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CONTENTS

Executive summary 3

1. Economic situation and outlook 7

2. Progress with country-specific recommendations 15

3. Reform priorities 19

3.1. Public finances and taxation 19
3.2. Financial sector 22
3.3. Labour market, education and social policies 27
3.4. Competitiveness, reforms and investment 34
3.5. Environmental sustainability 45

Annex A: Overview Table 49

Annex B: Commission debt sustainability analysis and fiscal risks 53

Annex C: Standard Tables 54

Annex D: Progress towards the Sustainable Development Goals (SDGs) 60

References 65

LIST OF TABLES

Table 1.1: **Key economic and financial indicators** 14
Table 2.1: **Assessment of 2019 CSR implementation** 17
Table 3.1.1: **Composition of tax revenues 2018** 19
Table 3.2.1: **Financial soundness indicators, all banks in UK** 22
Table C.1: **Financial market indicators** 54
Table C.2: **Headline Social Scoreboard Indicators** 55
Table C.3: **Labour market and education indicators** 56
Table C.4: **Social inclusion and health indicators** 57
Table C.5: **Product market performance and policy indicators** 58
Table C.6: **Green Growth** 59

LIST OF GRAPHS

Graph 1.1: **Annual real GDP growth** 7

Graph 1.2: **Private consumption and wages** 7
Graph 1.3: **Real household saving ratio** 7
Graph 1.4: **Potential GDP growth** 8
Graph 1.5: **Inflation and the nominal effective exchange rate** 9
Graph 1.6: **Key employment rates** 9
Graph 1.7: **Wage growth: actual and predicted based on economic fundamentals, 1999-2019** 10
Graph 1.8: **Current account balance** 10
Graph 1.9: **Consumer credit growth** 12
Graph 2.1: **Overall multiannual implementation of 2011-2019 CSRs to date** 15
Graph 3.1.1: **Public debt as % of GDP** 20
Graph 3.2.1: **Real house price growth** 23
Graph 3.2.2: **Quarterly housing starts and completions** 25
Graph 3.3.1: **Net childcare-related costs and benefits as a percentage of disposable income, by three earning levels** 29
Graph 3.4.1: **Trends in UK labour productivity and real wage** 34
Graph 3.4.2: **Contribution of production factors to labour productivity growth including intangible assets** 35
Graph 3.4.3: **Quarters needed to recover 2007 investment levels (in chained volume measures ref. 2016)** 38
Graph 3.4.4: **Breakdown of intangible investment in the market sector (current prices)** 39
Graph 3.4.5: **Trends in new infrastructure and housing work** 40
Graph 3.4.6: **GDP per capita (2017) and GDP per capita growth (2011-2017)** 43
Graph 3.4.7: **GDP per head (PPS) in UK, NUTS 2 regions (2017), EU=100** 43
Graph 3.5.1: **Indicative rates of decarbonisation required to achieve 80% and 100% reductions by 2050** 45

LIST OF BOXES

Box 2.1: **EU funds and programmes to address structural challenges and to foster growth and competitiveness in the UK** 18
Box 3.3.1: **Monitoring performance in light of the European Pillar of Social Rights** 28
Box 3.4.1: **Key drivers of the recent weakness of UK productivity** 36
Box 3.4.2: **Investment challenges and reforms in the UK** 44

EXECUTIVE SUMMARY

The United Kingdom has high employment but low, stagnant productivity. Unemployment is low and the UK business environment has many positive aspects, including relatively free and efficient product, labour and capital markets. However, labour productivity and investment are low and not improving. The UK faces a broad need for more investment in equipment, infrastructure and housing, while also bringing down project costs. There is scope to improve the effectiveness of education and training systems in areas such as basic and technical skills. Tight regulation of the land market can also prevent capital and labour from moving to where it is most needed([1]).

Following the withdrawal by the UK from the EU on 31 January 2020 and the entry into force of the Withdrawal Agreement, the UK entered a transition period, lasting until 31 December 2020. During this period, EU law — including that related to the European Semester — continues to apply to and within the UK. The UK will continue to participate in the implementation of EU programmes and activities committed to under the 2014-2020 multiannual financial framework until their final closure. During the transition period, trading relations between the EU and the UK will remain essentially unchanged. Beyond this period, however, they will depend on the outcome of the negotiations on the UK's future relationship with the EU. This report does not speculate on the impact of different scenarios, and the projections for 2021 are based on a purely technical assumption of status quo beyond the transition period in terms of trading relations between the EU and the UK. This means that the 2021 projection does not reflect the fact that, even in a scenario where a free trade agreement is concluded, the resulting situation will be less beneficial to EU-UK trading relations than when the UK was in the Internal Market and the Customs Union.

In 2019, UK GDP growth remained subdued. Annual growth was 1.4% in 2019, slightly up from 2018 (1.3%). Growth in private consumption continued to slow, despite increasing real wage growth, linked to subdued consumer confidence. After falling in 2018, business investment has stabilised. Investment remains subdued, in part due to uncertainty over the UK's future trading relations with the EU. On the basis of the purely technical forecast assumption, the UK's GDP growth is expected to be 1.2% per year over the forecast period, as consumption growth is supported by rising real wages and an expansionary fiscal stance but investment remains subdued.

Consumer price inflation eased to 1.3% in December 2019. This is well below a peak of 3.1% in November 2017 and reflects lower oil prices and the fading impact of the depreciation in sterling by about 15% from late 2015 to mid-2016. After a period of relative stability, sterling fell further in mid-2019 in the context of very high Brexit-related uncertainty. However, it has since recovered to a level slightly higher than in most of the post-referendum period. Annual inflation was 1.8% in 2019. It is expected to remain slightly below target at 1.7% in 2020, before picking up to 2.0% in 2021.

Employment is high. The employment rate (people aged 20-64) stood at 79.1% and unemployment was low and stable at 3.8% in the third quarter of 2019. Wage growth was relatively strong in 2019, peaking in the middle of the year. Average weekly earnings increased by 3.6% in September-November 2019 (1.8% in real terms). However, if labour productivity remains stagnant, the current rate of real wage growth does not appear to be sustainable.

After widening in 2018, the current account deficit was volatile over 2019. The deficit rose to 6.8% of GDP in the first quarter of 2019 before falling to 2.8% of GDP in the third quarter, largely due to fluctuations in the trade balance. The overall net trade response to the 2016 sterling depreciation has been disappointing, as evidenced by recent losses in the UK's export market share.

Household debt remains high, at 83% of GDP in 2018. After falling gradually for a number of years from its peak of 96% in 2009, the household debt ratio has broadly stabilised in the past four years. Growth in total lending to households has

([1]) This report assesses the UK's economy in light of the European Commission's Annual Sustainable Growth Strategy, published on 17 December 2019. In this document, Commission sets out a new strategy on how to address not only the short-term economic challenges but also the economy's longer-term challenges. This new economic agenda of competitive sustainability rests on four dimensions: environmental sustainability, productivity gains, fairness and macroeconomic stability.

also remained broadly stable, at 3.8% year-on-year in December 2019.

Most parts of the UK financial sector are well capitalised and in a position to absorb potential shocks. The UK banking system has maintained good capital adequacy and liquidity and continues to improve its profitability. However, the insurance sector faces a number of challenges that have weakened its profitability. The Bank of England's Financial Policy Committee judges that the UK banking system would be resilient to major and simultaneous domestic and global shocks.

The UK stands out among advanced economies for its low rate of investment. UK investment fell particularly sharply in the financial crisis, then recovered robustly until 2015, as the economy and employment grew. In the last 3 years, however, private investment has stalled in the context of high Brexit-related uncertainty, despite the UK having been in the phase of the economic cycle where investment is usually strongest. Growth in intangibles investment has also slowed markedly. Direct public sector investment is close to the EU average and currently growing.

Overall, the UK has made some ([2]) progress in addressing its 2019 country-specific recommendations.

There has been some progress in the following areas:

- Research and innovation. UK universities remain global research leaders. However, UK R&D intensity is flat and below the EU average, and knowledge diffusion is uneven. Delivering the recent ambitious proposals for future research and innovation support will be a challenge.

- Housing investment. Annual net housing supply has continued to rise but planning permissions have levelled off and there are signs of a slowdown in new housing starts. House building looks set to stabilise at a level below that which what would be necessary to meet estimated demand, due in part to capacity constraints in the construction sector. Real house prices are no longer rising though the cost of housing remains high in many places. The government has extended and revised a number of housing policies, including further changes to the planning system, but major new initiatives have been limited.

- Sustainable transport. Use of the UK's road, rail and aviation networks is reaching capacity and this contributes to congestion, rail reliability issues and air pollution. Public sector investment in transport has increased but the effects of decades of under-investment in infrastructure will take time to address. After some signs of improvement in project delivery, major rail schemes have recently fallen behind schedule and over budget. The UK is taking action to fulfil its ambition to be at the forefront of zero emission vehicles, though it currently lags in the proportion of renewable energy used in the transport sector.

- Low carbon and energy transition. With its new commitment to net carbon emissions by 2050, the government's ambitions are clear. The preparatory work for allocating planned increases in investment is advanced. The scale of the decarbonisation challenge will require a more detailed investment strategy and sustained commitment. In the electricity sector, the UK continues to make progress in attracting investment in large-scale cost-competitive renewables, particularly offshore. Progress is slower in the heating and cooling sector and the UK is not on course to meet its overall 2020 renewables target.

There has been limited progress in the following areas:

- Training and improving skills. While the number of people with low levels of skills who are looking for work has increased, the polarisation of job growth towards high and low-skilled roles (and away from roles requiring a medium level of skill) has been accompanied by increased skills mismatches. Implementing the reformed apprenticeship system is proving a challenge, with fewer

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

registrations than in previous years. There is evidence that the apprenticeship levy, introduced in 2017, has seen funding increasingly used to train more senior staff at the expense of entry-level apprenticeships.

The UK performs relatively well on a number of indicators of the Social Scoreboard supporting the European Pillar of Social Rights, but some challenges remain. The labour market shows robust performance in terms of job creation and reducing unemployment. However, some groups still have relatively high numbers of people who are not in work or who are looking for work. The proportion of young people who are neither in employment nor in education and training (NEET) increased slightly in 2018 and is now in line with the EU average (after having been consistently below it since 2014). While the employment rate for women (74.4% in Q3-2019) reached the highest level in recent decades, the employment gap between men and women is still close to 10pps. The risk-of-poverty or social exclusion has increased considerably, exceeding the EU average.

Regarding progress in reaching the national targets set in the Europe 2020 strategy, the UK is performing well on reducing greenhouse gas emissions. It is on track to meet its 2020 energy efficiency targets but additional effort is likely to be required if it is to achieve the 2020 renewable energy targets.

The UK has made progress towards achieving most aspects of the UN Sustainable Development Goals (SDGs). There has been particular progress on environment-related SDGs including "Affordable and Clean Energy" (SDG 7). There has been some deterioration over the past 5 years in several aspects of the SDGs relating to poverty and deprivation, including "Reduced Inequalities" (SDG 10) ([3]).

([3]) Within the scope of its legal basis, the European Semester can help drive national economic and employment policies towards the achievement of the United Nations Sustainable Development Goals (SDGs) by monitoring progress and ensuring closer coordination of national efforts. The present report contains reinforced analysis and monitoring on the SDGs. A new annex (Annex D) presents a statistical assessment of trends in relation to SDGs in the United Kingdom during the past five years, based on Eurostat's EU SDG indicator set.

Key structural issues analysed in this report, which highlight particular challenges for the UK economy, include:

- **General government debt remains high**. After several years of fiscal tightening and an improving budget balance, the general government deficit is projected to increase from 1.8% of GDP in 2018-2019 to 2.2% in 2019-2020 and 2.4% in 2020-2021. Debt is projected to fall slightly, but is expected to remain above 80% of GDP over the forecast period. The impact of an ageing population and non-demographic cost pressures on health and social care represent significant long-term fiscal risks.

- **The availability and affordability of housing remains a major challenge.** The housing market has softened and real house prices are no longer growing. However, house prices and rents remain high in areas of high demand, and there are signs of overvaluation. Significantly fewer young adults now own their own homes and this contributes to inequality between generations. The amount and location of land available for new housing is limited by tight regulation of the land market, particularly around big towns and cities. This has prevented housing supply from responding adequately to shifts in demand, and inflated the price of building land and existing houses. The government is implementing a range of measures to boost housing supply. House building remains below what is required to alleviate existing housing shortages.

- **Not all groups have shared the benefits of a high employment rate.** The employment rate (20-64) reached a record 79.1% in Q3-2019, well above the EU average (74.1%). However, significant challenges remain, including slower growth in labour productivity, polarisation of jobs towards high- and low-skilled roles, a high number of zero-hour contracts and jobs allocated through online platforms ('the gig economy'), and a persistent gender employment gap. There has been a significant increase in the use of zero-hour contracts, which are characterised by lower levels of social protection, skills progression and productivity. The number of women who are not in work or

who are not seeking work due to caring responsibilities is higher than the EU average. This is partly due to high childcare costs especially for low-income earners.

- **The risk of poverty or social exclusion increased significantly from 22% to 23.6% between 2017 and 2018, surpassing the EU average.** This translates into an additional 1.1 million people at risk of poverty or social exclusion. The number of people turning to food banks in the UK has increased over the last year. Market income inequality is high, but social benefits have a strong poverty-reducing effect. In-work poverty and child poverty remain high. Monetary poverty is projected to rise further. Homelessness figures show no signs of abating.

- **Labour productivity, which was already relatively low, has stagnated.** Output per hour is significantly lower in the UK than in most other developed economies, and is barely higher than it was before the financial crisis. Recent GDP growth has been driven by rising employment, not increases in productivity. Despite a tight labour market, UK labour productivity has been essentially flat since early 2018. There is scope to increase productivity by addressing broad-based problems such as low investment in equipment, infrastructure and R&D, and skills gaps (especially in basic and technical skills). Many parts of the UK are relatively poor with comparatively low levels of investment in skills and infrastructure, and inter-regional disparities have continued to grow. The UK aims to invest more in research and innovation and improve the use of existing technologies across the economy.

- **Infrastructure networks are under pressure.** Use of the UK's road, rail and aviation networks is reaching capacity and the country needs to deliver a substantial amount of new physical infrastructure. After decades of public under-investment, the government is starting to deal with the infrastructure deficit. In July 2018, the National Infrastructure Commission published a wide-ranging long-term assessment of infrastructure needs between now and 2050. A full government response in the form of a 'National Infrastructure Strategy' has been delayed, and is expected to be published alongside the March 2020 Budget.

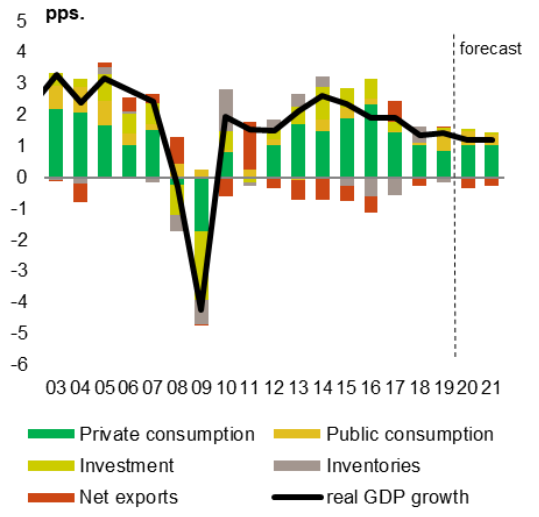
- **Major investment and reforms will be needed to continue the transition to a climate-neutral economy**. The UK has made good progress to date in reducing greenhouse gas emissions. In 2019, the UK committed to reach net zero carbon emissions by 2050. This will require large-scale investment and behavioural changes across the economy. The prospects for further investment in the renewable electricity sector are encouraging. Reducing the amount of energy used for home heating is complicated by the age of the housing stock. Congestion and long commutes will be a challenge in reducing transport sector emissions.

1. ECONOMIC SITUATION AND OUTLOOK

GDP growth

UK GDP growth remained subdued in 2019. Real GDP grew by 1.4% in 2019. While increasing slightly from 2018 (1.3%), recent growth has been well below the post-crisis peak of 2.6% in 2014 (Graph 1.1). Stockpiling and other actions by UK businesses, in advance of the possible disorderly withdrawal from the EU on 29 March 2019, temporarily boosted growth in Q1-2019. The unwinding of this mitigation activity had an opposite, dampening effect in the following quarter. A similar, though less pronounced pattern was visible in the months around the possible withdrawal date at the end of October 2019 ([4]).

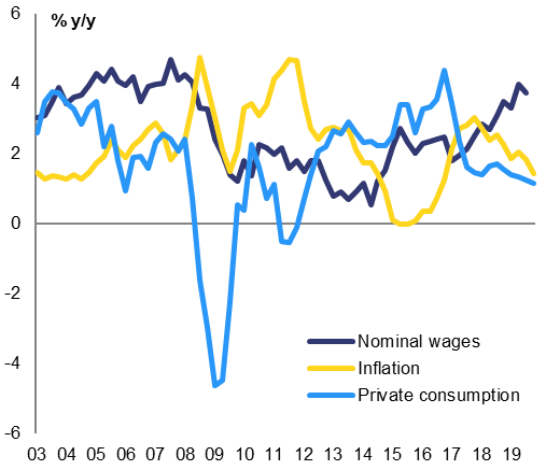
Graph 1.1: **Annual real GDP growth**



Source: Office for National Statistics, European Commission

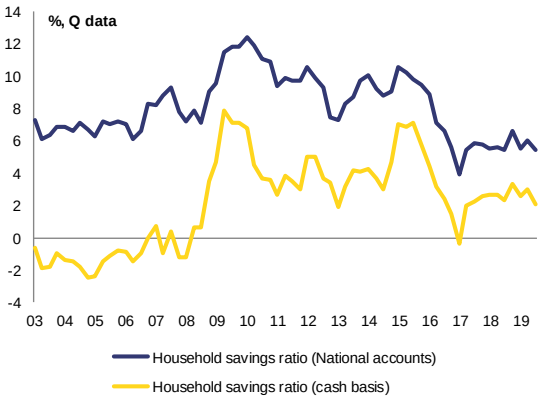
Growth in private consumption continued to slow. From its post global financial crisis peak of 3.6% in 2016, growth in private consumption eased to 1.6% in 2018 and 1.3% in 2019 (Graph 1.2). The slowdown in 2018 was despite increasing real wage growth but was consistent with a significant deterioration in the Commission's consumer confidence indicator over the second half of the year. Private consumption continued to grow at a modest pace in 2019, as the boost from rising real wages was dampened by subdued consumer confidence. The Bank of England suggest that Brexit uncertainty has weighed on consumer goods demand, in particular on 'non-essential' spending (Bank of England, 2019b). According to the Commission 2019 Autumn Forecast, growth in private consumption is expected to recover somewhat over the forecast period, supported by rising real wages and an expansionary fiscal policy.

Graph 1.2: **Private consumption and wages**



Source: Office for National Statistics

Graph 1.3: **Real household saving ratio**



Source: Office for National Statistics, European Commission

The household saving ratio increased in 2018 and has since stabilised (Graph 1.3). It increased from 5.3% in 2017 to 5.8% in 2018. In Q3-2019, the savings ratio stood at 5.4%. The cash-basis saving ratio (which captures only the immediately available and directly observed cash to households) increased to 2.8% in 2018 from 1.6% in 2017, in line with the increase in the national

([4]) If not mentioned otherwise, data used in Section 1 is from the UK Office for National Statistics (ONS).

accounts household saving ratio. In Q3-2019, the cash-basis ratio had fallen to 2.1%. In 2020 and 2021, growth in household expenditure is expected to grow generally in-line with gross household disposable income growth. The household saving ratio is therefore expected to remain broadly stable.

Business investment remains subdued. Business investment grew by 0.3% in 2019 and it has been weak for the last 3 years (see Box 3.4.1). According to the 2019/2020 Investment Survey by the European Investment Bank, uncertainty was the most cited barrier to investment (88% of the firms surveyed, up from 76% in 2018/2019) and well above the EU average (72%) (EIB, 2019). Over the forecast period, business investment is expected to remain weak as uncertainty about the UK's future trading relationship with the EU persists.

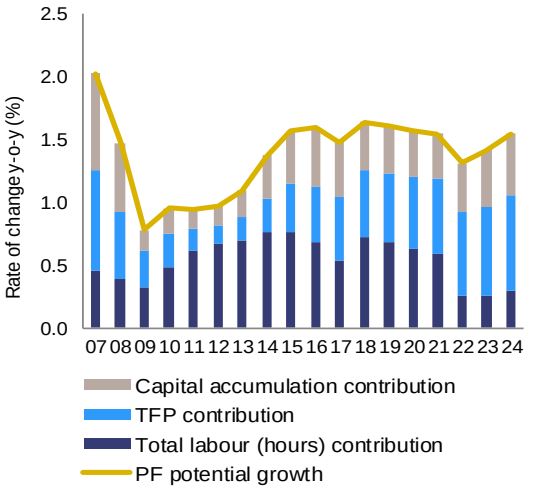
Trade was volatile through 2019. Net trade made a negative contribution to growth in 2018 (-0.3pps), and no contribution in 2019 (0.0pps). Mitigation activity by firms before the possible disorderly withdrawal from the EU on 29 March 2019 and its subsequent unwinding introduced significant volatility in UK trade data over the first half of 2019, and a similar, though less pronounced pattern was observable around the possible withdrawal date in October 2019. Over the forecast period, net exports are projected to weigh on growth, as continued weak external demand inhibits export growth while domestic demand supports moderate import growth.

UK GDP is forecast to grow at a broadly stable pace in 2020 and 2021. Whereas during the transition period trading relations between the EU and the UK are unchanged, there is uncertainty as regards their future economic relationship beyond the transition period. For that reason, 2021 projections for the UK are based on the purely technical assumption of status quo in terms of trading relations between the EU and the UK. This is for forecasting purposes only and does not reflect any assumptions or predictions with regard to the outcome of the negotiations between the EU and the UK, nor the fact that, in any outcome, their trading relations will be less beneficial than compared to when the UK was a member of the Internal Market and the Customs Union. On that basis, and assuming an expansionary fiscal stance based on the 2019 Spending Review announcements (see below), annual GDP growth is forecast to be 1.2% in both 2020 and 2021.

Potential growth

Weak productivity growth continues to weigh on potential GDP growth. Potential GDP growth has remained relatively subdued compared to the pre-crisis period (Graph 1.4). This is in line with the stagnation of labour productivity since the global financial crisis. In particular, growth in the labour force and employment contributed to the increase in potential GDP growth after the crisis, and with a small deterioration in 2016 and 2017, continues to be the main contributor. In recent years, companies appear to have opted for increasing labour inputs over capacity enhancing capital investments (see Section 3.4 for detail on UK productivity developments).

Graph 1.4: **Potential GDP growth**



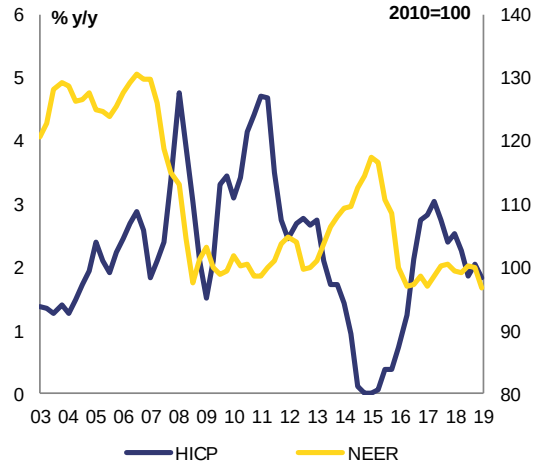
Source: European Commission

Inflation

After easing in 2019, inflation is expected to rise gradually over the forecast period. Despite the tight labour market, consumer price inflation eased to 1.3% in December 2019, and was 1.8% in 2019 as a whole (Graph 1.5). This was significantly down from 2.5% in 2018, partly due to lower oil prices and the unwinding of the effect of sterling's depreciation in 2016. After falling by around 15% between late 2015 and the aftermath of the UK's vote to leave the EU in mid-2016, the sterling net

effective exchange rate has been relatively stable at this lower level. Sterling fell further in mid-2019 in the context of very high Brexit-related uncertainty, but has since recovered to a level slightly higher than in most of the post-referendum period. Inflation is projected to remain slightly below target at 1.7% in 2020, before picking up to 2.0% in 2021.

Graph 1.5: **Inflation and the nominal effective exchange rate**



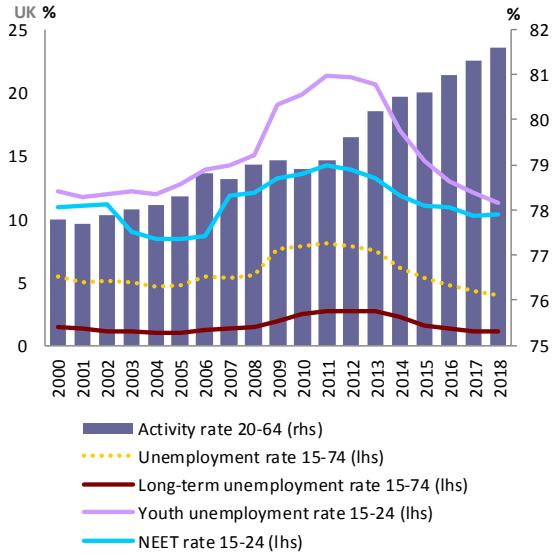
Source: European Commission

Labour market

The labour market continues to perform well but employment growth has slowed down. The labour market has been strong in recent years (see Graph 1.6). Based on Eurostat data, the employment rate was a record 79.1% in Q3-2019. Employment has increased across most sectors. The activity rate reached 81.9% in Q3-2019, after flattening in mid-2018. Unemployment was stable at 3.8% in Q3-2019, the lowest level over the last two decades. At the same time, job-finding rates (11.8% of unemployed people found a job in Q1-2019) have stagnated since mid-2017. The percentage of underemployed part-time workers has remained above the EU average (4.2% vs 3.2% in Q3-2019), though it has decreased in recent years.

Wage growth has accelerated and remains broadly in line with economic fundamentals. After years of relatively weak wage dynamics, real wage growth picked up through 2019 to nearly 2%. Nominal wage growth has accelerated and is expected to have averaged over 3% in 2019 (vs. 2.9% in 2018). This is marginally above a model prediction of what might be expected on the basis of developments in inflation, productivity and unemployment (2.9% for 2019, see Graph 1.7) ([5]). However, the current rate of real wage growth may not be sustainable if labour productivity remains stagnant (see Section 3.4).

Graph 1.6: **Key employment rates**

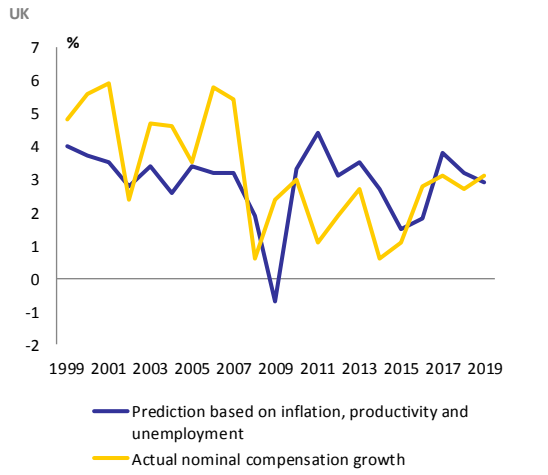


Source: Eurostat

Long-term international migration continued to add to the UK population, but the balance has shifted away from the EU. In the year to June 2019 net migration was 212,000. Net migration from the EU has continued to fall from a peak of 218,000 in 2015 and at 48,000 in the year to June 2019 is at its lowest level since 2003. Net migration from outside the EU has stabilised at an annual rate of over 200,000, after a gradual increase since 2013.

([5]) This is a benchmark for wage growth consistent with internal labour market conditions. It is wage growth predicted on the basis of changes in labour productivity, prices and unemployment rate (see Arpaia and Kiss, 2015).

Graph 1.7: **Wage growth: actual and predicted based on economic fundamentals, 1999-2019**



Source: European Commission

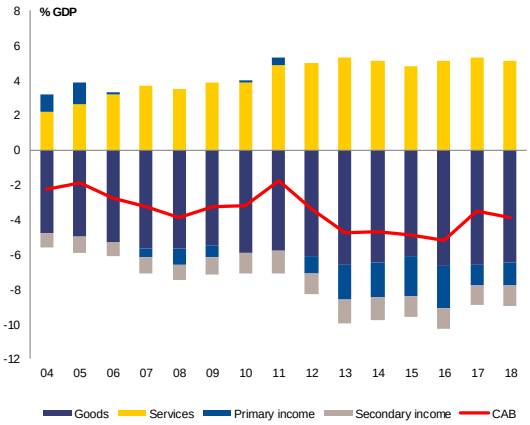
Social developments

The at-risk-of-poverty-or-social-exclusion rate increased by 1.6pps to 23.6% in 2018, significantly exceeding the EU average of 21.9%. Both relative poverty and material deprivation rose. In 2018, the at-risk-of-poverty rate increased to 18.9% (from 17% in 2017) and is expected to have increased further in 2019 (Eurostat, 2019a). The severe material deprivation rate increased to 4.6% (from 4.1% in 2017). Due to major reforms of the social security system, the poverty reducing effect of social transfers decreased from 41.7% in 2017 to 35.9% in 2018, bringing it closer to the EU average of 33.2%. As a result, income inequality after transfers, measured by the income quintile share ratio, increased from 5.4 in 2017 to 5.95 in 2018. In the past 5 years, the UK has moved away from reaching SDG 10 (reducing inequalities).

External position

The deterioration in the trade balance led to the current account deficit widening in 2018, while movements were more volatile in 2019. The UK current account deficit widened to 3.9% of GDP in 2018 from 3.5% in 2017 (see Graph 1.8). This deterioration was largely driven by an increase in the trade deficit, which widened to 1.4% of GDP in 2018 from 1.2% in 2017. In cyclically-adjusted terms, the current account position remained considerably below the country-specific 'norm' of around zero suggested by fundamentals ([6]). While the current account deficit increased to 6.8% in Q1-2019, it improved to 2.8% in the third quarter, both movements driven by changes in the trade balance. Trade was volatile in 2019 in part due to stockpiling activities ahead of the UK's expected withdrawal from the EU in March 2019, and subsequent unwinding. Since sterling's depreciation in 2016, the net trade response to the depreciating real effective exchange rate and associated improved price competitiveness has been disappointing, as evidenced by recent export market share losses.

Graph 1.8: **Current account balance**



Source: Office for National Statistics & European Commission

The primary income deficit widened very slightly to 1.3% of GDP in 2018, from 1.2% in 2017 and stood at 1.6% in Q3-2019. The main driver was a reduction of the foreign direct investment (FDI) income balance as the rates of return earned on FDI-related investments in the UK increased, and these maintained a better rate of return than that earned on UK investments abroad. This was partially offset by the portfolio income deficit narrowing from 2.3% of GDP in 2017 to 2.0% in 2018 and the other investment deficit narrowing from 0.4% of GDP in 2017 to 0.3% in 2018.

([6]) The benchmark is derived from reduced-form regressions capturing the main determinants of the saving-investment balance, including fundamental determinants (e.g. demography, resources), policy factors and global financial conditions. See also Coutinho, Turrini and Zeugner (2018).

Total net investment inflows into the UK decreased in 2018 and stabilised in the first half of 2019. Total net inward investment flows into the UK decreased substantially to 9.0% of GDP in 2018 from 23.7% in 2017. This was mostly due to a reduction in volatile other investment inflows from 10.8% of GDP in 2017 to 0.0% in 2018. In contrast, other investment inflows recorded a large net inflow of overall investment in the first half of 2019. Other investments, which includes loans and deposits to banks, are volatile as they are short-term in nature and are therefore subject to foreign investors' appetite and refinancing risk.

Inflows of FDI, a more stable form of inward investment, dropped to 2.8% of GDP in 2018, from 4.6% in 2017. Interpreting aggregate FDI statistics is often challenging as they can be affected by mergers and acquisitions activity that may not result in a significant economic benefit. However, data from the Department for International Trade (DIT, 2019) shows that in 2018-2019, the number of total FDI projects decreased by 14% compared to 2017-2018. Within this overall reduction, the number of FDI projects related to mergers and acquisitions actually increased by 8% but the number of new investment projects decreased by 12%. Reflecting this, the number of new jobs created from FDI decreased by 24% in 2018-19 when compared to 2017-2018. As new FDI is believed to support productivity growth, this decline is a concern in light of the UK's ongoing productivity growth challenge (see Section 3.4).

Despite persistent external deficits, the net international investment position (NIIP) is close to balance. The NIIP widened to 12.8% of GDP in 2018**,** from 10.0% in 2017, as the increase in total assets of £259 billion (€296 billion) was less than the increase in liabilities of £326 billion (€372 billion). This widening of the NIIP was due to both positive net investment flows into the UK by foreign investors and sterling appreciation effects.

Monetary Policy

In January 2020, the Bank of England maintained Bank Rate at 0.75%. The Bank's Monetary Policy Committee (MPC) also voted in its January meeting to maintain the stock of sterling non-financial investment-grade corporate bond purchases, financed by the issuance of central bank reserves, at £10 billion (€11.4 billion). The Committee also voted unanimously to maintain the stock of UK government bond purchases, financed by the issuance of central bank reserves, at £435 billion (€496 billion). In its summary, the Committee stated, 'policy may need to reinforce the expected recovery in UK GDP growth should the more positive signals from recent indicators of global and domestic activity not be sustained or should indicators of domestic prices remain relatively weak. Further ahead, if the economy recovers broadly in line with the MPC's latest projections, some modest tightening of policy may be needed to maintain inflation sustainably at the target' (Bank of England, 2020).

Financial sector and private debt

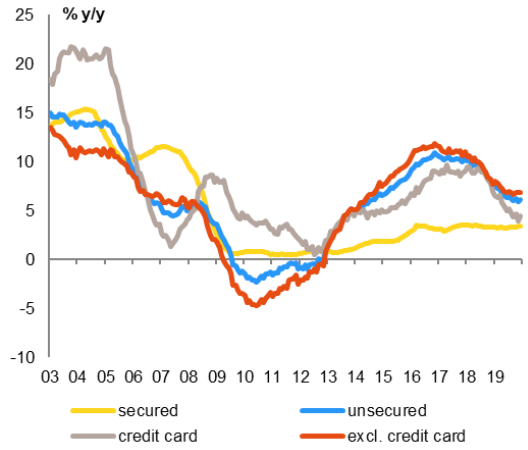
The UK banking sector's profitability has increased. Banking profits have grown, mainly driven by an increase in non-interest income and a reduction in impairment charges. As discussed in Section 3.2.1, the sector has increased provisioning for misconduct costs but future misconduct costs are expected to be lower. However, the insurance sector faces issues of weak profitability, due to the intensity of competition, regulatory scrutiny and increasing attrition costs (see Section 3.2.1.).

In December 2019, the Bank of England's Financial Policy Committee (FPC) raised the UK countercyclical capital buffer rate from 1% to 2%. The FPC continued to judge that, apart from those risks related to Brexit, domestic financial stability risks remained at a standard level overall. The FPC also judged that the Bank's 2019 stress test showed that the UK banking system was resilient to deep simultaneous UK and global recessions that were more severe overall than the global financial crisis, and would encompass 'a worst-case disorderly Brexit' (Bank of England, 2019a). The 2018 European Banking Authority stress test produced unexpectedly weak results for UK banks, which partly reflects differences in methodology and the scenarios applied (see Section 3.2.1).

The pace of growth in total lending to households stabilised in 2019. Total lending to households grew by 3.8% year-on-year in December 2019, slightly below its 2018 average of 4.2%. Lending secured on dwellings grew by 3.4%

(Graph 1.9) and it has been broadly stable for the last 3 years. Unsecured consumer credit growth is 6.1%, well below its post crisis peak of 10.9% in November 2016. The Bank of England's 2019 stress test showed that the UK banking system could successfully absorb potential losses on household debt, even in a severe downturn (Bank of England, 2019a).

Graph 1.9: **Consumer credit growth**



Source: Bank of England

Despite stabilising over recent years, household debt remains high. After falling steadily from a peak of 96% of GDP in 2009, household debt has broadly stabilised in the past four years. In 2018, it stood at just over 83% of GDP, broadly stable from 2017. In its December 2019 Financial Stability Report, the FPC stated that the proportion of households with high mortgage debt-servicing ratios remains low. Nonetheless, the Commission's prudential threshold and fundamentals-based benchmarks for household debt suggest that household indebtedness still poses financial stability risks ([7]). Furthermore, the Commission's household debt sustainability indicators (S1 and S2) suggest that the near record-low household saving ratio would need to increase to make debt levels sustainable over both the medium and long term.

Growth in credit to non-financial corporations was 3.2% year-on-year in December 2019. This growth was driven by credit to large businesses, which grew by 4.4% annually. At the same time, growth in credit to small and medium-sized enterprises grew by a more modest 0.8%. The ratio of gross non-performing loans improved and was one of the lowest in the EU at 1.3% as of Q2-2019 (the EU average is 3.0%) (European Banking Authority, 2019).

Public finances

Several methodological and data changes to the public sector finance data led to an upward revision of the budget deficit. In September 2019, the Office for National Statistics (ONS) changed its accounting treatment of student loans to better reflect the fiscal cost of loans that are not repaid, and revised other data, including on public sector pensions and corporate taxes. The changes led to an upward revision of the deficit from 2000-2001 onwards. For 2017-2018, the general government deficit was revised up from 2.1% of GDP to 2.7%, and from 1.2% to 1.8% for 2018-2019.

After several years of fiscal tightening and an improving budget balance, a looser fiscal stance is projected for the coming years. According to the Commission 2019 Autumn Forecast, the general government deficit is projected to increase to 2.2% of GDP in 2019-2020 and to 2.4% in 2020-2021, before falling slightly to 2.3% in 2021-2022. The structural deficit is projected to increase from 2.2% of GDP in 2018-2019 to around 2.4% over the forecast period. In addition to previously announced extra spending from 2019-2020 onwards, in particular on the National Health Service, the Commission's forecast also includes increases to departmental spending limits announced in the Spending Round on 4 September 2019. Due to the general election on 12 December 2019, the government cancelled its 2019 autumn budget. The next Budget will be presented in March 2020.

General government debt continues to fall. The methodological and data changes mentioned above had only a limited impact on the general government debt-to-GDP ratio. For 2018-2019, the

([7]) Fundamentals-based benchmarks are derived from regressions capturing the main determinants of credit growth and taking into account a given initial stock of debt. Prudential thresholds represent the debt threshold beyond which the probability of a banking crisis is relatively high. Methodologies are described in European Commission (2017) and updates to the methodology have been subsequently proposed in European Commission (2018a).

ratio was revised down slightly, from 85.2% to 84.3%. According to the Commission 2019 Autumn Forecast, the debt-to-GDP ratio is projected to continue to fall, from 84.1% in 2019-2020 to 83% in 2021-2022.

Sustainable development goals

The UK has made progress towards achieving most aspects of the UN Sustainable Development Goals. According to Eurostat's Sustainable Development Goals (SDG) indicators (see Annex D), the UK has registered improvements in most of the goals over the past 5 years. There has been particular progress on environment-related SDGs including "Affordable and Clean Energy" (SDG 7), "Responsible Consumption and Production" (SDG 12) and "Climate Action" (SDG 13). In many of the indicators in these areas, the UK's performance is in line with the EU average as many EU Member States have also made good progress. There has been some deterioration over the past 5 years in several elements of the SDGs related to poverty and deprivation, namely "No poverty" (SDG 1), "Zero Hunger" (SDG 2) and "Reduced Inequalities" (SDG 10). On several deprivation-related indicators the UK scores below the EU average, despite the UK's high employment rate and quite redistributive tax-benefit system.

Table 1.1: **Key economic and financial indicators**

Key economic and financial indicators - United Kingdom

	2004-07	2008-12	2013-16	2017	2018	forecast 2019	2020	2021
Real GDP (y-o-y)	2.7	0.1	2.3	1.9	1.3	1.3	1.2	1.2
Potential growth (y-o-y)	2.4	1.0	1.4	1.5	1.6	1.6	1.6	1.5
Private consumption (y-o-y)	2.4	-0.1	2.9	2.2	1.6	.	.	.
Public consumption (y-o-y)	2.8	1.2	1.1	0.3	0.4	.	.	.
Gross fixed capital formation (y-o-y)	3.4	-2.8	4.3	1.6	-0.2	.	.	.
Exports of goods and services (y-o-y)	5.5	1.3	2.2	6.1	1.2	.	.	.
Imports of goods and services (y-o-y)	5.0	0.2	4.2	3.5	2.0	.	.	.
Contribution to GDP growth:								
Domestic demand (y-o-y)	2.7	-0.3	2.8	1.8	1.1	.	.	.
Inventories (y-o-y)	0.0	0.0	-0.1	-0.6	0.3	.	.	.
Net exports (y-o-y)	0.0	0.3	-0.6	0.7	-0.3	.	.	.
Contribution to potential GDP growth:								
Total Labour (hours) (y-o-y)	0.5	0.5	0.7	0.5	0.7	0.7	0.6	0.6
Capital accumulation (y-o-y)	0.7	0.2	0.4	0.4	0.4	0.4	0.4	0.4
Total factor productivity (y-o-y)	1.2	0.3	0.3	0.5	0.5	0.5	0.6	0.6
Output gap	1.3	-2.9	-0.5	0.9	0.6	0.4	0.2	0.1
Unemployment rate	5.1	7.4	5.9	4.3	4.0	3.8	4.0	4.1
GDP deflator (y-o-y)	2.6	2.0	1.6	1.9	2.1	1.9	2.1	1.9
Harmonised index of consumer prices (HICP, y-o-y)	2.0	3.3	1.2	2.7	2.5	1.8	1.7	2.0
Nominal compensation per employee (y-o-y)	5.2	1.5	2.0	3.2	2.9	4.0	3.3	3.1
Labour productivity (real, person employed, y-o-y)	1.7	-0.2	0.5	0.9	0.1	.	.	.
Unit labour costs (ULC, whole economy, y-o-y)	3.5	1.7	1.5	2.2	2.7	3.7	2.6	2.4
Real unit labour costs (y-o-y)	0.9	-0.3	-0.1	0.4	0.6	1.8	0.5	0.5
Real effective exchange rate (ULC, y-o-y)	3.5	-4.4	0.3	-4.4	2.2	0.7	3.9	0.6
Real effective exchange rate (HICP, y-o-y)	0.8	-3.6	-0.2	-4.8	2.3	-0.3	3.5	0.2
Net savings rate of households (net saving as percentage of net disposable income)	3.9	5.4	3.5	-0.3	0.1	.	.	.
Private credit flow, consolidated (% of GDP)	15.3	2.1	6.1	7.2	4.4	.	.	.
Private sector debt, consolidated (% of GDP)	172.6	182.5	165.5	167.7	163.3	.	.	.
of which household debt, consolidated (% of GDP)	86.8	91.2	83.6	83.1	83.2	.	.	.
of which non-financial corporate debt, consolidated (% of GDP)	85.8	91.3	81.8	84.5	80.0	.	.	.
Gross non-performing debt (% of total debt instruments and total loans and advances) (2)	.	.	.	.	.	.	.	.
Corporations, net lending (+) or net borrowing (-) (% of GDP)	-1.3	0.5	-3.2	-1.4	-2.0	-2.5	-2.4	-2.4
Corporations, gross operating surplus (% of GDP)	21.2	21.5	21.6	21.5	20.9	20.3	20.4	20.2
Households, net lending (+) or net borrowing (-) (% of GDP)	1.5	4.5	2.9	0.2	0.3	1.0	1.0	1.0
Deflated house price index (y-o-y)	7.9	-4.1	6.1	3.1	0.6	.	.	.
Residential investment (% of GDP)	4.1	3.3	3.4	3.7	3.8	.	.	.
Current account balance (% of GDP), balance of payments	-2.6	-3.1	-4.9	-3.5	-3.9	-4.3	-4.2	-4.2
Trade balance (% of GDP), balance of payments	-2.2	-1.6	-1.4	-1.2	-1.4	.	.	.
Terms of trade of goods and services (y-o-y)	-0.2	-0.3	1.6	-0.9	0.2	1.3	1.0	0.9
Capital account balance (% of GDP)	0.0	0.0	-0.1	-0.1	-0.1	.	.	.
Net international investment position (% of GDP)	-6.0	-11.0	-15.7	-10.0	-12.8	.	.	.
NENDI - NIIP excluding non-defaultable instruments (% of GDP) (1)	-25.3	-26.9	-10.1	-2.6	3.1	.	.	.
IIP liabilities excluding non-defaultable instruments (% of GDP) (1)	355.0	539.6	413.8	378.1	377.8	.	.	.
Export performance vs. advanced countries (% change over 5 years)	-1.7	-15.6	-1.4	-3.9	-3.6	.	.	.
Export market share, goods and services (y-o-y)	-3.4	-4.7	0.7	-4.0	-1.0	0.0	-0.8	-1.5
Net FDI flows (% of GDP)	0.2	0.3	-5.2	0.6	-0.8	.	.	.
General government balance (% of GDP)	-2.9	-8.0	-4.8	-2.4	-2.3	-2.2	-2.4	-2.2
Structural budget balance (% of GDP)	.	.	-4.5	-2.9	-2.6	-2.4	-2.5	-2.3
General government gross debt (% of GDP)	40.0	70.1	86.0	86.2	85.9	85.2	84.7	84.2
Tax-to-GDP ratio (%) (3)	34.6	34.7	34.1	35.0	35.1	35.3	35.4	35.4
Tax rate for a single person earning the average wage (%) (4)	26.9	25.2	23.6	23.5	23.5	.	.	.
Tax rate for a single person earning 50% of the average wage (%) (4)	20.8	19.0	15.2	15.0	14.9	.	.	.

(1) NIIP excluding direct investment and portfolio equity shares

(2) domestic banking groups and stand-alone banks, EU and non-EU foreign-controlled subsidiaries and EU and non-EU foreign-controlled branches.

(3) The tax-to-GDP indicator includes imputed social contributions and hence differs from the tax-to-GDP indicator used in the section on taxation

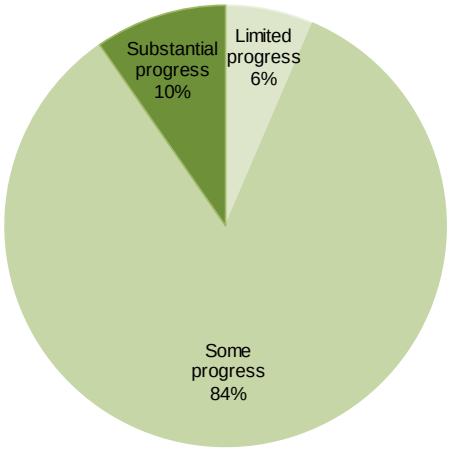
(4) Defined as the income tax on gross wage earnings plus the employee's social security contributions less universal cash benefits, expressed as a percentage of gross wage earnings

Source: Eurostat and ECB as of 4-2-2020, where available; European Commission for forecast figures (Winter forecast 2020 for real GDP and HICP, Autumn forecast 2019 otherwise)

2. PROGRESS WITH COUNTRY-SPECIFIC RECOMMENDATIONS

Since the start of the European Semester in 2011, the UK has recorded at least 'some progress' on 94% of CSRs addressed to it. This includes 10%, covering access to finance and fiscal policy, where it achieved 'substantial' progress. On the other 6% of CSRs, it has recorded only 'limited' progress (see Graph 2.1). On labour market, housing and infrastructure CSRs, it has tended to record 'some' progress. While the government has put in place a range of relevant policies, these are all deep-rooted and longstanding policy challenges still requiring sustained reform efforts. There has been more variation in the assessment of fiscal CSRs over time as the pace of ongoing fiscal consolidation has fluctuated, as have trends in public investment.

Graph 2.1: **Overall multiannual implementation of 2011-2019 CSRs to date**



(1) The overall assessment of the CSRs related to fiscal policy exclude compliance with the Stability and Growth Pact.
(2) 2011-2012: Different CSR assessment categories
(3) The multiannual CSR assessment looks at the implementation since the CSRs were first adopted until the February 2020 Country Report.
Source: European Commission

The fiscal deficit gradually decreased to below 3% of GDP, though it is no longer falling. The UK left the Excessive Deficit Procedure of the Stability and Growth Pact in 2017.

The UK received a recommendation on investment in 2019 that encompasses areas covered by previous recommendations. The UK stands out among advanced economies for its low rate of investment. UK private investment recovered robustly from the financial crisis until 2015. Private investment has since stalled in the context of high levels of Brexit-related uncertainty, despite the UK having been in the phase of the economic cycle where investment is usually strongest. Growth in intangibles investment has also slowed markedly. Direct public investment is close to the EU average and is currently growing, and it has been increasingly focused on economic infrastructure. The UK's research base is excellent, but the diffusion of knowledge and process innovation across the economy is uneven. Many parts of the UK are relatively poor with comparatively low levels of physical and human capital, and inter-regional disparities have continued to grow.

The UK has announced a range of policy measures to increase housing supply. Residential construction has risen in recent years, due both to a cyclical recovery and policy action, including major reforms to the planning system. Though real house prices have flattened, the cost of housing is particularly high in major urban centres and there is a structural shortage of housing in many parts of the country. The government has set itself the difficult goal of increasing annual housing supply in England to 300,000 units by the mid-2020s. Household debt remains high but household balance sheets are strong on aggregate.

The UK has received recommendations on a range of labour market and social issues. Concerns persist regarding the implications of low workforce skills for career progression and productivity. Skills mismatches and shortages have increased as employment rates have hit historical highs. However, career progression is difficult for many and upskilling of those in work needs sustained policy efforts and investment. Publicly funded childcare provision has expanded over the last decade, though net childcare costs for low-income earners remain highest in the UK. The UK also received recommendations from 2011 to 2014 on poverty and the welfare system. These had a particular focus on child poverty, which remains quite high and is predicted to increase due to cuts in public expenditure resulting from the rollout of Universal Credit.

The UK received recommendations on infrastructure from 2012 to 2014, and again in 2016 and 2019. In March 2020 the government will issue a comprehensive national infrastructure strategy, in response to the long-term National Infrastructure Assessment published by the National Infrastructure Commission in 2018. While pressure on networks is still building, the UK is starting to deal with the cumulative effects of decades of public under-investment in infrastructure. Rail usage has increased in recent years though a number of new rail projects and existing rail services have experienced problems. In 2019, the UK committed to reach net zero carbon emissions by 2050. There has been positive progress on the use of renewable energy, especially offshore wind.

The UK has made some ([8]) progress in addressing the 2019 country-specific recommendations (CSRs). The UK currently has two CSRs. CSR 1 on fiscal issues is not assessed in this country report. There has been some progress on CSR 2 as a whole, which relates to several aspects of investment.

There has been some progress on supporting research and innovation. UK universities remain global research leaders. However, UK research and development (R&D) intensity is flat and below the EU average. Delivering on the recent ambitious proposals for future research and innovation support will be a challenge.

There has been some progress on boosting housing supply. Annual net housing supply has continued to rise but grants of planning permission have levelled off and there are signs of a slowdown in housing starts. House building looks set to stabilise at a level below that which would be necessary to meet estimated demand, due in part to capacity constraints. Real house prices are no longer rising though the cost of housing remains high in many places. The government has extended and revised a number of housing policies, including tweaks to the planning system, but major new initiatives have been limited.

The UK has made limited progress on training and improving skills. While labour market participation by low-skilled people has improved, the polarisation of job growth towards high and low-skilled roles (and away from roles requiring a medium level of skills) has been accompanied by increased skills mismatches. Implementing the reformed apprenticeship system is proving a challenge, with registrations down compared to previous years. There is evidence that the apprenticeship levy, introduced in 2017, has seen funding increasingly used to train more senior staff at the expense of entry-level apprenticeships.

The UK has made some progress in sustainable transport. Use of the UK's road, rail and aviation networks is reaching capacity and this contributes to high levels of congestion, rail reliability issues and air pollution. Public investment in transport has increased but the effects of decades of under-investment in infrastructure will take time to address. After some signs of improvement in delivery, major rail schemes have recently fallen behind schedule and over budget. The UK is taking action to meet its ambition to be at the forefront of zero emission vehicles, though it currently lags in the proportion of renewable energy used in the transport sector.

The UK has made some progress on the low carbon and energy transition. With the new commitment to net zero carbon emissions by 2050 the government's ambitions are clear, and the preparatory work for allocating increases announced in investment is advanced. In the electricity sector, the UK continues to make progress in attracting investment cost-competitive renewables, particularly offshore wind. Progress is slower in the heating and cooling sector and the UK is not on course to meet its overall 2020 renewables target. The scale of the decarbonisation challenge will require a more detailed investment strategy and sustained commitment. The Industrial Energy Transformation Fund, announced in summer 2019, will provide £315 million (€359 million) to businesses to reduce the impact of emissions from the industrial sector.

([8]) 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 Annex A. This overall assessment does not include an assessment of compliance with the Stability and Growth Pact.

Table 2.1: **Assessment of 2019 CSR implementation**

The United Kingdom	**Overall assessment of progress with 2019 CSRs: Some progress.**
CSR 1: *Ensure that the nominal growth rate of net primary government expenditure does not exceed 1.9% in 2020-2021, corresponding to an annual structural adjustment of 0.6% of GDP.*	**The compliance assessment with the Stability and Growth Pact will be included when final data for 2019-2020 will be available.**
CSR 2: *Focus investment-related economic policy on research and innovation, housing, training and improving skills, sustainable transport and low carbon and energy transition, taking into account regional diversity.*	**The UK has made some progress on addressing CSR 2:** • **Some progress** on supporting research and innovation. • **Some progress** on boosting housing supply. • **Limited progress** on training and improving skills. • **Some progress** on sustainable transport. • **Some progress** on the low carbon and energy transition.

Source: European Commission

Box 2.1: **EU funds and programmes to address structural challenges and to foster growth and competitiveness in the UK**

The UK is a beneficiary of EU support and will continue to participate in the implementation of all European Structural and Investment Funds (ESIF) ([1]) programmes committed under the 2014-2020 Multiannual Financial Framework until their final closure. Its financial allocation from the EU cohesion policy funds ([2]) amounts to €11 billion (£9.65 billion) in the current Multiannual Financial Framework. By the end of 2019, 85% had been allocated to specific projects and 33% was reported as having been spent by the selected projects ([3]) showing a level of implementation below the EU average.

EU cohesion policy funding is invested in operations that address specific structural challenges in the UK: €3.7 billion (£3.25 billion) is allocated to investments in smart growth, €1.7 billion for sustainable growth and sustainable transport and €5.2 billion (£4.56 billion) for inclusive growth.

EU cohesion policy funding is contributing to transformations of the UK economy by promoting growth and employment via investment in: research; technological development and innovation; the competitiveness of enterprises; sustainable transport; energy transition; and employment and labour mobility. By 2019, investments supported by the European Regional Development Fund had already supported over 44,000 enterprises, of which more than 10,000 were start-ups, and helped more than 2,000 enterprises in their cooperation with research institutions. The European Social Fund has provided training to approximately 1.3 million participants, with an emphasis on disadvantaged groups. Of the participants, 245,500 came from an ethnic minority background, 241,000 had some form of disability, and some 295,000 were lacking basic skills. 110,000 of the participants subsequently moved into employment and 140,000 gained new or complementary skills, improving their employability.

Agricultural and fisheries funds and other EU programmes also help to address the UK's investment needs. The UK is eligible for €5.2 billion (£4.56 billion) of European Agricultural Fund for Rural Development (EAFRD) support, and €243 million (£213 million) from the European Maritime and Fisheries Fund (EMFF). In addition, €340 million (£298 million) has been allocated from the Connecting Europe Facility to specific projects on strategic transport networks in the UK and €6.1 billion (£5.35 billion) of EU funding from the Horizon 2020 programme has been allocated to Research and Innovation projects, of which €811 million (£711 million) has been allocated to 1 425 SMEs.

EU funding also supports the mobilisation of significant private investment. 8.4% of the ESIF funding allocation is invested through loans, guarantees and equity funds, which in turn is expected to mobilise substantial additional private sector capital.

EU funds already invest substantial amounts on actions that support the Sustainable Development Goals (SDGs). In the UK, the ESIF funds support 12 out the 17 SDGs and up to 96% of the ESIF expenditure is contributing to those goals.

([1]) European Regional Development Fund, European Social Fund, European Agricultural Fund for Rural Development, European Maritime and Fisheries Fund
([2]) European Regional Development Fund, European Social Fund, Youth Employment Initiative
([3]) https://cohesiondata.ec.europa.eu/countries/UK

3. REFORM PRIORITIES

3.1. PUBLIC FINANCES AND TAXATION

Taxation policy

At 33.8%, the UK's tax-to-GDP ratio remains well below the GDP-weighted EU average of 39.2% (Table 3.1.1). Total UK tax revenues increased by 2.8% between 2017 and 2018.

Table 3.1.1: **Composition of tax revenues 2018**

Tax category	GBP billion	% revenue	UK % GDP	EU % GDP*
Personal income tax	195.4	27	9.1	9.5
National insurance contributions (employers and employees)	137.6	19	6.4	12.2
Corporate income tax	57.4	7.9	2.7	2.7
Property taxes	90.1	12.4	4.2	2.5
VAT	149.7	20.7	7	7.1
Indirect taxes other than VAT	94.5	13	4.4	5.2
Total	724.7	100	33.8	39.2

Source: European Commission, Taxation Trends in the European Union, 2020 Edition (forthcoming)

In comparison to 2017, corporate income tax receipts fell by 3% to £57.4 billion (€59.2 billion) in 2018. At 2.7% of GDP they are now in line with the EU average. The effective marginal tax rate for new investment dropped slightly from 23.6% in 2017 to 22.7% in 2018. However, it continues to be one of the highest rates in the EU (ZEW, 2019) and may discourage corporate investment.

The tax burden on labour is among the lowest in the EU across the income scale. Personal income tax and national insurance contributions make the biggest contribution to tax revenues. At 28.93% of the average wage for a two-earner couple with two children, the UK's tax wedge is one of the lowest in the EU (the EU average was 36.34% in 2018) ([9]).

The UK's dividend tax regime and the UK's high number of bilateral tax treaties are features that may be used by companies that engage in aggressive tax planning. The UK is ranked high on indicators that identify a country as having features that can be used by companies for tax optimal repatriation schemes (European Commission, 2018b). The UK dividend tax regime may also have wider effects in the economy. UK dividend payments as a share of companies' gross operating surplus have risen significantly over the last decades (ONS, 2019a). The higher dividend payouts have occurred during a period of weak investment in the UK as companies retain less funds for investment (see also Section 3.4).

The UK has acted to curb aggressive tax planning by transposing the European Union ATAD1 ([10]) and ATAD2 provisions on hybrid mismatches ([11]) into its domestic law. At international level, the UK has broadly transposed the provisions of the OECD Action Plan on Base Erosion and Profit Shifting (BEPS) ([12]).

In 2019, the European Commission concluded that the UK's controlled foreign company (CFC) rules([13]) were partly in breach of EU State Aid rules, by giving illegal advantages to certain multinational companies through the Group Financing Exemption (European Commission, 2019a), a ruling the UK does not agree with and has appealed. This exemption partially (75%) or fully exempted from taxation in the UK financing income received by an offshore subsidiary from another foreign group company, even if the capital being used was 'UK connected' or this income was derived from 'UK activities', with the latter being ruled illegal. A multinational active in the UK using this exemption was able to provide financing to a foreign group company *via* an offshore subsidiary paying little or no tax on the profits from these transactions. In the context of ATAD1, the UK changed the scheme so that it complied with EU rules as of 1 January 2019. The UK is obliged to recover illegal State aid, pending the outcome of the appeal, to remove the distortion created.

([9]) The tax wedge shows the proportional difference between the costs of a worker to their employer and the employee's net earnings. Data are taken from the European Commission Tax and Benefit Indicator database.

([10]) ATAD – Anti-Tax Avoidance Directive: Council Directive 2016/1164 of 12 July 2016

([11]) Rules designed to prevent businesses lowering or avoiding taxation due to tax classification differences in a cross-border context.

([12]) Including the ratification of the Multilateral Convention to Implement Tax Treaty Related Measures to Prevent Base Erosion and Profit Shifting (MLI).

([13]) CFC Rules are an anti-avoidance measure to counteract diverting profits to low tax jurisdictions. CFC rules are included in ATAD 1.

The UK VAT gap is slightly lower than the EU average ([14]). It was estimated at 10.6% in 2017 (EU: 11.2%). According to the estimated policy gap, the government loses potential revenues by using reduced VAT rates ([15]). The actionable VAT policy gap, resulting from exemptions and reduced rates, was higher (16.6%) than the EU average (13.0%) in 2017 (CASE, 2019). The UK forecasts the VAT gap to have been 9.6% of GDP in 2018-2019 (OBR, 2019a). Foregone revenues due to zero and reduced VAT rates are estimated to have been £52.7 billion (€60.1 billion) in 2018-2019 (HMRC, 2019).

While the UK's environmental tax revenue is in line with the EU average of 2.4% of GDP, as a percentage of total UK tax revenue, environmental taxes are declining. The composition of UK environmental tax revenues reflects the EU average with energy taxes accounting for 74% of total revenues. Transport fuel taxes remain a significant source of revenue for the UK. Like Belgium, the UK has equalised its nominal tax rates on petrol and diesel for private use. These do however not reflect the full social costs of transport, including congestion (European Commission, 2019b). Government plans to increase the duty rate in line with inflation have frequently been postponed or cancelled; as a consequence, the fuel duty rates have fallen by 17% in real terms since the last actual increase in 2010-2011. Nevertheless, the fuel duty rates are among the highest in the European Union (IFS, 2019a). Pollution / resources taxes account for only 3% of total environmental tax revenue, which is roughly in line with the corresponding share in the EU. The Landfill Tax, introduced in 1996, has increased recycling, however the current Landfill Tax gap (the gap between the potential and the actual revenue from the expected tax) is estimated to be £125 million (€143 million) or 12% (Noel et al, 2018). The tax was extended to cover illegal waste sites in April 2018, which may increase tax revenues.

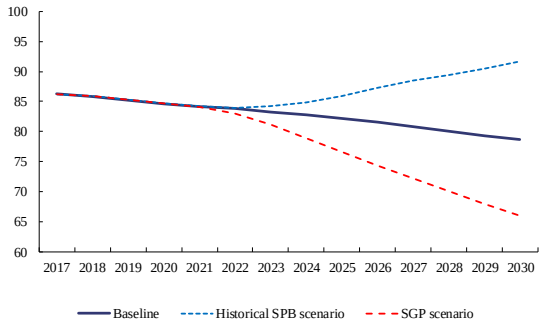
([14]) The VAT gap as a % of the total VAT liability (CASE, 2019).

([15]) The UK applies a reduced rate of 5% to, among others, domestic fuel and power, energy-saving materials and certain residential renovations. A zero rate applies to a broad range of goods and services including many foodstuffs, books, pharmaceutical products, water supply, passenger transport and the construction of new dwellings.

Debt sustainability analysis and fiscal risks

Despite a high debt-to-GDP ratio, there are no significant fiscal sustainability risks for the UK in the short term. The Commission's early detection indicator for fiscal stress S0 (indicating risk due to a high level of gross financing needs, of the primary deficit and of public debt) remains below its critical threshold (see Annex B).

Graph 3.1.1: **Public debt as % of GDP**



Source: European Commission, Fiscal Sustainability Report 2020, forthcoming.

Over the medium term, the UK faces high fiscal sustainability risks. While the Commission's medium-term fiscal sustainability indicator S1 indicates a medium level of risk, due to the high initial debt ratio, the Debt Sustainability Analysis (DSA) points to high risk. In the baseline no-policy change scenario, debt is expected to fall slightly, but remain high at 78.6% of GDP by 2030. If the structural primary balance (SPB) reverted to historical levels, as modelled in the historical scenario, debt could increase to 91.6% of GDP by 2030, leading to an overall assessment of a high fiscal sustainability risk over the medium term (see Graph 3.1.1.).

The UK also faces high fiscal sustainability risks in the long term. This assessment is driven by the DSA historical scenario mentioned above. The Commission's S2 indicator points to medium risk, showing that, relative to the baseline no-policy-change scenario, an improvement of 4.3pps of the structural primary balance would be needed to stabilise the debt-to-GDP ratio in the long term. According to the Fiscal Risks Report from the Office for Budget Responsibility (OBR), the impact of an ageing population and non-demographic cost pressures on health and social care are the most significant long-term risks for

public spending (OBR, 2019b). The report also addresses fiscal risks due to climate change, which could be very significant but have not yet been quantified.

Healthcare

Funding for the health system has not kept pace with the growth in demand for health services since 2008 (OECD/European Observatory on Health Systems and Policies, 2019). Public spending on health in England has roughly increased in line with demographic pressures in the past decade, but other pressures, such as higher costs for new treatments and increasing wages for healthcare staff, create additional financing needs. In addition, since 2014-2015 money meant for capital investments has frequently been shifted to resource spending (IFS, 2019b).

The 2019 Spending Round reaffirmed the previously announced increase of £33.9 billion (€38.6 billion) in cash terms to the NHS England budget by 2023-2024, compared to 2018-2019. The government also committed to around £1.85 billion (€2.1 billion) to upgrade outdated hospital facilities and equipment, an additional £150 million (€171 million) for continuing professional development of healthcare staff, and £250 million (€285 million) of investment in artificial intelligence solutions for healthcare. The financing from the 2019 Spending Round has been welcomed by stakeholders but with reservations that it does not go far enough (O'Dowd, 2019). NHS Providers considers that a doubling of the annual capital spending of NHS England, currently around £6 billion (€6.8 billion), is required over the next 5 to 10 years in order to overcome maintenance backlogs and meet patient needs (NHS Providers, 2019).

Fiscal frameworks

In September 2019, the Chancellor announced a review of the fiscal rules in the next Budget. The current overall fiscal objective, as set out in the January 2017 Charter of Budget Responsibility, is to return public finances to balance by the mid-2020s. The fiscal targets are the reduction of the structural deficit below 2% of GDP by 2020-2021 (fiscal mandate); a fall of public sector net debt as a percentage of GDP in 2020-2021 (the supplementary target) and a 'welfare cap', setting a limit on welfare spending. With the 2019 Autumn Budget having being cancelled due to the general election, the new government is expected to publish the outcome of the review of the fiscal rules at the rescheduled Budget on 11 March 2020.

While the latest official assessment of compliance with the current fiscal rules is favourable, there are several downside risks to the assessment. In its March 2019 Economic and Fiscal Outlook, the OBR expected the government to meet all three fiscal targets, but saw only a 40% chance of the government meeting the fiscal objective (OBR, 2019a). Several new developments create downside risks to this assessment, in particular for the fiscal mandate. Methodological and data changes (see section 1) have led to a significant upward revision of the deficit. In addition, in the one-year September 2019 Spending Round, the government set out plans to increase departmental spending by £13.8 billion (€15.7 billion) in 2020-21. These developments are not included in the March OBR assessment ([16]). The next multi-annual Spending Review, originally planned for 2019, has been postponed until the second half of 2020.

([16]) The restated March 2019 forecast, published in December 2019, updated the numbers for the methodological and data changes, but did not include an assessment of compliance with the fiscal rules (OBR, 2019c).

3.2. FINANCIAL SECTOR

3.2.1. FINANCIAL SECTOR

The UK banking system has maintained a good capital and liquidity position. From Q2-2018 to Q2-2019, UK banks managed to increase their Common Equity Tier 1 (CET 1) capital ratio from 15.0% to 15.4% (see Table 3.2.1), just above the EU average (15%). According to Copenhagen Economics (2019), capital requirements might rise significantly for UK banks once Basel III is fully implemented. On a non-risk-weighted-basis, UK banks' leverage ratios also remained above the EU average. Capital accumulation was helped by improved profitability. In Q2-2019, the return on assets and equity increased to 0.4% and 6.9%, respectively, about the same as the EU average. Growth in profit was mainly driven by an increase in non-interest income and a reduction in impairment charges. The proportion of non-performing loans in the UK's total loans further decreased further and in mid-2019, it was less than half of the EU average (1.2% versus 2.5%). UK banks have ample high-quality liquid assets and comfortably meet the liquidity coverage ratio requirement. After more provisioning for misconduct and settlements on a number of conduct issues in 2018, the Bank of England's Financial Policy Committee (FPC) expects misconduct costs to be lower in the future.

Table 3.2.1: **Financial soundness indicators, all banks in UK**

(%)	2014	2015	2016	2017	2018	2019Q2
Non-performing loans	3.3	-	1.9	1.5	1.2	1.2
o/w foreign entities	2.3	-	1.1	0.9	0.5	0.5
o/w NFC & HH sectors	4.1	-	2.7	2.3	2.0	2.0
o/w NFC sector	5.4	-	3.7	3.1	2.4	2.5
o/w HH sector	3.3	-	2.2	1.9	1.8	1.8
Coverage ratio	77.2	-	31.8	33.5	30.0	30.3
Return on equity(1)	3.8	3.2	2.1	4.3	5.5	6.9
Return on assets(1)	0.2	0.2	0.1	0.3	0.4	0.4
Total capital ratio	-	19.5	20.8	20.5	21.4	21.1
CET 1 ratio	-	13.8	15.0	14.9	15.5	15.4
Tier 1 ratio	-	15.6	16.9	17.1	17.9	17.7
Loan to deposit ratio	90.8	105.9	89.8	86.3	93.7	95.2

(1) Annualised data
Source: ECB - CBD2 - Consolidated Banking data; own calculation

In contrast, the insurance sector faces poor profitability issues, attributed to the intensity of competition, regulatory scrutiny and increasing attrition costs. This is particularly the case for the motor insurance industry, which may face losses this year due to falling prices and rising claims costs. According to the European Insurance and Occupational Pensions Authority (EIOPA), at the end of March 2019, the UK insurance sector's solvency coverage ratio (1.52) was well below the EEA median value (2.36) (EIOPA, 2019). The flatter risk-free rate curves also have a negative impact on the sector´s technical provisions.

The Bank of England's Financial Policy Committee (FPC) judges that the UK banking system would be resilient to major and simultaneous domestic and global shocks. Based on its 2019 stress test of major UK banks, the FPC concluded that the UK financial system would be able to withstand an economic shock more severe even than a worst-case disorderly Brexit coupled with a global trade war. The Bank of England found that UK banks would be able to keep lending to households and businesses in the event of a major economic crisis, while also continuing to pay billions of pounds in fines to address misconduct (BoE/FPC, 2019a). The Commission's assessment is that firms had largely prepared for the possibility of a withdrawal from the EU without an agreement, including by relocating some activities and applying for authorisation in the EU. As indicated in its Communication of 4 September 2019 (European Commission, 2019c), the Commission 'does not consider that the adoption of additional contingency measures is necessary'. Following the ratification and entry into force of the Withdrawal Agreement and the Political Declaration (European Commission, 2019d) the EU and the UK will start assessing the equivalence of their respective regulatory and supervisory frameworks in the relevant areas as soon as possible, endeavouring to conclude such assessments by the end of June 2020.

The UK is among the most active venture-capital investment markets in Europe. At 0.085% of GDP in 2018, venture capital investment in the UK is above the EU average (0.05% of GDP) (Invest Europe, 2019). However, the availability of equity is lower for scale-ups than start-ups. Private equity and risk capital is particularly available for entrepreneurship and high-tech sectors such as fintech, artificial intelligence, and information and communication technologies. With over 800 deals in 2019, London remains the main European hub for venture capital investment in technology firms, including for producing of venture capital backed 'unicorns' (start-ups reaching a market value above one

billion US dollars) (Dealroom as reported by Atomico, 2019).

Innovation in payments could bring significant benefits for users, but may pose risks to areas such as investor protection, legal certainty, and financial stability. In June 2019, the UK Treasury announced that it will conduct a long-term review of the UK's payments landscape and regulatory framework to lay the ground work for a new wave of fintech innovation (e.g. digital tokens) (HM Treasury, 2019a). In the most recent Financial Stability Report, the Bank of England's FPC developed a new approach to financial stability regulation of systemic payment chains. The emphasis is on regulation that reflects the financial stability risk rather than the legal form of payments. Furthermore, it suggests that systemically important firms should be subject to standards that reflect the risks they pose. (BoE/FPC, 2019a).

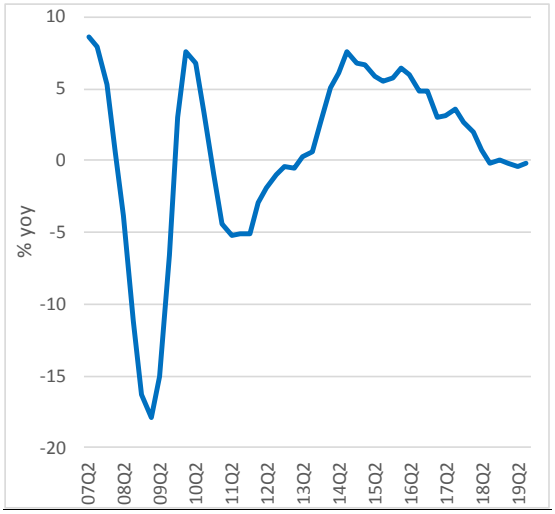
3.2.2. HOUSING SECTOR

The UK has a persistent housing shortage. The availability and affordability of housing are a particular challenge in areas of high and growing demand, such as in and around urban centres. Annual net housing supply has increased significantly from post-crisis lows. However, a recent fall in housing construction starts suggests it will peak at a level below that which would be necessary to meet estimated demand. In recent years the government has put in place a range of policy initiatives and set ambitious objectives to increase housing supply, though the flow of new policy slowed in 2019. At the same time, regulation of the land market is still tight, and the government has reaffirmed its commitment to limiting development around urban centres. The UK has a lot of old and often energy-inefficient housing and little of this is being replaced.

Housing affordability and demand

Real house prices are broadly flat nationally, and declining in some regions. After robust growth from 2014 to 2016, average real house price growth gradually eased. Real house prices have been essentially flat since mid-2018 (Graph 3.2.1) in the context of persistent economic uncertainty. Indicators of housing market activity (both supply and demand) were quite weak through most of 2019. Nominal national house price growth (year-on-year) picked up to 2.2% in November 2019 (ONS, 2020a), slightly above consumer price inflation. Growth in the price of buying and renting property has slowed the most in more expensive regions. In London, nominal house prices rose by 0.2% in the year to November 2019 and are no higher than in early 2017. Leading indicators of housing transactions and prices suggest the market for house purchases is picking up somewhat (RICS, 2019).

Graph 3.2.1: **Real house price growth**



Source: Eurostat

House prices and rents remain high, especially in areas of high housing demand. The average UK house price was £235,000 (€268,000) in November 2019 (ONS, 2020a). The ratio of median house prices to median annual earnings remained at a record high of 7.8 in 2018 (ONS, 2019b), following five years of decreasing affordability. The ratio is higher for newly built dwellings (9.6) than existing ones (7.6), and the decline in affordability since 2013 has been greater for new builds. The Commission estimates that, on average, UK housing is around 20% overvalued. After tending to widen over time, the gap in prices between more expensive and cheaper areas has started to close slightly. Average house prices in each of Scotland, Wales and Northern Ireland are more than a third below the English level. Private sector rent growth has been slightly below inflation since early 2017, and stood at 1.4% year-on-year in December 2019 (ONS, 2020b).

The overall home ownership rate is flat, but this masks continuing structural shifts in tenure. Housing transactions remain well below pre-crisis levels, but after being on a downward trend over the last two decades, the overall rate of home ownership has been stable for the last 2 or 3 years. However, this masks a continuing generational shift in property ownership. In 1995-1996, 65% of those aged 25-34 with incomes in the middle 20% for their age owned their home. By 2015-2016 the proportion had fallen to just 27% (IFS, 2018a). The likelihood of young adults owning a house has also become much more dependent on their parents' level of property wealth, with negative implications for social mobility (Resolution Foundation, 2018). At the same time, in addition to their high rates of owner-occupancy a significant proportion of older households own additional properties from which they receive income from (usually younger) private renters.

While mortgage debt remains high, there are few signs of risky growth in lending. Several years of significant levels of high loan-to-income mortgage lending linked to high house prices has contributed to persistently high household debt (see Section 1). Since the Bank of England took some macroprudential steps to curb risky mortgage lending (see Section 1), housing market activity has cooled in the context of high economic uncertainty. The number and value of residential property transactions fell slightly in the year to June 2019 and is well below the pre-crisis peak (ONS, 2019c). The proportion of houses bought with cash (without the need for a mortgage) fell significantly in 2018 and 2019. Secured credit to households is still growing at a slow but steady pace (See Section 1). The average 'loan to income ratio' is no longer rising (UK Finance, 2020), and the proportion of new mortgages with a 'loan to income ratio' of 4.5 or above is flat and remains well below the FPC's recommended limit of 15% (ibid.). Following a long, gradual decline, average interest rates on new and existing mortgages are bottoming out at historically low levels. Consistent with this, and the high employment rate, mortgage arrears and repossessions remain low. Less than 1% of homeowner mortgages are currently in significant arrears (UK Finance, 2019).

Housing supply and constraints

Housing completions have increased further, but there has been a decline in the number of dwellings on which construction is starting. The number of net additional dwellings in England (c.85% of the UK's population) rose by a healthy 9% to 241,130 in 2018-2019 (MHCLG, 2019a). The official level of annual demolitions is very low (less than one in 3,000 dwellings), which has implications for the pace at which the housing stock modernises and becomes more energy efficient. However, as shown in Graph 3.2.2, new housing starts have declined by over 10% since peaking in early 2017 (MHCLG, 2019a). This is likely at some point to feed into lower numbers of completions.

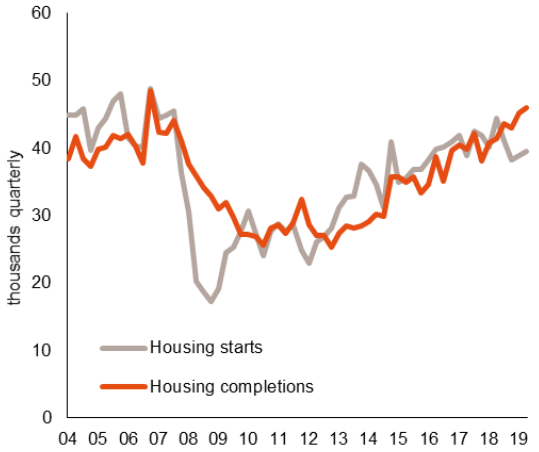
There has been a spike in the conversion of other building types into dwellings in recent years. 12% of net additional dwellings in 2018-2019 came from change of use, including through permitted development rights, mainly office-to-residential conversions. After falling by a third from their 2016-2017 peak in 2017-2018, the number of these conversions has stabilised (*ibid.*). However, concerns have been raised over the quality and appropriateness of many conversions through permitted development rights (LGA, 2018). Since 2015, the nationally described minimum space standard for residential units for one person in the UK has been 37m^2, but these standards do not apply to conversions under permitted development rights.

Grants of planning permission have levelled off, and there is pressure on the planning system. From 2012 the annual number of units granted residential planning permission grew rapidly. This progress has now stalled, consistent with the slowdown in the number of houses on which building has started. Planning permission for 365,200 housing units was granted in the year to September 2019 (MHCLG, 2019b), a 3% fall from the preceding year. About 80% of major and about 75% of minor residential planning applications are granted.

Urban centres and growth hubs cannot easily support economic growth or modernisation. As discussed in previous country reports, the process of obtaining planning permission is complex and costly. The 'green belt' policy was put in place to

contain urban sprawl and keep broad swathes of land around existing conurbations permanently open. After growing through the post-war period, the amount of land designated as green belt has remained broadly fixed in recent years (MHCLG, 2019c). For example, London's green belt now covers over half a million hectares, and is about three times larger than London itself. Demand for labour in London has continued to grow. This has only partially been met by densification, due in part to restrictions on the redevelopment and modernisation of existing buildings (which increases the challenge of decarbonising home heating, as discussed in Section 3.5). As well as high house prices, there has been an increase in the volume of long commutes that are expensive, reduce commuters' quality of life and increase transport congestion and emissions. Current rules give limited scope for targeted differentiation of the level of protection, where there may for example be a good rationale for facilitating housing development close to railway stations.

Graph 3.2.2: **Quarterly housing starts and completions**



Source: Ministry for Housing, Communities and Local Government

The cost of housing is linked to the high and volatile price of land with residential planning permission. On average, 70% of the price paid for a UK home is now linked to the value of the land (up from 50% in the mid-1990s) and only 30% to the value of the building itself (IPPR, 2018), though this average masks significant spatial variation. Housing supply is not responsive to shifts in demand, with little link between increases in dwellings and increases in housing prices and wealth. This inflates the role of land prices in the economy and has exacerbated regional gaps in wealth (Centre for Cities, 2019).

Housing supply might keep pace with national population growth. The ONS now expects the number of households in England (about 85% of the UK population) to increase by an average of 159,000 a year over the next 25 years (ONS, 2018a). While this is significantly less than the 210,000 previously projected, and projected population growth has also subsequently been revised down slightly (ONS, 2019d), the ONS and the Ministry for Housing, Communities and Local Government (MHCLG) have stressed that this does not mean the government's ambitions for house building should be reduced (ONS, 2018b). If it stays at or above current levels, and demolitions remain very low, residential construction could keep pace with national household formation.

Demand seems set to keep outstripping supply in areas of high housing pressure. However, there are few signs that construction will be high enough to alleviate the pressure in the areas that currently have the most acute housing shortages. In the majority of cities in England and Wales, and particularly those with high house prices, floor space per resident fell between 2011 and 2018 (Centre for Cities, 2019). High housing costs may also have suppressed household formation, for example by forcing young adults to live at home or cohabit as renters for longer. As discussed in Section 3.4.3, there are also signs of capacity and skills constraints in the construction industry.

The government's policy response

The government has implemented significant planning policy reforms. Fixing Our Broken Housing Market (DCLG, 2017), set out four housing policy objectives: (i) increasing the supply of land available for house building; (ii) accelerating the rate of house completions; (iii) encouraging more diversity in the building industry; and (iv) providing support to homebuyers. The government has been progressively implementing and updating a revised National Planning Policy Framework (NPPF) (MHCLG, 2019d). In 2019, the government made further changes to 'permitted development rights' that allow changes and extensions to existing buildings without the need to go through a full

planning process (MHCLG, 2019e). This includes allowing the conversion of certain types of commercial buildings to residential or office use. In many places, empty retail premises coexist with a housing shortage. Such conversions have played a larger role in delivering new housing supply in recent years, especially in areas with high house prices.

There are some concerns with the practical operation of the planning system. There have been large cuts to funding for spatial planning services at both the national and local levels, which has only partially been compensated for by increased fees and charges for planning applications and appeals (IFS, 2019c). At the same time, the post-crisis period has seen significant demand on these services, due both to the need to implement significant reforms and to a robust recovery in planning applications. The NAO examined the operation of the planning system and concluded that overall it is not working well. The issues highlighted by the NAO included a lack of consistency in targets for new homes, insufficient capacity in local planning systems, and an under-performing Planning Inspectorate (NAO, 2019a). The government planned to publish an accelerated planning white paper in late 2019, although this was delayed due to the December 2019 general election. The stated objectives are to reduce the number of planning conditions and improve the resources and incentives for local authority planning departments. This could potentially mean raising the fees for planning applications but requiring these to be refunded if a decision is not made on time (HM Government, 2019a).

The public sector has a significant impact on both housing supply and demand. The government is increasingly focusing direct public support for house building on areas with the highest housing demand and prices. This includes the Affordable Homes Programme, which provides housing with different tenure types and rent levels, not just socially rented properties. The Housing Infrastructure Fund provides £5.5 billion (€6.3 billion) by 2022-2023 to support the funding and planning of infrastructure linked to housing developments. Set against this, sales under 'help to buy' have reduced the stock of social housing over time, contributing to long waiting lists in many areas. The government has relaxed rules on local authority borrowing to build public housing. The NAO concluded that a 'Starter Homes' policy that the government pursued from 2015 to 2018 did not have effective objectives and implementation (NAO, 2019b).

The 'help to buy' scheme has accelerated home ownership for some households, but may have slightly pushed up house prices. It is not yet clear how much impact this will have on the ground. Under the 'help to buy' equity loan scheme the government provides a loan of up to 20% (or up to 40% in London) of the purchase price of a house, with the government taking a commensurate equity stake in the property. The number of house purchases under the scheme has grown gradually since its launch, to over 52,000 in the year to June 2019 (MHCLG, 2019e). While this only represents about 5% of all house purchases, two-fifths of all new-build properties have been bought under the scheme since its launch (NAO, 2019c). By reducing the level of deposit that purchasers need and increasing the amount they can borrow, it may have contributed to more rapid price growth in the new-build properties to which its use is restricted. New builds now typically cost 15-20% more than comparable second hand properties. The National Audit Office concluded the scheme might have increased the profit margins of builders (ibid.). If house prices fell in future, the government could lose money on its equity stake.

3.3. LABOUR MARKET, EDUCATION AND SOCIAL POLICIES

3.3.1. LABOUR MARKET

Robust labour market performance persists though the economy has slowed. Employment reached a record 78.7% in 2018, well above the EU average (73.2%). Despite subdued GDP growth (see Section 1), employment continued to rise to 79.1% in Q3-2019, 0.5pps higher than a year earlier. Improving the quality of employment and education would help to raise low and stagnant labour productivity (see Section 3.4), as would reducing skills mismatch. Both skills shortages and over-qualification have increased in the last decade, to above the EU average (Vandeplas et al, 2019).

High employment rates are partly explained by increases in less secure jobs. The biggest employment increases occurred in households with children and among those on lower incomes (Bell et al., 2019). Although at a slower rate than the overall growth in employment, the number of part-time employees has been increasing steadily since 2006. Within part-time employment, young people, old-aged workers, women, and low-skilled workers are over-represented ([17]). The proportion of zero hour contracts and platform work continued to increase in 2018.

There has been an increase of zero hour contracts in almost all regions of the UK. According to a report by the Economic Research Council, in the year from Q2-2018 to Q2-2019, the proportion of zero hour contracts within the UK workforce continued to grow, except in the North East and North West of England (ERC, 2020) which saw a marginal decrease. The biggest increases were of 1% in the East Midlands and the South East.

The UK has a higher incidence of platform work than the EU average. The recent surge of digital labour platforms has led to new forms of work organisation and task distribution across the workforce. The proportion of adult residents in the UK who have provided labour services via platforms at least once in their lives was estimated at 12.8% in 2018. About 3.6% of the adult workforce in the UK received their main income through platforms in 2018, compared to an EU average of 2.3%. This represents a slight increase from the previous year for the UK (3.2% in 2017) (Pesole et al, 2018). The analysis of two online surveys by the University of Hertfordshire yields similar results (UH, 2019). Between July 2016 and July 2019, the share of the adult population working for online platforms at least once a week doubled from 4.7% to 9.6%. For a substantial minority (9.4% of platform workers), it is their only or main source of income, while just under 30% report that platform work provides at least half of their income. Precarious and insecure work offers substantially lower social and employment protection for the individual worker and it might also contribute to lower productivity rates at the macroeconomic level, given that firms tend to invest less in skills and training in relation to short-term employment.

Despite high and increasing employment levels, labour market activity in some groups remained relatively low. The share of young people neither in employment nor in education and training (NEET) increased slightly in 2018, leading to the indicator being marked as 'to watch' in the Social Scoreboard, and is now in line with the EU average (after having been consistently below since 2014). The youth unemployment rate (11.7% in Q3-2019) is three times higher than the overall unemployment rate. As discussed below, the gender employment gap is still close to 10pps.

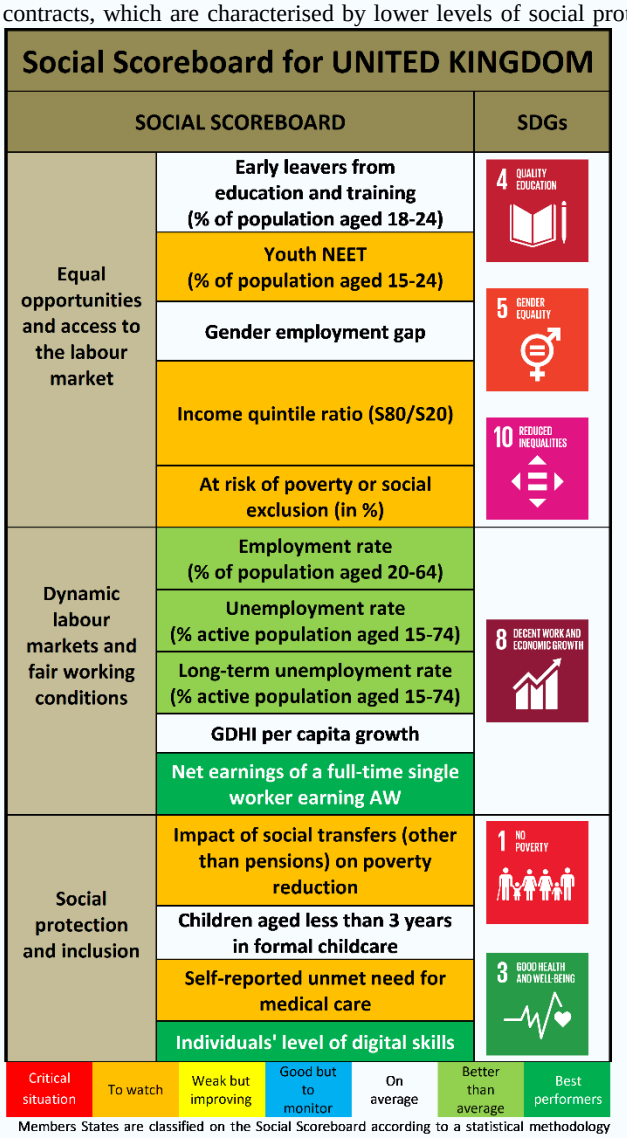
The labour market is becoming more polarised. Due to technological changes, employment that relies on non-routine cognitive (high-skill) tasks is on the rise while the share of jobs with routine tasks (medium-skilled) is falling and is very low in comparison to EU Member States. Like many other advanced economies, the UK is experiencing simultaneous growth in high and low-skilled tasks, while middle-skilled tasks have declined. Job polarisation has been accompanied by increasing macroeconomic skills mismatches, despite improving general economic conditions and increasing activity rates of the low skilled. Over-qualification is a matter of concern in the UK, as one quarter of workers with tertiary education are employed in occupations that do not require tertiary education.

([17]) Calculations based on Labour Force Survey (LFS) data

Box 3.3.1: Monitoring performance in light of the European Pillar of Social Rights

The European Pillar of Social Rights is a compass for a renewed process of upward convergence towards better working and living conditions in the EU. It sets out 20 essential principles and rights in the areas of equal opportunities and access to the labour market; fair working conditions; and social protection and inclusion.

The UK performs relatively well on a number of indicators on the Social Scoreboard that supports the European Pillar of Social Rights, but some challenges remain. The labour market shows strong performance in terms of employment creation and unemployment. However, slower growth in labour productivity, employment polarisation, a high incidence of atypical types of contract and a persistent gender employment gap remain important challenges. There has been a rise in the prevalence of zero-hour contracts, which are characterised by lower levels of social protection, skills progression and productivity. Female labour market inactivity due to caring responsibilities is higher than the EU average. This is partly due to high childcare costs, especially for low-income earners.



Members States are classified on the Social Scoreboard according to a statistical methodology agreed with the EMCO and SPC Committees. It looks jointly at levels and changes of the indicators in comparison with the respective EU averages and classifies Member States in seven categories. For methodological details, please consult proposal for a Joint Employment Report 2020, COM(2019) 653 final; NEET: neither in employment nor in education and training; GDHI: gross disposable household income. Update of January 2020.

The risk of poverty or social exclusion has considerably increased and surpassed the EU average, going from 22% to 23.6% between 2017 and 2018. This translates into 1.1 million more people at risk of poverty or social exclusion. More people have turned to food banks in the UK over the last year. Market income inequality is high, but social transfers have a strong impact on poverty reduction. In-work poverty and child poverty remained high and predicted to rise further. The extent of homelessness shows no signs of abating.

The UK has recently introduced pay transparency to help reduce the gender pay gap. The gender pay gap remained stable in 2017, with women earning on average 20.8% less than men. The pay transparency reform introduced in 2017 has led to mandatory pay transparency reporting for companies with 250 or more employees in the private and voluntary sectors in England, Scotland and Wales. In 2018 and 2019, this highlighted that almost 80% of companies pay their male staff more per hour than their female colleagues. The data also reveal that the highest gender pay gaps among the firms covered by the gender pay gap reporting are in the sectors of construction, finance, mining and communications. As a result of the findings, as of June 2019, 52% of in-scope employers had published an action plan to tackle the gender pay gap in their company.

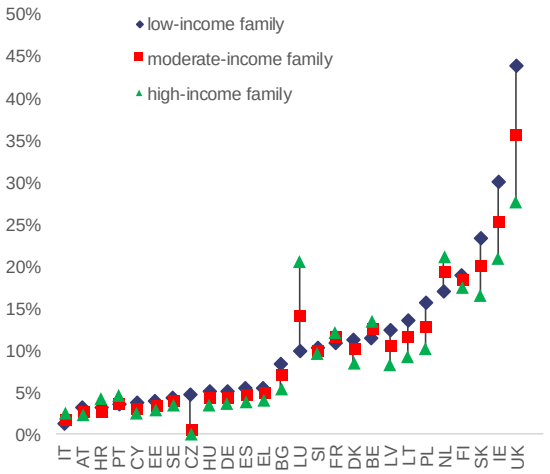
Implementing the apprenticeship reform is proving a challenge, with registrations down on previous years. The apprenticeship levy introduced in 2017 provides an opportunity for employers and training providers to improve the technical education of young people, yet the way this funding has been used is proving controversial. According to a recent report, the funding has increasingly been used to train more senior staff, not only in the private sector but also in academia, while entry-level apprenticeships have fallen (Richmond, 2019).

The proportion of workless households and children living in them has slightly decreased. In January to March 2019, the percentage of all households with dependent children where no one worked was 8.2% (663 000), down 0.5pps on the same period a year ago. Compared to some EU Member States, the concentration of joblessness at the household level does not pose a main labour market challenge for the UK. However, the quality of employment and underemployment, which is strongly correlated with in-work poverty, remain a cause for concern, delaying progress towards SDG 8 (Decent work and economic growth).

The gender employment gap remains a challenge. While the rate of women in employment (74.4% in Q3-2019) is the highest in recent decades, the gender employment gap is close to 10pps (74.4% vs. 84.2%). This is driven, among other factors, by inadequate provision of affordable childcare and social services. In 2018, 37.6% of women reported inactivity due to family and caring responsibilities, which is well above the EU average of 31.8%. These figures are more striking for the 25-49 age group, where up to 61% of economically inactive women attribute their inactivity to family responsibilities. In addition, 42% of women worked part-time in 2018 due to caring responsibilities. These rates are amongst the highest in the EU.

Childcare provision has been extended but it is limited by capacity constraints and remains out of reach for many due to high costs. The government maintained its investment in childcare after the financial crisis. In 2019 it extended the 30-hour entitlement to free childcare for children aged 0-3. However, the rollout of free, full-time early education and care provided for 30 hours per week is facing constraints and delays due to insufficient funding and lack of capacity among providers. The Childcare Survey 2019 found that only just over half of local areas had enough childcare capacity to support all full-time working parents. Average childcare costs are not only higher in the UK than in EU Member States, but the difference between the relative cost of childcare among income groups is also greater. Low-income families pay much higher net childcare costs as a percentage of their disposable income (45% on average) than medium- and high-income families in the UK (see Graph 3.3.1).

Graph 3.3.1: **Net childcare-related costs and benefits as a percentage of disposable income, by three earning levels**



Source: ESDE 2019

Childcare providers in more disadvantaged areas risk closing due to financial unsustainability. A funding gap between government financial provision for free childcare (30 hours per week childcare allowance) and the running costs for providers, may lead nurseries to be less financially viable. Many providers consider that they will be forced to limit places, raise fees or introduce extra charges in order to remain financially sustainable (Pre-school learning Alliance, 2017). The funding gap has been estimated at £660 million (€752.4 million) and around 17% of childcare providers surveyed in the most deprived areas of the country anticipate closure in the next 12 months (BBC, 2019a).

A recent regulatory reform introduces more transparency into the debate on gender pay gap. Mandatory gender pay gap reporting came

into force on 6 April 2017. It requires all private and voluntary sector employers in England, Scotland and Wales with more than 250 employees to publish information about gender pay gaps or face a fine for non-compliance. The gender pay gap reporting from March 2019 and April 2019 show that almost 8 in 10 companies (78%) still pay their male employees more than their female employees based on median hourly pay. The legislation does not require employers to do anything to address their pay gap, which reduces the pressure for employers to take any actions.

3.3.2. EDUCATION & SKILLS

The level of basic skills has improved somewhat, except in science. UK pupils' performance in reading, mathematics and science has been usually ranked above the EU average in successive PISA surveys. Results of the PISA 2018 survey (OECD, 2019a) indicate a broadly stable long-term (2006-2018) trend, and in the short-term (2015-2018) improved mean performance in mathematics, and stable performance in reading and science. PISA 2018 also shows that the proportion of students aged 15 who underachieve in reading, mathematics and science remained stable. There are differences in PISA performance between the UK nations, but these are not significant. Disparities in reading performance between students with different socio-economic background are small, as are differences between migrant and non-migrant pupils. Both narrowed further in 2018. Disadvantaged pupils are less likely to complete tertiary education. Data from the PISA tests carried out between 2003 and 2015 indicate that the academic level of parents, especially mothers, has a significant influence on student results, with average differences in the mathematics test scores of 76 points over an average total of 446 points (Volante et al., 2019).

The school attainment gap in England remains a matter of concern. The attainment gap between disadvantaged pupils and their peers has narrowed by 13% since 2011. A report from the Education Policy Institute shows, however, that the gap for pupils aged 16 stopped narrowing between 2017 and 2018. Disadvantaged 16 year olds are now an average of 18 months behind their non-disadvantaged peers, with large variation across England (Hutchinson et al., 2019). The gap in reading, writing and mathematics (combined) between pupils at the end of primary school whose first language is not English and those who speak it as their first language has almost disappeared. However, the gap between males and females widened from 8 to 10pps (70% females, 60% males), in reading in particular (DfE, 2019a). A recent analysis reveals that in England in 2018, 18% of people aged 18 left education without substantive qualifications, a higher rate than in 2015 (CCO, 2019).

Ongoing reforms and measures have been undertaken in secondary education. In England, the government encourages schools to join Multi-Academy Trusts (MATs). MATs are viewed by the government as the best way of driving up standards and giving schools independence from local authority control. However, not all MATs have been successful. In some cases, public funding of MATs was terminated following ongoing concerns about educational performance (BBC, 2017) and some MATs closed (The Guardian, 2017). In contrast, the Scottish government continued with a process of empowering schools and parents and children through a mechanism very different to the one in England – close involvement of local authorities rather than moving schools away from local authority control. In September 2019, the Scottish government set out its work programme for 2019-2020, including funding provisions for participation in early childhood education and care, investment in new or refurbished schools, the attainment challenge and equity fund, and a teacher innovation fund for teacher training. The Welsh government plans a curricular reform including provision of education in the Welsh language and potential changes to religious education. For Northern Ireland, the continuing lack of a functioning government has led to little policy development.

Teachers consider themselves well prepared for information and communication technology (ICT) teaching, to teach in multicultural settings or to train students in transversal skills. According to the 2018 OECD Teaching and Learning survey (TALIS), 50.7% of lower secondary school teachers in England feel well or very well prepared to use ICT for teaching when they finished their studies (increasing to 63.7% for

teachers who completed their formal teacher education and training in the last five years) (OECD, 2019b). Only 5.3% of teachers reported a high level of need for professional development in ICT skills for teaching. TALIS 2018 also reports that the proportion of teachers who feel well or very well prepared to teach in a multicultural and/or multilingual setting is above the EU average (42.7%, EU 23.8%). The proportion who report a high level of need for continuing professional development in this area (4.9%) is lower than the EU average of 13.4%. With regard to teaching transversal competences (for example, creativity, critical thinking and problem solving), 47.3% feel well or very well prepared; the number is even higher (61.5%) for newly qualified teachers.

Teacher retention is a concern. The number of teachers leaving the profession continues to increase. In 2018, 8.3% of teachers who left state-funded schools in England for reasons other than retirement (DfE, 2019b). In the 2018 TALIS, only 77.5% of teachers in England reported that they were satisfied with their job, well below the EU average of 89.5% (OECD, 2019b). The government has flagged teacher recruitment and retention in England as a priority. Authorities aim particularly to reduce departures during teachers' early careers, since 'over 20% of new teachers leave the profession within their first 2 years of teaching, and 32% leave within their first 5 years' (DfE, 2019a).

Digital skills

The UK performs relatively well in relation to the basic digital skills of its population but remains behind the leading countries in the EU. The proportion of the UK population aged 16-74 who have at least basic digital skills (74%) is higher than the EU average (59%), as indicated by the Social Scoreboard. However, after years of the UK lagging behind other digitally advanced economies in this regard the UK is now catching up with the leaders.

The UK also suffers from a structural deficit of ICT specialist skills, as the supply of new graduates falls short of the demand for these skills in the labour market. A large number of companies in the UK report difficulty in filling ICT posts — 50% of companies trying to recruit ICT specialists report difficulties finding people with the right skills. Despite strong growth in demand for these skills, domestic supply is not responding sufficiently. Indeed, while ICT specialist jobs now account for 5.1% of total employment (though for only 1.8% of women in work), the proportion of graduates in ICT (3.8%) remains relatively low.

In order for the UK to achieve its goal of becoming a technological leader, investments in digital technologies need to be accompanied by improved digital skills. The UK economy is already a relatively highly digitised economy (European Commission, 2019e). It has the ambition to be a digital leader, and is investing significantly in digitising its economy further. However, these investments will only produce the desired effects for growth and competitiveness if they go hand-in-hand with investments to support their adoption and use through improving the digital skills of the public and the labour force.

In recent years, the UK has introduced a broad set of measures to increase the digital skills of the UK population. However, these will take time to achieve their full effect. These measures include reforming curricula and introducing new qualifications (in schools, for adult learning and in vocational education and training), providing new funds and creating a digital skills partnership with the private sector. More recently, the government has also introduced specific measures to support the development of advanced digital skills, such as a programme to create 1,000 new PhDs in artificial intelligence over the next 5 years, as part of its Artificial Intelligence Sector Deal.

3.3.3. SOCIAL POLICY

The risk of poverty or social exclusion significantly increased from 2017 to 2018. Overall, relative poverty, measured by the at-risk-of-poverty or social exclusion rate (AROPE), increased by 1.6pps to 23.6% in 2018 (exceeding the EU average of 21.9%). This increase can be explained by a rise both in relative poverty and in material deprivation. The at-risk-of-poverty rate increased from 17% to 18.9% (exceeding the EU average of 17.1%), while the severe material deprivation rate increased from 4.1% in 2017 to 4.6% in 2018. Due to major reforms of the social

security system, the poverty reducing effect of social transfers decreased from 41.8% in 2017 to 35.9% in 2018, bringing it closer to the EU average of 33.2%. As a result, income inequality after transfers, measured by the income quintile share ratio increased from 5.4% in 2017 to 5.95% in 2018. With these poverty outcomes, the UK has moved away from reaching SDG 10 (reducing inequalities) in the past five years.

More people than ever have turned to food banks in the UK over the last year. The Trussell Trust, which runs two thirds of the UK's food banks, reports that it distributed a record 823,145 food parcels between April and September 2019, including 301,653 that went to children. This was a 23% increase on the same period the previous year, representing the steepest rise the charity has witnessed since its network of food banks was fully established.

People with disabilities are at a higher risk of poverty and exclusion. The proportion of people with disabilities who are at risk of poverty or social exclusion in the UK is 32.2% (EU average: 30.1%). The AROPE gap between people with and without disabilities is wider than the EU average (14.6pps vs 9.2pps). The UK also has a much wider employment rate gap between people with and without disabilities than the EU (33.5pps vs the EU average of 25.8pps). The Disability Employment Strategy targets include getting a million more people with disabilities in work by 2027 and providing a more comprehensive offering encompassing welfare, health, local authority and employer initiatives. Good progress has been made in recent years. Between Q3-2013 and Q3-2019, the number of working age people with disabilities in employment in the UK increased by 1.3 million to 4.2 million. Over the same period, the employment rate of people with disabilities increased by 9.8pps to 53.2%, while the disability employment gap had fallen to28.6pps.

Child poverty is well above the EU average and the number of poor working households is increasing. The number of children (aged under 18) at risk of poverty or social exclusion in the UK has further increased since 2017, to 4.1 million in 2018. This is equivalent to a rate of 29.9% (+2.5pps from the previous year, the highest increase in the EU), far exceeding the EU declining average of 24.3%, and impeding progress towards SDG 1 (No Poverty). Single parent households face the highest risk of poverty due to low rates of maintenance payments, gender inequality in employment and pay, and childcare costs. Children with a minority background are more likely to be in relative poverty, with 45% currently living in relative poverty. Regionally, London has the highest rate of child poverty in the country. Children in large families are at a far greater risk of living in poverty – almost half (43%) of children living in families with three or more children are at risk of poverty. Given the polarisation in terms of employment quality and the increasing rates of in-work poverty (from 8.9% in 2017 to 11.3% in 2018 compared to an EU average of 9.5%), work does not always provide a guaranteed route out of poverty in the UK. Of children growing up at risk of poverty, 70% live in a household where at least one person works.

Child poverty is increasing with the rollout of Universal Credit. A number of sources (House of Commons, 2018, p22), including the Institute for Fiscal Studies (IFS), concur that the main drivers of the projected increase in child poverty are linked to cuts and caps to public expenditure and associated means-tested family support that have been implemented alongside the rollout of Universal Credit. Under-investment by central government in children's social care services over the last decade has led to considerable overspending by local councils in this area. According to the Local Government Association (LGA), 132 out of 153 local councils in England (88%) overspent in 2017-2018, with the number of children in care at a ten year high.

The implementation of Universal Credit is still ongoing. While the introduction of the fully digital service of Universal Credit to all areas of the country was completed on 12 December 2018 for new claims, the rollout of Universal Credit to existing claimants will take longer. Recent calculations of the Resolution Foundation show that Universal Credit will be less generous than the system it is replacing (Resolution Foundation, 2019).

The UK has experienced a sharp increase in homelessness and rough sleeping. In England, the number of homeless people increased by 162% between 2010 and 2018. Most rough sleepers are men aged over 25. A substantial minority are non-

UK nationals, although the proportion of these is decreasing. Rough sleeping has been concentrated in London but has been spreading across the south of England over the past years. Across the UK, large proportions of statutory homeless households have serious support needs.

UK agencies provide various services for people who are homeless or at risk of homelessness. The right to housing provided through the UK's homelessness legislation and right to prevention of homelessness in England and Wales rely on the availability of private rented or social housing and housing benefits. The Homeless Reduction Act, which came into force in April 2018, provides a new legislative framework for local authorities to refocus their work on preventing homelessness. The government has committed to maintaining housing benefit for all supported housing, to halving rough sleeping by 2022, and to eliminating the phenomenon by 2027, in line with the Rough Sleeping Strategy. To what extent these and other measures will alleviate the problem of increasing homelessness remains to be seen.

Health care

Limited financial and human resources affect the access, performance and sustainability of the health system. The health system in the UK is efficient but the growing demand outstrips available resources. As a result, waiting lists increase, performance targets are missed and health service providers experience budget deficits. Policy responses across all four nations of the UK move in the direction of changing the model of care in order to better manage the increase in demand for health services. This includes improving integration of care across all levels, with a stronger role for primary and community care. It is a transformation process, which requires upfront investments and time to complete and bring the expected results. Currently, the UK invests the most in the EU in disease prevention as a proportion of the overall health expenditure: 5% in 2017 compared to an EU average of 3% (OECD/European Observatory on Health Systems and Policies, 2019; European Commission, 2019f).

The situation in relation to the health workforce remains challenging. There are shortages of various staff groups including nurses, general practitioners, clinical oncologists and psychiatrists. The number of vacancies is increasing and the estimated shortfall is expected to grow further in the coming years (European Commission, 2019f; The Royal College of Radiologists, 2019; IFS & The Health Foundation, 2018). Without reducing the level of workforce shortages, it will be difficult to increase the offer of health services and meet performance targets, even if extra funding is poured into the health system (OECD/European Observatory on Health Systems and Policies, 2019). The announced increase in undergraduate places for doctors and nurses is insufficient to address the problem in the coming years. The NHS acknowledges that a rise in international recruitment of nurses in the short to medium term, together with improved retention of the existing workforce and support for nurses to return to the health sector, are essential measures in order to fill 40,000 nursing vacancies by 2024 (NHS, 2019).

Social care lacks the resources to meet the levels of demand, adding pressure on the health system (European Commission, 2019f and NHS England, 2020). In a move to ease the burden, the Queen's Speech in December 2019 allocated an extra £1 billion (€1.14 billion) for social care in England in every year of the current Parliament. It also allowed local authorities to potentially raise £500 million (€570 million) more for social care in 2020-2021 through council tax.

3.4. COMPETITIVENESS, REFORMS AND INVESTMENT

3.4.1. PRODUCTIVITY AND INNOVATION

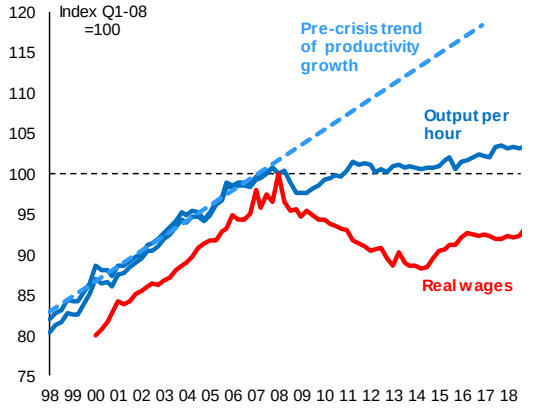
Productivity

UK labour productivity remains comparatively low. This is mainly linked to low within-sector productivity, though structural composition (e.g. small manufacturing share) does play a part. As discussed in Section 3.4.2, the UK has exceptionally low level of private investment as a proportion of GDP. There are also significant skills gaps, particularly for basic and technical skills. Regional differences also matter, with most UK nations and regions outside London having a lower output per hour than the EU average (see Section 3.4.5).

In some respects, the UK's low productivity is surprising. The UK economy has a number of characteristics that, in principle, tend to be associated with high average productivity. The UK has a high quality of government (European Quality of Government Index, 2016) and generally free and efficient markets (with the exception of the land market, as discussed in Section 3.2.2). It ranks eighth among 190 countries in the World Bank's classification of the ease of doing business (World Bank, 2019). In the 2019 European Innovation Scoreboard, the UK is considered a 'strong innovator' (European Commission, 2019g). The UK scores particularly well in human resources occupied in research, research networks, linkages with SMEs, venture capital expenditure (see Section 3.2), the sales impact of innovation activities and ICT training provided by firms, although it does less well in terms of R&D investment including in firms. The UK also has a relatively high churn rate of firms and an above-average proportion of workers in large firms. Investment in intangible capital assets is substantial, although as discussed in Section 3.4.2 it has slowed post-crisis.

Recent GDP growth has been driven by rising employment, not productivity. There is a sharp divide between the pre- and post-crisis drivers of UK GDP growth (WIIW, 2019). In the pre-crisis years, labour productivity grew more rapidly than hours worked. In the post-crisis period, UK employment has risen strongly, driven by increases in both the working age population and the employment rate. Hours worked have tracked changes in real GDP increasingly closely since 2009. Both female and male employment has risen, while average hours worked have been broadly flat (ONS, 2019e). The record-high employment rate is positive for GDP per capita and for mitigating inequality and social exclusion. However, by adding more low-productivity workers to the labour force, it is likely to have dragged down average productivity slightly. Many countries have seen a slowdown in productivity growth. However, the UK is still an outlier in the extent to which the primary driver of growth has shifted to become the quantity of labour (WIIW, 2019). As a result, the labour productivity gap with other G7 nations has grown. Real wages are still well below the level at the onset of the financial crisis (Graph 3.4.1), despite sustained strong employment growth (see Sections 1 and 3.3).

Graph 3.4.1: **Trends in UK labour productivity and real wage**

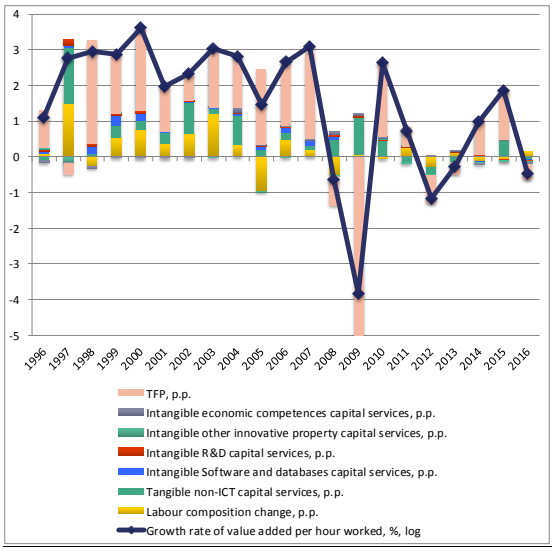


Source: European Commission

Labour productivity growth has slowed sharply since the crisis. UK labour productivity recovered relatively quickly after the 1973, 1984 and 1990 recessions. However, following the financial crisis there appears to have been a structural break in UK productivity (Graph 3.4.1), which is now 19% lower than it would have been had the pre-crisis trend continued (IFS, 2019d). This is due to both a negative shock to the level of productivity in the financial crisis and a slower rate of growth in its wake. The unprecedented nature of this slowdown is highlighted by the Royal Statistical Society choosing the UK's average annual labour productivity growth rate of 0.3% as the 'Statistic of the Decade' in December 2019.

The drivers of this productivity slowdown appear to be broad-based. The contributions to productivity growth from capital investment, the quality of labour and multifactor productivity (the efficiency with which capital and skills are used) all appear to have decreased (see Graph 3.4.2). As discussed in Section 3.4.2, the weakness in investment since the financial crisis encompasses both tangible investment and most types of intangibles. The low levels of capital deepening alongside rising employment has meant that through the post-crisis period the volume of capital available per unit of labour has not been growing and contributing to improved productivity (WIIW, 2019). Output per hour picked up modestly in 2014 and 2015 in the context of a recovery in business investment, but has since stalled. Box 3.4.1 discusses this renewed weakness in productivity in more detail.

Graph 3.4.2: **Contribution of production factors to labour productivity growth including intangible assets**



Source: KLEMS 2019 Analytical Section

By some measures, the UK economy is less efficient than before the financial crisis. As well as shortcomings in capital investment and skills, multifactor productivity has still not recovered to its 2008 level (ONS, 2019f). This could be due to a shift to a weaker trend (Melolinna and Toth 2019), though it is difficult to fully identify why that might be, given the residual nature of the metric. Some significant intangible assets in the UK such as financial innovation products and 'organisational capital' are not directly reflected in productivity analysis (Bauer, 2019). The UK has issues with relatively low R&D (see Section 3.4.2) and a failure by many firms to effectively implement efficiency-enhancing technologies and processes that already exist. For example, the EIB Investment Survey (EIB, 2019) shows that the use of strategic monitoring in firm management in the UK is below the US and average EU levels. By the end of 2016, 24% of businesses surveyed were not yet using advanced ICT systems to improve the management of internal processes and relations with clients. Using these methods can raise productivity by 25% (ONS, 2018c).

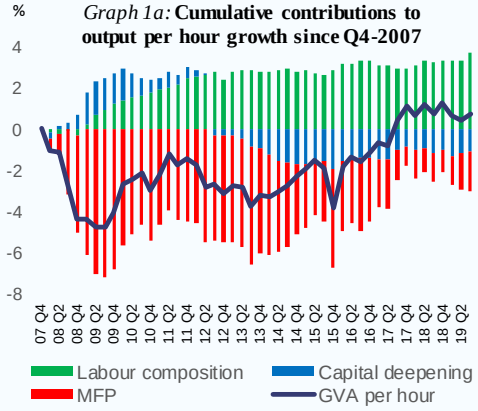
There is a positive correlation between firm size and age, and labour productivity. The profile of a UK firm with high labour productivity performance is one with between 500 and 1,000 workers, foreign owned, created over 21 years ago and operating in utilities, petroleum, extractive industries or pharma. For more than a decade, the average productivity of foreign-owned firms has remained over 60% higher than that of domestic firms. Capital-intensive sectors lead the labour productivity rankings, including the pharmaceuticals sector in which intellectual property assets are very important.

The post-crisis period has seen growing dispersion of productivity at firm level. Firms in all percentiles of the distribution saw their productivity fall in the financial crisis (Schneider, 2018a). In the post-crisis periods (both 2010-2015 and 2015-2017) firms with high productivity levels also had higher productivity growth. Without the contribution of the upper 10% of firms, the UK's productivity would have still been below the 2008 level in 2017. The relatively high volatility in the growth of productivity in highly productive firms suggests that the 'productivity puzzle' is driven disproportionately by the top of the distribution rather than its larger lower end (Schneider, 2018b). Micro firms employing 1 to 9 people are more likely to have very low productivity (ONS, 2017), as are restaurants, hotels and firms operating in distribution services. One puzzle in the UK is why so many poor performers remain in the market in an economy where most aspects of the regulatory and market environment should encourage competition and the churn of firms is relatively high.

Box 3.4.1: Key drivers of the recent weakness of UK productivity

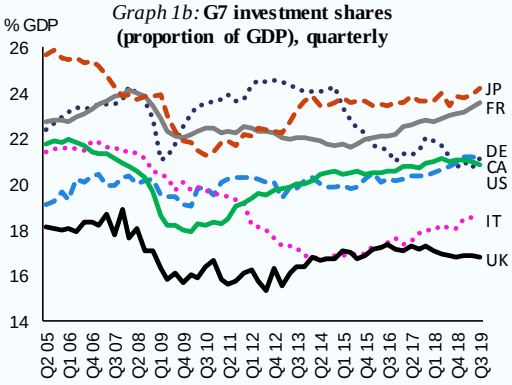
Despite a tight labour market, UK labour productivity has stagnated following a weak post-crisis recovery. As discussed in Section 3.4.1, both employment and productivity fell during the financial crisis, The UK's post-crisis recovery has been driven predominantly by growth in hours worked, not by improving productivity. Productivity growth stalled between 2012 and 2015, then briefly picked up. In the past 2 years productivity growth has again stalled, with output per hour essentially flat since early 2018 (see Graph 1a). This is despite consistently low unemployment through a mature phase of the economic cycle.

Graph 1a: **Cumulative contributions to output per hour growth since Q4-2007**



Source: ONS

Graph 1b: **G7 investment shares (proportion of GDP), quarterly**



Source: OECD

Growth has fallen short of pre-referendum expectations in the last three years. UK business investment fell sharply in the financial crisis then recovered until 2015 as the economy and employment grew. In the last 3 years, private investment has stalled in the context of high Brexit-related uncertainty, despite the UK having been in the phase of the economic cycle where investment is usually strongest. As a result, the UK effectively missed a global cyclical peak of growth and investment in 2017 and 2018 (see Graph 1b). A number of bodies have estimated the extent to which the level of UK GDP has fallen short of what might have been expected before the 2016 EU referendum. For example, the Centre for European Reform calculates the lost growth to have totalled 2.9% by mid-2019 (CER, 2019).

This slowdown in UK economic growth has been driven by stalling productivity and investment, as employment has continued to grow. The most striking element of the slowdown has been the weakness of private investment. The Bank of England estimate that increased economic uncertainty has reduced business investment by 11% over 3 years compared to the counterfactual (Bank of England, 2019c). The Bank also estimates that UK productivity was 2-5% lower than expected by mid-2019. As well as the impact of low investment, firms have been diverting management and other resources to contingency planning that does not have an immediate return (ibid). In contrast, employment has remained robust, and real wages surprisingly strong through the last year in the absence of productivity growth (see Sections 1 and 3.3). There is some evidence of firms choosing to add flexible labour rather than capital. The capital available per worker in the UK has recently been flat or falling (ONS, 2020c). This has resulted in an intensification of the post-crisis trend of hours worked driving GDP growth, rather than productivity, which implies that the recent robust real wage growth is not sustainable.

To date, the main effect of the prolonged period of high uncertainty has been for firms to hold back on significant investment and expansion decisions. According to the 2019 EIB Investment Survey (EIB, 2019), political uncertainty had a significant impact on economic investment plans in 2019. 42% of firms have become more pessimistic about the economic climate (up from 18% in 2018). Repeated episodes of Brexit-related uncertainty have raised the risk premium of investing and increased the relative attractiveness of the 'wait' option for firms (Nabarro and Schulz, 2019). As a result, 'firms have not prioritised the most profitable investments, but instead the most essential ones' (ibid.). The Enterprise Research Centre (ERC), an institute formed of several universities, reported that the number of high-growth enterprises — those

increasing headcount by at least 20% each year for 3 years — dipped from 11,855 in 2012-2015 to 10,968 in 2015-18, which it attributed to Brexit uncertainty. The proportion of high-growth businesses, which tend to have above average productivity, fell from 7.5% to 6.2% of all companies over the same period (Annual Scale Up Review 2018). The inflow of FDI to greenfield projects and mergers and acquisitions has been falling since 2016 (see Section 1), though the number of jobs created by FDI was falling before then.

Many of the sectors which have seen the weakest output or productivity growth since 2016 are investment-intensive. The cyclical recovery in business investment until 2016 was driven disproportionately by capital-intensive manufacturing. However, despite weaker sterling manufacturing has stalled since 2016. This is especially the case for vehicle production, where strong production growth from 2012 to 2016 (ONS, 2019g) has been followed by a sharp downturn attributable to both global and domestic factors. On a rolling twelve-month basis UK car production (80% of which is for export) has fallen by a quarter from a peak of 1.75 million in the year to early 2017 to 1.3 million in the year to December 2019 (SMMT, 2020). Investment in vehicle production has fallen particularly sharply (SMMT, 2019). While overall construction output grew robustly until 2017 before levelling off, output per hour in the construction sector has fallen since 2016 and was particularly weak in 2018 (ONS, 2019h).

In November 2019, the government published the Business Productivity Review (HM Government, 2019b). The publication followed a review process launched in 2018 'focused on improving the productivity of businesses with lower productivity, sometimes described as a "long tail", that lag behind the leading firms and underperform relative to domestic and international benchmarks' (BEIS, 2018, p.4). The review formed part of the broader Industrial Strategy (HM Government, 2017) and focused on management capabilities and technology adoption as drivers of firm level productivity. Its main conclusion was that improving firm productivity performance requires a four stage business change cycle: i) realisation that a change is needed; ii) assessment of the costs of change and associated outcomes, quality and value of change, and of the business support available to help identify solutions; iii) navigation of the business support environment to find advice, or new services and products, to deliver the desired change; and iv) embedding the change in the business to realise the benefits, which may require strong leadership and staff training. More effective skills policies will also be key to improving UK productivity as, while the UK has significant gaps in basic and technical skills and skills mismatches have increased in recent years, the amount of training undertaken per worker has fallen and the apprenticeship levy introduced in 2017 has not been as effective as expected (see Section 3.3).

Research, development and innovation

While the UK is considered a 'Strong Innovator' (see above), R&D investment intensity has remained flat, and below the EU average, for the past decade. In 2018, R&D expenditure reached £36.5 billion (€41.3 billion). However, research intensity (total R&D expenditure as a percentage of GDP) was still only 1.71%, below the EU average of 2.11%. In 2018, although the business sector spent £25.2 billion (€28.5 billion) – representing 69% of UK total R&D expenditure –business research intensity was at 1.18% of GDP also significantly below the EU average of 1.41% (Eurostat, 2019b).

R&D investment in the UK remains concentrated in a limited number of companies and regions. 400 firms account for the bulk of business R&D investment. The South East, the East of England and London regions undertook the majority of total UK research and innovation activity (ONS, 2019i).

Although UK universities are regarded as global research leaders, science-business linkages could be strengthened. UK universities are a leader in terms of highly cited publications ([18]), and the UK has improved in international rankings of knowledge diffusion ([19]). Nevertheless there is scope for the business sector to capitalise more on the UK's scientific strength.

The approach to future R&D funding in the UK was laid out in the December 2019 Queen's

([18]) In 2018, 14% of the total scientific publications in the UK ranked among the top-10% most cited publications worldwide.

([19]) According to the Global Innovation Index by Cornell university, INSEAD and WIPO, the UK has improved to 12th place in terms of knowledge diffusion.

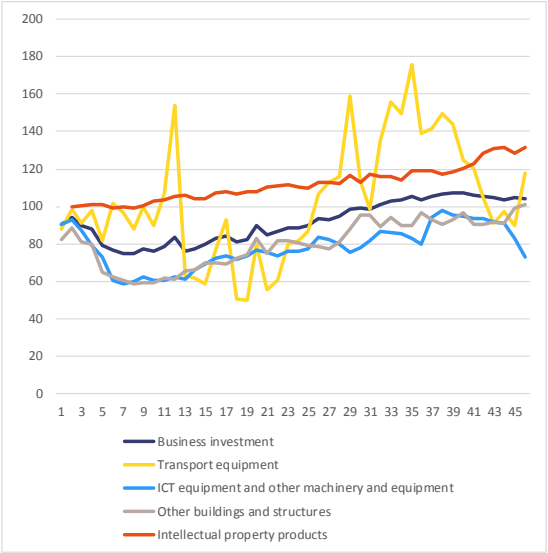
Speech. The UK plans to increase public R&D funding, with greater emphasis on high-risk, high-payoff research in emerging fields, a fast-track immigration scheme and reducing bureaucracy in research funding (HM Government, 2019a). Delivering on these ambitious proposals will be a challenge, as will the aim to increase R&D investment intensity to 2.4% of GDP by 2027.

3.4.2. INVESTMENT

The UK has long had lower capital investment as a proportion of GDP than other G7 economies (see Graph 1b in Box 3.4.1). The UK has underinvested in housing, network infrastructure and capital equipment for decades. National savings are also very low in the UK, which is linked to the persistence of a sizeable current account deficit despite the depreciation of sterling in 2016 (see Section 1) and low domestic investment.

Private sector investment recovered slowly and unevenly following the financial crisis, and has recently stalled. Investment by non-financial corporations as a percentage of GDP fell sharply in the financial crisis then recovered, particularly from 2012 to 2015. Total business investment regained the peak level of Q4-2007 8 years later, in 2015, but investment in some sectors remains below pre-crisis levels (Graph 3.4.3). As discussed in Box 3.4.1, overall private sector investment has flat lined since 2016. While business investment stagnated, private sector investment in dwellings continued to grow moderately. Quarterly investment growth is volatile, but since early 2018 it has tended to be particularly weak (see Section 1). On a sectoral basis, investment in 'other buildings and structures' has just returned to pre-crisis levels. Machinery investment has not returned to pre-crisis levels and is now falling again. The UK's low investment rate is mainly driven by the service sector, due to its size. Investment has weakened in subsectors such as financial services and insurance that drove growth in the past. Higher investment could drive progress on SDG 8, but as discussed in Box 3.4.1, there are currently few signs of a private sector investment recovery.

Graph 3.4.3: **Quarters needed to recover 2007 investment levels (in chained volume measures ref. 2016)**



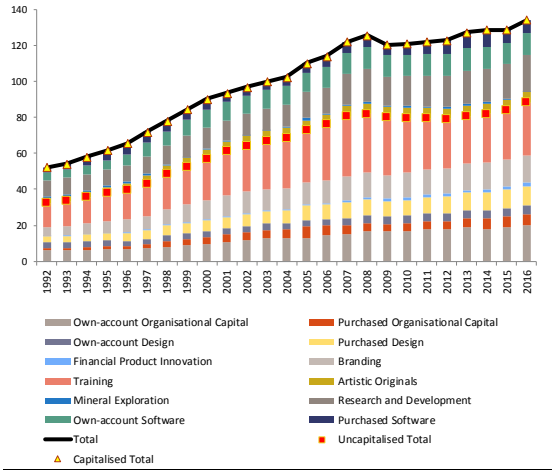
Source: ONS

The level of UK investment looks better if all intangible investment assets are included. Intangible assets have growing economic importance, especially in a service-dominated economy like the UK. This has justified an extension of the capital assets considered in accounting beyond physical assets (Adarov and Stehrer, 2019, and ONS, 2019j). In addition to research and development, software and databases, intangible assets include artistic originals, mineral exploration, design financial innovations, branding organisational capital and firm-specific training. In the UK, the total volume of investment in intangible assets is estimated to match that in physical capital. Together, they account for about 25% of market sector gross value added.

Growth in investment in intangible assets has also slowed markedly following the financial crisis (Graph 3.4.4). Organisational capital has, however, been growing fast and, unlike financial innovations, the investment rate in this has not fallen. An additional exception is the continued growth of 'intellectual property products' as discussed above. The increasing proportion of intellectual property products and software in the capital-labour ratio could be positive for the UK's productivity prospects, though as discussed in Section 3.4.1 R&D intensity is still quite low. Spending on training per worker has also fallen (DfE, 2018b).

In addition to uncertainty, structural factors may have also been discouraging firms from investing their cash reserves. The return on capital and the rate of return on equity have remained relatively stable over time and do not therefore explain subdued investment. In the UK, as in several advanced economies, low investment rates have resulted in cash hoarding. Since 2012, UK corporates have been increasing dividend payments but still dissaving in net terms despite robust profitability and modest investment levels (Deutsche Bank, 2019). This may be linked to corporate culture and incentives in the tax system, as discussed in Section 3.1. These factors could continue to limit investment after economic uncertainty reduces.

Graph 3.4.4: **Breakdown of intangible investment in the market sector (current prices)**



Source: ONS

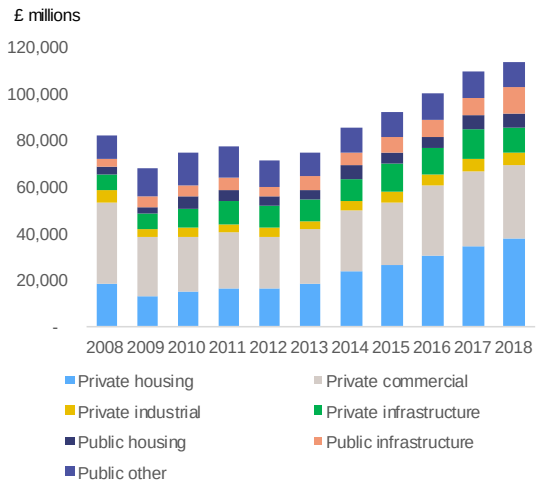
Direct public investment is close to the EU average and currently growing somewhat. Public sector investment rose temporarily to a peak in 2010 in the wake of the financial crisis, then dropped back. Total public sector net investment was up by 6.1% year-on-year to Q2-2019 and is projected to average somewhat more than 2% of GDP over the next few years. In recent years, the government has increasingly focused investment on network infrastructure, and this can be seen in the rise in new public infrastructure projects shown in Graph 3.4.5. Local authority capital expenditure, which is slightly below 1% of GDP, has been broadly stable in recent years after temporarily rising in the wake of the financial crisis. In response to a recent surge in borrowing by local authorities from the Public Works Loan Board, the government raised the interest rate on these loans.

3.4.3. INFRASTRUCTURE

Major investment is needed to modernise and expand infrastructure networks while bringing down project costs, greenhouse gas emissions and other environmental pressures. The UK has growing capacity pressures in road, rail and aviation networks. There is also a need for new and greener energy generation and supply capacity, as well as broader investment to support decarbonisation across the economy (see Section 3.5). The UK has often struggled to deliver infrastructure in a timely and cost-effective way. The reasons for this include short termism and fragmented, stop-start decision making (NIC, 2018), the structure of the UK construction industry (PWC, 2016), and the complex and restrictive spatial planning system (see Section 3.2). To help address this, the National Infrastructure Commission (NIC) was created in 2016 to carry out long-term infrastructure planning. The Infrastructure and Projects Authority (IPA) was also created to monitor projects and help to deliver them.

The government is due to publish a delayed National Infrastructure Strategy. In July 2018, the National Infrastructure Commission published the first National Infrastructure Assessment (NIC, 2018), a wide-ranging analysis and set of recommendations on UK infrastructure investment needs and management to 2050. The NIC was asked to work on the assumption that annual government spending on economic infrastructure would be 1.0-1.2 % of GDP between 2020 and 2050, which is broadly in line with current levels. The main themes of its recommendations include tackling urban congestion, improving the capacity of the UK's water supply and digital infrastructure, and reducing carbon emissions. The government gave an interim response to the NIC's assessment alongside the 2018 Autumn Budget. A full government response in the form of a National Infrastructure Strategy has been delayed, and is expected to be published alongside the March 2020 Budget.

Graph 3.4.5: **Trends in new infrastructure and housing work**



Source: ONS

Growth in construction sector activity is subdued and there are signs of capacity constraints in the sector. As Graph 3.4.5 shows, the amount of new construction work levelled off in 2018 after growing strongly from 2013 to 2017 (ONS, 2019h). While new public sector projects grew by more than 10% in 2018, new private sector projects fell slightly in real terms. Construction employment increased by 2.8% in 2018 (ONS, 2019h), though productivity in the sector fell and is no higher now than before the financial crisis. The construction sector lost much of its skills base in the bust following the financial crisis. The presence of skills shortages is shown by the strong growth of average wages in construction, which grew by 5.5% in nominal terms in 2018, despite the weakness of productivity. This fed into relatively high construction price inflation (ibid.). Throughout 2019, survey indicators such as the construction PMI indicated falling activity, a reduction in new orders and employment in the construction sector although when compared to 2018, construction output increased by 2.5% in 2019 (ONS, 2020d).

The balance of infrastructure investment has recently shifted towards the public sector. After decades of public sector under-investment, the government is starting to deal with the infrastructure deficit. New public sector infrastructure work grew by 45.7% in 2018 and it is now much higher than a decade ago. In contrast, the value of new private sector infrastructure projects fell by 15.9%. As a result, 2018 was the first year since 1996 that public projects made up the majority of new infrastructure work.

The government envisages a bigger private sector role in future infrastructure investment, on a scale which could prove challenging. The November 2018 National Infrastructure and Construction Pipeline (IPA, 2018) set out over £600 billion (€684 billion) of public and private sector investment projects that are planned across the economy over the next decade. Around half of the value of the pipeline requires private sector funding, including in privatised utilities subject to economic regulation. However, new infrastructure orders fell sharply in 2018, partly due to base effects from a high level of orders for the HS2 rail scheme in 2017, before recovering somewhat in 2019 (ONS, 2020d). UK projects will not have access to European Investment Bank (EIB) funding in future. The EIB has had an important role in funding UK projects in the past, particularly in infrastructure and in funding projects based around less established technologies. It is likely to be challenging to secure the amount of external funding required to meet the needs set out in the pipeline. The government is expected to soon issue a response to its Infrastructure Finance Review consultation (HM Treasury & IPA, 2019), one aspect of which is how best to replace funding that used to come from the EIB.

Transport and telecommunications

Rail system performance recovered in 2019, but passenger satisfaction and reliability remain issues. Usage of the UK passenger rail network has nearly doubled over the last 20 years and almost two-thirds of all rail journeys start or end in London (DfT, 2019a). Rail performance indicators recovered in 2019, after deteriorating in 2018 when a number of train operating companies experienced extensive delays and cancellations. In the 2019 Global Competitiveness Report (WEF, 2019) UK travellers gave a relatively low perception score for rail efficiency (55.5, down from 60.1 in 2018), while the overall rail infrastructure score fell to 77.4 (EU average 70.8). Passenger trust in the sector is low, with a perceived lack of competence, motivation, leadership and communication in the sector (DfT, 2019b). Fare payers are less satisfied with the

value for money of rail services than other aspects of the rail system (Transport Focus, 2019).

After some signs of improvement in delivery, major rail schemes have recently fallen behind schedule and over budget. The new 'Crossrail' underground link between east and west London and the surrounding area, was further delayed in 2019. The first services are now not expected before 2021 (BBC, 2019b), with fears of the budget rising to £18.25 billion (€20.8 billion), more than £2 billion (€2.3 billion) above the original budget (NAO, 2019d). The Department for Transport commissioned the 'Williams Review', a comprehensive review of the structure and operation of the railway system, in the wake of network problems in 2018. The review has taken longer than initially envisaged but its final report is expected to be published soon. The government plans to publish a White Paper informed by the recommendations of the Williams Review in the course of 2020 (HM Government, 2019a).

The new 'High Speed 2' rail service will go ahead following a review, but the cost is set to rise further. There has been progress on the preparation work for the first phase of High Speed 2 between London and Birmingham, though the start of construction has been delayed. This complex project has been beset by delays, cost increases and contracting problems, and the National Audit Office recently concluded that the government underestimated the challenges involved (NAO, 2020). A review of the project's scope and costs noted a number of issues with High Speed 2 but recommended that on balance, the government should go ahead with construction (Oakervee 2020). In February 2020, the government announced that High Speed 2 should go ahead, potentially with delays and modifications. However, the cost of the whole project looks set to rise further from the currently estimated £88 billion (€100 billion) (FT, 2020). Parliamentary approval of the second phase, to run up to Manchester and Leeds, has been postponed.

Road congestion levels are higher than in most parts of the EU. According to estimates from the Commission's Joint Research Centre (European Commission, 2018c) car users in the UK spent on average 45.7 hours in road congestion in 2017. This is among the highest in the EU. According to the World Economic Forum's Global Competitiveness Report (WEF, 2019), the 2019 perception scores for road quality (64.4) and road infrastructure overall (81.1) remain relatively low, despite the latter having risen by 6.1 points since 2018.

A stakeholder consultation was launched regarding the Heathrow airport third runway project, in advance of applying for a development consent order in 2020. The plans for expansion continue to face strong opposition from politicians, local residents and environmental groups, and the project's future is uncertain.

The deployment of full fibre networks has increased rapidly (Ofcom, 2019). This follows the publication of the 2018 Future Telecoms Infrastructure Review, setting out the strategy for digital infrastructure. Despite the currently modest level of rolled-out fibre networks, network competition in the full fibre market is growing, with a range of larger and smaller full fibre providers rolling out networks in various parts of the country (Ofcom, 2019). Both the incumbent and local and national alternative providers have made a number of significant investment announcements.

The UK is significantly increasing its public support in fibre network rollout. On 30 September 2019, the Government announced that it secured £5 billion (€5.7 billion) of funding for subsidising the market to deliver coverage to the least commercial 20% of UK premises, at the same time as incentivising the market to build to the more commercial 80%.

As of October 2019, all four mobile network operators have launched active 5G services in cities across the UK. Auction of 5G pioneer bands 700 MHz and 3.6-3.8 GHz is scheduled for spring 2020.

Energy infrastructure

Half of the UK's current nuclear generating capacity of 8.8 GWe is currently expected to shut down by 2025, and investment in new nuclear capacity is on hold. Construction continues on the 3.2 GWe Hinkley Point project, while the final investment decision has yet to be taken in respect of the 3.2 GWe Sizewell C project or the 1 GWe Bradwell project. In July 2019, the

government launched a consultation (BEIS, 2019a) on the regulated asset base (RAB) model for funding large projects, including nuclear. The government has not yet published its response to the consultation, and potential projects are on hold. The NIC published information on the costs of UK nuclear projects, which found the median cost overrun to be at least 50% (NIC, 2019a).

The prospects for further investment in the renewable electricity sector are encouraging. The third round of Contracts for Difference auctions, which took place in September 2019 resulted in further cost reductions in offshore deployment: 12 projects were allocated 5.8 GW of new capacity to be deployed from 2023 to 2025 at a price range of £39.65-41.61 (€45.2-47.44) per MWh. These results are below current market prices and 30% lower than the prices achieved in the second Contracts for Difference round in 2017. The UK authorities have committed to delivering up to 40GW of offshore wind capacity by 2030. The previous feed-in tariff scheme for small-scale renewables was phased out in 2019, and a new requirement was created for most suppliers to offer at least one tariff for the purchase of exported electricity (at a rate of their choice) to small generators.

The UK currently has an interconnection level of about 6% of installed electricity generating capacity. Two interconnectors between the UK and France that are still under construction (Electlink; IFA2) are expected to increase the UK's interconnection level in 2020, but it will still remain below the target of 10%. Ten further new interconnectors were labelled 'Projects of Common Interest' on 31 October 2019 and are currently at various stages of planning or development. The government's projections for the future see interconnections playing an important role in maintaining energy security.

The UK's wholesale electricity market is relatively liquid due to its early work on energy market liberalisation. However, wholesale prices are above the EU average (average day-ahead price of €64.89 (£56.92) per MWh in 2018) (ACER, 2019) due to the energy mix of electricity generation and the relatively low level of interconnection. This constitutes a wholesale price increase of 25% compared to 2017, less than in neighbouring countries Ireland (32%) and the Netherlands (34%), but more than in France (12%).

In October 2019, the European Commission reapproved under EU State aid rules the capacity market scheme introduced in 2014. The scheme aims to ensure security of electricity supplies in view of the projected increases in electricity demand and the upcoming closure of a significant share of generation capacity. Three auctions are scheduled for early 2020 to secure the majority of the UK's capacity needs to 2023-2024.

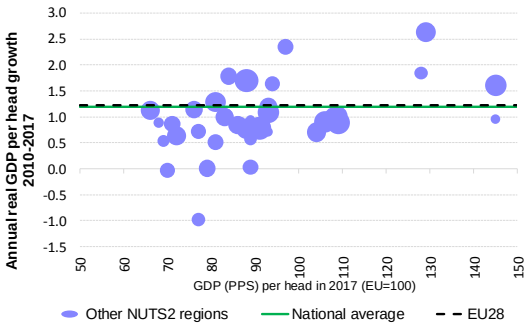
The retail electricity market remains competitive, despite a number of challenges. For a mature market (the UK electricity market was liberalised in 1999), supplier switching rates are high, standing at 19% per year in 2018 (Ofgem, 2019). Retail market concentration has fallen since 2011, suggesting fluid competition. Nevertheless, concerns over rising prices for disengaged consumers led to the introduction of a price cap on 'default' energy tariffs on 1 January 2019. The cap was lowered in October 2019. Affecting around 11 million energy customers, the price cap is intended to be a temporary measure until longer-term reforms, including smart metering, can be implemented. The rollout of smart meters is underway and aims to have around 53 million smart gas and electricity meters fitted in over 30 million premises (households and businesses) in Great Britain.

3.4.4. REGIONAL DISPARITIES

Inter-regional variations in GDP per capita are significant and continue to grow. London and its surrounding areas are economically successful, supporting large numbers of high productivity and well paid jobs. However, some other regions of the UK are relatively poor (Graph 3.4.7) and lack physical and human capital, by developed world standards. Between 2011 and 2017, 32 of the 41 UK NUTS 2 regions recorded GDP per capita growth below the EU average (Graph 3.4.6). The four areas with no or negative growth (Tees Valley and Durham, Merseyside, East Yorkshire and Northern Lincolnshire) are all relatively poor. More recently, in the year to Q1-2019, the two fastest growing regions were the two richest, London and South East England (ONS, 2019k).

The UK seems to derive relatively few agglomeration benefits in conurbations outside London. In general, larger cities tend to have higher productivity levels. Despite the strong degree of urbanisation in the UK and the presence of several sizeable metropolitan areas only the city regions of London, Edinburgh, Aberdeen and the West of England conurbation (Bristol), had above average productivity levels in 2017 (ONS, 2019l). The OECD Spatial Analytics Centre characterises economies into two types: i) a leading city drives the economy, and other areas do not follow; and ii) multiple centres. It considers the UK to be a clear example of type i). The constriction of growth poles has economic and social costs in and around UK conurbations (see Section 3.2). An NIC study concluded that part of the issue is poor connectivity and that there are complementarities between the need to better connect places to each other (which is more trade-related) and the need to improve connectivity within places (often linked to commuting) (NIC, 2019b).

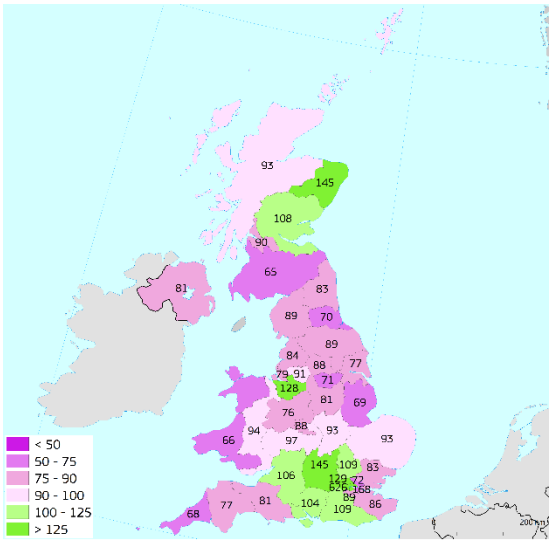
Graph 3.4.6: **GDP per capita (2017) and GDP per capita growth (2011-2017)**



(1) The size of the bubbles represents population size.
Source: Eurostat

Public sector investment has been concentrated in London and South East England. A large proportion of total public investment in physical infrastructure in the UK is invested in and around London. Spatial transport and digital infrastructure strategies could help to address some of the drivers of regional economic weakness. As discussed in Section 3.4.1, there are significant regional imbalances in R&D funding which correlate with disparities in innovation performance. The three innovation leaders – London, the South East and the East of England (European Commission, 2019g) – accounted for half or more of public and private sector R&D expenditure in 2017. Per capita government expenditure on R&D ranges from £67 (€76.4) in South East England to less than £10 (€11.4) in Northern Ireland and Wales (ONS, 2019i). The new UK government has stated an ambition to "level up" poorer regions of the UK, including by allocating more public investment to these areas (HM Government, 2019a).

Graph 3.4.7: **GDP per head (PPS) in UK, NUTS 2 regions (2017), EU=100**



Source: Eurostat

Poorer regions struggle to produce, attract and retain highly skilled workers. The proportion of the population aged 25-64 with high educational attainment is highest in London (57%), followed by Scotland and South East England (47%). The proportion is below the national average (43%) in all other regions. It is lowest in the West Midlands (36%) and North East England (34%). School results show a similar pattern. Poorer regions also struggle to attract and retain higher-skilled workers. This is exacerbated by the fact that highly skilled individuals are increasingly part of dual-income couples who are both highly skilled and need access to a diverse labour market from the same place of residence. Conurbations outside London often do not provide this, due in part to poor connectivity, so highly skilled couples continue to work in or around London, despite its high living costs (CEBR, 2019).

Box 3.4.2: **Investment challenges and reforms in the UK**

Macroeconomic perspective

Total physical investment in the UK fell significantly during the crisis, with a sharp fall in private sector investment only partially offset by a temporary increase in public sector investment. Public sector investment is close to the EU average, and it has been reoriented towards economic infrastructure, but there are shortcomings in transport connectivity (see Section 3.4). Private sector investment is significantly below the EU average, and has stalled in the last three years following a recovery from a post-crisis trough. Equipment investment is particularly low. Relatively low levels of housebuilding have contributed to the UK's housing shortage (see Section 3.2). Heightened uncertainty has continued to weigh on investment (see Section 1 and Box 3.4.1).

Assessment of barriers to investment and ongoing reforms

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

Legend:

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

Overall, barriers to private investment in the UK are moderate, as reflected in the European Commission's assessment. Relevant reforms have been adopted on spatial planning and technical skills, but structural problems remain.

Main barriers to investment and priority actions underway

1. Spatial planning regulations: Regulation of the land market, particularly of residential construction, is strict and complex (see Section 3.2). The process of obtaining planning permission is often lengthy, complex, uncertain and costly. Limits on the scope for development, particularly around poles of economic growth, have led to an undersupply of housing and very high prices for non-agricultural land. Land prices and the complex planning system contribute to the tendency for infrastructure projects to take longer and cost more than in other European countries (see Section 3.4). Planning restrictions can also hinder the use of modern, efficient commercial buildings and equipment. Substantial reforms to the planning system have gone some way to facilitating increased development, but may not prove sufficient.

2. Technical skills: While the UK has a strong higher education system, there are weaknesses in both technical and basic skills (see Section 3.3) which contribute to its weak productivity. The UK suffers from a structural deficit of ICT specialist skills, as the supply of new graduates falls short of the demand for these skills. The government has introduced a broad set of measures to increase digital skills, but these will take time to achieve their full effect. Recent measures include reforming school curricula and introducing new qualifications, providing new funds and establishing a digital skills partnership with the private sector. More recently, the UK government announced a programme to create 1 000 new Artificial Intelligence PhDs over the next 5 years, as part of its Artificial Intelligence Sector Deal.

3.5. ENVIRONMENTAL SUSTAINABILITY

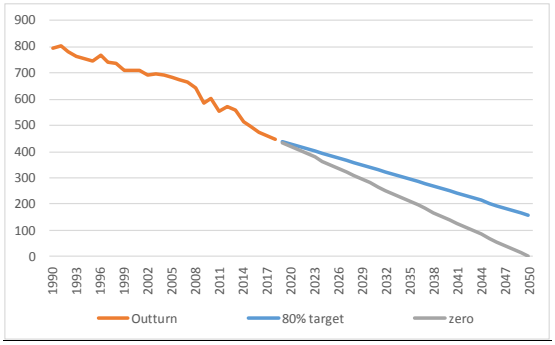
The UK has made good progress to date in decarbonising its economy, but it now needs to step up its efforts to continue the transition to a climate neutral economy and make further progress on SDG 13. The UK is on track to meet its Europe 2020 target for greenhouse gas emissions not covered by the EU Emissions Trading Scheme (ETS). According to approximated data, UK greenhouse gas emissions were 21% lower in 2018 than in 2005. Projections based on existing measures indicate that emissions from non-ETS sectors will be 27% below 2005 levels by 2020, exceeding the 16% target under Europe 2020. However, without additional measures the UK may miss its 2030 target of 37% by 5pps. In its annual report to the UK Parliament on progress in reducing UK emissions, the Committee on Climate Change (CCC) concluded that UK action to curb greenhouse gas emissions is lagging behind what is needed to meet legally binding emissions targets (CCC, 2019a). It noted that between June 2018 and the July 2019 publication date, the government has delivered only 1 of 25 critical policies needed to get emissions reductions back on track.

The UK has relatively high domestic resource efficiency but it also has significant net imported emissions. In large part, the UK's resource efficiency reflects the relatively high share of the services sector in the economy. Most waste indicators are also better than the EU average. However, as the physical waste intensity is above the EU average, there seems scope to improve the efficiency of using materials in production. The UK also has a large deficit in trade in goods, the production and shipping of which is carbon-intensive. As a result, the UK has substantial net imported emissions. The CCC estimated that in 2015 UK emissions measured on a consumption basis were 13tCO2e per person compared to 8tCO2e on a production basis (CCC, 2018).

While the UK is currently above its indicative trajectory towards its Europe 2020 renewables target, there is a need to step up efforts to bridge the gap of around 4pps to the 15% target. This can be done either through national renewables deployment or by using the cooperation mechanisms provided for under the Renewables Directive. It is uncertain if the measures in place are sufficient to reach the overall 2020 renewables target, particularly in view of the slower progress in the heating and cooling and transport sectors.

The UK is currently on track to fulfil its required end-use energy savings obligation for the first obligation period 2014 – 2020. It is also on track to meet its national 2020 energy efficiency targets, for primary energy consumption. However, the UK needs to increase efforts to reduce final energy consumption. The transport sector requires further attention, since its final energy consumption is increasing faster than the EU average.

Graph 3.5.1: **Indicative rates of decarbonisation required to achieve 80% and 100% reductions by 2050**



Source: Department for Business, Energy & Industrial Strategy; own calculations

In 2019, the UK committed to a 2050 net zero emissions target. The UK legislated in June 2019 to reach net zero greenhouse gas emissions by 2050. This was a step-up from a previous target of an 80% reduction in 1990 baseline emissions (see Graph 3.5.1). The CCC anticipates the annual cost of meeting the new target could be 1-2% of UK GDP in 2050 (CCC, 2019b). The CCC noted that this is comparable with the original estimates made for the cost of meeting the previous 80% target, and that it is a conservative estimate as the actual net economic impact could be lower and may even be positive. The UK government is now undertaking a range of work to better understand the implications of the net zero commitment. In November 2019, HM Treasury published the terms of reference for a review into funding the transition to a net zero economy (HM Treasury, 2019b). The review will consider the full range of government levers, including tax, and is due to report in autumn 2020. The 2050 net zero emissions target

will make sure that the UK delivers on the Paris Agreement (CCC, 2019b).

The UK's overdue National Energy and Climate Plan[20] will set out the UK's energy and climate-related investment needs until 2030. A draft plan, published in January 2019, provided an overview of the investment challenges and policy responses. The final plan was due to be submitted to the European Commission by 31 December 2019 in line with the Regulation on the Governance of the Energy Union and Climate Action. However, its publication was delayed by the December 2019 general election. This plan is particularly important since inaction in the face of climate change carries significant economic and social costs (European Commission, 2019h).

The goal of net zero will require large-scale investment across the economy. The UK's progress in decarbonisation to date has largely been driven by a few sectors, including electricity and manufacturing. Moving towards net zero will pose increasing challenges across the whole of the economy. In some sectors (for example home heating, discussed below) there are particular challenges to decarbonising in the UK. The CCC's technical report on net zero (CCC, 2019c) assesses the options for decarbonisation by sector. It divides them up into 'core options' that are low cost and would have likely been required to meet the 80% target, 'further ambition' options that are more challenging and currently more expensive, and 'speculative options' that may or may not ever become feasible. As discussed in Section 3.4.3, the government is taking a range of action to give more stability and certainty in infrastructure-related policy and financing. An NIC study concluded that the UK's regulatory system must adapt to secure the strategic investment needed in the energy, water and telecoms sectors to reduce emissions, improve digital connectivity and build resilience to floods and drought (NIC, 2019c).

There are challenges in determining how and where the costs should fall. While the net cost of decarbonisation may be limited or even negative, it will entail a substantial reallocation of resources and changes in the relative price of different goods and services. For example, the CCC estimate the UK may need a carbon tax of £78/tCO2e (€89/tCO2e) in 2030 and £220/tCO2e (€251/tCO2e) in 2050 to meet the net zero 2050 target (CCC, 2019d). This is significantly higher level than current price of carbon in the EU ETS. The terms of reference for the UK Treasury's review into funding the green transition are focused on analysing the range of choices for how households, businesses and the taxpayer could contribute towards different elements of the transition to net zero (HM Treasury, 2019b). Raising the costs of utilities and basic services can be regressive, and there will be inevitable trade-offs between cost, competitiveness, effects on consumers and impacts on the taxpayer.

Climate action will also have uneven consequences across the population. The most profound effect on the economy of the transition to a carbon-neutral economy will be a reallocation of capital and to a lesser extent labour. Some occupations and regions in the UK could face more challenges as a result of this process than others. There may be a net positive impact on employment of the Paris Agreement and the transition to energy sustainability in general (ILO, 2018). However, climate action is also likely to exacerbate the existing polarisation of jobs in the UK by skill level (see Section 3.3.1) as the job creation it supports will be largely low skilled (European Commission 2019h). To make sure that the transition is socially inclusive, additional investment in reskilling and upskilling will be necessary in the most-affected areas, particularly where they are already lagging behind and have been negatively affected by past deindustrialisation.

Given that energy-related emissions represent the majority of the UK's total greenhouse gas emissions, achieving further emission reduction will be key. In 2017, the largest share of energy-related emissions originated from the transport sector (34%), power and heat generation (25%) and the residential sector (18%) (IEA, 2019). As discussed above, there has been encouraging progress on investment in renewables and significant emission reduction has been achieved in the power sector. In 2018, the share of energy from renewable sources for electricity was at a record high level of 31%, up from 27.4% in 2017.

[20] The Commission will assess, in the course of 2020, the final National Energy and Climate Plan. The UK has not yet submitted its final Plan.

In 2018, 7.5% of energy in the heating sector came from renewable sources, so significant potential remains to decarbonise this sector further (Eurostat, 2019c). As set out in Section 3.4.3, the investment needed to decarbonise the energy system was one of the key themes of the National Infrastructure Commission's first National Infrastructure Assessment (NIC, 2018). The NIC concluded that the main energy services consumers use (electricity, heating hot water and transport) could be delivered at the same cost in 2050 by a low carbon system as their price today. A recent National Audit Office report on electricity networks concluded that strong pressure will be needed to incentivise network companies to support the transition to a low-carbon energy system, which may not otherwise be in their economic interests (NAO, 2020).

The building sector will be key to meeting future energy efficiency and climate targets. The UK housing stock will need to become more energy-efficient and fossil fuel heating systems such as gas boilers will need to be replaced by cleaner alternatives. In the short term, this entails the effective implementation of the revised Energy Performance of Buildings Directive. The government has recently consulted on a new 'Future Homes Standard' which would reduce energy consumption in new homes and require them to be fitted with clean heating technologies (such as air source heat pumps) rather than fossil fuel heating systems from 2025 (MHCLG, 2019g). The government's stated intention is to cut carbon emissions from new homes by up to 80% under this new standard.

Reducing the amount of energy used for home heating is complicated by the age of the housing stock. A higher proportion of housing in England is over a hundred years old (21%) than was built after 1990 (17%) (MHCLG, 2019h). Most of the housing stock expected to exist in 2050 has already been built (European Commission, 2018d). The funding and disruption required to retrofit this housing stock will be a challenge, especially in the case of the 35% of privately rented housing which is more than a hundred years old. As set out in Section 3.2, there are regulatory and cost barriers to the more rapid modernisation of the UK housing stock.

The UK has an ambition to be at the forefront of zero emission vehicles but most of the rail network is not yet electrified. The government has set up an Office for Low Emission Vehicles to support the low carbon transition in transport and has set an objective for all new cars and vans to be effectively zero emission by 2040. In October 2019 the government announced the first Transport Decarbonisation Plan, which is due to be complete in the course of 2020 and will set out what is needed to decarbonise transport by 2050. The number of electric charging points in the UK has increased significantly between 2013 and 2019, to more than 37.5 per 100,000 inhabitants, serving on average 10 plugin electric vehicles per point. The market share of new alternative-fuelled passenger cars rose to over 2.5% in 2018. (European Alternative Fuels Observatory, 2019). In 2018, the UK was slightly less than two thirds (6.5%) of the way to meeting the 2020 objective of 10% of renewable energy in transport (Eurostat, 2019c). The UK has seen strong growth in passenger rail traffic (see Section 3.4.3) but despite recent progress in extending electrification, at 38% of the network it remains well below the EU average (DfT, 2019a). Congestion and the prevalence of long commutes in the UK (see Sections 3.2 and 3.4.3) will be a challenge in reducing UK transport sector emissions.

The Climate Change Act 2008 provides a good basis for the UK's adaptation to climate change. The Act requires certain organisations to report on climate risks and mitigation measures taken. The Act also requires a National Adaptation Plan (NAP) to be drawn up and updated regularly. The second NAP was published in July 2018 (DEFRA, 2018), and sets out how the Government will address the risks highlighted in the 2017 Climate Change Risk Assessment.

The UK is vulnerable to the impacts of climate change, in particular inland and coastal flooding, water supply shortages, and risks to health due to high temperatures. Reported economic losses due to climate-related natural disasters for the 1980-2017 period in the UK were €51 billion (£58 billion) (EEA, 2019). 70% of these losses were insured, the highest proportion of insured losses in the EU. Recent evidence suggests that climate change has increased ten-fold the likelihood of recording temperatures as high as those experienced in the summer 2018 in the UK.

Access to finance will be a key enabler for the sustainability transition in both the public and private sectors. The UK is rich in scientific research and technical expertise and access to finance can facilitate research and development relating to energy efficiency, such as demand-side management, hydrogen and heat pumps. Through its Industrial Strategy Challenge Fund, the government is funding research and development related to eight 'challenges' to support clean growth. The UK is also channelling £505 million (€576 million) between 2015 and 2021 through the Energy Innovation Programme. This includes a series of competitions to provide the private sector with access to finance to research and develop low carbon technologies.

The financial sector regulators and government are advancing with consultations and policies on green finance. In October 2019, the Financial Conduct Authority set out its priorities and key planned actions relating to climate change (FCA, 2019) following a consultation launched in October 2018. They aim to ensure that financial regulators and market players are adequately prepared for the risks that climate change poses. In particular, issuers need to provide information on their exposure to climate change risks, regulated financial services firms need to integrate climate change risks into their business decisions and consumers need to have access to green finance products and services. In April 2019, the Bank of England published its supervisory statement on 'enhancing banks' and insurers' approaches to managing the financial risks from climate change', setting out expectations for practices across governance, risk management, scenario analysis, and disclosure (BoE/PRA, 2019). The Bank of England also asked insurers to consider the impact of different physical and transition risks scenarios as part of a UK market-wide insurance stress test. (HM Government, 2019c). In July 2019, the Bank of England announced plans to test the financial system's resilience to climate-related risks as part of the Biennial Exploratory Scenario (BES) stress test in 2021 (BoE/FPC, 2019). In parallel, the government issued its Green Finance Strategy in July 2019 (HM Government, 2019c). The strategy's overall aim is to align private sector investment flows with clean, environmentally sustainable and resilient growth.

ANNEX A: OVERVIEW TABLE

Commitments	Summary assessment ([21])
2019 country-specific recommendations (CSRs)	
CSR 1: Ensure that the nominal growth rate of net primary government expenditure does not exceed 1.9% in 2020-2021, corresponding to an annual structural adjustment of 0.6% of GDP.	The compliance assessment with the Stability and Growth Pact will be included when final data for 2019-2020 will be available.
CSR 2: Focus investment-related economic policy on research and innovation, housing, training and improving skills, sustainable transport and low carbon and energy transition, taking into account regional diversity.	The UK has made **some progress** in addressing CSR 2: **Some progress on research and innovation**. UK universities remain global research leaders. However, UK R&D intensity is flat and below the EU average and knowledge diffusion is uneven. Delivering on the recent ambitious proposals for future research and innovation support will be a challenge. **Some progress on boosting housing supply**. Annual net housing supply has continued to rise but grants of planning permission have levelled off and there are signs of a slowdown in new housing starts. House building looks set to stabilise at a level below that which would be necessary to meet estimated demand, due in part to capacity constraints. Real house prices are no longer rising, though

([21]) The following categories are used to assess progress in implementing the 2019 country-specific recommendations (CSRs):
No progress: The Member State has not credibly announced nor adopted any measures to address the CSR. This category covers a number of typical situations, to be interpreted on a case-by-case basis taking into account country-specific conditions. They include the following:
no legal, administrative, or budgetary measures have been announced;
in the national reform programme;
in any other official communication to the national Parliament/relevant parliamentary committees or the European Commission;
publicly (e.g. in a press statement or on the government's website);
no non-legislative acts have been presented by the governing or legislative body;
the Member State has taken initial steps in addressing the CSR, such as commissioning a study or setting up a study group to analyse possible measures to be taken (unless the CSR explicitly asks for orientations or exploratory actions). However, it has not proposed any clearly-specified measure(s) to address the CSR.
Limited progress: The Member State has:
announced certain measures but these address the CSR only to a limited extent; and/or
presented legislative acts in the governing or legislative body but these have not been adopted yet and substantial further, non-legislative work is needed before the CSR is implemented;
presented non-legislative acts, but has not followed these up with the implementation needed to address the CSR.
Some progress: The Member State has adopted measures
that partly address the CSR; and/or
that address the CSR, but a fair amount of work is still needed to address the CSR fully as only a few of the measures have been implemented. For instance, a measure or measures have been adopted by the national Parliament or by ministerial decision, but no implementing decisions are in place.
Substantial progress: The Member State has adopted measures that go a long way towards addressing the CSR and most of them have been implemented.
Full implementation: The Member State has implemented all measures needed to address the CSR appropriately.

	the cost of housing remains high in many places. The government has extended and revised a number of housing policies, including tweaks to the planning system, but major new initiatives have been limited. **Limited progress on training and improving skills**. While labour market participation by low-skilled people has improved, the polarisation of job growth towards high and low-skilled roles (and away from roles requiring medium levels of skills) has been accompanied by increased skills mismatches. Implementing the reformed apprenticeship system is proving a challenge, with registrations down compared to previous years. There is evidence that the apprenticeship levy, introduced in 2017, has seen funding increasingly used to train more senior staff at the expense of entry-level apprenticeships. **Some progress on sustainable transport**. The UK has made some progress in sustainable transport. Use of the UK's road, rail and aviation networks is reaching capacity and this contributes to high levels of congestion, rail reliability issues and air pollution. Public investment in transport has increased but the effects of decades of under-investment in infrastructure will take time to address. After some signs of improvement in delivery, major rail schemes have recently fallen behind schedule and over budget. The UK is taking action to meet its ambition to be at the forefront of zero emission vehicles, though it currently lags in the proportion of renewable energy used in the transport sector. **Some progress on the low carbon and energy transition.** With the new commitment to net zero carbon emissions by 2050 the government's ambitions are clear, and the preparatory work for allocating the increased investment is advanced. In the electricity sector, the UK continues to make progress in attracting investment in large scale cost-competitive renewables, particularly offshore. Progress is slower in the heating and cooling sector and the UK is not on course to meet its overall 2020 renewables target. The scale of the decarbonisation challenge will require a

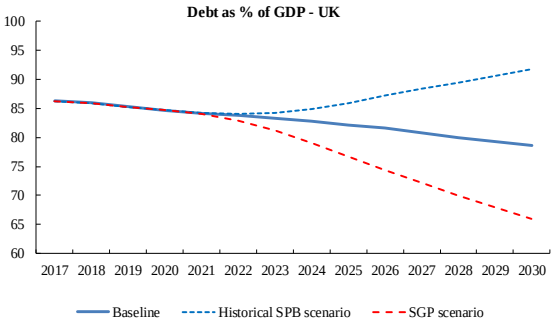
	more detailed investment strategy and sustained commitment. The Industrial Energy Transformation Fund (IETF), announced in summer 2019, will provide £315 million (€359.1 million) to businesses to reduce the impact of emissions from the industrial sector.
Europe 2020 (national targets and progress)	
Employment rate target: None	78.7% of the population aged 20-64 was employed in 2018.
R&D target: None	R&D intensity rose marginally to 1.71% in 2018. Public sector R&D intensity was 0.49% and business R&D intensity 1.18%. The UK is below the EU average of 2.11% for R&D intensity. EU average public sector R&D intensity was 0.69% and business R&D intensity 1.41%.
National greenhouse gas (GHG) emissions target: -16% in 2020 compared to 2005 (in sectors not included in the EU emissions trading scheme)	**2020 target**: -16% According to the latest national projections and taking into account existing measures, the target is expected to be achieved: -27% in 2020 compared to 2005 (with a margin of 11pps). **Non-ETS 2018 target**: -14% According to preliminary estimates, the change in non-ETS greenhouse gas emissions between 2005 and 2018 was -21%, therefore the target is expected to be achieved.
2020 renewable energy target: 15% 2020 Share of renewables in transport:	At a level of 11% in 2018, the UK is still some distance away from its 2020 target of 15%, even though it is in line with its indicative national trajectory. With a 6.5% share of renewable energy sources used in transport in 2018, the UK is more than halfway towards the binding 10% target in transport to be achieved by 2020.
2020 Energy Efficiency Target: 129.2 million tonnes of oil equivalent (Mtoe) for final energy consumption corresponding to 177.6 Mtoe for primary energy consumption.	The UK has already met its 2020 primary energy consumption target but remains 4pps above its 2020 final energy consumption target. The UK has to increase its effort to cut final energy consumption by the required

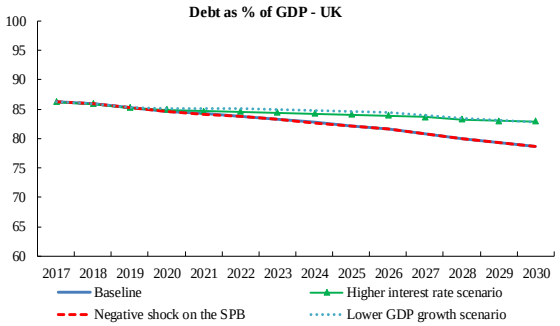
	levels.
Early school leaving target: None	The rate of early school leavers remained stable at 10.7% in 2018, marginally above the EU average.
Tertiary education target: None	The tertiary attainment rate of 30-34 year olds reached 48.8% in 2018, increasing by 0.6pps from 2017. This is significantly above the EU average of 40.7%.
Target for reducing the number of people at risk of poverty or social exclusion: None	The 'at risk of poverty or social exclusion rate' stood at 23.6% in 2018, a sharp increase from the 2017 figure of 22%.

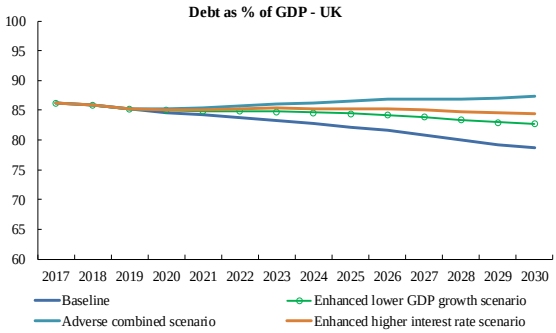
ANNEX B: COMMISSION DEBT SUSTAINABILITY ANALYSIS AND FISCAL RISKS

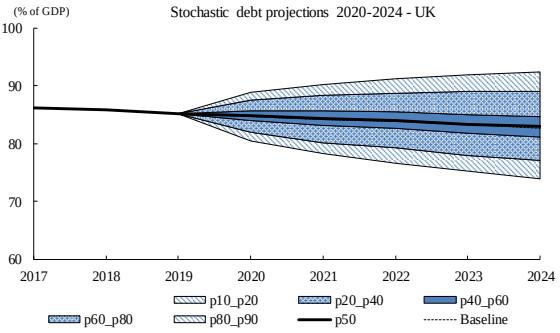
General government debt projections under baseline, alternative scenarios and sensitivity tests

UK - Debt projections baseline scenario	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Gross debt ratio	**85.9**	**85.2**	**84.7**	**84.2**	**83.8**	**83.3**	**82.7**	**82.2**	**81.6**	**80.8**	**80.0**	**79.3**	**78.6**
Changes in the ratio (-1+2+3)	*-0.4*	*-0.7*	*-0.6*	*-0.5*	*-0.4*	*-0.5*	*-0.6*	*-0.6*	*-0.6*	*-0.7*	*-0.8*	*-0.7*	*-0.6*
of which													
(1) Primary balance (1.1+1.2+1.3)	**0.2**	**0.0**	**-0.2**	**-0.1**	**-0.2**	**-0.4**	**-0.5**	**-0.6**	**-0.7**	**-0.6**	**-0.6**	**-0.7**	**-0.9**
(1.1) Structural primary balance *(1.1.1-1.1.2+1.1.3)*	***-0.2***	***-0.2***	***-0.3***	***-0.2***	***-0.2***	***-0.4***	***-0.5***	***-0.6***	***-0.7***	***-0.6***	***-0.6***	***-0.7***	***-0.9***
(1.1.1) Structural primary balance (bef. CoA)	*-0.2*	*-0.2*	*-0.3*	*-0.2*	*-0.2*	*-0.2*	*-0.2*	*-0.2*	*-0.2*	*-0.2*	*-0.2*	*-0.2*	*-0.2*
(1.1.2) Cost of ageing					*0.1*	*0.3*	*0.4*	*0.5*	*0.6*	*0.6*	*0.6*	*0.7*	*0.9*
(1.1.3) Others (taxes and property incomes)					*0.0*	*0.0*	*0.1*	*0.1*	*0.1*	*0.1*	*0.2*	*0.2*	*0.2*
(1.2) Cyclical component	***0.3***	***0.2***	***0.1***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***
(1.3) One-off and other temporary measures	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***
(2) Snowball effect (2.1+2.2+2.3)	**-0.3**	**-0.5**	**-0.7**	**-0.6**	**-0.6**	**-0.8**	**-1.1**	**-1.2**	**-1.2**	**-1.3**	**-1.4**	**-1.4**	**-1.5**
(2.1) Interest expenditure	*2.4*	*2.2*	*2.2*	*2.1*	*2.0*	*1.9*	*1.8*	*1.7*	*1.6*	*1.5*	*1.5*	*1.4*	*1.4*
(2.2) Growth effect	*-1.2*	*-1.1*	*-1.2*	*-1.2*	*-1.0*	*-1.1*	*-1.2*	*-1.2*	*-1.3*	*-1.3*	*-1.3*	*-1.3*	*-1.3*
(2.3) Inflation effect	*-1.6*	*-1.6*	*-1.8*	*-1.5*	*-1.6*	*-1.6*	*-1.6*	*-1.6*	*-1.6*	*-1.6*	*-1.6*	*-1.6*	*-1.6*
(3) Stock-flow adjustments	**0.1**	**-0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**









Short term	Medium term	S1	Debt sustainability analysis (detail)						DSA	S2	Long term
			Baseline	Historical SPB	Lower GDP growth	Higher interest rate	Negative shock on SPB	Stochastic projections			
			Risk category	MEDIUM	HIGH	MEDIUM	MEDIUM	MEDIUM	LOW			
			Debt level (2030)	78.6	91.6	82.8	82.9	78.7			
			Debt peak year	2019	2030	2019	2019	2019			
			Percentile rank	61.0%	80.0%						
			Probability debt higher						36.8%		
			Dif. between percentiles						18.5		
LOW (S0 = 0.4)	HIGH	MEDIUM (S1 = 1.9)							HIGH	MEDIUM (S2 = 4.3)	HIGH

Note: For further information, see the European Commission Debt Sustainability Monitor (DSM) 2019.

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

[2] The charts present a series of sensitivity tests around the baseline scenario, as well as alternative policy scenarios, in particular: the historical structural primary balance (SPB) scenario (where the SPB is set at its historical average), the Stability and Growth Pact (SGP) scenario (where fiscal policy is assumed to evolve in line with the main provisions of the SGP), a higher interest rate scenario (+1 pp. compared to the baseline), a lower GDP growth scenario (-0.5 pp. compared to the baseline) and a negative shock on the SPB (calibrated on the basis of the forecasted change). An adverse combined scenario and enhanced sensitivity tests (on the interest rate and growth) are also included, as well as stochastic projections. Detailed information on the design of these projections can be found in the FSR 2018 and the DSM 2019.

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

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

b. For the medium term, the risk category (low/medium/high) is based on the joint use of the S1 indicator and of the DSA results. The S1 indicator measures the fiscal adjustment required (cumulated over the 5 years following the forecast horizon and sustained after that) to bring the debt-to-GDP ratio to 60 % by 2034. The critical values used are 0 and 2.5 pps of GDP. The DSA classification is based on the results of five deterministic scenarios (baseline, historical SPB, higher interest rate, lower GDP growth and negative shock on the SPB scenarios) and the stochastic projections. Different criteria are used such as the projected debt level, the debt path, the realism of fiscal assumptions, the probability of debt stabilisation, and the size of uncertainties.

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

ANNEX C: STANDARD TABLES

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

	2014	2015	2016	2017	2018	2019
Total assets of the banking sector (% of GDP)(1)	389.5	354.3	365.1	380.6	373.5	378.0
Share of assets of the five largest banks (% of total assets)	38.9	37.0	35.5	36.9	31.8	-
Foreign ownership of banking system (% of total assets)(2)	37.1	37.2	38.8	37.7	36.2	36.6
Financial soundness indicators:(2)						
- non-performing loans (% of total loans)	3.3	-	1.9	1.5	1.2	1.2
- capital adequacy ratio (%)	-	19.5	20.8	20.5	21.4	21.1
- return on equity (%)(3)	3.8	3.2	2.1	4.3	5.5	6.9
Bank loans to the private sector (year-on-year % change)(1)	1.9	7.6	-9.1	1.5	4.2	4.6
Lending for house purchase (year-on-year % change)(1)	9.7	9.6	-10.8	0.6	2.6	3.7
Loan-to-deposit ratio(2)	90.8	105.9	89.8	86.3	93.7	95.2
Central bank liquidity as % of liabilities(1)	-	-	-	-	-	-
Private debt (% of GDP)	163.6	161.7	166.4	167.7	163.3	-
Gross external debt (% of GDP)(2) - public	26.0	27.4	29.4	30.0	29.7	29.5
- private	124.3	100.9	96.2	102.7	100.7	99.7
Long-term interest rate spread versus Bund (basis points)*	97.7	129.8	113.1	86.3	101.2	114.0
Credit default swap spreads for sovereign securities (5-year)*	21.8	18.4	32.7	20.6	17.9	22.6

(1) Latest data Q3 2019. Includes not only banks but all monetary financial institutions excluding central banks.
(2) Latest data Q2 2019.
(3) Quarterly values are annualized.
* Measured in basis points.

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

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

	2014	2015	2016	2017	2018	2019 [5]
Equal opportunities and access to the labour market						
Early leavers from education and training (% of population aged 18-24)	11.8	10.8	11.2	10.6	10.7	:
Gender employment gap (pps)	11.3	11.2	11.0	10.2	9.9	9.4
Income inequality, measured as quintile share ratio (S80/S20)	5.1	5.2	5.1	5.4	6.0	:
At-risk-of-poverty or social exclusion rate[(1)] (AROPE)	24.1	23.5	22.2	22.0	23.6	:
Young people neither in employment nor in education and training (% of population aged 15-24)	11.9	11.1	10.9	10.3	10.4	:
Dynamic labour markets and fair working conditions						
Employment rate (20-64 years)	76.2	76.8	77.5	78.2	78.7	79.1
Unemployment rate[(2)] (15-74 years)	6.1	5.3	4.8	4.3	4.0	3.8
Long-term unemployment rate (as % of active population)	2.2	1.6	1.3	1.1	1.1	1.0
Gross disposable income of households in real terms per capita[(3)] (Index 2008=100)	100.8	104.8	104.3	104.3	106.5	:
Annual net earnings of a full-time single worker without children earning an average wage (levels in PPS, three-year average)	28255	28770	29177	:	:	:
Annual net earnings of a full-time single worker without children earning an average wage (percentage change, real terms, three-year average)	-0.62	0.29	0.93	:	:	:
Public support / Social protection and inclusion						
Impact of social transfers (excluding pensions) on poverty reduction[(4)]	42.9	43.3	43.4	41.8	35.9	:
Children aged less than 3 years in formal childcare	28.9	30.4	28.4	33.2	38.7	:
Self-reported unmet need for medical care	2.1	2.8	1.0	3.3	4.5	:
Individuals who have basic or above basic overall digital skills (% of population aged 16-74)	:	67.0	69.0	71.0	:	:

(1) People at risk of poverty or social exclusion (AROPE): individuals who are at risk of poverty (AROP) and/or suffering from severe material deprivation and/or living in households with zero or very low work intensity.
(2) Unemployed persons are all those who were not employed but had actively sought work and were ready to begin working immediately or within two weeks.
(3) Gross disposable household income is defined in unadjusted terms, according to the draft 2019 joint employment report.
(4) Reduction in percentage of the risk-of-poverty rate, due to social transfers (calculated comparing at-risk-of-poverty rates before social transfers with those after transfers; pensions are not considered as social transfers in the calculation).
(5) Average of first three quarters of 2019 for the employment rate, unemployment rate and gender employment gap.
Source: Eurostat

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

Labour market indicators	**2014**	**2015**	**2016**	**2017**	**2018**	**2019** [5]
Activity rate (15-64)	76.7	76.9	77.3	77.6	77.9	78.1
Employment in current job by duration						
From 0 to 11 months	14.6	15.3	14.9	15.0	14.6	:
From 12 to 23 months	10.3	11.0	11.6	11.4	11.4	:
From 24 to 59 months	18.1	18.2	19.5	19.9	20.4	:
60 months or over	56.1	54.7	53.2	52.9	52.8	:
Employment growth* (% change from previous year)	2.4	1.7	1.5	1.0	1.2	1.1
Employment rate of women (% of female population aged 20-64)	70.6	71.3	72.1	73.1	73.8	74.5
Employment rate of men (% of male population aged 20-64)	81.9	82.5	83.1	83.3	83.7	83.9
Employment rate of older workers* (% of population aged 55-64)	61.0	62.2	63.4	64.1	65.3	66.1
Part-time employment* (% of total employment, aged 15-64)	25.3	25.2	25.2	24.9	24.6	24.7
Fixed-term employment* (% of employees with a fixed term contract, aged 15-64)	6.3	6.1	5.9	5.6	5.5	5.1
Transition rate from temporary to permanent employment (3-year average)	57.7	58.6	57.1	54.9	:	:
Youth unemployment rate (% active population aged 15-24)	17.0	14.6	13.0	12.1	11.3	11.2
Gender gap in part-time employment	30.2	29.9	29.7	29.5	29.0	29.0
Gender pay gap[2] (in undadjusted form)	20.9	21.0	20.7	20.8	:	:
Education and training indicators	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
Adult participation in learning (% of people aged 25-64 participating in education and training)	16.3	15.7	14.4	14.3	14.6	:
Underachievement in education[3]	:	21.9	:	:	:	:
Tertiary educational attainment (% of population aged 30-34 having successfully completed tertiary education)	47.7	47.8	48.1	48.2	48.8	:
Variation in performance explained by students' socio-economic status[4]	:	10.5	:	:	:	:

* Non-scoreboard indicator
(1) Long-term unemployed are people who have been unemployed for at least 12 months.
(2) Difference between the average gross hourly earnings of male paid employees and of female paid employees as a percentage of average gross hourly earnings of male paid employees. It is defined as "unadjusted", as it does not correct for the distribution of individual characteristics (and thus gives an overall picture of gender inequalities in terms of pay). All employees working in firms with ten or more employees, without restrictions for age and hours worked, are included.
(3) PISA (OECD) results for low achievement in mathematics for 15 year-olds.
(4) Impact of socio-economic and cultural status on PISA (OECD) scores.
(5) Average of first three quarters of 2019. Data for youth unemployment rate is seasonally adjusted.
Source: Eurostat, OECD

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

	2013	2014	2015	2016	2017	2018
Expenditure on social protection benefits* (% of GDP)						
Sickness/healthcare	8.7	8.5	8.9	8.3	8.5	:
Disability	1.6	1.6	1.7	1.7	1.7	:
Old age and survivors	11.8	11.6	11.5	10.8	11.3	:
Family/children	2.8	2.8	2.7	2.5	2.5	:
Unemployment	0.6	0.4	0.4	0.4	0.3	:
Housing	1.4	1.4	1.3	1.2	1.2	:
Social exclusion n.e.c.	0.7	0.7	0.6	0.6	0.6	:
Total	27.7	27.0	27.1	25.6	26.1	:
of which: means-tested benefits	5.4	5.0	4.8	4.5	4.3	:
General government expenditure by function (% of GDP)						
Social protection	16.6	16.2	16.1	15.8	15.2	:
Health	7.4	7.5	7.5	7.6	7.4	:
Education	5.2	5.2	5.0	4.8	4.6	:
Out-of-pocket expenditure on healthcare	15.0	15.0	15.1	15.5	16.0	:
Children at risk of poverty or social exclusion (% of people aged 0-17)*	32.6	31.2	30.3	27.2	27.4	29.9
At-risk-of-poverty rate[1] (% of total population)	15.9	16.8	16.6	15.9	17.0	18.9
In-work at-risk-of-poverty rate (% of persons employed)	8.4	8.7	8.1	8.6	8.9	11.3
Severe material deprivation rate[2] (% of total population)	8.3	7.4	6.1	5.2	4.1	:
Severe housing deprivation rate[3], by tenure status						
Owner, with mortgage or loan	1.2	1.1	0.5	0.6	0.3	1.1
Tenant, rent at market price	5.0	4.5	4.8	5.2	1.4	3.8
Proportion of people living in low work intensity households[4] (% of people aged 0-59)	13.2	12.3	11.9	11.3	10.1	8.6
Poverty thresholds, expressed in national currency at constant prices*	7920	8054	8127	8304	8763	8610
Healthy life years						
Females	10.7	10.6	10.4	11.1	11.1	:
Males	10.6	9.7	10.2	10.4	10.5	:
Aggregate replacement ratio for pensions[5]	0.5	0.5	0.5	0.5	0.5	0.6
Connectivity dimension of the Digital Economy and Society Index (DESI)[6]	:	65.7	69.3	72.1	74.2	:
GINI coefficient before taxes and transfers*	54.3	53.6	55.3	53.6	:	:
GINI coefficient after taxes and transfers*	30.2	31.6	32.4	31.5	:	:

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

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

Table III. Product market performance and policy indicators						
Performance indicators	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
Labour productivity per person[1] growth (t/t-1) in %						
Labour productivity growth in industry	-0.39	1.38	-0.30	1.66	0.11	-2.36
Labour productivity growth in construction	1.71	6.42	1.40	0.14	2.18	-1.86
Labour productivity growth in market services	1.92	-0.26	0.22	0.87	1.28	1.37
Unit Labour Cost (ULC) index[2] growth (t/t-1) in %						
ULC growth in industry	7.14	-0.49	-1.15	-0.66	-0.21	4.59
ULC growth in construction	3.66	-8.12	3.10	-0.50	1.52	5.14
ULC growth in market services	2.59	0.98	0.70	1.95	2.28	2.04
Business environment	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
Time needed to enforce contracts[3] (days)	437	437	437	437	437	437
Time needed to start a business[3] (days)	11.5	6.0	4.5	4.5	4.5	4.5
Outcome of applications by SMEs for bank loans[4]	0.76	0.57	0.35	0.33	0.48	0.27
Research and innovation	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
R&D intensity	1.62	1.64	1.65	1.66	1.65	1.71
General government expenditure on education as % of GDP	5.20	5.20	5.00	4.80	4.60	:
Employed people with tertiary education and/or people employed in S&T as % of total employment	52	53	53	54	54	55
Population having completed tertiary education[5]	36	37	38	38	39	39
Young people with upper secondary education[6]	83	84	86	85	86	86
Trade balance of high technology products as % of GDP	-0.94	-1.12	-1.11	-1.26	-1.14	-1.05
Product and service markets and competition	**2003**	**2008**	**2013**			**2018***
OECD product market regulation (PMR)[7], overall	1.10	1.21	1.08			0.78
OECD PMR[7], retail	2.15	2.18	1.79			0.03
OECD PMR[7], professional services[8]	0.96	0.82	0.82			0.79
OECD PMR[7], network industries[9]	1.30	0.98	0.79			0.56

Table C.6: **Green Growth**

Green growth performance		2013	2014	2015	2016	2017	2018
Macroeconomic							
Energy intensity	kgoe / €	0.10	0.09	0.09	0.09	0.09	-
Carbon intensity	kg / €	0.29	0.26	0.25	0.23	0.22	-
Resource intensity (reciprocal of resource productivity)	kg / €	0.29	0.29	0.28	0.27	0.26	0.26
Waste intensity	kg / €	-	0.13	-	0.13	-	-
Energy balance of trade	% GDP	-1.1	-0.8	-0.6	-0.5	-0.6	-0.7
Weighting of energy in HICP	%	8.80	8.00	7.60	6.70	6.47	6.37
Difference between energy price change and inflation	p.p.	4.6	2.9	-3.3	-3.7	1.1	4.3
Real unit of energy cost	% of value added	13.1	11.1	11.4	11.6	-	-
Ratio of environmental taxes to labour taxes	ratio	0.19	0.20	0.19	0.20	0.20	-
Environmental taxes	% GDP	2.4	2.4	2.4	2.4	2.4	2.4
Sectoral							
Industry energy intensity	kgoe / €	0.07	0.07	0.06	0.06	-	-
Real unit energy cost for manufacturing industry excl. refining	% of value added	16.7	14.1	14.7	15.4	-	-
Share of energy-intensive industries in the economy	% GDP	5.72	5.61	5.62	5.48	-	-
Electricity prices for medium-sized industrial users	€ / kWh	0.12	0.13	0.15	0.13	0.13	0.14
Gas prices for medium-sized industrial users	€ / kWh	0.04	0.04	0.04	0.03	0.02	0.03
Public R&D for energy	% GDP	0.01	0.01	0.01	0.02	0.02	0.01
Public R&D for environmental protection	% GDP	0.02	0.01	0.01	0.01	0.01	0.01
Municipal waste recycling rate	%	43.2	43.4	43.3	44.0	43.8	-
Share of GHG emissions covered by ETS*	%	39.9	37.9	35.0	30.6	29.2	28.1
Transport energy intensity	kgoe / €	0.70	0.69	0.69	0.71	-	-
Transport carbon intensity	kg / €	1.08	1.09	1.11	1.14	-	-
Security of energy supply							
Energy import dependency	%	47.8	46.8	37.5	35.7	35.3	-
Aggregated supplier concentration index	HHI	6.0	6.3	3.8	1.4	2.0	-
Diversification of energy mix	HHI	27.0	27.2	27.2	30.0	30.3	-

All macro intensity indicators are expressed as a ratio of a physical quantity to GDP (in 2010 prices)
- Energy intensity: gross inland energy consumption (in kgoe) divided by GDP (in EUR)
- Carbon intensity: greenhouse gas emissions (in kg CO2 equivalents) divided by GDP (in EUR)
- Resource intensity: domestic material consumption (in kg) divided by GDP (in EUR)
- Waste intensity: waste (in kg) divided by GDP (in EUR)

Energy balance of trade: the balance of energy exports and imports, expressed as % of GDP.
Weighting of energy in HICP: the proportion of 'energy' items in the consumption basket used for the construction of the HICP.
Difference between energy price change and inflation: energy component of HICP, and total HICP inflation (annual % change).
Real unit energy cost: real energy costs as % of total value added for the economy.
Industry energy intensity: final energy consumption of industry (in kgoe) divided by gross value added of industry (in 2010 EUR).
Real unit energy costs for manufacturing industry excluding refining: real costs as % of value added for manufacturing sectors.
Share of energy-intensive industries in the economy: share of gross value added of the energy-intensive industries in GDP.
Electricity and gas prices for medium-sized industrial users: consumption band 500–20 00MWh and 10 000 -100 000 GJ; figures excl. VAT.
Recycling rate of municipal waste: ratio of recycled and composted municipal waste to total municipal waste.
Public R&D for energy or for the environment: government spending on R&D for these categories as % of GDP.
Proportion of GHG emissions covered by EU emissions trading system (ETS) (excluding aviation): based on GHG emissions. (excl. land use, land use change and forestry) as reported by Member States to the European Environment Agency.
Transport energy intensity: final energy consumption of transport activity including international aviation (kgoe) divided by gross value added in transportation and storage sector (in 2010 EUR).
Transport carbon intensity: GHG emissions in transportation and storage sector divided by gross value added in transportation and storage sector (in 2010 EUR).
Energy import dependency: net energy imports divided by gross inland energy consumption incl. consumption of international bunker fuels.
Aggregated supplier concentration index: Herfindahl index covering oil, gas and coal. Smaller values indicate larger diversification and hence lower risk.
Diversification of the energy mix: Herfindahl index covering natural gas, total petrol products, nuclear heat, renewable energies and solid fuels. Smaller values indicate larger diversification.
* European Commission and European Environment Agency - 2018 provisional data.
Source: European Commission and European Environment Agency (Share of GHG emissions covered by ETS); European Commission (Environmental taxes over labour taxes and GDP); Eurostat (all other indicators).

ANNEX D: PROGRESS TOWARDS THE SUSTAINABLE DEVELOPMENT GOALS (SDGS)

Assessment of the United Kingdom's short-term progress towards the SDGs ([22])

Table D.1 shows the data for the United Kingdom and the EU-28 for the indicators included in the EU SDG indicator set used by Eurostat for monitoring progress towards the SDGs in an EU context ([23]). As the short-term trend at EU-level is assessed over a 5-year period, both the value at the beginning of the period and the latest available value is presented. The indicators are regularly updated on the SDI dedicated section of the Eurostat website.

Table D.1: **Indicators measuring the United Kingdom's progress towards the SDGs**

SDG / Sub-theme	Indicator	Unit	United Kingdom				EU-28			
			Starting		Latest		Starting		Latest	
			year	value	year	value	year	value	year	value
SDG 1 – No poverty										
Multidimensional poverty	People at risk of poverty or social exclusion	% of population	2013	24.8	2018	23.6	2013	24.6	2018	21.9
	People at risk of income poverty after social transfers	% of population	2013	15.9	2018	18.9	2013	16.7	2018	17.1
	Severely materially deprived people	% of population	2013	8.3	2018	4.6	2013	9.6	2018	5.8
	People living in households with very low work intensity	% of population aged 0 to 59	2013	13.2	2018	8.6	2013	11.0	2018	8.8
	In-work at-risk-of-poverty rate	% of population aged 18 or over	2013	8.4	2018	11.3	2013	9.0	2018	9.5
Basic needs	Population living in a dwelling with a leaking roof, damp walls, floors or foundation or rot in window frames or floor	% of population	2013	15.9	2018	17.7	2013	15.6	2018	13.9
	Self-reported unmet need for medical care	% of population aged 16 or over	2013	1.6	2018	4.5	2013	3.7	2018	2.0
	Population having neither a bath, nor a shower, nor indoor flushing toilet in their household	% of population	2013	0.2	2018	0.1	2013	2.2	2018	1.7
	Population unable to keep home adequately warm	% of population	2013	10.6	2018	5.4	2013	10.7	2018	7.3
	Overcrowding rate	% of population	2013	8.0	2018	4.8	2013	17.0	2018	15.5
SDG 2 – Zero hunger										
Malnutrition	Obesity rate	% of population aged 18 or over	2014	20.1	2017	21.0	2014	15.9	2017	15.2
Sustainable agricultural production	Agricultural factor income per annual work unit (AWU)	EUR, chain linked volumes (2010)	2012	34 093	2017	36 365	2012	14 865	2017	17 304
	Government support to agricultural research and development	million EUR	2013	475.9	2018	414.3	2013	3 048.6	2018	3 242.5
	Area under organic farming	% of utilised agricultural area	2013	3.2	2018	2.6	2013	5.7	2018	7.5
	Gross nitrogen balance on agricultural land	kg per hectare	2012	87	2017	86	2010	49	2015	51
Environmental impacts of agricultural production	Ammonia emissions from agriculture	kg per ha of utilised agricultural area	2012	12.8	2017	14	2011	19.7	2016	20.3
	Nitrate in groundwater	mg NO_3 per litre	N/A	:	N/A	:	2012	19.2	2017	19.1
	Estimated soil erosion by water	km^2	2010	8 624.9	2016	8 441.2	2010	207 232.2	2016	205 294.5
	Common farmland bird index	index 2000 = 100	N/A	:	N/A	:	2013	83.9	2018	80.7
SDG 3 – Good health and well-being										
Healthy lives	Life expectancy at birth	years	2012	81.0	2017	81.3	2012	80.3	2017	80.9
	Share of people with good or very good perceived health	% of population aged 16 or over	2013	73.7	2018	73.2	2013	67.3	2018	69.2
Health determinants	Smoking prevalence	% of population aged 15 or over	2012	27	2017	17	2014	26	2017	26
	Obesity rate	% of population aged 18 or over	2014	20.1	2017	21.0	2014	15.9	2017	15.2
	Population living in households considering that they suffer from noise	% of population	2013	17.0	2018	19.8	2013	18.8	2018	18.3
	Exposure to air pollution by particulate matter ($PM_{2.5}$)	$\mu g/m^3$	2012	13.2	2017	10.0	2012	16.8	2017	14.1
Causes of death	Death rate due to chronic diseases	number per 100 000 persons aged less than 65	2011	119.8	2016	113.3	2011	132.5	2016	119.0
	Death rate due to tuberculosis, HIV and hepatitis	number per 100 000 persons	2011	1.4	2016	1.2	2011	3.4	2016	2.6
	People killed in accidents at work	number per 100 000 employed persons	2012	0.55	2017	0.88	2012	1.91	2017	1.65
	People killed in road accidents	number of killed people	2012	1 802	2017	1 856	2012	28 231	2017	25 257
Access to health care	Self-reported unmet need for medical care	% of population aged 16 or over	2013	1.6	2018	4.5	2013	3.7	2018	2.0

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([22]) Data extracted on 9 February 2020 from the Eurostat database (official EU SDG indicator set; see https://ec.europa.eu/eurostat/web/sdi/main-tables).

([23]) The EU SDG indicator set is aligned as far as appropriate with the UN list of global indicators, noting that the UN indicators are selected for global level reporting and are therefore not always relevant in an EU context. The EU SDG indicators have strong links with EU policy initiatives.

Table (continued)

SDG / Sub-theme	Indicator	Unit	United Kingdom				EU-28			
			Starting		Latest		Starting		Latest	
			year	value	year	value	year	value	year	value
SDG 4 – Quality education										
Basic education	Early leavers from education and training	% of the population aged 18 to 24	2013	12.4	2018	10.7	2013	11.9	2018	10.6
	Participation in early childhood education	% of the age group between 4-years-old and the starting age of compulsory education	2012	97.3	2017	100.0	2012	94.0	2017	95.4
	Underachievement in reading	% of 15-year-old students	2015	17.9	2018	17.3	2015	19.7	2018	21.7
	Young people neither in employment nor in education and training	% of population aged 15 to 29	2013	14.6	2018	11.7	2013	15.9	2018	12.9
Tertiary education	Tertiary educational attainment	% of the population aged 30 to 34	2013	47.4	2018	48.8	2013	37.1	2018	40.7
	Employment rate of recent graduates	% of population aged 20 to 34	2013	83.8	2018	86.7	2013	75.4	2018	81.7
Adult education	Adult participation in learning	% of population aged 25 to 64	2013	16.6	2018	14.6	2013	10.7	2018	11.1
SDG 5 – Gender equality										
Gender-based violence	Physical and sexual violence to women experienced within 12 months prior to the interview	% of women	N/A	:	2012	8	N/A	:	2012	8
Education	Gender gap for early leavers from education and training	percentage points, persons aged 18–24	2013	2.5	2018	3.1	2013	3.4	2018	3.3
	Gender gap for tertiary educational attainment	percentage points, persons aged 30–34	2013	6.0	2018	6.5	2013	8.5	2018	10.1
	Gender gap for employment rate of recent graduates	percentage points, persons aged 20–34	2013	4.4	2018	3.4	2013	4.4	2018	3.4
Employment	Gender pay gap in unadjusted form	% of average gross hourly earnings of men	2012	22.6	2017	20.8	2012	17.4	2017	16.0
	Gender employment gap	percentage points, persons aged 20–64	2013	11.1	2018	9.9	2013	11.7	2018	11.6
	Gender gap in inactive population due to caring responsibilities	percentage points, persons aged 20–64	2013	31.5	2018	29.4	2013	25.5	2018	27.1
Leadership positions	Seats held by women in national parliaments and governments	% of seats	2014	23.7	2019	29.3	2014	27.2	2019	31.5
	Positions held by women in senior management	% of board members	2014	24.2	2019	32.0	2014	20.2	2019	27.8
SDG 6 – Clean water and sanitation										
Sanitation	Population having neither a bath, nor a shower, nor indoor flushing toilet in their household	% of population	2013	0.2	2018	0.1	2013	2.2	2018	1.7
	Population connected to at least secondary wastewater treatment	% of population	2009	97.0	2014	100.0	N/A	:	N/A	:
Water quality	Biochemical oxygen demand in rivers	mg O_2 per litre	2012	1.30	2017	1.50	2012	2.06	2017	2.00
	Nitrate in groundwater	mg NO_3 per litre	N/A	:	N/A	:	2012	19.2	2017	19.1
	Phosphate in rivers	mg PO_4 per litre	2012	0.077	2017	0.091	2012	0.096	2017	0.093
	Inland water bathing sites with excellent water quality	% of bathing sites with excellent water quality	2013	30.8	2018	62.5	2013	76.5	2018	80.8
Water use efficiency	Water exploitation index	% of long term average available water (LTAA)	2009	4.8	2014	4.2	N/A	:	N/A	:
SDG 7 – Affordable and clean energy										
Energy consumption	Primary energy consumption	million tonnes of oil equivalent (Mtoe)	2013	191.6	2018	176.3	2013	1 577.4	2018	1 551.9
	Final energy consumption	million tonnes of oil equivalent (Mtoe)	2013	136.9	2018	134.7	2013	1 115.5	2018	1 124.1
	Final energy consumption in households per capita	kgoe	2013	646	2018	573	2013	605	2018	552
	Energy productivity	EUR per kgoe	2013	9.8	2018	11.6	2013	7.6	2018	8.5
	Greenhouse gas emissions intensity of energy consumption	index 2000 = 100	2012	98.7	2017	84.4	2012	91.5	2017	86.5
Energy supply	Share of renewable energy in gross final energy consumption	%	2013	5.5	2018	11.0	2013	15.4	2018	18.0
	Energy import dependency	% of imports in gross available energy	2013	47.8	2018	35.5	2013	53.2	2018	55.7
Access to affordable energy	Population unable to keep home adequately warm	% of population	2013	10.6	2018	5.4	2013	10.7	2018	7.3

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Table (continued)

SDG / Sub-theme	Indicator	Unit	United Kingdom				EU-28			
			Starting		Latest		Starting		Latest	
			year	value	year	value	year	value	year	value
SDG 8 – Decent work and economic growth										
Sustainable economic growth	Real GDP per capita	EUR per capita, chain-linked volumes (2010)	2013	30 660	2018	32 700	2013	25 750	2018	28 280
	Investment share of GDP	% of GDP	2013	15.7	2018	17.0	2013	19.5	2018	20.9
	Resource productivity	EUR per kg, chain-linked volumes (2010)	2013	3.42	2018	3.78	2013	1.98	2018	2.04
Employment	Young people neither in employment nor in education and training	% of population aged 15 to 29	2013	14.6	2018	11.7	2013	15.9	2018	12.9
	Employment rate	% of population aged 20 to 64	2013	74.8	2018	78.7	2013	68.4	2018	73.2
	Long-term unemployment rate	% of active population	2013	2.7	2018	1.1	2013	5.1	2018	2.9
	Gender gap in inactive population due to caring responsibilities	percentage points, persons aged 20–64	2013	31.5	2018	29.4	2013	25.5	2018	27.1
Decent work	People killed in accidents at work	number per 100 000 employed persons	2012	0.55	2017	0.88	2012	1.91	2017	1.65
	In-work at-risk-of-poverty rate	% of population	2013	8.4	2018	11.3	2013	9	2018	9.5
SDG 9 – Industry, innovation and infrastructure										
R&D and innovation	Gross domestic expenditure on R&D	% of GDP	2013	1.62	2018	1.71	2013	2.01	2018	2.12
	Employment in high- and medium-high technology manufacturing and knowledge-intensive services	% of total employment	2013	52.4	2018	53.3	2013	45.0	2018	46.1
	R&D personnel	% of active population	2013	1.20	2018	1.45	2013	1.15	2018	1.36
	Patent applications to the European Patent Office (EPO)	number	2012	5 389	2017	5 437	2012	56 772	2017	54 649
Sustainable transport	Share of buses and trains in total passenger transport	% of total inland passenger-km	2012	13.9	2017	13.9	2012	17.2	2017	16.7
	Share of rail and inland waterways in total freight transport	% of total inland freight tonne-km	2012	12.2	2017	9.6	2012	25.4	2017	23.3
	Average CO2 emissions per km from new passenger cars	g CO_2 per km	2013	128.3	2018	124.7	2014	123.4	2018	120.4
SDG 10 – Reduced inequalities										
Inequalities within countries	Relative median at-risk-of-poverty gap	% distance to poverty threshold	2013	19.6	2018	24.9	2013	23.8	2018	24.6
	Income distribution	income quintile share ratio	2013	4.6	2018	6.0	2013	5.0	2018	5.2
	Income share of the bottom 40 % of the population	% of income	2013	21.3	2018	19.3	2013	21.1	2018	21.0
	People at risk of income poverty after social transfers	% of population	2013	15.9	2018	18.9	2013	16.7	2018	17.1
Inequalities between countries	Purchasing power adjusted GDP per capita	Real expenditure per capita (in PPS)	2013	29 400	2018	32 500	2013	26 800	2018	31 000
	Adjusted gross disposable income of households per capita	Purchasing power standard (PPS) per inhabitant	2013	22 615	2018	24 721	2013	20 392	2018	22 824
	Financing to developing countries	million EUR, current prices	2012	49 394	2017	15 699	2012	147 962	2017	155 224
	Imports from developing countries	million EUR, current prices	2013	105 132	2018	120 018	2013	817 475	2018	1 013 981
Migration and social inclusion	Asylum applications	Positive first instance decisions, per million inhabitants	2013	133	2018	152	2013	213	2018	424
SDG 11 – Sustainable cities and communities										
Quality of life in cities and communities	Overcrowding rate	% of population	2013	8.0	2018	4.8	2013	17.0	2018	15.5
	Population living in households considering that they suffer from noise	% of population	2013	17.0	2018	19.8	2013	18.8	2018	18.3
	Exposure to air pollution by particulate matter ($PM_{2.5}$)	$\mu g/m^3$	2012	13.2	2017	10.0	2012	16.8	2017	14.1
	Population living in a dwelling with a leaking roof, damp walls, floors or foundation or rot in window frames or floor	% of population	2013	15.9	2018	17.7	2013	15.6	2018	13.9
	Population reporting occurrence of crime, violence or vandalism in their area	% of population	2013	17.4	2018	24.2	2013	14.5	2018	12.7
Sustainable mobility	People killed in road accidents	number of killed people	2012	1 802	2017	1 856	2012	28 231	2017	25 257
	Share of buses and trains in total passenger transport	% of total inland passenger-km	2012	13.9	2017	13.9	2012	17.2	2017	16.7
Adverse environmental impacts	Settlement area per capita	m^2	2009	441.8	2015	430.5	2012	625.0	2015	653.7
	Recycling rate of municipal waste	% of total waste generated	2012	42.6	2017	43.8	2013	41.7	2018	47.0
	Population connected to at least secondary wastewater treatment	% of population	2009	97.0	2014	100.0	N/A	:	N/A	:

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Table (continued)

SDG / Sub-theme	Indicator	Unit	United Kingdom				EU-28			
			Starting		Latest		Starting		Latest	
			year	value	year	value	year	value	year	value
SDG 12 – Responsible consumption and production										
Decoupling environmental impacts from economic growth	Consumption of toxic chemicals	million tonnes	N/A	:	N/A	:	2013	300.3	2018	313.9
	Resource productivity	EUR per kg, chain-linked volumes (2010)	2013	3.42	2018	3.78	2013	1.98	2018	2.04
	Average CO2 emissions per km from new passenger cars	g CO_2 per km	2013	128.3	2018	124.7	2014	123.4	2018	120.4
	Energy productivity	EUR per kgoe	2013	9.8	2018	11.6	2013	7.6	2018	8.5
Energy consumption	Primary energy consumption	million tonnes of oil equivalent (Mtoe)	2013	191.6	2018	176.3	2013	1 577.4	2018	1 551.9
	Final energy consumption	million tonnes of oil equivalent (Mtoe)	2013	136.9	2018	134.7	2013	1 115.5	2018	1 124.1
	Share of renewable energy in gross final energy consumption	%	2013	5.5	2018	11.0	2013	15.4	2018	18.0
Waste generation and management	Circular material use rate	% of material input for domestic use	2012	15.7	2017	17.8	2012	11.5	2017	11.7
	Generation of waste excluding major mineral wastes	kg per capita	2012	1 690	2016	1 813	2012	1 716	2016	1 772
	Recycling rate of waste excluding major mineral wastes	% of total waste treated	2012	56	2016	58	2012	55	2016	57
SDG 13 – Climate action										
Climate mitigation	Greenhouse gas emissions	index 1990 = 100	2012	75.6	2017	62.4	2012	82.1	2017	78.3
	Greenhouse gas emissions intensity of energy consumption	index 2000 = 100	2012	98.7	2017	84.4	2012	91.5	2017	86.5
	Primary energy consumption	million tonnes of oil equivalent (Mtoe)	2013	191.6	2018	176.3	2013	1 577.4	2018	1 551.9
	Final energy consumption	million tonnes of oil equivalent (Mtoe)	2013	136.9	2018	134.7	2013	1 115.5	2018	1 124.1
	Share of renewable energy in gross final energy consumption	%	2013	5.5	2018	11.0	2013	15.4	2018	18.0
	Average CO2 emissions per km from new passenger cars	g CO_2 per km	2013	128.3	2018	124.7	2014	123.4	2018	120.4
Climate impacts	European mean near surface temperature deviation	temperature deviation in °C, compared with the 1850–1899 average	N/A	:	N/A	:	2013	1.4	2018	2.1
	Climate-related economic losses	EUR billion, in 2017 values	N/A	:	N/A	:	2012	2 719	2017	2 649
	Mean ocean acidity	pH value	N/A	:	N/A	:	2013	8.06	2018	8.06
Support to climate action	Contribution to the international 100bn USD commitment on climate related expending	EUR million, current prices	N/A	:	2017	1 017.8	N/A	:	2017	20 388.7
SDG 14 – Life below water										
Ocean health	Coastal water bathing sites with excellent water quality	% of bathing sites with excellent water quality	2013	80.5	2018	63.2	2013	85.5	2018	87.1
	Mean ocean acidity	pH value	N/A	:	N/A	:	2013	8.06	2018	8.06
Marine conservation	Surface of marine sites designated under NATURA 2000	km^2	2013	74 083	2018	132 130	2013	251 566	2018	551 899
Sustainable fisheries	Estimated trends in fish stock biomass	index 2003 = 100	N/A	:	N/A	:	2012	110.0	2017	136.0
	Assessed fish stocks exceeding fishing mortality at maximum sustainable yield (Fmsy)	% of stocks exceeding fishing mortality at maximum sustainable yield ($F>F_{MSY}$)	N/A	:	N/A	:	2012	52.9	2017	42.7
SDG 15 – Life on land										
Ecosystems status	Share of forest area	% of total land area	2009	25.3	2015	26.9	2012	40.3	2015	41.6
	Biochemical oxygen demand in rivers	mg O_2 per litre	2012	1.30	2017	1.50	2012	2.06	2017	2.00
	Nitrate in groundwater	mg NO_3 per litre	N/A	:	N/A	:	2012	19.2	2017	19.1
	Phosphate in rivers	mg PO_4 per litre	2012	0.077	2017	0.091	2012	0.096	2017	0.093
Land degradation	Soil sealing index	index 2006 = 100	2009	100.5	2015	102.0	2009	101.7	2015	104.2
	Estimated soil erosion by water	km^2	2010	8 624.9	2016	8 441.2	2010	207 232.2	2016	205 294.5
	Settlement area per capita	m^2	2009	441.8	2015	430.5	2012	625.0	2015	653.7
Biodiversity	Surface of terrestrial sites designated under NATURA 2000	km^2	2013	20 884	2018	21 008	2013	787 766	2018	784 252
	Common bird index	index 2000 = 100	N/A	:	N/A	:	2013	94.7	2018	93.5
	Grassland butterfly index	index 2000 = 100	N/A	:	N/A	:	2012	72.2	2017	74.1

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Table (continued)

SDG / Sub-theme	Indicator	Unit	United Kingdom				EU-28			
			Starting		Latest		Starting		Latest	
			year	value	year	value	year	value	year	value
SDG 16 – Peace, justice and strong institutions										
Peace and personal security	Death rate due to homicide	number per 100 000 persons	2011	0.2	2016	0.1	2011	0.9	2016	0.6
	Population reporting occurrence of crime, violence or vandalism in their area	% of population	2013	17.4	2018	24.2	2013	14.5	2018	12.7
	Physical and sexual violence to women experienced within 12 months prior to the interview	% of women	N/A	:	2012	8	N/A	:	2012	8
Access to justice	General government total expenditure on law courts	million EUR	2012	10 749	2017	8 840	2012	48 381	2017	51 027
	Perceived independence of the justice system	% of population	2016	70	2019	68	2016	52	2019	56
Trust in institutions	Corruption Perceptions Index	score scale of 0 (highly corrupt) to 100 (very clean)	2013	76	2018	80	N/A	:	N/A	:
	Population with confidence in the EU Parliament	% of population	2013	20	2018	33	2013	39	2018	48
SDG 17 – Partnerships for the goals										
Global partnership	Official development assistance as share of gross national income	% of GNI	2013	0.70	2018	0.70	2013	0.43	2018	0.48
	EU financing to developing countries	million EUR, current prices	2012	49 394	2017	15 699	2012	147 962	2017	155 224
	EU imports from developing countries	million EUR, current prices	2013	105 132	2018	120 018	2013	817 475	2018	1 013 981
Financial governance within the EU	General government gross debt	% of GDP	2013	84.2	2018	85.9	2013	86.3	2018	80.4
	Shares of environmental and labour taxes in total tax revenues	% of total tax revenues	2013	7.4	2018	7.0	2013	6.4	2018	6.1

Source: Eurostat

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