressed. 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 corporate and government investment in equipment and non-residential construction will depend on improvements 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, but rather to uncertainty and unfavourable perceptions of the investment climate. 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			Sector specific regulation	Business services / Regulated professions	CSR
	Competition and regulatory framework				Retail	
Labour market/ Education	EPL & framework for labour contracts		Construction			
	Wages & wage setting		Digital Economy / Telecom			
	Education		Energy			
			Transport			

Legend:

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

Main barriers to investment and priority actions underway:

1. Among the main barriers to private investment, the relatively high level and complexity of corporate taxation and high tax administration costs remain key. 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. 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.
3. The current design of federal fiscal relations has been a barrier to public investment at municipal level. The scope for public investment tends to be narrowed by a mismatch between the 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.

4.4.2. INVESTMENT-FRIENDLINESS OF THE TAX SYSTEM

Despite significant reductions in corporate capital costs, the friendliness of the tax system for private investment still ranks low by EU-wide comparison. Corporate capital costs⁽⁴¹⁾ in Germany are still high. The overall mean corporate capital costs fell by around 16 % between 2000 and 2016. This was largely driven by significant reductions in the corporate tax rate as part of the corporate tax reforms of 2001 and 2008.⁽⁴²⁾ Although this is the highest reduction among the EU-28, corporate capital costs in Germany are still among the highest in the EU-28. Besides the high level of corporate taxation, the tax system is also complex and tax administration costs are high (see European Commission, 2016a).

Several corporate taxation provisions may be hampering private investment.⁽⁴³⁾ A recurring issue is the bias towards debt in corporate taxation. Due to a less favourable tax treatment, investments financed by equity need to earn 2.7 percentage points more in return than investments financed by debt (ZEW, 2017). This debt bias was the seventh highest in the EU in 2016. At shareholder level, the extent of the debt bias is similar. This matters in particular for SMEs, which tend to have domestic shareholders. Lowering the capital costs on equity could strengthen private investment, e.g. by strengthening the underdeveloped German venture capital market. Other features of the tax system that might distort financing and investment decisions are the inclusion of non-profit elements in the tax base of the local trade tax (*Gewerbesteuer*), limitations on loss carry-forwards, and tax induced distortions with respect to the choice of legal form. In addition, several specific provisions reduce the investment-friendliness of the tax system. These include the depreciation regime, the interest rate used to calculate deductible pension provisions, the taxation of capital gains, cash accounting for the

purpose of value-added taxation, the high tax wedge and the negative tax incentives for second earners.

There are several options for eliminating the debt bias, with varying effects on the investment-friendliness of corporate taxation. One would be to discontinue the deductibility of interest payments. Alternatively, an allowance for corporate equity (ACE) has been discussed,⁽⁴⁴⁾ which provides for a deduction of a notional return on equity at corporate level, thereby improving the conditions for equity-financed investment. The effect of introducing an ACE crucially depends on the chosen notional interest rate and on a solid anti-avoidance framework.⁽⁴⁵⁾ The ACE rate will determine to which extent financing neutrality is ensured, and how much effective corporate taxation is reduced, thus providing a positive impact on corporate investment and location choice. Overall, simulations based on the CORTAX model suggest that an ACE reduces the marginal cost of capital for new investments. This has correspondingly a positive impact on GDP, employment, and wages (Box 4.4.2). Lowering the cost of equity financing could also benefit in particular those companies that usually face stronger borrowing constraints, such as young businesses.

Adjusting the current depreciation regime could also help to make the tax system more investment-friendly, though only to a limited extent. Although declining-balance depreciation was permitted until 2008, the German system has since opted for straight-line depreciation.⁽⁴⁶⁾ Lowering corporate capital costs by re-introducing the declining-balance depreciation could improve the private investment climate. However, Spengel and Bergner (2015) suggest that declining-balance depreciation would lower corporate capital costs only slightly, hence limiting positive the impact on private investment.

⁽⁴¹⁾ 'Cost of capital' in this context is defined as the minimum pre-tax real rate of return on an investment, given an after-tax real rate of return of an alternative capital market investment.

⁽⁴²⁾ In the 2001 reform, the corporate tax rate was reduced by 15.8 pp to 26.38 %, while the 2008 reform introduced a further reduction to 15.83%.

⁽⁴³⁾ See Ifo Institut (2015), Federal Ministry for Economic Affairs and Energy (2015), Fratzscher et al. (2014), and Spengel and Bergner (2015).

⁽⁴⁴⁾ See DIW (2016); German Council of Economic Experts (2014 and 2012).

⁽⁴⁵⁾ An alternative reform that is significantly more robust to tax avoidance and budgetary less costly is the Allowance for growth and investment, as recently proposed by the Commission as part of the Common (Consolidated) Corporate Tax Base (European Commission 2016f, 2016g).

⁽⁴⁶⁾ Declining-balance depreciation was allowed again in the years 2009 and 2010 to cushion the effects of the financial crisis.

Box 4.4.2: Reducing the debt bias and improving the investment-friendliness of corporate taxation

The debt bias of corporate taxation may have a negative impact on investment by credit constrained firms. In 2015, German corporations, whose indebtedness is on aggregate already the lowest in the euro area, continued deleveraging. However, this did not result in increased nominal corporate investment. As in most other countries, the German corporate tax system treats debt and equity-financed investments differently. While interest on debt is deductible from the corporate tax base, equity financing costs are not tax deductible. This debt bias, which was the seventh highest in the EU in 2016, puts credit constrained firms at a disadvantage, thus potentially hampering their investment activity.

Several reform options may address the debt bias. The Allowance for Corporate Equity (ACE) allows the deduction of a notional return on equity from the corporate income tax base, similar to the existing deductibility provision for debt interest.⁽¹⁾ The debt bias could also be eliminated by disallowing any deduction of interest payments.

The macroeconomic effects of both reform options for Germany were evaluated using CORTAX, a computable general equilibrium model for the EU.⁽²⁾ The analysis focuses on an ACE with the ACE rate varying from 1 % to 6.4 %, the central reform scenario assuming a rate equal to the nominal interest rate on debt (3.4 %). Table 1 shows the macroeconomic impact of the reform scenarios in terms of differences to the baseline scenario without an ACE. All simulations assume a budget neutral implementation of the reforms.

Table 1: **Impact of budget neutral ACE reforms**

ACE rate	CIT rate	Cost of Capital	Investment	Wage	Employment	GDP	Revenue (corporate)	Revenue (total)	Welfare
Central scenario									
3.4%	6.38	-0.27	3.37	0.92	0.40	1.11	-0.11	0.00	0.23
	-	0.00	-0.02	0.01	-0.02	0.08	0.01	0.00	0.02
Sensitivity									
1%	1.65	-0.06	0.73	0.20	0.08	0.23	-0.02	0.00	0.06
	-	0.00	0.00	0.00	-0.01	0.02	0.00	0.00	0.01
5%	10.49	-0.49	6.63	1.80	0.85	2.24	-0.25	0.00	0.38
	-	0.00	-0.03	0.01	-0.04	0.16	0.01	0.00	0.05
6.4%	14.97	-0.80	11.80	3.15	1.63	4.04	-0.50	-0.01	0.53
	-	0.00	-0.05	0.02	-0.07	0.27	0.02	0.00	0.08

Notes: Results are reported for Germany (normal font) and for the rest of the EU (italic). All scenarios reported here assume ex-ante closure on corporate income tax rate and rate and ex-post closure on transfers to the old generation. Corporate income tax (CIT) rate = percentage point change in the corporate tax rate; Cost of Capital = percentage point change in the cost of capital; Investment = percentage change in total capital stock; Wage = percentage change in the wage rate; Employment = percentage change in total employment; GDP = percentage change in gross domestic product; Revenues (corporate) = change in the corporate tax revenue in % of baseline revenues; Revenues (total) = change in total tax revenue in % of baseline revenues; Welfare = change in compensating variation in % of GDP (positive value reflects a welfare gain).

Source: European Commission, Joint Research Centre.

- ⁽¹⁾ The ACE has been criticised because of the tax planning opportunities it can create in the form of cascading of the deductions on the same initial capital within corporate groups. An alternative reform that is significantly more robust to tax avoidance and budgetary less costly is the Allowance for growth and investment, as recently proposed by the Commission as part of the Common (Consolidated) Corporate Tax Base (European Commission 2016f and 2016g).
- ⁽²⁾ Simulations were conducted by the Joint Research Centre of the European Commission. CORTAX simulates the production and investment behaviour of domestic and multinational firms including their cross-border profit shifting activities. CORTAX models in detail corporate taxes according to the rules in place in each Member State; it also models personal and consumption taxes in a stylised way. The model incorporates firms' behavioural responses concerning the level of capital investment, employment, the choice between debt or equity financing, profit shifting to a tax haven and (for multinationals only) tax avoidance by transfer pricing. The simulations are based on calibration data for 2012. The methodology and data source used for calibration are described in Álvarez-Martínez et al. (2016).

(Continued on the next page)

Box (continued)

The ACE addresses the debt bias and reduces the marginal cost of capital for new investments, with a corresponding positive impact on GDP, employment, and wages. Increasing the ACE rate leads to stronger effects, but also requires larger compensatory measures to ensure budget neutrality. By assumption, the model increases the German corporate tax rate to compensate for the loss in revenues. This is, however, insufficient as firms' subsequent behavioural responses cause further revenue losses.⁽³⁾ The decrease in corporate income tax revenues is broadly compensated for by the positive economic impacts and the resulting increases in other taxes. Welfare rises with the size of the ACE rate. The results also suggest that introducing an ACE would move the economy towards more balanced debt-equity ratios. For example, the central scenario would lead to a reduction in the share of investment financed by debt by 4 percentage points.

Disallowing any deduction of interest payments results in a higher cost of capital, with a corresponding adverse macroeconomic impact. The debt bias could also be addressed by disallowing interest deductibility. The results of introducing such a regime are summarised in Table 2. To keep corporate tax revenues in line with the pre-reform scenario, the tax rate has been lowered. The combined effect of lowering the tax rate and broadening the tax base increases the cost of capital. Consequently, investment, GDP, wages and employment, and welfare decrease.

Table 2: **ACE vs. non-deductibility of interest**

Scenario	CIT rate	Cost of capital	Investment	Wage	Employment	GDP	Revenue (corporate)	Revenue (total)	Welfare
ACE (central scenario)	6.38	-0.27	3.37	0.92	0.40	1.11	-0.11	0.00	0.23
	-	0.00	-0.02	0.01	-0.02	0.08	0.01	0.00	0.02
No interest deductibility	-6.87	0.20	-2.25	-0.50	-0.30	-0.62	0.07	0.00	-0.06
	-	0.00	0.02	0.00	0.02	-0.06	-0.01	0.00	-0.02

Notes: Results are reported for Germany (normal font) and for the rest of the EU as a whole (italic).

Source: European Commission, Joint Research Centre

⁽³⁾ The reason for the impact on tax revenues despite the adjustment in the corporate tax rate are the subsequent behavioural responses by households and firms. To keep the reform budget neutral, any remaining changes in revenue are compensated through transfers to the older generation.

4.4.3. PUBLIC INVESTMENT

In the last few years, the Federal Government has taken a number of measures to strengthen its own investment spending as well as that of the federal states and municipalities. In 2014, the Federal Government made available additional funds for investment in childcare facilities, public transport infrastructure and urban development. It provided financial relief to the federal states and municipalities and topped up a special fund for the expansion of childcare facilities. In 2015, it allocated for example an additional EUR 10 billion for investment in infrastructure, energy efficiency, climate and flood protection, and urban development, set up a special fund of EUR 3.5 billion to support investment in municipal infrastructure, and contributed funds to finance local public transport, expand social housing and finance energy-saving measures. Parts of the

proceeds from auctioning off broadcast spectrum were made available for investment in broadband expansion. In 2016, the Federal Government provided the federal states once more with extra funds for investment in social housing and expanding preschool childcare. Overall, these measures amount to an average of about EUR 8.5 billion or 0.3 % of GDP annually over the period 2016-2018.

Providing further financial relief to federal states and municipalities and reforming federal fiscal relations are expected to increase the scope for public investment. Federal states and municipalities have been further relieved of expenditure relating to asylum seekers and refugees and other social spending, which should increase their scope for public investment. Moreover, the Federal Government and the federal states agreed on a reform of federal fiscal relations that, once adopted, will take effect in 2020 (Box

4.4.3). This reform should improve conditions for public investment at all levels of government and address some of the barriers to financing and implementing transport infrastructure investment identified in last year's Country Report (European Commission, 2016a). However, the reform fell short of more fundamental changes in terms of increasing the tax autonomy of federal states and municipalities, which could have further increased the scope for public investment. It also still remains to be seen to what extent the federal states and municipalities will use the additional fiscal space for more public investment. On the other hand, the recent extension of consulting services on infrastructure investment planning to include the municipalities should boost the planning and implementation of infrastructure investment at municipal level. This appears particularly relevant, given that the federal funds made available to support infrastructure investment in the federal states and municipalities have remained to a large extent untapped due to capacity and planning constraints.

Education and research expenditure as a proportion of GDP has remained largely stable in recent years. Total consolidated public and private expenditure on education and research amounted to 9.1 % of GDP in 2013 and 2014. (Federal Statistical Office, 2016b) It therefore fell short of the national target of 10 % of GDP that the Federal Government and the federal states agreed to meet by 2015. General government expenditure on education as a proportion of GDP has remained stable at around 4.3 % of GDP since 2009 and therefore well below the EU average (4.9 % in 2014). Public expenditure on research and development (R&D) has remained stable at around 0.9 % of GDP in recent years. Total gross domestic public and private expenditure on R&D accounted for around 2.9 % of GDP in 2014 and 2015, thus Germany almost met its Europe 2020 target of 3 % R&D spending. However, Germany's R&D intensity in 2015 was lower than in Sweden (3.3 %), Austria (3.1 %), Denmark (3.0 %) and Finland (2.9 % of GDP) and also remained behind that of South Korea (4.3 % in 2014) and Japan (3.6 % in 2014).

Box 4.4.3: **Main elements of the reform of federal fiscal relations**

The equalisation transfers between federal states (*Länderfinanzausgleich*) will be abolished. Instead, fiscal equalisation will be achieved mainly through the horizontal allocation of the federal states' share of VAT revenue. To this end, VAT revenue will be allocated to the individual federal states based on the number of inhabitants, modified by supplements or deductions according to the federal states' financial capacity. The financial capacity will be calculated using a method similar to that used to calculate the current equalisation transfers, though with some modifications. In particular, it will include 75 % of municipalities' revenue, rather than 64 % as at present.

The Federal Government agreed to increase the federal states' revenue in a number of ways in order to ensure that no state ends up in a worse position owing to the fiscal equalisation reform. The federal states will receive a higher share of the vertically-allocated VAT revenue. The Federal Government will also contribute to partially equalise differences in the financial capacity of municipalities. It will provide additional supplementary federal grants to the federal states and additional consolidation assistance to the states of Bremen and Saarland.

In turn, the Stability Council will be endowed with additional powers and competences. The Stability Council consists of the federal ministers of finance and economic affairs as well as the federal state ministers of finance. It is currently in charge of monitoring budgetary developments at national and federal state level to avoid budgetary emergencies and assessing compliance of the federal states receiving specific consolidation assistance with the agreed consolidation path. Furthermore, the Stability Council reviews whether Germany (federation, federal states, municipalities and social insurances) complies with the requirements of the Fiscal Compact and the Stability and Growth Pact. In the future, it will also be responsible for monitoring compliance with the constitutional balanced-budget rule ('debt brake') at national and federal state level, based on the corresponding European standards and procedures.

Moreover, some executive competences will be redistributed between the Federal Government and the federal states. A transport infrastructure company will be established at the national level that combines all relevant competences for the funding, planning, construction and maintenance of federal motorways. It should overcome the current split of competences between the Federal Government (funding) and the federal states (planning and construction) which has led to inefficiency, including significant delays in infrastructure projects and only limited use of the additional amounts provided by the Federal Government in recent years. In turn, the perpetuity of public ownership in federal transport infrastructure will be enshrined in the constitution. The Federal Government will also have more possibilities to promote public investment in areas of general government interest but outside its constitutional competences, in particular education infrastructure (e.g. schools, kindergartens) in financially weak municipalities. In the event of federal co-funding, the Federal Court of Auditors will be granted monitoring powers. The federal tax administration will be granted additional general functional authority over the federal states' tax administrations and additional authority to ensure a more uniform use of tax administration software between states. The Federal Government will set up a central internet portal for citizens which will also link to public services from the federal states.

4.5. SECTORAL POLICIES

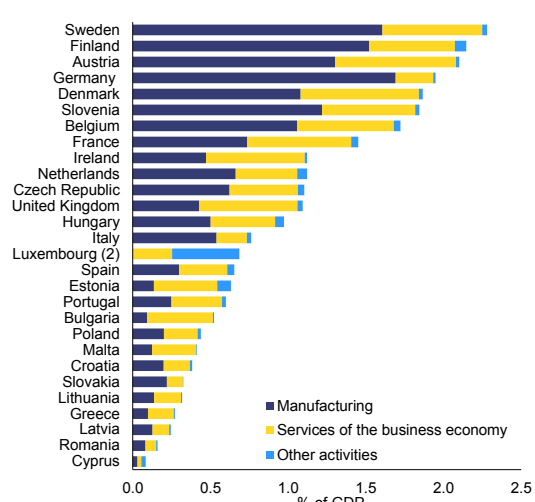
4.5.1. INNOVATION, VENTURE CAPITAL AND ENTREPRENEURIAL ACTIVITY

While investment in knowledge-based capital is crucial for long-term productivity growth, it is currently lower than in other high-income economies. In countries close to the technology frontier, such as Germany, the contribution of knowledge-based capital⁽⁴⁷⁾ to productivity growth is expected to be particularly strong. Business expenditure on R&D (a sub-component of knowledge-based capital) is high in Germany by international standards. Overall, however, investment in knowledge-based capital relative to GDP is lower than in some other high-income economies such as Denmark, Sweden or the US and has grown little over time. It is particularly low in the services sector (OECD, 2016b).

Strong R&D investment by the manufacturing sector contributes to a high level of intellectual property rights, while R&D investment in the services sector is relatively low. In 2014, Germany recorded the fourth highest business expenditure on R&D in relation to GDP in the EU (Graph 4.5.1). German manufacturers contributed 86 % to total business expenditure on R&D and were the top investors in innovation (1.7 % of GDP) across the EU. Yet the relative share of the manufacturing sector was even higher in the more R&D-intensive countries, Japan and South Korea (both 89 %). By contrast, expenditure on R&D in the services sector accounted for only 0.24 % of GDP. As a result, the services share of German business expenditure on R&D was by far the lowest in the EU. In 2013, Germany filed in relation to GDP the third highest number of international patent applications under the Patent Cooperation Treaty (PCT) in the EU. The country is the world's largest applicant for design rights in the transport sector (OECD, 2013).

⁽⁴⁷⁾ Knowledge-based capital includes computerised information (software and databases), innovative property (R&D, mineral explorations, copyright and creative assets, new product development in financial services, and new architectural and engineering designs) and economic competences (brand-building advertisement, market research, training of staff, management consulting, and own organisational investment).

Graph 4.5.1: Business enterprise expenditure on R&D by economic activity (2014)



(1) BE, IE, EL, FR, LU, AT, SE: 2013

(2) LU: Other activities includes manufacturing

Source: European Commission

Business R&D investment is increasingly concentrated in large firms. While overall business R&D investment is growing, it is increasingly concentrated in big companies, in particular in medium-high technology manufacturing sectors. At the same time, the contribution of SMEs is declining. In particular, smaller companies and those with only occasional research needs seem to have reduced their innovation activities. Most of the obstacles to innovation for SMEs stem from shortages of financial and human resources.

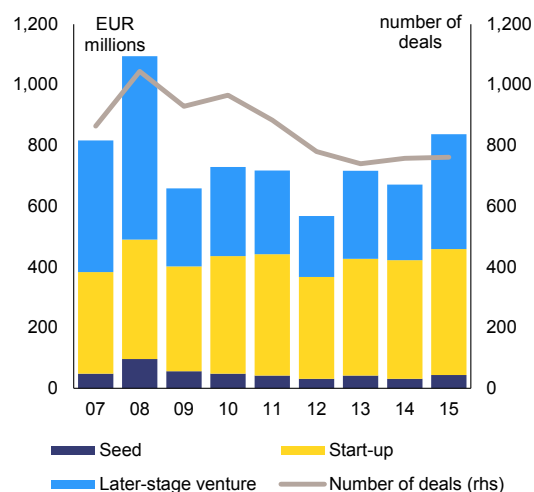
Public support for business R&D in Germany is relatively low by international comparison and does not include tax incentives. While investment in public R&D has increased in recent years in Germany, government support for business R&D (0.08 % of GDP in 2014) is significantly lower than for example in Belgium (0.44 %), France (0.42 %) and Austria (0.40 %) and some OECD countries like South Korea (0.36 %), Russia (0.41 %) and the US (0.26 %) (OECD, 2016c). Unlike the majority of EU and OECD countries, Germany relies entirely on direct government funding, e.g. through grants or contracts, and does not offer preferential tax treatment for business R&D expenditure.

Venture capital investment has increased in Germany, but the market still remains

underdeveloped by international standards.

Venture capital investment in Germany increased to about EUR 837 million in 2015, which is still below the level in 2008 (Graph 4.5.2). In 2015, venture capital investment accounted for about 0.03 % of GDP, which is slightly above the EU average but still below countries such as Finland, the UK, Sweden, Ireland or France and much below non-EU countries such as Israel and the US. The venture capital market in Germany appears to be failing to provide in particular bigger later-stage investments (KfW *et al.*, 2016). While the public funding of start-ups has developed well as a result of specific funding instruments (*EXIST and High-Tech Gründerfonds*), the framework conditions for private investors during the growth phase remain poor (Commission of Experts for Research and Innovation 2016). Despite some encouraging developments, including the dynamic start-up ecosystems in Berlin and Munich, Germany and Europe as a whole continue to lag behind the US in terms of venture capital investment in important areas of the digital economy, such as computer and consumer electronics (OECD, 2015c).

Graph 4.5.2: Venture capital investments in German companies



Source: Invest Europe, PEREP_Analytics

Some steps have been taken to support venture capital investment. The Federal Government has simplified the taxation of investment funds and has improved loss carry-forwards under the corporate income taxation system to make it easier for young and innovative companies to access equity. Moreover, *Kreditanstalt für Wiederaufbau* (KfW)

is again operating as an anchor investor⁽⁴⁸⁾ and the INVEST programme for business angels has been expanded. Further measures are being considered, including a dedicated technology growth fund to support the venture debt market. The absence of a dedicated stock market segment for SMEs may be a disadvantage. However, the *Deutsche Börse* Venture Network launched in 2015 aims to bring young, fast-growing companies together with potential investors and a new SME stock market segment is planned for March 2017. Nevertheless, some elements of corporate taxation might still hamper private investment (see Section 4.4).

Despite some encouraging developments, trends in entrepreneurial activity are overall rather negative, including in knowledge-intensive sectors.

The dynamic start-up ecosystem in Berlin and the large increase in entrepreneurs with a migrant background – who currently account for nearly 45 % of new businesses compared to 13 % in 2003 – are two examples of increasing entrepreneurial activity.⁽⁴⁹⁾ However, the number of high-growth innovative firms and employment in such firms has decreased. There are a range of challenges in this area, including limited venture capital markets, tax and regulatory obstacles, a lack of exit prospects for venture capital providers and demographic trends. An ageing population may also have an impact on entrepreneurial activity in the coming years, including on the transfer of existing businesses. Up to 17 % of entrepreneurs are planning to transfer or sell their businesses by 2018, while there are currently around three times as many entrepreneurs willing to hand over their business as there are potential investors.

4.5.2. COMPETITION IN PRODUCT AND SERVICES MARKETS*

Restrictions on entering the service market persist and are holding back productivity

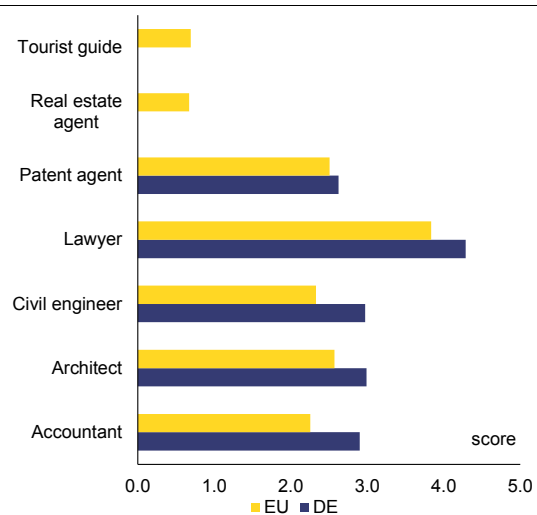
⁽⁴⁸⁾ Anchor investors are usually investors that take a large share in the investment and provide confidence to potential other investors.

⁽⁴⁹⁾ As part of the project ‘*Die Neue Gründerzeit*’, the German government launched a pilot scheme called ‘*Gründerpaten*’ to support the entrepreneurial potential of refugees. See Federal Ministry for Economic Affairs and Energy (2016a).

growth. Regulatory restrictiveness in the services sector remains high, in particular for business services. This is affecting business dynamics and competitiveness (European Commission, 2016a). As a result, productivity growth in the services sector is considerably below that of the manufacturing sector. However, inefficiency in the business services sector is also having wider negative repercussions on the economy, given its importance for manufacturing.

Germany announced only a limited number of measures for certain professions in its National Action Plan. Some measures are envisaged for liberal professions and business services. Germany is planning selected minor modifications to existing regulations, partly in response to national court decisions declaring certain existing regulations unlawful. This concerns the prohibition on medical doctors and lawyers offering services in partnership and mandatory tariffs for tax advisers. However, there is no comprehensive policy initiative to modernise the regulated professions and to strengthen competition in the services sector. According to a new indicator developed by the European Commission (European Commission, 2016h), the level of restrictiveness in Germany is higher than the EU weighted average for architects, engineers, lawyers and accountants/tax advisers (Graph 4.5.3). A recent EU-wide survey revealed that 33 % of the German labour force can be considered to be working in regulated professions (Koumenta and Pagliero, 2016). This is far above the EU average (21 %) and higher than in any other EU country, suggesting that changes to the regulatory framework could have significant impact.

Graph 4.5.3: Restrictiveness indicator (2016)



Source: European Commission

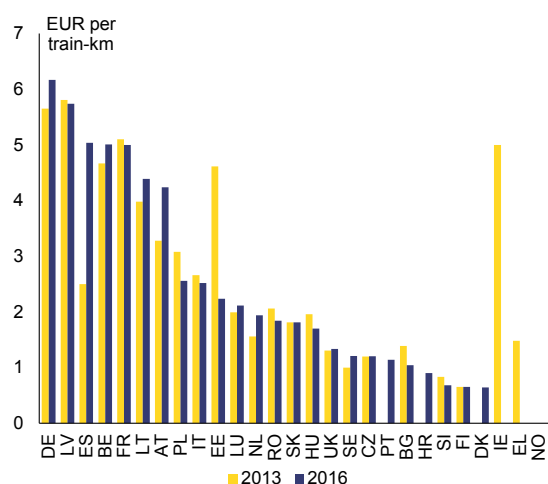
Germany is among the 10 Member States with the most restrictive rules for retail establishment. This is according to a recent assessment of retail establishment restrictiveness (European Commission, 2015c). Restrictive spatial planning rules are applied in some federal states, which are having a negative impact on retail market dynamics. In particular, they are hampering the establishment of certain retail formats based on a wider range of complementary products that are not commonly found on the German market.

Germany is witnessing a lively public debate on the emerging collaborative economy in the country. At policy level, the approaches taken differ between the federal states, notably as regards short-term tourist accommodation. The state of Berlin has taken a very restrictive approach to the short-term rental of tourist accommodation. A recent law constitutes an effective ban on such activities⁽⁵⁰⁾. Parts of the law have been rendered inapplicable by court decisions rejecting its necessity and proportionality in meeting public interest objectives. In the urban passenger transport sector, court decisions have effectively banned collaborative platforms from working with providers of urban transport services that are not in the possession of the appropriate business licences, with negative implications for competition and innovation in this sector.

⁽⁵⁰⁾ Zweckentfremdungsgesetz.

The market share of new entrants in the long-distance passenger train services market is stagnating at around 1 %. High track access charges remain one of the main obstacles for new entrants. Track access charges for intercity passenger services in Germany are the highest of all Member States (European Commission, 2016i) (Graph 4.5.4). They are also higher than in the freight and regional segments where market shares and the number of competitors to the incumbent are considerably higher. This situation is expected to further deteriorate further once the ongoing revision of the track access charges by the German infrastructure manager *DB Netz* is completed and enters into force in December 2018. This is because the new railway law adopted in 2016 contains a provision restricting increases in track access charges for regional passenger services provided under public service obligation contracts⁽⁵¹⁾. Given the limited ability of freight services to pay higher track access charges, it is expected that the long-distance passenger segment may have to bear additional increases in charges.

Graph 4.5.4: Trends in track access charges



Notes: DK – break in time series from 2016; HR and DE – 2014 charges; LV – 2015 charges; LT and SI – arithmetic mean of min./max. charges; FR – some train services excluded; UK – increase only in line with inflation and currency movements; data for several EU countries missing, NO – does not apply charges.

Source: European Commission

In addition, the existing legal framework may also be impeding competition. Germany has been

⁽⁵¹⁾ See Section 37 of *Eisenbahnregulierungsgesetz* of 29 August 2016 (BGBl. I S. 2082).

referred to the European court in 2013 for its failure to separate financial flows between operators and infrastructure managers and for its failure to ensure that public funds used for the provision of public passenger transport services are shown separately in the relevant accounts. According to the 2016 opinion of the advocate general (Opinion of advocate general, 2016) the failure to publish accounts showing the public funds paid for business relating to the management of infrastructure prevents the monitoring of the prohibition on the transfer of these funds to businesses relating to the provision of transport services. Additional factors hindering competition are the limited availability of used rolling stock for long-distance passenger markets and restricted access to ticket distribution channels (German Monopolies Commission, 2015).

4.5.3. ENERGY, RESOURCES AND CLIMATE CHANGE

Despite recent reforms of the Renewable Energy Act, the renewables surcharge has increased further. The resulting rise in electricity prices is expected to continue until feed-in tariffs for older renewable energy installations are phased out to a significant extent as from the mid-2020s. Exemptions from the renewable surcharge granted to large sections of the manufacturing sector are further adding to the electricity bills of other industrial consumers and households and tend to distort price signals. The latest reform of the Renewable Energy Act, which entered into force on 1 January 2017, has improved the cost-effectiveness of new installations. It expands competitive tendering for the funding of renewable energy-based electricity generation. Tenders will also be open to installations in other EU countries up to 5 % of newly installed renewable energy-based electricity capacity per year.

Planned investment in domestic electricity infrastructure is significantly delayed, but may be accelerated by underground cables, albeit at a significantly higher cost. Only around 35 % of the highest voltage grid projects identified in the 2009 Energy Network Expansion Act had been implemented by mid-2016, mainly owing to public opposition. 45 % are expected to be implemented by 2017. Out of a current total of 6 100 km of power lines planned in the Federal Requirement

Plan Act, only around 6 % have been approved and only 1 % have been constructed. Full implementation is not expected before the mid-2020s. The political decision in 2015 to prioritise underground high-voltage direct current (HVDC) transmission lines is expected to accelerate grid expansion, though at a cost two to three times higher than for comparable overhead lines. The total investment cost of all land-based electricity transmission grid expansion and reinforcement projects until 2024 is expected to be approximately EUR 26 to 31 billion according to the Transmission System Operators (TSOs), of which EUR 3 to 8 billion is additional expenditure on underground HVDC transmission lines.

The shift towards renewable energy makes significant investment in electricity distribution networks necessary. The increasing feed-in of renewable energies means that not only electricity transmission infrastructure, but also distribution grids covering about 98 % of power lines in Germany must enable and manage weather-dependent power flows. A study commissioned by the Federal Ministry of Economic Affairs and Energy (2014) estimated the additional investment needed to modernise distribution networks at between EUR 23 billion and EUR 49 billion until 2032 compared to the level in 2012. 70 % would be provided until 2022. Investment in low-voltage grids will be concentrated mainly in southern Germany (due to the continued expansion of photovoltaics) and in high-voltage grids in northern and eastern Germany (to transmit wind energy to consumption centres). The Incentive Regulation Ordinance (*Anreizregulierungsverordnung*), establishing a revenue cap for each network operator, was recently amended with the aim of improving the investment-friendliness of the payment framework for grid operators, while ensuring overall efficiency.

The lack of sufficient cross-border interconnections is still constraining trade in electricity with neighbouring countries and impairing the security of supply. In 2014, Germany's interconnection level for electricity was 10 % of its installed electricity production capacity. In particular, the available electricity interconnection capacity with Denmark appears insufficient. The implementation of the Projects of Common Interest with Poland, Austria, Belgium,

the Netherlands and Norway will also improve links to the electricity networks of neighbouring countries. Moreover, current national arrangements for congestion management and the establishment of bidding zones in central Europe that do not always accurately reflect current congestion are leading to increasing limitations on cross-border flows of electricity. This points to a lack of a joint regional solution agreed by all affected neighbours.

Although Germany reduced its primary and final energy consumption in 2014, it could fall short of its indicative national energy efficiency targets for 2020. The measures included in the National Energy Efficiency Action Plan for the energy supply side and the transport sector may be insufficient. In particular, energy consumption has increased in the residential sector if climate factors are taken into account. The Federal Government adopted major action programmes and published a green paper on energy efficiency in August 2016. The measures proposed and implemented mostly target the building stock (e.g. funding for renovation). Further measures are not expected before the federal elections in autumn 2017.

Although Germany is following an advanced circular economy approach, it is in danger of missing its own resource productivity objectives. The circular economy concept increasingly permeates political programmes and objectives. In 2002, the Federal Government included in its sustainable development strategy the objective of doubling resource productivity by 2020 compared to 1994. The *ProgResS* programme was set up in 2012 to promote resource efficiency and was last updated in 2016. However, despite some success in decoupling economic growth from resource use, the current growth rate in resource productivity appears insufficient. Based on the improvements in resource productivity over the last five years, it is likely that only 60 % of the target will be reached (Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety, 2015).

It appears uncertain whether Germany will achieve its emission reductions targets. Under EU law, the country needs to reduce its emissions in sectors that are not covered by the EU emission trading system (EU ETS) by 14 % between 2005 and 2020. Current projections suggest that this

target may be met by only a very small margin, with an expected emissions reduction of just 14.8 % over this period. Moreover, a recent report published by the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety casts doubt on the attainability of the target of reducing total greenhouse gas emissions by 40 % between 1990 and 2020. It estimates an emissions reduction of just 37 % to 40 % if all measures under the Action Programme for Climate Protection 2020 and the plan to decommission lignite power plants are implemented. The Federal Government has recently published a long-term climate strategy setting ambitious targets post-2020. The goal is to be greenhouse gas neutral to a large extent by 2050.

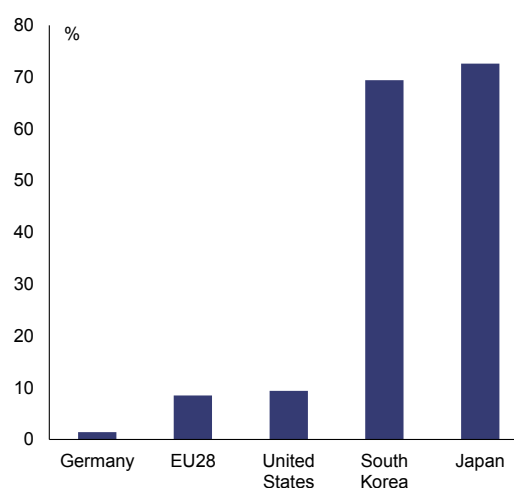
4.5.4. TELECOM NETWORKS

Germany is lagging behind in the availability of high-speed broadband connections, in particular in semi-urban and rural regions.

Although fixed-line operators have in recent years upgraded their legacy copper and coaxial cable networks, the current market share of fibre-based access networks is well below the EU average (1.3 % compared with 8.7 %) and the share in other advanced economies (Graph 4.5.5). Germany is also performing below the EU average in the uptake of fast broadband services. 40 % of companies recently reported that insufficient broadband infrastructure was a major constraint. Consequently, to set up ultrafast networks there will be an increasing need to install fibre closer to business premises and households. The Federal Ministry for Economic Affairs and Energy estimates that nationwide fibre network coverage requires investment of up to EUR 100 billion. The Federal Government's Digital Agenda 2014-2017 aims to provide fast broadband internet (≥ 50 Mbit/s) to all rural and urban areas through a variety of technologies by 2018. The roll-out of nearshore vectoring should contribute to reaching the 2018 targets by providing for the first time connection speeds above 50 Mbit/s for about 1.4 million households. However, this could lead to lower investment in fibre-based access networks, which are the basis for ultrafast connections in the future. The Federal Government also plans to increase the budget for broadband infrastructure investment by EUR 1.3 billion in addition to the

EUR 2.7 billion already allocated until 2020. Investment will be focused on rural areas where private investment is lacking due to insufficient profitability and where the availability of fast networks is particularly limited (Table 4.5.1).

Graph 4.5.5: Share of fibre connections as a proportion of total fixed broadband (2015)



Source: OECD and Communications Committee (COCOM)

Table 4.5.1: Broadband availability (2016)

Bandwidth	Urban	Semi urban	Rural
≥ 1 Mbit/s	100	99.8	98.7
≥ 2 Mbit/s	100	99.7	98.2
≥ 6 Mbit/s	99.8	97.6	91.3
≥ 16 Mbit/s	97.2	82.3	63.2
≥ 30 Mbit/s	92.4	72	48.9
≥ 50 Mbit/s	86.2	60.3	29.9

Source: Federal Ministry of Transport and Digital Infrastructure, 2016

4.6. PUBLIC ADMINISTRATION

4.6.1. E-GOVERNMENT AND PUBLIC PROCUREMENT

Germany's performance in digital public services is below the EU average. According to the National Regulatory Control Council (2016), Germany's federal structure poses specific challenges to establishing consistent and nationwide e-government services. A wide variety of systems that are not always interoperable creates inefficiency. Moreover, according to the eGovernment Monitor (eGovernment Monitor, 2016), existing digital public services may need to be better promoted. The 'Digital Administration 2020' programme aims to ensure that, in the future, public administration is electronically accessible to all citizens. It includes measures on electronic filing, the central DE-Mail gateway, the central e-ID service, an extended payment platform and public procurement. Furthermore, as part of the reform of federal fiscal relations (see Box 4.4.3) the Federal Government will set up a central internet portal for citizens which will also offer public services from the federal states. If implemented effectively, this could contribute to consistent and nationwide e-government services.

The value of contracts published under EU procurement legislation remains low despite ongoing efforts. German contracting authorities submit a disproportionately low number of tenders for publication in Tenders Electronic Daily (TED). At 1.2 % of GDP Germany has for years recorded the lowest values for contracts published under EU rules (the EU average is 4.2 % of GDP). E-procurement may in the long run have a positive effect on the publication rate and may lead to further efficiency gains. The Federal Government has developed an e-procurement standard which ensures the compatibility of data processed by different procurement platforms. Once fully operational, the system should significantly reduce complexity. At federal level, the transition to e-procurement is considered to be complete. At local level, e-notification of tenders has been set up but some concerns may remain regarding the online availability of documents. The EU-wide publication of public tenders could increase transparency, improve the quality of services and enable further efficiency gains. For example, the value of procurement contracts published in TED in the healthcare sector is lower than that of Denmark and procurement contracts for medical

imaging equipment, such as CT scanners, rarely seem to be published in TED, even though individual prices are often well above the threshold. Moreover, even if a public contract for the purchase of medical imaging equipment or of medicinal products is published, there is little competition as only a single bid is submitted in 29 % and 41 % of cases, respectively.

Aggregated purchasing is hardly used. In 2015 public procurement expenditure on works, goods and services amounted to EUR 461.7 billion, or 15.2 % of GDP. According to data extracted from TED, individual authorities in Germany rarely buy together (only in 5 % of procedures, compared with an EU average of 8 %).⁽⁵²⁾ Buying in bulk can lead to better prices and better quality. Although not all types of purchase are suitable for aggregation, excessively low aggregation rates imply lost opportunities. Moreover, the smarter use of public procurement could also encourage innovation. Despite the introduction of a centre of excellence for innovative public procurement in 2013, the progress made at federal and regional level in stimulating innovation through public procurement seems limited.

4.6.2. BUSINESS ENVIRONMENT

The business environment is favourable, but further improvements could be made for example to digital public services. The World Bank ranks Germany 17th in the world for doing business. The 'one-in, one-out' rule introduced in 2015 is helping to avoid a further increase in the administrative burden. A law to reduce red tape for SMEs, focusing in particular on young businesses and start-ups, entered into force in January 2016.⁽⁵³⁾ It raises the thresholds for complying with certain accounting rules and producing company statistics and exempts start-ups from certain reporting requirements. In June 2016, the Federal Government presented a Better Regulation Work Programme 2016⁽⁵⁴⁾ and in August 2016 adopted a second law to reduce red tape for SMEs which is still under parliamentary consultation.⁽⁵⁵⁾ The

⁽⁵²⁾ Information system for public procurement (SIMAP), standard forms for public procurement, question I.4: 'Contract award on behalf of other contracting authorities'.

⁽⁵³⁾ Bürokratieentlastungsgesetz (BEG).

⁽⁵⁴⁾ Arbeitsprogramm Bessere Rechtsetzung 2016.

⁽⁵⁵⁾ Bürokratieentlastungsgesetz (BEG II).

latter includes simplifications, for example in the fields of taxation, social security and digital procedures. National rules on directly transferring companies' registered offices into and out of Germany are still insufficient. Furthermore, a shortage of skilled workers, the network infrastructure and the slow response of regulatory bodies to new digital requirements have been identified as the greatest weaknesses of the digital economy (Federal Ministry of Economic Affairs and Energy, 2016b).

Box 4.6.1: Selected highlights

Future productivity growth is closely linked to the digital transformation of the economy. A successful transformation requires both excellent telecommunications infrastructure (high-speed broadband network) and a pro-active attitude of enterprises, social partners and the government towards grasping the chances of digitisation while being guarded against its risks. Despite the prevailing shortcomings in the availability of high-speed broadband connections, in particular in semi-urban and rural regions (see Section 4.5.4), German companies increasingly take advantage of the possibilities offered by digitisation. In particular, micro-enterprises and large companies show a high level of digitisation. However, small and medium-sized enterprises (SMEs) have a need to catch up, in particular with respect to 'Industry 4.0' applications, and only one-fifth of SMEs have a digitisation strategy.

Strengthening and accelerating the digitisation of industry is a priority of the Federal Government in order to help businesses play a leading role in increasingly digitised and connected industrial production processes and value chains. In particular, the Federal Government has set up the '*Industrie 4.0*' platform which brings together all relevant stakeholders, including business, social partners and education providers. The platform makes policy recommendations and offers practical guidance to support and accelerate technology adoption at company level. The funding programme 'Smart Service World' addresses 'smart services' that include value chains beyond the factory gates and the related online services.

In addition, Germany has set up a network of 10 SME centres of excellence and one centre of excellence in digital crafts ('*Mittelstand 4.0*'). The main purpose of these centres is to make small businesses aware of the potential benefits and risks of digitisation. The centres help SMEs to test advanced technologies and train their staff. Since 2017, SMEs are also offered a go-digital programme providing financial assistance for the use of digitisation consultants. Germany plans to set up additional centres and extend the subjects they cover. At present, digital hubs are emerging in several cities and regions, with a view to promoting closer cooperation between start-ups, SMEs, industry, science and administration.

In November 2016, the government launched the funding programme 'Smart Service World II' to promote cross-cutting, flagship solutions for SMEs in the fields of employment (e.g. use of smart services to safeguard employment or to alleviate the skills shortage), mobility (e.g. new logistics solutions for multimodal local transport use), housing (e.g. digital services to help older people by increasing the safety and comfort of buildings), and basic services (e.g. smart services for energy supply, the supply of goods and services, and basic medical care). No evaluations of the impact and effectiveness of these recent initiatives are yet available.

ANNEX A

Overview table

Commitments

Summary assessment ⁽⁵⁶⁾

2016 Country-specific recommendations (CSRs)	
<p>CSR 1: Achieve a sustained upward trend in public investment, especially in infrastructure, education, research and innovation, while respecting the medium term objective. Improve the design of federal fiscal relations with a view to increasing public investment, especially at municipal level.</p> <p>Achieve a sustained upward trend in public investment, especially in infrastructure,...</p> <p>...education,...</p>	<p>Germany has made some 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"> • Some progress has been made in increasing investment in public infrastructure. The federal infrastructure plan 2030 announces significant increases in transport infrastructure investment. If implemented effectively, the planned transport infrastructure company could be a step forward in addressing the barriers to investment identified in last year's country report. Funds provided for investment in transport infrastructure in the federal budget have increased in recent years. • 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

⁽⁵⁶⁾ The following categories are used to assess progress in implementing the 2016 country-specific recommendations:

No progress:

The Member State has not credibly announced nor adopted any measures to address the CSR. Below a number of non-exhaustive typical situations that could be covered under this, to be interpreted on a case by case basis taking into account country-specific conditions:

- no legal, administrative, or budgetary measures have been announced in the National Reform Programme or in other official communication to the national Parliament / relevant parliamentary committees, the European Commission, or announced in public (e.g. in a press statement, information on government's website);
- no non-legislative acts have been presented by the governing or legislator 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 that would need to be taken (unless the CSR explicitly asks for orientations or exploratory actions), while clearly-specified measure(s) to address the CSR has not been proposed.

Limited progress:

The Member State has:

- announced certain measures but these only address the CSR to a limited extent; and/or
- presented legislative acts in the governing or legislator body but these have not been adopted yet and substantial non-legislative further work is needed before the CSR will be implemented;
- presented non-legislative acts, yet with no further follow-up in terms of implementation which is needed to address the CSR.

Some progress:

The Member State has adopted measures that partly address the CSR;

and/or

the Member State has adopted measures that address the CSR, but a fair amount of work is still needed to fully address the CSR as only a few of the adopted measures have been implemented. For instance: adopted by national parliament; by ministerial decision; but no implementing decisions are in place.

Substantial progress:

The Member State has adopted measures that go a long way in addressing the CSR and most of which have been implemented.

Full implementation:

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

<p>...research and innovation, while respecting the medium term objective.</p>	<p>research expenditure has increased only slightly in recent years and may have fallen short of the national target of 10 % of GDP.</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. Public expenditure on R&D has remained stable at around 0.9 % of GDP in recent years and total public and private expenditure stabilised at around 2.9 % of GDP in 2014 and 2015.
<p>Improve the design of federal fiscal relations with a view to increasing public investment, especially at municipal level.</p>	<ul style="list-style-type: none"> • Some progress has been made in improving the scope for public investment, including at federal state and municipal level, though it remains to be seen to what extent this additional fiscal space will actually be used for more public investment. • The Federal Government is further relieving federal states and municipalities of expenditure relating to asylum seekers and refugees and other social spending, which should increase their scope for public investment. The transfers to the federal states comprise an annual lump sum of EUR 2 billion over the period 2016-2018 through an equivalent increase in the federal states' share of joint VAT revenue. They also include compensation for the cost of accommodation allowances for those granted asylum, amounting to EUR 400 million in 2016, EUR 900 million in 2017 and EUR 1.3 billion in 2018. As of 2018, the municipalities will receive an additional EUR 5 billion of relief annually through a combination of a higher share of municipalities in joint VAT revenue and an increased federal contribution to the funding of the accommodation allowance for the long-term unemployed. In total, the relief planned for 2016 amounted to about 0.1 % of GDP (or 5.4 % of the gross fixed capital formation of the federal states and municipalities in 2015), rising to around 0.3 % of GDP (20 %) by 2018. • The planned reform of federal fiscal relations that will take effect in 2020 (see Box 4.4.3) should also improve the conditions for public investment at all levels of government. The adoption of the related constitutional changes and implementing legislation by both the Federal Parliament and the Federal Council representing the federal states is envisaged for spring 2017. The extra revenue

	<p>allocated to the federal states – estimated at around EUR 9.7 billion in 2020 (0.3 % of 2015 GDP), rising to EUR 13 billion by 2030 – should increase the scope for public investment both at federal state and municipal level in the longer term. However, the reform falls short of more fundamental changes in terms of increasing the tax autonomy of federal states and municipalities, which could have further increased the scope for public investment. The planned federal transport infrastructure company could alleviate significant barriers to public infrastructure investment.</p> <ul style="list-style-type: none"> • The recent extension of the services of the existing independent consulting firm (ÖPP Deutschland AG) that promotes public private partnerships to include the whole public sector should also boost the planning and implementation of infrastructure investment, particularly at municipal level.
<p>CSR 2: Reduce inefficiencies in the tax system, in particular by reviewing corporate taxation and the local trade tax, modernise the tax administration and review the regulatory framework for venture capital. Step up measures to stimulate competition in the services sector, in particular in business services and regulated professions.</p> <p>Reduce inefficiencies in the tax system, in particular by reviewing corporate taxation and the local trade tax,...</p> <p>...modernise the tax administration...</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 inefficiencies in the tax system. The law on the reform of investment fund taxation aims at simplifying the taxation of public investment funds and at closing some loopholes for tax avoidance. Key elements are that public funds will be subject to corporate taxation, while the transparency principle will be abolished. No measures have been taken to review corporate taxation and the local trade tax. • Limited progress has been made in modernising the tax administration. • The law on modernising taxation procedures aims at strengthening the automatic processing of tax returns. Previous requirements to submit supporting documents have largely been abolished. Combined with a stronger emphasis on risk-based audits, this also prepares the ground for a more efficient and effective tax administration.

<p>...and review the regulatory framework for venture capital.</p> <p>Step up measures to stimulate competition in the services sector, in particular in business services and regulated professions.</p>	<ul style="list-style-type: none"> • If implemented effectively, additional general and IT-specific functional authority of the federal tax administration in relation to the states' tax administrations as agreed as part of the reform of federal fiscal relations could facilitate an accelerated modernisation of the tax administration. • Several additional measures to curb tax evasion and avoidance have been proposed by the Federal Government. • Some progress has been made in reviewing the regulatory framework for venture capital. The Federal Government has adopted a draft law to improve the loss carry-forward for companies that have a change in shareholders but continue their core business. This is to facilitate access to venture capital for young and innovative companies, particularly in later start-up stages. • Limited progress has been made in stimulating competition in the services sector. The Federal Government plans some limited modifications for certain liberal professions and business services, partly in response to national court decisions having declared some existing regulations unlawful. This concerns the prohibition of medical doctors and lawyers on offering services in partnership and mandatory tariffs for tax advisers. However, there is no strategy to substantially modernise the regulated professions and to strengthen competition in the services sector.
<p>CSR 3: Increase incentives for later retirement and reduce disincentives to work for second earners. Reduce the high tax wedge for low-wage earners and facilitate the transition from mini-jobs to standard employment.</p> <p>Increase incentives for later retirement...</p>	<p>Germany has made limited progress in addressing CSR 3:</p> <ul style="list-style-type: none"> • Limited progress has been made in increasing incentives for later retirement. A law on facilitating the transition of older workers into retirement (<i>'Flexi-Rente'</i>) has been adopted. It mainly aims to make the transition of older workers into retirement more flexible. In particular, the reform promotes the combination of early retirement and part-time work by reducing pension deductions in the event of extra income. It also incentivises employment above retirement age for employees by enabling them to

<p>...and reduce disincentives to work for second earners.</p> <p>Reduce the high tax wedge for low-wage earners...</p> <p>...and facilitate the transition from mini-jobs to standard employment.</p>	<p>acquire additional pension entitlements as well as for employers, by releasing them from the obligation to pay unemployment insurance contributions for employees above retirement age. It is too early to assess to what extent the reform may offset the stronger incentives for early retirement introduced by the last pension reform and the impact of an ageing population. Further assessment and monitoring appears required in this regard.</p> <ul style="list-style-type: none"> • No progress has been made in reducing disincentives to work for second earners. No initiatives have been taken or announced in this regard. • Limited progress has been made in reducing the high tax wedge for low-wage earners. The Federal Government adopted a package of measures aimed at safeguarding the minimum subsistence level and compensating for fiscal drag. The basic personal income tax allowance, the child allowance, the child benefit and the child supplement will be increased in 2017 and 2018 to align them with the adjusted subsistence level in accordance with existing law. Moreover, the income tax brackets will be adjusted to offset the impact of fiscal drag based on the tax progression report that is published every two years. These measures largely aim at adjusting for price developments and tend to benefit in particular low and middle income groups. However, only a limited impact on the tax wedge, if any, can be expected. • No progress has been made in facilitating the transition from mini-jobs to standard employment. No initiatives have been taken or announced in this regard.
Europe 2020 (national targets and progress)	
Employment rate of the population aged 20-64 years: 77 %	78.9 % in the year ending September 2016.
Employment rate of the population aged 55-64 years: 60 %	68.9 % in the year ending September 2016.
Employment rate of women: 73 %	74.7 % in the year ending September 2016.
R&D target set in the 2016 NRP: 3.0 % of GDP	Germany has made good progress and almost reached the 3 % R&D intensity target (total R&D expenditure

	as % of GDP). Total R&D intensity increased by around 0.5 pps over the last decade and stabilised at around 2.9 % in 2014 and 2015. Between 2005 and 2014, business R&D intensity increased by about 0.3 pps, with a corresponding increase of around 0.2 pps for the government, higher education and private non-profit sectors taken together. Businesses account for about two thirds of total R&D expenditure.
Greenhouse gas emissions, national target: -14 % in 2020 compared to 2005 (in non-ETS sectors)	According to the latest national projections submitted to the Commission and taking into account existing measures, it is expected that the target will be achieved by only a very small margin: -14.8 % in 2020 compared with 2005.
2020 renewable energy target in gross final energy consumption: 18 %	With a share of energy from renewable sources in gross final energy consumption of 13.8 % in 2014, Germany is on track to meet its 2020 renewable energy target. However, further deployment may be restrained by insufficient electricity infrastructure. ⁽⁵⁷⁾
Energy efficiency, indicative national 2020 targets: <ul style="list-style-type: none"> • 276.6 Mtoe (primary energy consumption); • 194.3 Mtoe (final energy consumption). 	Germany increased its primary energy consumption by 1 % from 291.1 Mtoe in 2014 to 292.9 Mtoe in 2015. Final energy consumption increased by 2 % from 208.9 Mtoe in 2014 to 212.1 Mtoe in 2015. Germany needs to increase its effort to decrease its primary and final energy consumption in order to achieve its indicative national 2020 targets.
Early school leaving target: <10 %.	The downward trend continued and at 10.1 % Germany has almost reached the European target and is close to the national target. However, it is below the EU average of 11 %.
Tertiary education target: 40 % (EU 2020) or 42 % (national target).	Germany is continuing to increase tertiary attainment which now stands at 32.3 % but remains below the EU average of 38.7 % and below the EU average increase. But it still has a long way to go to meet the EU target of 40 % and the national target of 42 %.
Target for reducing the number of people at risk of poverty or social exclusion, expressed as an absolute number of people: 20 % reduction in the number of long-term unemployed by 2020 as compared with 2008 (i.e. reduction by 320 000 long-term unemployed).	The number of long-term unemployed people fell by 658 000 in 2013, 707 000 in 2014 and 775 000 in 2015 compared with 2008. The number of long-term unemployed people fell by around 48 % between 2008 and 2015. Germany has already met the national Europe 2020

⁽⁵⁷⁾ Renewable energy shares for 2015 are approximations and not official data, reflecting the available data (04.10.2016). See *Öko-Institut Report: Study on Technical Assistance in Realisation of the 2016 Report on Renewable Energy*, <http://ec.europa.eu/energy/en/studies>.

	poverty target.
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ANNEX B

MIP Scoreboard

Table B.1: The MIP Scoreboard for Germany

			Thresholds	2010	2011	2012	2013	2014	2015	
External imbalances and competitiveness	Current account balance, (% of GDP)	3 year average	-4%/6%	5.7	5.8	6.2	6.6	7.0	7.5	
	Net international investment position (% of GDP)			-35%	25.7	23.2	28.0	33.8	40.2	48.7
	Real effective exchange rate - 42 trading partners, HICP deflator	3 years % change	±5% & ±11%	-3.7	-4.9	-9.0	-1.9	-0.4	-1.4	
	Export market share - % of world exports	5 years % change	-6%	-7.5	-8.8	-16.0	-11.9	-8.9	-2.8	
	Nominal unit labour cost index (2010=100)	3 years % change	9% & 12%	7.5	5.7	2.7	5.9	7.3	5.7	
Deflated house prices (% y-o-y change)			6%	-0.9	1.4	2.0	2.0	2.2	4.1	
Private sector credit flow as % of GDP, consolidated			14%	0.0	1.6	1.2	1.7	0.2	3.0	
Internal imbalances	Private sector debt as % of GDP, consolidated			133%	106.6	102.7	102.1	102.8	99.5	98.9
	General government sector debt as % of GDP			60%	81.0	78.7	79.9	77.5	74.9	71.2
	Unemployment rate	3 year average	10%	7.3	6.8	6.1	5.5	5.2	4.9	
Total financial sector liabilities (% y-o-y change)			16.5%	-1.1	2.9	3.3	-6.1	4.2	2.8	
New employment indicators	Activity rate - % of total population aged 15-64 (3 years change in p.p)			-0.2%	1.1b	1.4b	0.9	0.9	0.4	0.4
	Long-term unemployment rate - % of active population aged 15-74 (3 years change in p.p)			0.5%	-1.6	-1.1	-1.1	-1.0	-0.6	-0.4
	Youth unemployment rate - % of active population aged 15-24 (3 years change in p.p)			2%	-2.0	-1.9	-3.1	-2.0	-0.8	-0.8

1) b: break in time series.

Note: Figures highlighted are those falling outside the threshold established in the European Commission's Alert Mechanism Report. For real effective exchange rate and unit labour cost, the first threshold applies to euro area Member States.

Source: European Commission, Eurostat and Directorate General for Economic and Financial Affairs (for real effective exchange rate), and International Monetary Fund

ANNEX C

Standard tables

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

	2011	2012	2013	2014	2015	2016
Total assets of the banking sector (% of GDP)	310.5	298.3	266.4	266.8	252.7	252.0
Share of assets of the five largest banks (% of total assets)	33.5	33.0	30.6	32.1	30.6	-
Foreign ownership of banking system (% of total assets)	11.5	12.2	11.2	11.7	12.3	-
Financial soundness indicators: ¹						
- non-performing loans (% of total loans)	1.6	1.7	1.8	2.5	2.0	1.9
- capital adequacy ratio (%)	15.8	17.4	18.7	17.3	17.9	17.8
- return on equity (%) ²	2.2	1.1	1.3	2.5	1.7	0.8
Bank loans to the private sector (year-on-year % change)	2.0	1.1	0.5	1.3	2.3	3.8
Lending for house purchase (year-on-year % change)	1.2	1.9	2.0	2.4	3.5	3.7
Loan to deposit ratio	83.4	82.5	80.1	79.2	78.4	78.3
Central Bank liquidity as % of liabilities	1.8	1.7	1.4	1.1	1.0	1.0
Private debt (% of GDP)	102.7	102.1	102.8	99.5	98.9	-
Gross external debt (% of GDP) ¹ - public	47.4	49.7	45.8	48.9	42.8	42.6
- private	43.8	41.8	41.7	41.5	42.3	43.8
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)*	44.8	32.7	14.9	12.7	7.7	11.5

¹ Latest data Q2 2016.

² Quarterly values are not annualised.

* Measured in basis points.

Source: European Commission (long-term interest rates); World Bank (gross external debt); Eurostat (private debt); European Central Bank (all other indicators).

Table C.2: Labour market and social indicators

	2011	2012	2013	2014	2015	2016 ⁴
Employment rate (% of population aged 20-64)	76.5	76.9	77.3	77.7	78.0	78.5
Employment growth (% change from previous year)	1.4	1.2	0.6	0.8	0.9	1.1
Employment rate of women (% of female population aged 20-64)	71.3	71.6	72.5	73.1	73.6	74.3
Employment rate of men (% of male population aged 20-64)	81.7	82.1	82.1	82.2	82.3	82.6
Employment rate of older workers (% of population aged 55-64)	60.0	61.6	63.6	65.6	66.2	68.4
Part-time employment (% of total employment, aged 15-64)	25.9	25.8	26.6	26.5	26.8	26.8
Fixed-term employment (% of employees with a fixed term contract, aged 15-64)	14.6	13.8	13.4	13.1	13.2	13.0
Transitions from temporary to permanent employment	40.7	40.2	27.5	31.1	:	:
Unemployment rate ¹ (% active population, age group 15-74)	5.8	5.4	5.2	5.0	4.6	4.2
Long-term unemployment rate ² (% of labour force)	2.8	2.4	2.3	2.2	2.0	1.7
Youth unemployment rate (% active population aged 15-24)	8.5	8.0	7.8	7.7	7.2	7.1
Youth NEET ³ rate (% of population aged 15-24)	7.5	7.1	6.3	6.4	6.2	:
Early leavers from education and training (% of pop. aged 18-24 with at most lower sec. educ. and not in further education or training)	11.6	10.5	9.8	9.5	10.1	:
Tertiary educational attainment (% of population aged 30-34 having successfully completed tertiary education)	30.6	31.8	32.9	31.4	32.3	:
Formal childcare (30 hours or over; % of population aged less than 3 years)	15.0	15.0	19.0	15.0	:	:

1 The unemployed persons are all those who were not employed but had actively sought work and were ready to begin working immediately or within 2 weeks.

2 Long-term unemployed are those who have been unemployed for at least 12 months.

3 Not in education, employment or training.

4 Average of first three quarters of 2016. Data for total unemployment and youth unemployment rates are seasonally adjusted.

Source: European Commission (EU Labour Force Survey).

Table C.3: Labour market and social indicators (continued)

Expenditure on social protection benefits (% of GDP)	2010	2011	2012	2013	2014	2015
Sickness/healthcare	9,2	9,1	9,3	9,5	9,7	:
Disability	2,2	2,1	2,2	2,2	2,2	:
Old age and survivors	11,4	11,0	11,0	10,9	10,9	:
Family/children	3,1	3,1	3,1	3,1	3,1	:
Unemployment	1,6	1,3	1,1	1,1	1,1	:
Housing	0,7	0,6	0,6	0,6	0,6	:
Social exclusion n.e.c.	0,1	0,1	0,2	0,2	0,2	:
Total	28,5	27,3	27,4	27,7	27,8	:
of which: means-tested benefits	3,4	3,3	3,3	3,4	3,4	:
Social inclusion indicators	2010	2011	2012	2013	2014	2015
People at risk of poverty or social exclusion ¹ (% of total population)	19,7	19,9	19,6	20,3	20,6	20,0
Children at risk of poverty or social exclusion (% of people aged 0-17)	21,7	19,9	18,4	19,4	19,6	18,5
At-risk-of-poverty rate ² (% of total population)	15,6	15,8	16,1	16,1	16,7	16,7
Severe material deprivation rate ³ (% of total population)	4,5	5,3	4,9	5,4	5,0	4,4
Proportion of people living in low work intensity households ⁴ (% of people aged 0-59)	11,2	11,2	9,9	9,9	10,0	9,8
In-work at-risk-of-poverty rate (% of persons employed)	7,2	7,7	7,8	8,6	9,9	9,7
Impact of social transfers (excluding pensions) on reducing poverty	35,5	37,1	33,7	34,0	33,2	33,5
Poverty thresholds, expressed in national currency at constant prices ⁵	10715	10727	10772	10544	10454	10862
Gross disposable income (households; growth %)	2,4	3,1	2,6	1,7	2,4	3,1
Inequality of income distribution (S80/S20 income quintile share ratio)	4,5	4,5	4,3	4,6	5,1	4,8
GINI coefficient before taxes and transfers	52,0	51,5	50,5	51,7	51,6	:
GINI coefficient after taxes and transfers	29,4	29,1	28,5	29,7	30,7	:

1 People at risk of poverty or social exclusion: individuals who are at risk of poverty and/or suffering from severe material deprivation and/or living in households with zero or very low work intensity.

2 At-risk-of-poverty rate: proportion of people with an equivalised disposable income below 60% of the national equivalised median income.

3 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.

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 For EE, CY, MT, SI and SK, thresholds in nominal values in euros; harmonised index of consumer prices = 100 in 2006 (2007 survey refers to 2006 incomes).

Source: For expenditure for social protection benefits ESSPROS; for social inclusion EU-SILC.

Table C.4: Product market performance and policy indicators

Performance indicators	2010	2011	2012	2013	2014	2015
Labour productivity (real, per person employed, year-on-year % change)						
Labour productivity in industry	12.57	1.83	-0.34	-0.97	3.48	0.93
Labour productivity in construction	5.60	2.10	-0.98	-1.72	0.92	0.26
Labour productivity in market services	-0.61	1.85	2.53	1.86	-0.20	0.89
Unit labour costs (ULC) (whole economy, year-on-year % change)						
ULC in industry	-11.80	-0.34	3.63	3.96	-1.80	1.09
ULC in construction	-5.20	0.79	4.67	2.65	2.11	3.77
ULC in market services	2.38	1.11	2.65	0.62	3.73	2.27
Business environment	2010	2011	2012	2013	2014	2015
Time needed to enforce contracts ¹ (days)	394.0	394.0	394.0	394.0	459.0	479.0
Time needed to start a business ¹ (days)	14.5	14.5	14.5	14.5	14.5	10.5
Outcome of applications by SMEs for bank loans ²	0.55	0.49	0.28	0.17	0.58	0.35
Research and innovation	2010	2011	2012	2013	2014	2015
R&D intensity	2.71	2.80	2.87	2.82	2.89	2.87
Total public expenditure on education as % of GDP, for all levels of education combined	5.08	4.98	4.84	4.80	na	na
Number of science & technology people employed as % of total employment	42	41	43	43	44	44
Population having completed tertiary education ³	23	24	25	25	23	24
Young people with upper secondary education ⁴	75	76	76	77	77	77
Trade balance of high technology products as % of GDP	0.35	0.59	1.05	1.05	0.90	0.97
Product and service markets and competition				2003	2008	2013
OECD product market regulation (PMR) ⁵ , overall				na	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 the outcome is not known.

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

⁴ Percentage of 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.5: Green growth

Green growth performance		2010	2011	2012	2013	2014	2015
Macroeconomic							
Energy intensity	kgoe / €	0,13	0,12	0,12	0,12	0,11	0,11
Carbon intensity	kg / €	0,38	0,36	0,36	0,37	0,35	-
Resource intensity (reciprocal of resource productivity)	kg / €	0,52	0,54	0,52	0,51	0,52	0,50
Waste intensity	kg / €	0,15	-	0,14	-	0,15	-
Energy balance of trade	% GDP	-2,8	-3,6	-3,7	-3,5	-2,8	-
Weighting of energy in HICP	%	11,58	12,30	12,55	12,39	11,94	11,78
Difference between energy price change and inflation	%	-0,8	7,0	3,6	3,2	-1,6	-5,5
Real unit of energy cost	% of value added	9,6	10,5	10,4	9,9	9,9	-
Ratio of environmental taxes to labour taxes	ratio	0,10	0,10	0,10	0,10	0,09	-
Environmental taxes	% GDP	2,1	2,2	2,1	2,0	2,0	-
Sectoral							
Industry energy intensity	kgoe / €	0,11	0,10	0,10	0,10	0,10	0,10
Real unit energy cost for manufacturing industry excl. refining	% of value added	12,1	12,9	12,8	12,4	12,2	-
Share of energy-intensive industries in the economy	% GDP	10,47	10,16	10,27	10,13	10,20	-
Electricity prices for medium-sized industrial users	€ / kWh	0,12	0,12	0,13	0,14	0,16	0,15
Gas prices for medium-sized industrial users	€ / kWh	0,04	0,04	0,04	0,05	0,04	0,04
Public R&D for energy	% GDP	0,03	0,03	0,04	0,05	0,05	0,04
Public R&D for environmental protection	% GDP	0,02	0,02	0,02	0,03	0,03	0,03
Municipal waste recycling rate	%	62,5	63,0	65,2	63,8	65,6	66,1
Share of GHG emissions covered by ETS*	%	51,1	51,6	51,5	51,1	51,4	50,3
Transport energy intensity	kgoe / €	0,58	0,57	0,57	0,56	0,61	0,61
Transport carbon intensity	kg / €	1,46	1,44	1,43	1,43	1,54	-
Security of energy supply							
Energy import dependency	%	60,3	61,9	61,5	62,7	61,7	61,9
Aggregated supplier concentration index	HHI	12,3	13,9	13,7	15,0	15,3	-
Diversification of energy mix	HHI	0,24	0,24	0,24	0,25	0,24	-

General explanation of the table items:

All macro intensity indicators are expressed as a ratio of a physical quantity to GDP (in 2005 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 harmonised index of consumer prices (HICP): the proportion of 'energy' items in the consumption basket used for the construction of the HICP.

Difference between energy price change and inflation: energy component of HICP, and total HICP inflation (annual % change).

Real unit energy cost: real energy costs as a percentage of total value-added for the economy.

Environmental taxes over labour taxes and GDP: from European Commission's database, 'Taxation trends in the European Union'.

Industry energy intensity: final energy consumption of industry (in kgoe) divided by gross value-added of industry (in 2005 EUR).

Real unit energy costs for manufacturing excluding refining: real costs as a percentage 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 greenhouse gas (GHG) emissions covered by EU Emissions Trading System (ETS) (excluding aviation): based on greenhouse gas emissions (excl. land use, land use change and forestry) as reported by Member States to the European Environment Agency.

Transport energy intensity: final energy consumption of transport activity (kgoe) divided by transport industry gross value-added (in 2005 EUR).

Transport carbon intensity: greenhouse gas 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 over natural gas, total petrol products, nuclear heat, renewable energies and solid fuels.

* European Commission and European Environment Agency

Source: European Commission (Eurostat) unless indicated otherwise

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