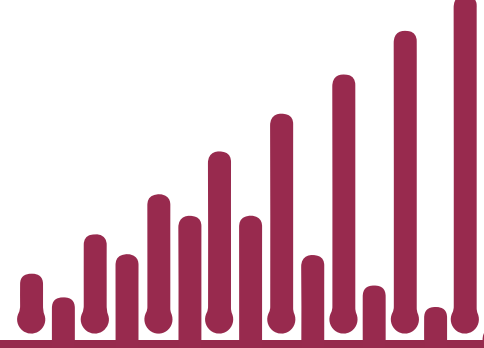**National**
Institute of
Economic and
Social Research

National Institute
UK Economic Outlook
Brexit Britain in Covid Recovery Ward

February 2021
Series A. No. 1

The National Institute of Economic and Social Research is an independent research institute, founded in 1938. The vision of our founders was to carry out research to improve understanding of the economic and social forces that affect people's lives, and the ways in which policy can bring about change. And this remains central to NIESR's ethos. We continue to apply our expertise in both quantitative and qualitative methods and our understanding of economic and social issues to current debates and to influence policy. The Institute is independent of all party political interests.

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Foreword

"..to carry out research into the economic and social forces that affect people's lives and to improve the understanding of those forces and the ways in which policy can bring about change."
On the establishment of the National Institute of Economic and Social Research in 1938.

The country is facing the twin traumas of managing two exits. Exit from the Covid-19 crisis and from the European Union. Of course, much of the world is dealing with the first and the European Union has also had the latter with which to contend. But the UK, and indeed Ireland, is set to lose permanently some 5-8% of national income as a result of the scarring from these events. There can be little doubt that it is a dire moment in our national history. And it is against that backdrop that the National Institute is launching a new form of its Economic Outlook for the UK. We will continue to work with our aggregate model of the UK that conditions on our global econometric model (NiGEM) but also link a sectoral model of the UK and develop modelling of the income deciles in the regions. This will allow us to take a view on better policy responses to shocks and events that not only accounts for the interactions between sectors but also allow us to measure the implications for regions and for households across the income spectrum.

The lockdowns in England (23 March, 5 November, 4 January), as well as those in the devolved regions, associated with Covid-19 and the persistent question marks placed on our methods of "getting and spending" have triggered large falls in economic activity, as measured by GDP. The spread of the virus has also called for a switch from socially intensive private sector activities such as hospitality, leisure and restaurants to the provision of public sector support in health, education, social care and communication networks. And our exit from the European Union after the end of the transition period on 31 December 2020 is with a Trade and Co-Operation Agreement that opens a huge gap in every area of economic, social, security and foreign policy. While this policy gap is not insurmountable, it does require imagining and implementing a consistent process of structural reform over several years that confronts the key conceptual issues of filling gaps. So unlike the 1980s, which were concerned with deregulating product, labour, financial markets, it is now much more about addressing specific capital gaps – human, organisational and knowledge – which, in my view, also finally have to deal with the ninety-year old "Macmillan Gap" in finance.

The calculation of economic losses from these two exits reflects a scientific consensus, stated well by the Office for Budgetary Responsibility in November 2020, and should be used as a starting point for formulating responsible policies in mitigation. Given the body of research, dither and delay is not helpful and rather more understanding and action to mitigate is required from the government. In the former case, exit from the Covid-19 crisis needs to address the loss of firm specific knowledge and the slow re-orientation of the economy, which has some 10-15% of employees working in industries acutely vulnerable to Covid-19, to digital service and public good provision when there happens to be a limited initial pool of people to work in these areas. The costs of EU exit result from the compression of trade with a large wealthy partner, who also happens to be a neighbour that allows the full force of trade through gravity to work, as well the enduring uncertainty of reaching substantive agreements on trade in capital, labour, goods and services with each of the key trading blocs in the rest of the world. To indicate some measure on the task ahead, we said in 2016, that "[A]fter Brexit…there (will) still remain 56 potentially live negotiations. As a benchmark, the European Commission is currently engaged in 10 active trade negotiations."

This uncertainty over the nature of final agreements on trade will tend to lead to firms delaying investment. And note it is very hard for regions to regain their internationally competitive advantage once lost, particularly if there are agglomeration effects at work. If not addressed by prompt policy response, regions may fall into the sump of a low-wage, low-skill and low-growth future. While we can agree that certain regions are not able to participate sufficiently in international markets and wish to address that by "levelling up", we do not have a working definition of what that would require and when we know we have succeeded or failed. Our work should help define that goal and progress towards it.

Finally, I would like to thank my colleagues at the National Institute for producing this new style of economic outlook in lockdown conditions. My thanks extend to the Fellows, Trustees and Governors. But also to the ESRC, our model subscribers and corporate sponsors and to the support of the University of Glasgow who will over time help us deepen our regional analysis. Should you have any comments on our new outlook, please do send them to economicoutlook@niesr.ac.uk.

Jagjit S. Chadha
Director, NIESR
February 2021

National Institute UK Economic Outlook – February 2021

- The resurgence of Covid-19 has led to a downward revision in our growth forecasts for 2021 from 5.9 per cent to 3.4 per cent following a contraction of 9.9 per cent in 2020. Early indications are that the lockdown in the first quarter is having a larger impact on activity than in November, but a smaller impact than the spring lockdown.

- There are major risks to the downside associated with the roll-out and effectiveness of vaccines, the emergence of new Covid-19 strains and their effect on the path of the virus, which might imply the continuation of lockdown measures for a longer period, suppressing domestic demand. A slower than expected global recovery due to Covid-19 is also a major downside risk for the UK economy through the trade channel.

- A successful vaccination of the population followed by a permanent easing of social distancing rules presents an upside risk to our forecast in 2021 and beyond.

- Public sector net debt, which increased to 99.4 per cent of GDP as of December 2020, is projected to peak at 111 per cent in 2023. If Covid-19 support is withdrawn prematurely, or if consolidation is prematurely applied in response to the increase in public debt, the economic recovery will be delayed and the long-term economic impact of the pandemic exacerbated.

- The Coronavirus Job Retention Scheme (CJRS) and the Self-employed Income Support Scheme (SEISS) have protected millions of jobs, costing the government an estimated £100 billion or 4.8 per cent of GDP, for 20-21 fiscal year. In our main case forecast scenario unemployment rises to 7½ per cent or 2½ million people at the end of the year.

- To prevent a rise in unemployment of the magnitude of our forecast, and to limit the economic and social damage from the ongoing health crisis, the Chancellor should should soon be announcing policies to follow the CJRS when it is due to expire in April.

- Despite the roll-out of vaccines, Covid-19 will have long-lasting economic effects. By 2025, the level of GDP is forecast to be around 6 per cent lower compared with pre-Covid expectations, reflecting a lower path for consumption caused by higher unemployment, weaker business investment due to stressed balance sheets and uncertainty during the pandemic, and the adoption of an FTA with the European Union which imposes more barriers to trade than before.

- At a sectoral level, compared to the previous recession, the recovery is forecast to be relatively stronger in the production industries, construction and finance and relatively weaker in the public sector, real estate and private traded services.

Table 1.1   Summary of the forecast (percentage change unless otherwise stated)

	2017	2018	2019	2020	2021	2022	2023	2024	2025
GDP	1.7	1.3	1.4	–9.9	3.4	4.3	2.4	1.9	1.7
Per capita GDP	1.1	0.7	0.9	–10.4	2.9	3.8	1.9	1.4	1.2
CPI Inflation	2.7	2.4	1.8	0.8	1.0	1.9	1.6	1.7	1.8
RPIX Inflation	3.8	3.3	2.5	1.7	1.9	2.6	2.4	2.3	2.5
RPDI	0.1	2.3	1.8	0.2	0.7	1.6	2.3	2.3	2.2
Unemployment, %	4.4	4.1	3.8	4.6	6.5	7.1	6.0	5.3	4.9
Bank Rate, %	0.3	0.6	0.8	0.2	0.1	0.1	0.1	0.2	0.3
10-year Gilt yield, %	1.2	1.4	0.9	0.3	0.4	0.5	0.7	0.9	1.0
Effective exchange rate	–5.5	1.9	–0.3	0.5	1.9	0.2	0.2	0.2	0.2
Current account as % of GDP	–3.8	–3.7	–3.1	–3.3	–3.5	–4.5	–4.3	–4.4	–4.7
Net borrowing as % of GDP	2.6	1.8	2.6	17.6	6.1	5.1	4.3	3.8	3.4
Net debt as % of GDP	83.9	81.9	81.1	107.9	109.9	110.7	110.9	106.6	106.1

Note: Numbers reported are yearly averages except for net borrowing and net debt which are for the full fiscal year

1 UK economic outlook: Brexit Britain in Covid recovery ward

by Hande Küçük, Cyrille Lenoël and Rory Macqueen[1]

Economic background and recent developments

One risk materialises while another dissipates.
At the time our last forecast was produced in late October the UK economic recovery faced significant downside risks from a resurgence of Covid-19 and the possibility of a No Deal Brexit.

Failure to control Covid-19 is holding back the economic recovery.
The first of these risks has been realised in the emergence of a major 'second wave' of infections and deaths (see Figure 1.1). Tragically, total number of Covid-19 related deaths have risen to 108,013 as of 2 February 2021, making the UK death rate one of the highest in the world—162.8 per 100,000 population. The resurgence of the virus has led to a series of increasingly strict lockdown measures since November. Since last summer we have consistently emphasised that the economic recovery from the recession of 2020 is dependent on successfully controlling the virus.

Figure 1.1 UK daily Covid-19 statistics

— Deaths within 28 days of a positive test (LH scale)

— Patients admitted to hospital (RH scale)

Source: Data.gov.uk. See coronavirus.data.gov.uk for further information.

As well the occurrence of new lockdowns, the uncertainty around their deployment and of their duration have serious implications for economic activity as they make planning very difficult for households and businesses.
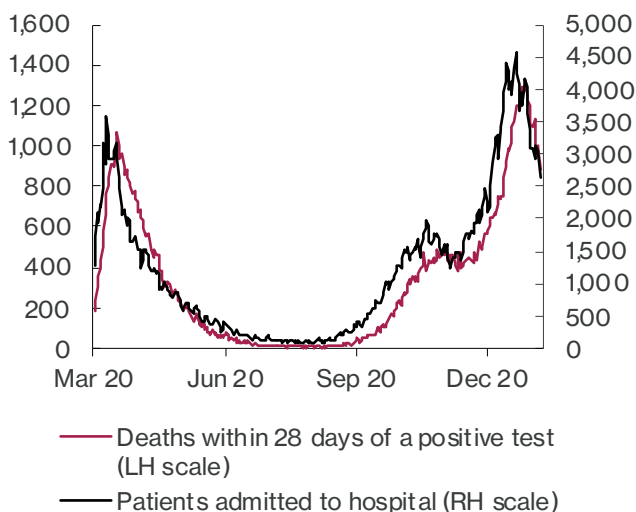
The initial partial re-opening of the economy during summer 2020 led to a rapid 'bounceback' in many sectors of the economy, but the persistence of the virus meant that the recovery was already petering out before restrictions were partially re-imposed in November in the form of a four-week national lockdown for England and similar measures in the devolved nations. Their lifting in December, combined with some stockpiling ahead of the Brexit deadline of 1st January 2021, is likely to lead to a temporarily higher monthly growth rate, but with the UK economy still 8 per cent smaller than in December 2019. The tragic Covid-19 developments have led to the Coronavirus Job Retention Scheme (CJRS) being extended until April 2021 along with other fiscal support measures.

The Brexit deal removes a major risk while leaving in place some worries for the future.
The second main downside risk from November has now dissipated, with the signing of a Trade and Co-Operation Agreement with the European Union. Our previous main case forecast scenario incorporated the assumption of a Free Trade Agreement being signed, so this does not constitute a material change to the central scenario, but it does mean the removal of a major downside risk.

As described in our November 'Prospects for the UK Economy' the economic impact of Brexit is already evident in the UK economy, which is reflected in a lower assumed long-term growth path for the UK. Notably, the Agreement does not contain any provision for continued integration with the EU in financial services. The gaps opened by the Agreement require implementing mitigation policies and structural reforms over several years as well as negotiating trade agreements with key trading blocs in the rest of the world (Chadha, 2021).

Figure 1.2 Google Community Mobility Reports
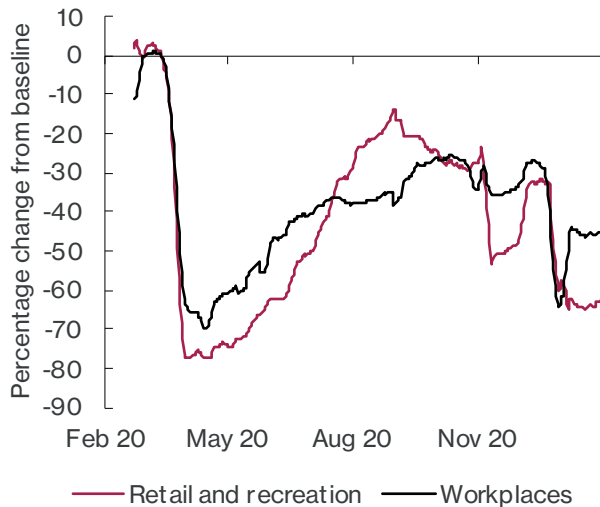
Note: Baseline is median value for the day of the week. Seven-day rolling average.
Source: Google, NIESR.

Figure 1.3 ONS spending and hiring indicators

Note: ᵃ England and Wales. Debit and credit cards: 100 = February 2020, percentage change on a backward looking seven-day rolling average, non-seasonally adjusted, nominal prices. Job adverts: change from the same week in the previous year. EPC certificates: change from the same week in the previous year, four-week rolling average, adjusted for timing of December holiday.
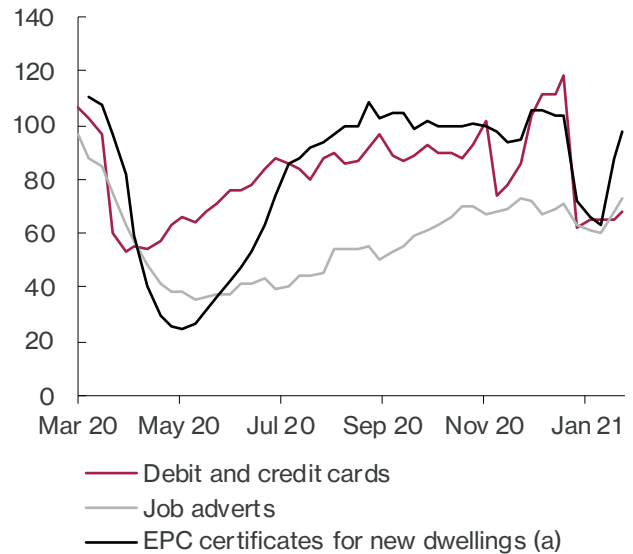Source: ONS, BoE, Adzuna, MHCLG.

High frequency indicators suggest a bigger slowdown in January than November, but less than April.
The winter lockdown was announced by the Prime Minister on 4 January 2021. The largest difference with November's lockdown is that, unlike then but as in spring 2020, schools in England are closed to most pupils at least until 8 March. There are nonetheless several differences in restrictions, interpretation or observance compared with the original lockdown, notably that many more workplaces have remained open. Economic and other indicators suggest that activity in early 2021 is, as a result, at a level somewhere between that of April (25 per cent below February 2020) and November 2020 (8.5 per cent below February 2020).

Google Mobility data (see figure 1.2) suggest that November saw only a small reduction in travel to workplaces, to around the same level as October half-term, whereas retail and recreation activity fell to the level of late June. Following the Christmas holiday period, both indicators returned to levels between those seen in April and November.

Experimental high frequency data collated by the Office for National Statistics (see figure 1.3) may be informative about the impact of the latest restrictions, though their predictive content is uncertain. Nominal credit and debit card expenditure in January returned to levels last seen in the first half of 2020. Job vacancies, which recovered slowly until the start of December, appear to have turned downwards again. Construction of new dwellings, which recovered quickly and strongly, may have begun 2021 at a subdued level compared with 2020.

Private sector surveys suggest an economic contraction in early 2021.
IHSMarkit's purchasing manager indices suggest that December saw strong manufacturing growth (driven by stockpiling) but weakness in the much larger services sector. The flash PMI for services in January registered 40.6 in January: an 8-month low and significantly weaker than the final November reading of 49.

Weak economic activity keep wages and price pressures subdued.
Data from the Labour Force Survey until November suggest that the November lockdown had limited impact on average weekly earnings. A fall in the number and proportion of lower-paid jobs led to earnings growth accelerating to 3.6 per cent in the three months to November after falling by 1.3 per cent in the second quarter and recovering by 1½ per cent the third quarter of 2020. Despite a late surge in average pay driven by composition effects, the National Institute Monthly Wage Tracker (January 2021) suggests that 2020 will end up being the worst year for total pay growth since 2014, with Average Weekly Earnings (AWE) growing at 1½ per cent on average.

The National Institute Monthly CPI Tracker (January 2021) found that underlying inflation pressures are currently fairly stable, but regions that entered higher tiers of restrictions in December experienced marked decreases in consumer prices during the month.

Economic activity

A 10 per cent fall in 2020 and a slower recovery in 2021.
Despite the November lockdown, we have revised up our forecast for GDP growth in 2020 from a fall of 10½ per cent to a fall of 9.9 per cent. This is because growth in the third quarter was slightly stronger than expected, and the effects of the restrictions in the fourth quarter are expected to be moderate.

Economic recovery in 2021 is highly dependent on the path of the pandemic.
Early indicators discussed in the previous section suggest that economic activity in January was lower than in November but higher than during Spring 2020. There are notable differences in the extent of restrictions compared with the first lockdown: far more children are attending schools and more employers have either invested in home working capabilities or are requiring staff to attend work. We forecast a contraction in the first quarter of 2021 (see figure 1.4), followed by a robust rebound in the following quarters as restrictions are lifted.

We assume lockdown restrictions persist for the most part of the first quarter and will be largely lifted from the second quarter on the back of a successful vaccine roll-out programme.
We assume in our main case forecast scenario that the current lockdown restrictions in England remain in place throughout January and February, with some easing

in March, before being largely lifted during the second quarter of 2021. In the main case forecast scenario our assumptions about restrictions are mainly reflected in the path of consumption, which is expected to recover in the second and third quarters (see figure 1.5).

Our forecast for 2021 is for year-on-year growth of 3.4 per cent, a revision down from our previous forecast of 5.9 per cent, reflecting the effects of the second wave of Covid-19 and associated lockdowns. Our forecasts are conditional on the assumption that Covid-19 vaccines are rolled out by the third quarter of 2021 to enough of the population that distancing restrictions may be safely lifted. Voluntary social distancing and remote working are likely to remain in place for a longer period until the pandemic is brought fully under control, and part of the shift to working from home may be permanent. Growth over the remainder of the forecast period reflects this gradual adjustment process (see figure 1.6) and an element of 'catch-up', as well as weak pre-pandemic trends in business investment and productivity growth, with GDP growth averaging 2.7 per cent over the forecast period. The UK economy is expected to return to pre-pandemic levels by the end of 2023, reflecting – compared with pre-Covid expectations – a lower path for consumption caused by higher unemployment, weaker business investment due to stressed balance sheets and uncertainty during the pandemic, and the adoption of an FTA with the European Union which imposes more barriers to trade than before. This implies an output loss of about 6 per cent by 2025 compared with pre-Covid expectations.

Risks come from Covid-19: a further resurgence or vaccine problems but also from policy errors.
Major risks to our new main case forecast scenario fall largely into two categories. Epidemiologically, if the vaccine roll-out is slower than expected, if further Covid-19 strains

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Figure 1.4   GDP: 2020 data and NIESR estimate
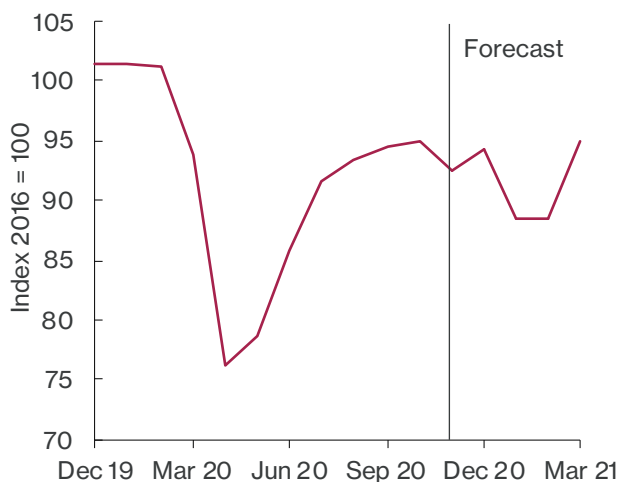
Source: ONS, National Institute Monthly GDP Tracker (January 2021).

Figure 1.5   2021 quarterly profiles

Source: NiGEM database and NIESR forecast.

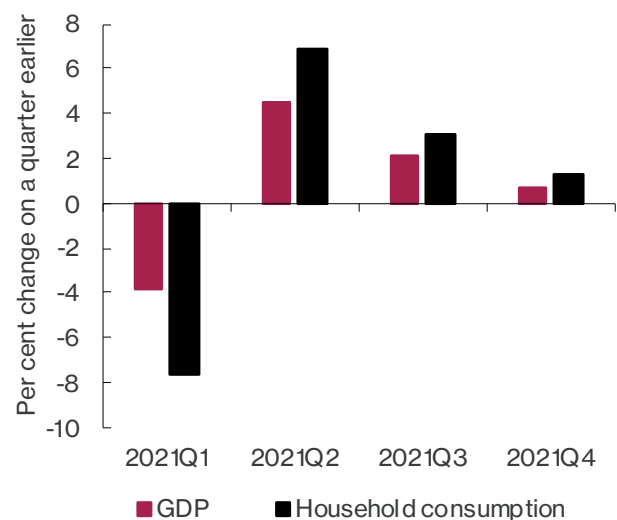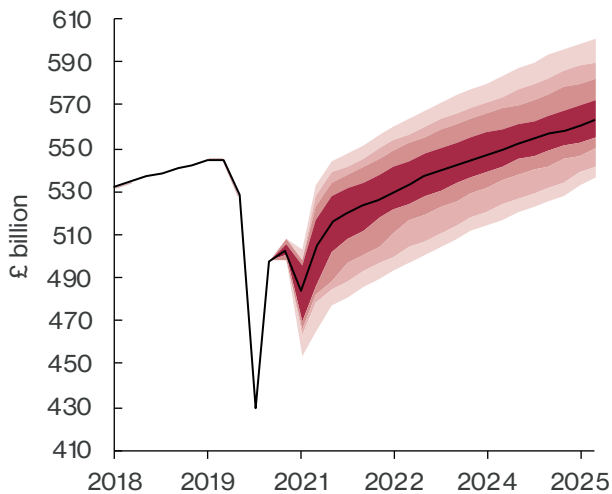**Figure 1.6**   GDP fan chart

Notes: The fan chart is intended to represent the uncertainty around the main-case forecast scenario shown by the black line. There is a 10 per cent chance that GDP growth in any particular year will lie within any given shaded area in the chart. There is a 20 per cent chance that GDP growth will lie outside the shaded area of the fan
Source: NIESR forecast and judgement.

emerge which make the public health situation worse, or if for some other reason the virus is not controlled, the short-term (and therefore long-term) impact on the economy may be far worse. A failure to distribute vaccines equally around the world is also a major downside risk on the UK economy not only through its implications on the path of the virus in the UK but also through its implications on UK's trade with the rest of the world. The long-term effects of the vaccines on the path of the virus are as yet unknown but our main case forecast is conditional on the disappearance of Covid-19 as a major cyclical concern in the medium-term future, albeit with permanent effects on the level of GDP. In the current main case, GDP is forecast to be around 6 per cent below the pre-Covid forecast by 2025.

Fiscally, if Covid-19 support is withdrawn prematurely, or if consolidation is wrongly or prematurely applied in response to the increase in public debt, the economic recovery will be delayed and the long-term economic impact of the pandemic exacerbated.

If both turn out better than expected we could see a much faster recovery in demand…
Upside risks could be a faster than anticipated vaccination programme, a larger post-Covid consumer spending spree or a productivity boost arising from a Covid-enforced

reallocation of capital towards automation and away from low productivity industries.

…but there remain significant downside risks to the supply side of the economy
The announcement of further restrictions has led to a downward revision of our GDP forecasts, driven by lower demand, but we do not foresee any additional scarring from the latest lockdown. By and large this reflects the belief that most firms which will not survive Covid-19 did not survive the first lockdown period, and that the second lockdown predominantly consists of temporary closures of businesses which have shown they can recover after restrictions are lifted. We would also expect some reallocation of capital to new businesses. Naturally if lockdown lasts for much longer than expected, or fiscal support is prematurely withdrawn, this may lead to further permanent closures, especially in social consumption sectors, but these remain downside risks to our forecast of supply. Risks to the supply side will be mitigated by policies to support domestic demand and the gradual evolution of internationally competitive industries.

There are additional risks due to difficulties in economic measurement during a pandemic.
Following scrutiny of official inflation calculations in the early stages of Covid-19, doubts have recently been cast on the official GDP and employment figures. Official GDP data, specifically public sector output, are constructed differently in the UK to other countries and, with nominal spending steady or even increased, the reduced level of normal activity (operations, doctor visits) led to an unprecedented 30 per cent rise in in the public sector deflator in Q2 of 2020. Initial estimates (Chadha and Dixon, 2020) in December suggested that measurement issues could lead to the level of GDP being reported at 3–6 per cent lower than its true level in the second and third quarters of 2020, though these should be considered no more than indicative.

Households

Unemployment only rose moderately thanks to the furlough scheme…
The unemployment rate rose to 5 per cent in the three months to November, which is equivalent to 1.7 million unemployed. This would undoubtedly have been higher if the government had not at the last moment committed to extending the CJRS until March 2021 (later further extended to April).

The Covid-19 pandemic has had important implications for the measurement of labour market statistics. In line with international standards, furloughed workers, who are temporarily away from work, are counted as employed as they remain contracted to an employer, keeping the

Figure 1.7 Number furloughed
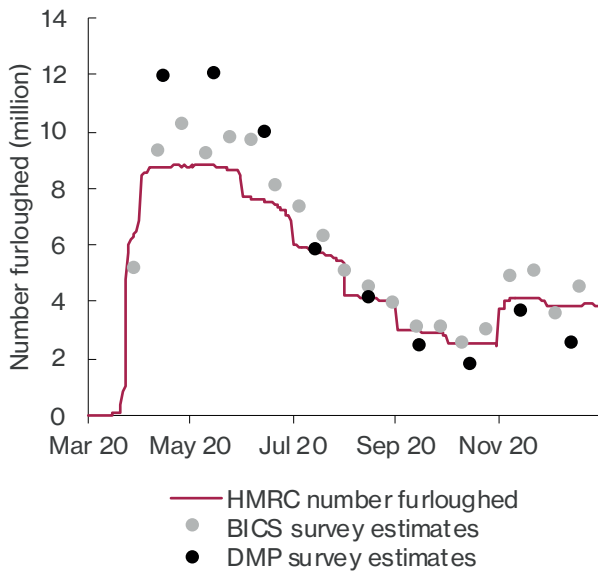
Source: HMRC, ONS Business Impact of Coronavirus Survey, Bank of England Decision Maker Panel survey.

Figure 1.8 Unemployment rate and forecast
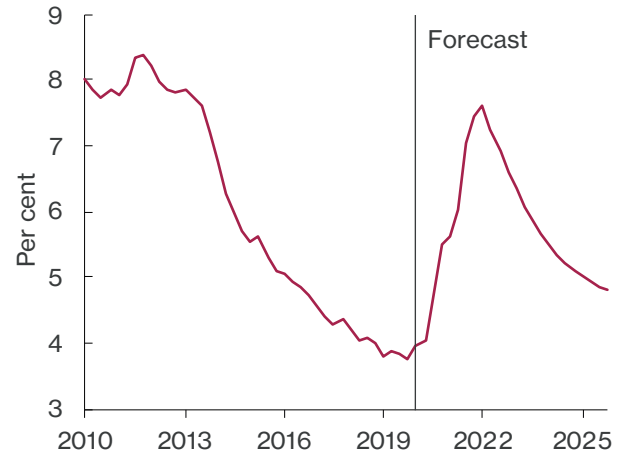
Note: Unemployment rate is the number of unemployed people (aged 16+) divided by the economically active population (aged 16+).
Source: NiGEM database and NIESR forecast.

unemployment rate down. There is also a significant number of people temporarily away from work because of the pandemic but not being paid at all who report themselves as employed in the Labour Force Survey.[2] This is another factor that potentially keeps unemployment rate down.

The Labour Force Survey measurement of employees has also come under scrutiny. Research at NIESR's Economic Statistics Centre of Excellence (O'Connor and Portes, 2021) suggests that the absence of data on migration during the pandemic has led to the LFS reporting a 200,000 increase in employees rather than a fall of up to 750,000. The ONS responded by explaining that the LFS is a measure of rates and not levels and that population estimates will need to be revised once the impact of the pandemic on international migrations is better understood. As with the GDP figures, the aggregate number of employees in our forecast should be treated with caution, based, as it is, on the official data as it currently stands.

In our November forecast we suggested that surveys were compatible with around 2.5 million workers being furloughed in October: official data have since confirmed this. The number of furloughed workers increased in November to about 4 million because of the second lockdown. That number is likely to increase in January 2021, but to stay below the 9 million peak during the first lockdown (figure 1.7).

The number of redundancies in the three months to November 2020 increased by 280,000 on the year to a record high of 395,000. The number of vacancies in the three months to December increased to 578,000 from a trough of 343,000 in the three months to June. It remains well below the pre-pandemic levels of above 800,000.

… but will rise to 7½ per cent in early 2022 without further support.
In our main case forecast scenario the unemployment rate peaks at 7½ per cent in the first quarter of 2022, and then falls gradually to reach 4.9 per cent in 2025 (see figure 1.8). The delayed peak is partly a result of the extending the CJRS, which at the time of our last forecast was expected to end in October 2020, and partly due to uncertainty, damage done to corporate balance sheets and lower investment. Lessons from previous recessions also suggest that unemployment tends to peak several quarters or years after the end of a recession. For example, unemployment peaked at 8.2 per cent in the second quarter of 2012, about 3 years after the end of the 2008-9 recession and there were similar length lags in the 1980-1 and 1990-1 recessions. Reallocation of labour as the economy adjusts to sectoral shifts due to both Covid-19 and Brexit also suggest a delayed recovery in the labour market. Unemployment stays above the pre-pandemic rate of 4 per cent even at the end of our forecast horizon.

2   See ONS blog by Jonathan Athow July 16, 2020. https://blog.ons.gov.uk/2020/07/16/a-covid-19-conundrum-why-are-nearly-half-a-million-employees-not-being-paid/

Figure 1.9 Average weekly earnings by sector in 2020
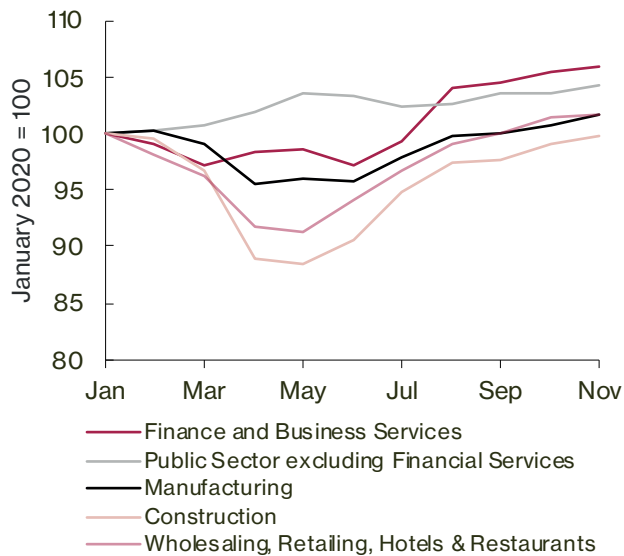
Source: ONS. Seasonally adjusted.

Figure 1.10 Whole economy trends in pay review outcomes, 2020
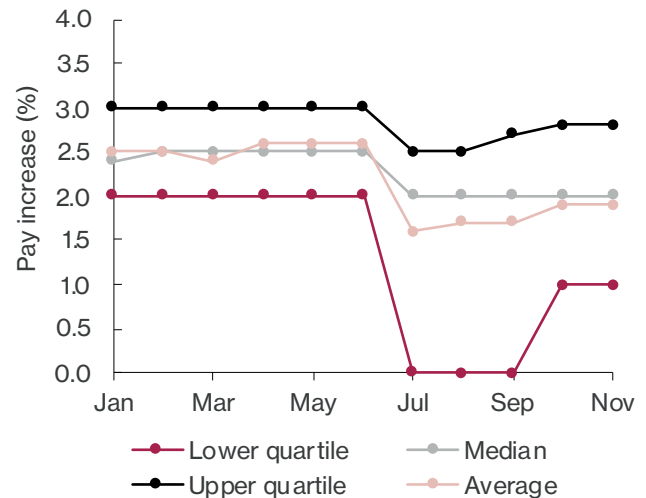
Source: Incomes Data Research.

The high degree of uncertainty surrounding the recovery calls for a state-contingent job support scheme.

The labour market policy has so far consisted in rolling over the CJRS and Self-Employed Income Support Scheme (SEISS) whenever a new lockdown was announced. While this policy was successful in limiting the rise in unemployment that would have occurred without these schemes, it did not allow businesses to plan ahead because the extensions were announced too close to the previously announced end of schemes. The furlough scheme that was originally planned to end on 31 October 2020 was initially extended by a month on the very same day following the announcement of the November lockdown by the Prime Minister. A few days later, on 5 November 2020, the Chancellor announced an extension until the end of the March 2021. A further extension to the scheme until April 2021 came on 17 December 2020 as lockdown restrictions were tightened once again.

To prevent a rise in unemployment of the magnitude of our forecast, the Chancellor should announce as soon as possible policies to follow the CJRS when it is due to expire in April. By this time, a significant part of the labour force will probably still be furloughed. Our recommendation is to continue to support the labour market beyond April with local and sectoral schemes targeted towards businesses that are most affected by Covid-19 restrictions. The new schemes ought to consider the degree of restrictions imposed in a region, as well as how the restrictions affect each sector. Similar schemes are also needed for the self-employed. The March Budget should clearly lay out government policies which both protect jobs until the pandemic is brought under control

and encourage the transition to new ones as discussed in Macqueen (2020b).

There have been dramatic wage falls concentrated in the worst affected parts of the economy.

Average earnings are expected to have held up relatively well in 2020 thanks to direct and indirect government transfers, growing by 1.9 per cent compared to 2019, though this disguises significantly different outcomes across the economy (see figure 1.9 for the sectoral decomposition of average weekly earnings excluding Northern Ireland). Clearly the degree of furloughing correlates highly with falls in earnings, with not all employers 'topping up' the 80 per cent of wages subsidised by government (Küçük, Lenoël, Macqueen, 2020 and Macqueen, 2020c).

Incomes Data Research analysis suggests that, while the number of pay freezes increased dramatically in the middle of 2020, the median award fell only slightly, suggesting that many companies and sectors remained largely unaffected (figure 1.10) while others clearly were not. Redundancies and low levels of recruitment have disproportionately affected low-paid jobs, which has the effect of raising the average.

We forecast average earnings to fall by 1.1 per cent in 2021 because of pay freezes and wage moderation, then grow by an average of 3.2 per cent per year over the remainder of the forecast period (table A5).

As a result of the above we forecast real personal disposable income to grow by 0.7 per cent in 2021, as government transfers and rising average hours slightly outweigh the effect of falling employment and hourly wages (table A5).

The housing market remains strong partly thanks to government support.

We have revised up our estimate for house price growth in 2020 from 0.5 per cent to 3.1 per cent due to strong activity in the housing market in the second half of the year driven by pent-up demand, the stamp duty holiday and people reassessing their housing needs in light of increased working from home. The Halifax house price index was 6 per cent higher in December 2020 than a year ago. Mortgage approvals have risen in November 2020 to 105,000, the highest number since August 2007 while HMRC monthly property transactions stood at 115,190: 19 per cent higher than a year earlier.

This momentum is likely to continue despite the lockdown as estate agents can carry on working and viewings can still be organized either virtually or on site with precautions. We forecast house prices to increase by close to 4 per cent in 2021 and housing investment to increase by 10 per cent after decreasing by 10 per cent in 2020 (table A5). However, the end of the stamp duty holiday[3] and of Help to Buy (in its current form) in March 2021, combined with an increase in unemployment, is likely to put downward pressure on the housing market in the remaining years of the forecast period.

A tale of two pandemics: some barely affected, others plunged into poverty.

The overall impact of the Covid-19 pandemic on household finances, as on employment and other economic variables, has been highly uneven. Households who reported having increased their savings had incomes 45 per cent higher than those who had decreased their savings (Bank of England, 2020). Low-income households have seen their saving rates decline sharply as their earnings fell more than their expenditure (Hacioglu et al, 2020). In contrast, middle- and high-income households have seen their saving rates increase due to containment measures that restricted spending on contact-intensive services and non-essential goods.

Household spending has been reallocated from hospitality to retail.

As with household income, household spending changes varied in 2020. Retail was one of the fastest sectors to recover from a significant fall in output during the first Covid-19 lockdown and activity was just 4 per cent below its February level in November, compared with 36 per cent in April 2020. Retail sales rose by only 0.3 per cent month-on-month in December,[4] with the British Retail Consortium survey reporting strong divergence: record spending on food and groceries but a "dismal" December on the high street for non-essential high street shops.[5] Some of the strength of retail over 2020 results from substitution away from unavailable social consumption in bars, restaurants, and the like.

While the hospitality sector is undoubtedly badly affected by the re-emergence of the virus, there is evidence that some businesses have successfully switched to providing takeaways. Barclaycard data suggests that restaurant, bar and pub spending was down by around two thirds in December year-on-year.[6]

A potential consumer recovery may be held back by the weak growth in household incomes.

We forecast household consumption to rise by 2.6 per cent in 2021 after a fall of 11.6 per cent in 2020. Our downward revision to household consumption since November is largely the result of the current wave of Covid-19 that restricts consumption and reduces income during the third lockdown that is expected to last for a large part of the first quarter (figure 1.5). The household savings ratio is forecast to fall only moderately from 17 per cent in 2020 to 15 per cent in 2021. This is in line with recent evidence suggesting that serious economic downturns can 'scar' consumers in the long run by increasing their tendency to save (Malmendier and Shen, 2020; Kozlowski et al, 2020). One upside risk to household consumption (with consequences for demand, wages and inflation) comes from the potential for a lifting of restrictions sooner thanks to a successful vaccines rollout. Accompanying our August forecast we simulated (see Macqueen, 2020a) consumer optimism returning sooner than expected while the Bank of England maintained loose monetary policy due to lingering high unemployment and continued low inflation.

Firms

The pandemic has led to some businesses seeking significant financial support though by no means all.

As it has with households, the Covid-19 pandemic has affected the business sector unevenly: some sectors which were badly affected at first have recovered strongly, others less so (see section 2).

Supply and demand for credit has not been uniformly distributed across the corporate sector. Lending to small and medium sized enterprises (SMEs), including government support, totalled £54 billion in the first three quarters of 2020, more than double its 2019 total for the same period.[7] The Federation Small Businesses' quarterly Small Business Index in January suggested that a record 250,000 of firms are set to close in 2021 in the absence of further government support.

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3 According to OBR November 2020 forecasts, the expected cost of the stamp duty holiday between 8 July 2020 to 31 March 2021 is £3.3 billion.

4 https://www.ons.gov.uk/businessindustryandtrade/retailindustry/bulletins/retailsales/december2020

5 https://brc.org.uk/retail-insight/content/retail-sales/retail-sales-monitor/reports/202012_uk_rsm/

6 https://home.barclaycard/press-releases/2021/01/Consumer-spending-declined-2-3-per-cent-in-December/

7 https://www.ukfinance.org.uk/system/files/Business-Finance-Review-2020-Q3-Final.pdf

Figure 1.11 Growth rates of loans to non-financial businesses
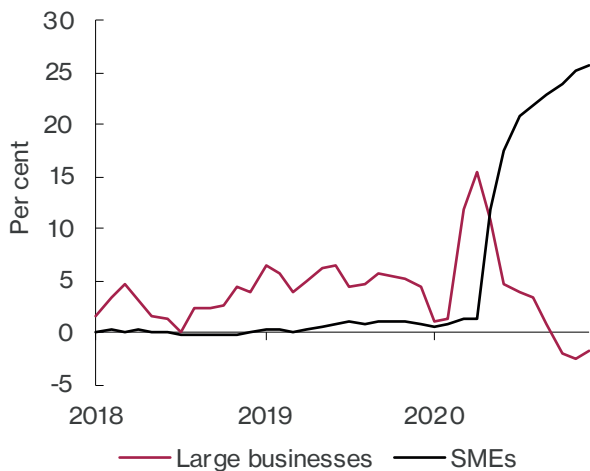
Source: Bank of England.

Figure 1.12 Net finance raised by UK PNFCs in Q2 and Q3 2020
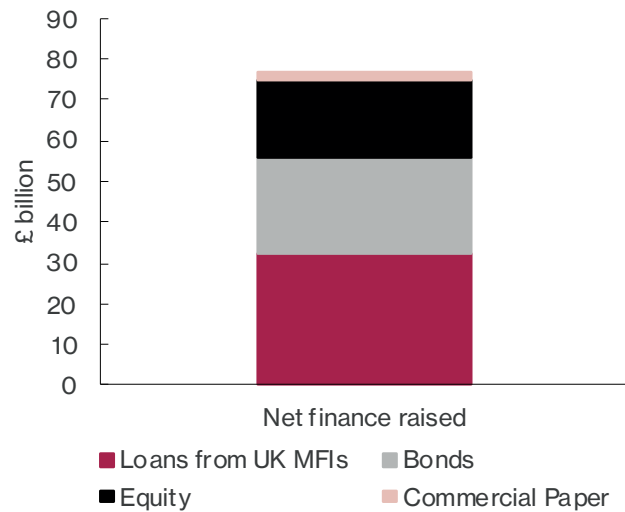
Source: ONS. Seasonally adjusted.

At the same time evidence from NIESR's Business Conditions Forum is that many large corporates drew on revolving capital facilities, took short term financing (public and private sector) and repaid from cash flow. In November, during the second lockdown in England, lending to non-financial businesses was 25 per cent higher than a year ago for SMEs but 3 per cent lower for large firms (see figure 1.11). The lower credit for large corporates may also reflect their focus on cutting costs and investments during a period of weak demand.

Higher borrowing during the pandemic will weigh on some corporate balance sheets for years to come.
As the recovery takes hold during 2021 and 2022 the focus of corporate borrowing is likely to switch from whether firms are able to access enough credit to survive to whether they have taken on more than they can service. By some distance the largest government loan programme has been the Bounce Back Loan Scheme, accounting for £44 billion of the £68 billion of lending made up to 13 December and on which repayments will have been disproportionately made by those with healthier cashflows.[8]

The Bank of England Financial Stability Report in December estimated that companies would face cash-flow deficits of up to £178 billion in the 2020-21 fiscal year, well-above typical values for cash-flow deficit for businesses which is around £100 billion. According to these estimates, if used, cash buffers could cover almost half of the cash-flow deficits. Along with the cash buffers,

the net increase in finance that amounted to £77 billion between March and October 2020, have helped businesses finance the unusually high levels of cash flows in this period (see figure 1.12). Stricter lockdowns since then might imply higher financing needs given the effects on cash-flows through reduced economic activity.

Equities have been supported by accommodative monetary policy, but compared with other major large corporate indices, the UK's relative economic stagnation since summer 2020 can be seen from figure 1.13.

The Deloitte quarterly survey of Chief Financial Officers in January recorded that a net 58 per cent were more optimistic about their companies' prospects compared with three months earlier but, while those expecting increases in spending improved, the net number remained negative. The CBI's Industrial Trends survey from January suggested a significant degree of stockpiling in the quarter to January, with significantly weaker outlook over the first quarter of 2021.

An uncertain demand recovery may be accompanied by uneven growth in supply capacity.
Servicing acquired debt will weigh on balance sheets for the next few years, especially in the sectors most affected by Covid-19. Although corporate bond spreads have been stable and close to their historical levels, increased debt service requirements might hold back investment and productivity by increasing fixed costs.

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8   https://www.gov.uk/government/collections/hm-treasury-coronavirus-covid-19-business-loan-scheme-statistics

Figure 1.13 Stock indices: large companies
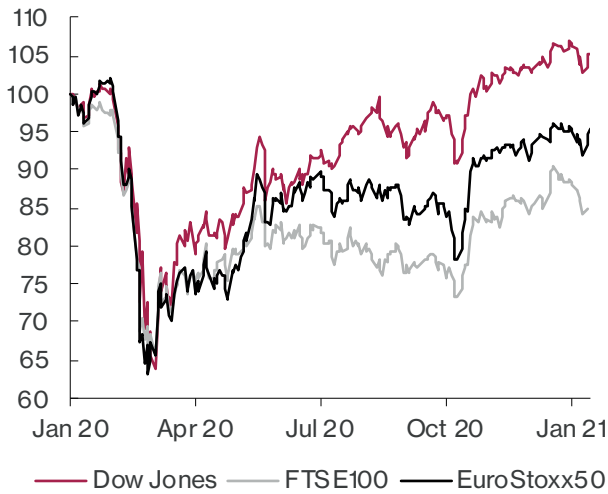
Source: Yahoo Finance.

Figure 1.14 UK labour productivity (GDP per hour worked)
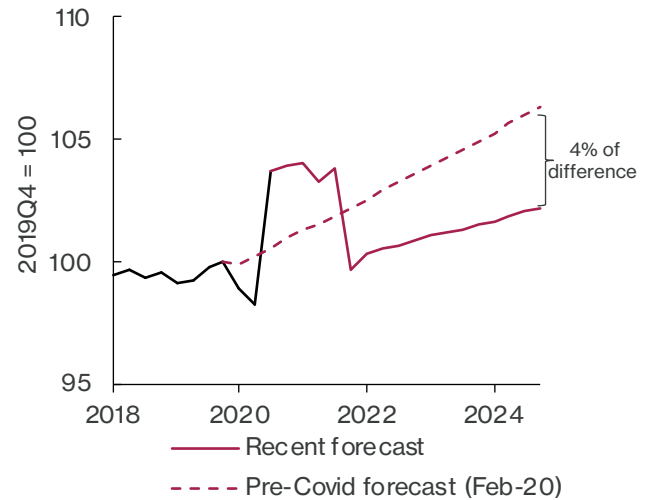
Source: NIGEM database and NIESR forecast.

Labour productivity has been temporarily higher during the pandemic.

Covid-19 led to an unusual increase in output per hour worked because hours worked fell more than output. The winter lockdown and the possibility of further restrictions during the year are likely to keep productivity temporarily higher in 2021. We forecast output per hour to increase by 1.8 and 1.6 per cent respectively in 2020 and 2021 before dropping by 2.3 per cent in 2022. Productivity would then go back to pre-Covid growth rates of about ½ per cent per year.

Figure 1.14 shows that this path for productivity implies a 4 per cent scarring compared to our pre-Covid forecast. Approximately half of the scarring can be attributed to the change in assumption from a soft Brexit to an FTA and half from the long-term impact of Covid-19. A downside risk to our productivity forecast is related to Brexit and weak capital accumulation and an upside risk is related to potential productivity gains from increased investments in digitalization during the pandemic, which could support a long-run improvement (Van Ark et al., 2020; Bloom et al., 2020).

Trade

The Brexit deal is better than a no-deal outcome but will still imply significant losses through trade and productivity compared to staying in the EU Single Market.

After a long period of negotiations, the UK and the EU have signed a Trade and Co-Operation Agreement with the European Union that came into force on the 1st January 2021. Our November forecast (Küçük, Lenoël,

Macqueen, 2020) incorporated the assumption of a Free Trade Agreement (FTA) with the EU that would provide a high level of access in the goods sector but a poor level of access in services, which is broadly in line with the signed trade deal. Hantzsche and Young (2019) estimated that in the long run the UK economy would be 3½ per cent smaller under an FTA deal compared to continued EU membership, mainly due to reduction in trade and migration as well as weaker productivity growth.

As in our previous main case scenario, the economic impact of Brexit is reflected in a lower assumed long-term growth path for the UK. Hence, according to the signed trade deal, there should be no tariffs levied on bilateral trade of goods between the UK and the EU as before provided that the rules of origin can be met. While this will reduce the losses from leaving the EU compared to a no-deal outcome, other costs of accessing the EU market come from an increase in non-tariff barriers and rules of origin which will make bilateral trade more difficult in comparison to the UK being a member of the EU (Ayele et al, 2021).

Despite the significance of services trade for the UK, services provisions in the trade agreement are thin, or even non-existent as in the case of financial services, implying a major change compared to the arrangements under the EU Single Market. The EU Single Market facilitates the international integration of EU services markets by the country-of-origin principle. However, under the new agreement, UK businesses will be subject to rules prevailing in the receiving country rather than the rules prevailing in the UK with potentially severe implications for air transportation, financial services and many professional and business services (Borchert and

Figure 1.15 Sectoral balances (saving minus investment)
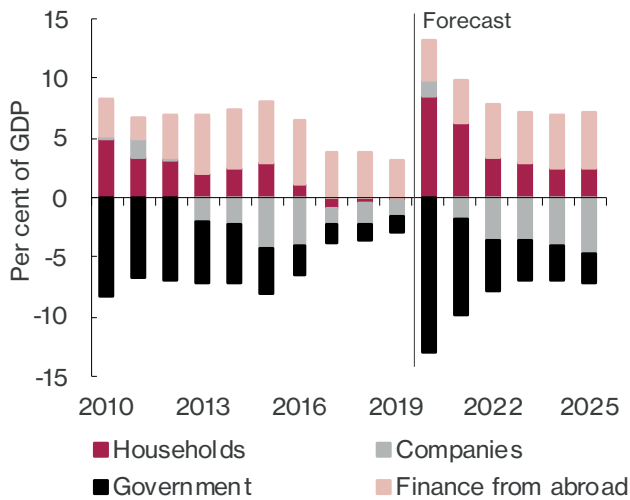
Source: NiGEM database and NIESR forecast.

Morita-Jaeger, 2021). The lack of a trade agreement on services implies that the economic recovery cannot easily fall back on sectors like financial services which have been less exposed to the effects of Covid-19.

In our main-case forecast scenario, export and import volumes fell by around 15 per cent and 20 per cent respectively in 2020 reflecting the dramatic fall in world trade and the large contraction in economic activity due to Covid-19. Exports are expected to recover gradually by around 3 per cent and 9 percent in 2021 and 2022, respectively, due to the exit from the EU Single Market. Imports are expected to recover much faster, driven by recovering consumer spending, leading to a rising current account deficit from 2021. There are significant downside risks to our forecasts of exports and imports, depending on the extent of disruptions from Brexit and the pace of recovery from the pandemic across the world.

As the economy recovers from the pandemic on the back of consumption, domestic savings of households will gradually fall. Net financial position of the corporate sector will turn negative as business investment picks up. These will contribute to a decline in government net borrowing and imply a slight increase in current account deficit, i.e. net finance from abroad to fill in the saving and investment gap during recovery (see figure 1.15).

Fiscal policy

Fiscal support is money well spent.
The wide range of emergency measures introduced by the government since the beginning of the pandemic to support businesses and households have prevented a much sharper contraction than the 9.9 per cent decline in GDP that we predict for 2020 (Holland and Lenoël, 2020). Since our

November forecast the principal fiscal development has been the extension of existing forms of Covid-19 support as a result of the further public health restrictions which have been introduced to halt the resurgence of the virus. NIESR called for the CJRS extension from July 2020, on the basis that it would protect the economy and pay for itself through higher taxes and lower welfare spending; its late announcement will, however, have reduced its benefits.

The government has undertaken large amounts of borrowing but most of it is temporary.
As a consequence of the economic crisis caused by the pandemic and the associated government measures to contain the virus, the government deficit has risen substantially. The increase in the budget deficit resulted partly from greater spending and transfers and partly from lower tax receipts during the downturn. Government revenues declined because of reduced economic activity and tax breaks and holidays, while expenditure increased to provide much needed support to businesses and households. Examples of new expenditure are the CJRS and SEISS that we estimate will cost the Treasury up to £100 billion in the 2020–21 fiscal year.

In its November Economic and Fiscal Outlook the Office for Budget Responsibility estimated that government borrowing would increase to £394 billion in the fiscal year 2020-21 (19 per cent of GDP) and £164 billion in 2021-22 (7.4 per cent of GDP), with government debt peaking at 109 per cent of GDP in 2023-24. Since then, the December data show that borrowing has turned out £44 billion lower than the OBR forecast in the first 9 months of the fiscal year because of higher tax receipts and lower public spending. But on the other hand, the winter lockdown is expected to push up the deficit in the last quarter of the current fiscal year because of additional spending related to the extension of the job support scheme and lower revenues in the sectors most hit by the lockdown.

The deficit stays persistently high during the forecast period.
Assuming no change in policy, borrowing reaches £364 billion (17.6 per cent of GDP) in 2020 and £135 billion (6.1 per cent of GDP) in 2021. A downside risk to our forecast results from the losses that the Treasury could incur in the case of write-offs from pandemic loans, which we have not explicitly accounted for because they are very uncertain. The OBR estimates the write-offs could reach 27½ billion in 2020-21, or 1.3 per cent of GDP. The deficit then gradually falls to 3.4 per cent of GDP in 2025. This is a full percentage point higher than the average of the deficit in the years from 2016-2019, and highlights the persistent impact of COVID-19 on the budget deficit. The higher deficit comes a combination of lower GDP which reduces tax revenues and higher expenditure. Küçük and Whyte (2021) show that a good rule of thumb is that a 1 percentage point decrease in GDP growth results in a 0.8 percentage point increase in expenditure growth.

Receipts and spending are both forecast to be larger as a share of GDP but spending is expected to have risen slightly more, partly as a result of the increased investment programme announced before the pandemic (see Table A8) and higher unemployment. Our main case forecast scenario includes no additional discretionary fiscal consolidation beyond the £13bn announced at the Autumn Statement in the form of a public sector pay freeze, cuts to local authority funding and overseas aid.

Interest rates stay low despite the higher debt, and debt sustainability does not appear to be under threat.
Public sector net debt increased to 99.4 per cent of GDP in the 9 months to December 2020 – the highest debt to GDP ratio since the financial year ending in 1962, and we estimate that it will reach 108 per cent of GDP in 2020–21 and 110 per cent in 2021–22 (see Figure 1.16). Debt should only decline moderately in the following years, reaching 106 per cent of GDP in 2025. The higher level of debt has not prompted any worry from financial markets about the ability of the UK to service its debt. All three major credit agencies S&P, Fitch and Moody's rate UK-issued bonds just 2 or 3 levels below the maximum rating. 10-year gilt yield reached a record low of 0.1 per cent in August 2020 and stayed between 0.2 and 0.4 per cent since then (see figure 1.17). We forecast gilt yields to increase only very moderately in the next few years and interest payments to actually fall as a share of GDP, from 2.2 per cent in 2020-21 to 1.7 per cent in 2025-26.

It may at first appear advantageous for the UK to 'lock-in' the low interest rates and increase the average maturity of debt by issuing more longer maturity bonds and purchasing shorter maturity bonds. Such new long-maturity bonds may be required for example to finance new infrastructure projects as part of the objective to increase public sector net investment to 3 per cent of GDP. But the Debt Management Office, which is the agency that manages UK debt, must balance this opportunity with the necessity to provide liquidity for the market at all sorts of maturities, including short maturities.

One reason for low gilt yields is clearly the Bank of England's continued participation in the bond market: something we anticipate continuing for some time (see figure 1.17). In theory the expansion of the Bank of England's gilt holdings presents a fiscal risk: the fiscal benefit of quantitative easing is the difference between gilt rates and interest paid on Bank reserves, so an increase in the latter may lead to a fall in the Bank's profits which are returned to HM Treasury. However, the central case scenario for interest rate rises is included in fiscal forecasts and any larger or earlier rises in interest rates are likely to have been occasioned and accompanied by a larger or earlier recovery in the economic and, therefore, in the fiscal forecasts: any fiscal risk arises from the confluence of slow growth and higher inflation.

Figure 1.16 Public sector net debt
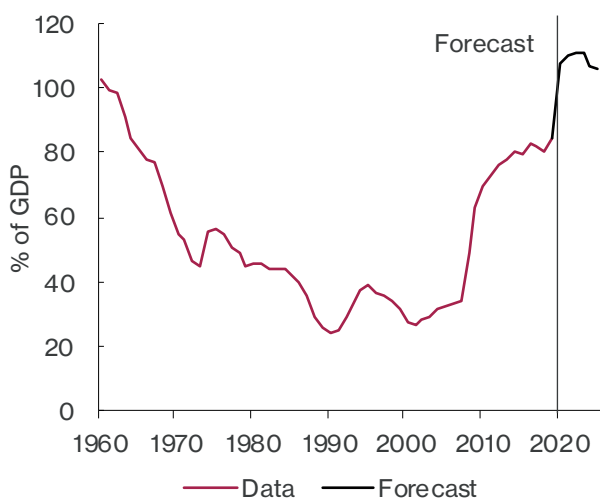
Source: ONS, NIESR forecast.

Figure 1.17 Public sector net debt and 10-year gilt
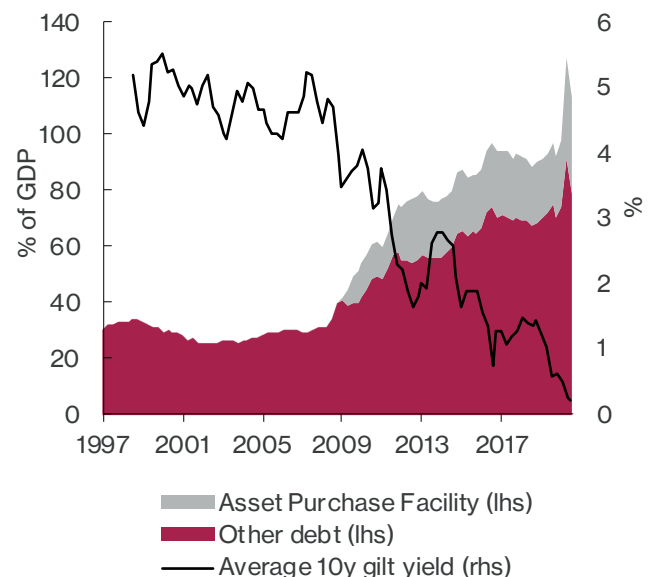
Source: Debt Management Office, NIESR.

Box A   A post-Covid fiscal consolidation

By Cyrille Lenoël and Kemar Whyte

Given the immense pressure on the Chancellor of the Exchequer to outline a plan to steer the economy out of the doldrums and restore public finances, using NiGEM, NIESR's global macroeconometric model, we present different scenarios of fiscal consolidation to reduce the deficit by 2 percentage points in 3 years. In doing so, we assume that the consolidation does not start until the pandemic is brought under control and the economy is on a steady recovery path. The size of the consolidation of 2 per cent of GDP is taken from the estimated long-term impact of the pandemic on the deficit estimated in the OBR November 2020 forecast.

Simulation results depend crucially on the parameters that govern the size of the fiscal multipliers, defined as the ratio of the change in national income arising from an exogenous change in government spending or revenue plans. Fiscal multipliers in NiGEM are based on historical estimates, i.e. estimates obtained during 'normal times', and therefore would not be applicable during crisis periods, especially when significant parts of the economy are shut down to control the spread of the virus. Therefore, we analyse alternative consolidation strategies when the economy has recovered most of its losses due to Covid-19.

Figure A1 shows the implied multipliers for a set of tax and spending shocks based on historical estimates. A smaller multiplier is preferable in the case of a consolidation because it gives a smaller reduction in GDP for a given increase in government revenues or reduction in government spending. We find that the smallest tax multiplier is for income tax (0.2 after 3 years) and the largest multiplier is for corporate tax (0.6). The increase in income tax reduces real personal disposable income. Households reduce consumption, but also decrease their savings to preserve some of the consumption. The increase in VAT leads to higher consumer prices, which also reduce real personal disposable income. But it also hits the corporate sector because workers ask for higher wages to keep up with inflation and this increases producer costs and reduces their profits. Lower private sector investment is moderated by the fact that we assume that the Bank of England does not immediately respond to the inflationary effect of the VAT hike, which means that real rates decrease. The highest multiplier is for corporate tax because of its negative effect on the supply side. The increase in corporate tax leads to higher user cost of capital, which results in a permanent decrease in investment and therefore of potential output. Corporate profits are squeezed and the demand for labour diminishes. Household income is reduced because of higher unemployment.

The average spending multiplier is about the same as the average tax multiplier at slightly below 0.5. The literature finds that multipliers tend to be time and state-dependent (see for e.g. Lenoël, 2020; Sims and Wolff, 2017; and Canzoneri et. al, 2016). Because there is currently a large negative output gap and the Bank Rate is at the effective lower bound, we have reasons to believe that the multipliers may be larger than usual, and starting a consolidation too soon or too aggressively may tip the economy back into a recession.

We run two simulations, one of a tax increase and one of a spending cut. Both simulations are calibrated to a 2 per cent reduction in the deficit in the three years following the start of the consolidation. The tax increase is equally split among increases in income tax, corporate tax and VAT, so that each tax increase should increase revenues by ⅔ of GDP in three years. We calculate that to achieve this, effective corporate tax rate needs to increase gradually from 10.7 per cent to 13.9 per cent, VAT from 20 per cent to 21 per cent and the effective income tax rate from 22.3 per cent to 23.1 per cent. The tax increases are assumed to be spread over three fiscal years. The second simulation involves a reduction of government expenditure of the same magnitude as the shock to taxes. We compute that expenditure needs to be cut by 5.3 per cent in order to obtain a 2 percentage point reduction in the deficit-to-GDP ratio in three years. The expenditure shock is split among consumption, investment, and transfers according to their respective size.

Multipliers will generally be affected by the endogenous response of monetary policy to a fiscal shock as explained by Chadha and Nolan (2004). For example, an increase in VAT pushes up inflation and, if the central bank increases interest rate as a response, it will further reduce GDP and therefore increase the multiplier. To separate the monetary response, we assume in the simulations that the Bank of England does not change its policy rate in the first two years.

Figure A.2 shows the impact on GDP and the budget balance under the two simulations. The expenditure scenario leads to a slightly larger decline in GDP after 3 years, a 1 per cent reduction in GDP as opposed to ¾ per cent for the tax scenario. Spending cuts might have a larger downside effect than implied by the historical parameters even in the recovery phase given the continued need for fiscal support as the economy adjusts to a post-pandemic allocation with differential impacts at household, sector and region level and an increased emphasis on health and

Figure A1 3rd year cumulative fiscal multiplier
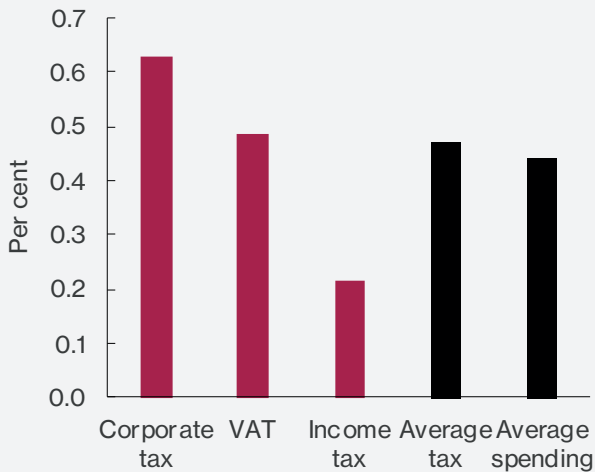
Note: Absolute value of the change in 3rd year GDP for a change in tax revenues or in spending of 1 per cent of GDP spread over 3 years. Spending shock is composed of government expenditure, investment and transfers based on historical weights. Average tax shock is calibrated so that each tax (income, VAT and corporate) brings in the same amount of additional revenue.
Source: NiGEM simulation.

Figure A2 GDP and budget balance
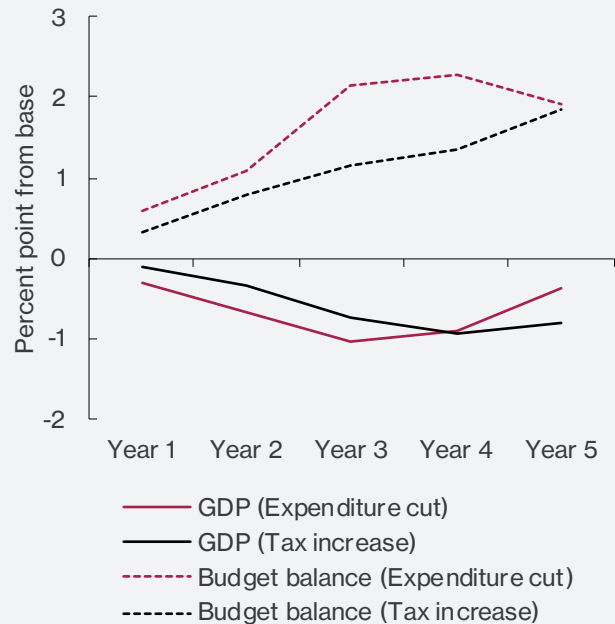
Note: The expenditure cut and the tax increase are calibrated to 2% of GDP each and introduced over 3 years.
Source: NiGEM simulation.

social care. For households, the expenditure scenario is the most harmful because it reduces their transfers by over 5 per cent, which leads to a slightly larger reduction in real personal disposable income than in the tax scenario where they suffer from higher prices because of the VAT hike. The tax scenario leads to a smaller than 2 per cent of GDP improvement in the budget balance because the recessionary impact leads to a smaller tax base. In both scenarios, the unemployment rate rises by 0.6 percentage points after 4 years. Our findings are also consistent with related studies in the literature. For example, Erceg and Linde (2013) find that with limited scope for monetary accommodation, tax-based consolidation tends to have smaller adverse effects on output that expenditure-based consolidation in the near-term, though is more costly in the longer-run.

The results of our simulations suggest that a prudent approach to fiscal consolidation would favour tax rises to spending cuts because of their relatively smaller impact on GDP initially. Among the possible tax rises, income tax should be preferred because of its lower multiplier. The emphasis on tax rises is also justified by the need for increased spending on welfare, health, infrastructure and education due to the large negative shock from the pandemic. Cutting public investment and spending on social care and education would have more adverse effects on the economy's longer-term potential output through their impact on productivity. The consolidation should only start when the economy is on a clear recovery path, and even so should be done gradually in order not to harm the recovery.

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The Budget comes at a crucial time in the fight against Covid-19.

The Chancellor of the Exchequer will present his Budget to the House of Commons on 3 March. He is expected to announce short-term measures to continue to support the economy during the pandemic (Universal Credit, furlough and self-employed schemes). But he should in our view resist political pressures to increase taxes until the recovery is on a firmer footing. The fiscal background is a debt-to-GDP ratio which is high by modern standards but this follows two shocks of unusual magnitudes in just over a decade. His first priority should be providing the necessary fiscal support to support the public health measures required to tackle Covid-19 until the vaccination programme is successful in reducing the health threat. The second priority should be a new framework that gives us time to ride this storm and provide comfort to market participants that there is no credit or inflation risks for UK debt.

There is no need to panic about the higher debt as a result of the pandemic but fiscal consolidation will require detailed planning.

Standard theory suggests that one-off level shocks to the debt stock or ratio should not necessarily result in fiscal adjustment but that what matters for the future path of debt are the deficit and the relationship between interest rates and growth. The government of the day may decide for other reasons – for example, because it perceives the edge of a 'fiscal cliff', or because it anticipates another large negative economic shock in the near future – that it nonetheless wishes to reduce government debt more rapidly.

Any plan to reduce public debt should be consistent with economic and social objectives for fiscal policy (Chadha, 2020). It would arguably be too early to start a fiscal consolidation when the country is in the middle of battling the pandemic and the economy is weakened. The number of Covid-19 related daily deaths reached a peak of 1820 on 20 January 2021, and GDP in the first quarter of 2021 is forecast to be 11.6 per cent below end-2019 level. The degree of fiscal consolidation required is also uncertain at this point because we do not know the full extent of the impact of the pandemic on public finances and the economy until the pandemic is over. This should not, however, preclude the government from beginning a Comprehensive Tax Review to examine the best way to raise additional taxation should it turn out to be necessary on the basis of lasting economic damage.

The choice of an appropriate fiscal instrument is critical as debt reduction requires sequences of fiscal surpluses and nominal GDP growth. In box A, we present different scenarios of fiscal consolidation to compare the implications of tax rises and spending cuts once the recovery from the pandemic is on a stronger footing.

Prices and monetary policy

Inflation subdued but likely to rise through 2021.

Inflation has remained low in recent months, largely in line with our expectations for Q4 of 2020 and Q1 of 2021, rising slightly to 0.6 per cent in December 2020. NIESR's Lockdown Weighted Consumer Prices Index[9] also strengthened in December and the gap between it and the CPIH measure has gradually diminished since the start of the pandemic.

As discussed in Section 6 we expect debt servicing to add to input costs post-Covid; this may also be accompanied by costs relating to making workplaces safe for social consumption.

Coupled with the recovery in domestic demand we expect inflation to rise during 2021, with CPI inflation reaching 1.3 per cent in Q4 and 2 per cent in 2022. Inflation then remains close to but below its 2 per cent target in each year between 2023 and 2025 (figure 1.18).

Inflation expectations implied by forward interest rates for the coming years were marginally lower in January 2021 than in October 202, but still slightly higher than before the Covid-19 pandemic (see figure 1.19).

Interest rates to remain low but positive for the medium term with asset purchases still the go-to for policymakers.

Interest rates have been maintained at 0.1 per cent and remain at that level in our main case forecast scenario until the start of 2024. The Bank of England has been consulting on the introduction of negative interest rates, with Monetary Policy Committee members clearly taking different views on their effectiveness, but at this stage we regard it as a theoretical discussion about the monetary policy toolkit available in the case of a further negative shock, rather than a sign that negative interest rates are imminent. Term Funding Schemes have given the authorities the means to pass on lower rates to parts of the economy without threatening intermediaries' margins and seemingly without unwanted side effects.

Further extensions of quantitative easing – seemingly the marginal policy instrument – at the February or March meetings of the Monetary Policy Committee are possible, though unlikely to be unanimous, given the different mood music coming from its members. There remains a tail possibility of interest rates rising more quickly than forecast due to a consumer boom driven by the savings accumulated by some households during the lockdown periods. The Governor of the Bank of England has indicated a preference for 'unwinding' asset purchases before raising interest rates. In general, it is difficult to estimate when asset purchases will be 'wound down' because of the lack of prior experience and precise estimates about what it

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9   Dixon, H. (2021) 'The Lockdown Weighted inflation CPILW for December 2020' https://www.niesr.ac.uk/blog/lockdown-weighted-inflation-cpilw-december-2020

Figure 1.18 Inflation fan chart
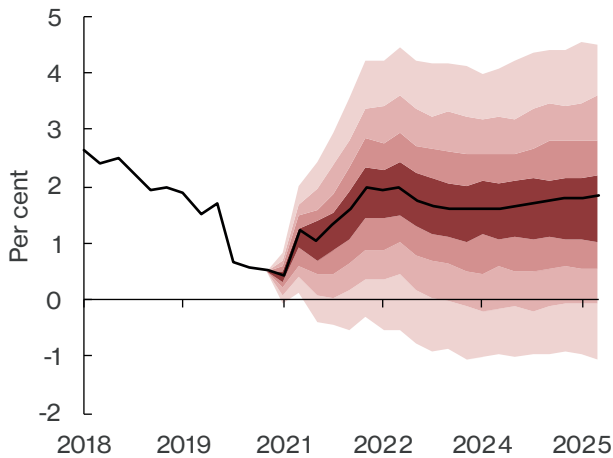
Note: The fan chart is intended to represent the uncertainty around the main-case forecast scenario shown by the black line. There is a 10 per cent chance that CPI inflation in any particular year will lie within any given shaded area in the chart. There is a 20 per cent chance that CPI inflation will lie outside the shaded area of the fan. The Bank of England's CPI inflation target is 2 per cent per annum
Source: NIESR forecast and judgement.

Figure 1.19 UK instantaneous implied inflation forward curve
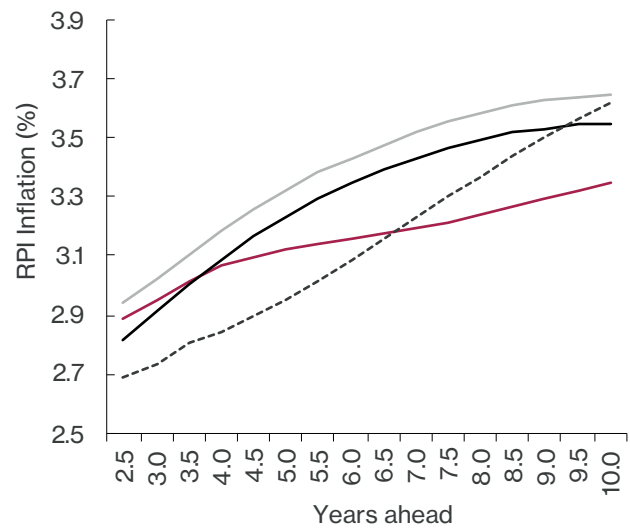
Note: RPI inflation rates derived from the gilt yield curve include an inflation risk premium related to liquidity.
Source: BoE, NIESR.

would do to inflation and the economy (Independent Evaluation Office, 2021).

As discussed above, support from monetary policy, in the form of low interest rates and increased quantitative easing (QE), has contributed to lowering rates on government bonds. At the end of December 2020, the contribution to public debt of Bank of England interventions was just under £232 billion, or 10.8 per cent of GDP, largely a result of its quantitative easing activities through the BoE Asset Purchase Facility Fund and Term Funding Schemes[10]. Term Funding Scheme loans are expected to be repaid at their four-year term, contributing to a decline in headline net debt after 2024-25. Turner (2021) reviews the financial stability implications of central bank balance sheet policies and highlights the potential risks associated with a rise in real interest rates discussed on page 15.

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2 UK sectoral outlook

by Cyrille Lenoel and Garry Young

■ Most industries experienced large falls in output during the spring lockdown and have only partially recovered by November 2020.

■ Activity is currently subdued even in sectors not directly impacted by social distancing measures because of negative spillovers from other sectors.

■ We forecast the recovery to be relatively stronger compared to the recovery from the 2008-09 recession in the production industries, construction and finance, and to be relatively weaker in the public sector, real estate and private traded services.

The Covid-19 shock has had an unequal impact on different sectors of the economy as we have discussed extensively in our forecasts since the start of the pandemic (see for e.g., Lenoël and Young, 2020 and Küçük, Lenoël and Macqueen, 2020). Table 2.1 sets out the size of the initial hit and the recovery in different sectors, giving the peak to trough fall in output and an indication of how far each sector is from previous peak at 2020 and end-2022.

Forecasts of sectoral recovery paths are based on a new Dynamic Sectoral Model of the UK economy currently under development at NIESR. The model disaggregates the UK forecast in NiGEM into nine industrial sectors that are linked via input-output and output-expenditure relationships. These are: agriculture and utilities, mining and quarrying, manufacturing, construction, public, private non-traded services, finance, imputed rent and

Table 2.1   Sectoral trends

Sector and industry	Weight per 1000	% fall in output to April 2020 Trough	% fall in output at November 2020	Forecast recovery from 2020q4 to 2022 q4 (%)	Difference between forecast output at end-2022 compared with end-2019 (%)
Public:	181	–24.1	-7.2	9.0	–3.8
Health	75	–11.4			
Education	59	–9.4			
Administration	47	1.8			
Private non-traded services:	151	–48	–19.6	9.4	–1.5
Wholesale and retail	104	–36.5	-5.3		
Accomodation and food	29	–88.6	-63.1		
Other services	18	–48.7	-31.9		
Real estate	135	–2.7	–1.9	–0.6	–2.9
Construction	64	–43.3	–0.3	7.9	–1.0
Manufacturing	101	–29.4	–4.2	8.7	1.5
Mining and quarrying	11	–23.1	–10.9	–14.9	–18.3
Private traded services:	236	–24.5	–11.2	8.5	–4.0
Transport and storage	40	-39	–14.7		
Information and communication	66	–11.6	–6.9		
Professional, scientific	77	–20.4	–6.8		
Administration & support	53	–35.7	–20.5		
Financial services	68	–5.0	–3.2	6.6	–2.5
Utilities	33	–8.7	–2.5	1.2	3.8
Agriculture	6	–8.6	–4.1		
Electricity	14	–9.4	–3.4		
Water supply	13	–7.9	–0.9		
Total	1000	–25	–8.9	7.2	–2.4

Source: ONS, Markit, NIESR calculations.

private traded services. Gross output of each sector is equal to domestic final and intermediate demand plus exports net of imports less a residual term that in aggregate is equal to taxes less subsidies on products. Value added output in each sector is assumed to be given by a Cobb-Douglas production function, which is then used to compute the implied level of employment in the sector given production, capital and productivity assumptions. The choice of the sectors is particularly appropriate to study the impact of shocks like Brexit or Covid. This model has been used to show spillovers from sectors during a lockdown (see Lenoël and Young, 2020).

The immediate fall in output from January to April 2020 was very sharp, with gross value added (GVA) in the whole economy falling by 25 per cent. Most industries experienced large falls in output, with the largest falls in accommodation and food services (89 per cent), other services including arts and entertainment (49 per cent), and construction (43 per cent).

By November whole economy GVA remained 8.9 per cent below its January level. This partly reflected the lack of social consumption in some sectors, especially accommodation and food (63 per cent down) and other services (32 per cent down). And while construction activity was almost back to January levels, GVA was mostly significantly lower than at the beginning of the year.

It is worth noting that activity was also subdued in sectors where people could easily work from home (such as finance and other private sector services) or where social distancing is not thought to be a constraint (utilities). This is likely to partly reflect the lack of demand for the intermediate output of these sectors coming from sectors more directly affected by restrained social consumption.

A robust recovery is likely over the next two years once the Covid crisis eases. The main-case forecast scenario is for cumulative GVA growth in the whole economy of 7.3 per cent between the end of 2020 and end-2022. Growth is likely to be stronger in sectors where activity was most depressed in 2020, as the economy returns towards some normality.

But the level of output at the end of 2022 in the main-case forecast scenario is almost 2½ per cent lower than at the end of 2019. That reflects the transmission through the economy of lower spending as government, households and businesses are assumed gradually to rebuild their balance sheets. In this scenario, public sector output is 3.8 per cent lower at the end of 2022 than at the end of 2019, largely reflecting low public spending, private non-traded output is 1.5 per cent lower, reflecting lower private consumption, and construction is 1.9 per cent lower, reflecting lower investment. Lower spending is

Figure 2.1 Recoveries compared (GVA whole economy)
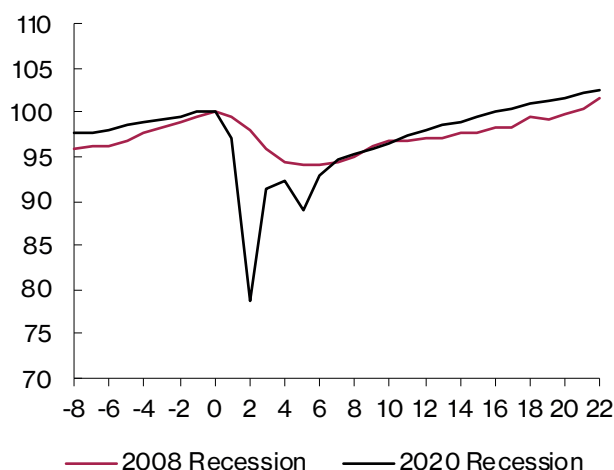
Note: Output is normalised to 100 in the pre-recession quarter (2008Q1 and 2019Q4). The pre-recession quarter is set at 0 on the x-axis.

transmitted to other sectors such as private traded services (down 4 per cent) and finance (down 2.5 per cent) as demand for intermediate outputs from other sectors is reduced.

How does the recovery from the Covid recession of 2020 in the main-case forecast scenario compare with the recovery from the financial-crisis-recession of 2008? Figure 2.1 compares the time series of aggregate GVA around these two recessions. It shows that output did not recover its pre-recession level in the 2008 recession for 21 quarters. The recovery is somewhat faster in the current main-case forecast scenario, taking 16 quarters to recover the pre-recession level of output, though the cumulative loss of output is larger.

At a sectoral level, the pace of the forecast recovery is broadly similar to the post-2008 recession recovery as shown in figure 2.2. The main difference is that the recovery is forecast to be relatively stronger this time in the production industries, construction and finance (where the recession was focused last time) and relatively weaker in the public sector, real estate (which includes imputed rent of owner-occupiers) and private traded services.

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Figure 2.2 Comparison of gross value added by sector between 2008 and 2020 recessions
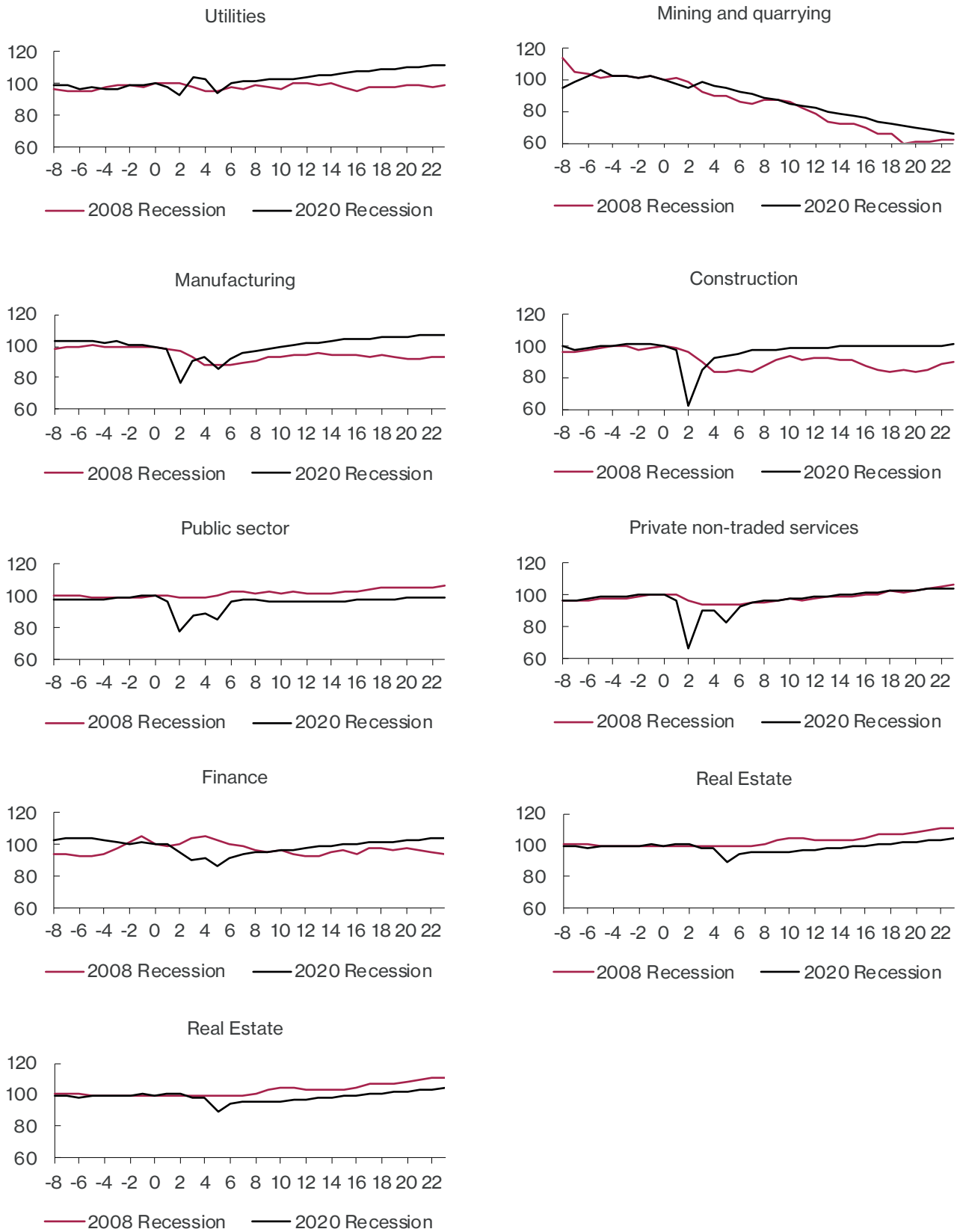
Note: GVA is normalised to 100 in the pre-recession quarter (2008Q1 and 2019Q4). The pre-recession quarter is set at 0 on the x-axis.

3 UK regional outlook

by Arnab Bhattacharjee and Elena Lisauskaite[11]

- The effects of COVID-19, together with Brexit, continues to burden the UK economy (Lenoël et al., 2021). We analyse the regional impacts of the two shocks on a number of aggregate economic indicators – GVA, employment, labour productivity – as well as the effects on the poorest of the society, specifically income at the 10th percentile and destitution levels[12] in the UK.

- All regions in the UK experienced a decline in GVA levels starting 2020Q1 and continuing throughout 2020. Some suffered more than others. A substantial decline in GVA for London, with 12.6% decrease in 2020Q4 from 2019Q4, followed by East of England, Wales, North East and West Midlands, with around 10% decline or more. These patterns are consistent with nowcasts (upto 2020Q3) published by ESCoE (2020).

- London, South East and South West will recover quickly. Northern Ireland, the North East, West Midlands and Wales suffer from longer term effects. Regional resilience differs markedly. Sectoral projections partially explain these differences. Regions with higher shares in Manufacturing and Public services will suffer longer consequences, whereas Financial and Private Services (traded and nontraded) sectors help regions to recover quicker. These patterns mirror sectoral projections in Lenoël and Young (2021). This recovery pattern is contingent upon continued Brexit negotiations.

- The fall in employment was most pronounced in the East Midlands, Northern Ireland and West Midlands, falling around 4 percent or more in 2021Q4 relative to 2019Q4. This is followed by the South West, the South East and the East of England. The impact on employment levels was comparatively lower in London, the North East and Yorkshire and the Humber.

- Similarly, as with the trends of GVA, labour productivity was lower in all regions in 2020Q4 relative to 2019Q4. However, the magnitude differs and so too the recovery times. London suffered the highest drop in productivity, followed by North East and East of England. The smallest decreases were observed for South East and South West.

- East Midlands is projected to have among the quickest recoveries, together with less impacted South East and South West. Northern Ireland is projected to have persistently low productivity levels in comparison to 2019Q4 levels. This is subject to its role in post-Brexit connections with the EU, which is a space to be closely monitored.

- The extreme poor in different regions are differently affected. Based on the 10th percentile of household income for the different regions, the North West is affected the most, with substantially lower income at the bottom decile than it would have been in the absence of COVID-19 and Brexit. Destitution in the North West is also projected to be higher, together with London and the East of England.

- Northern Ireland fares better, despite the huge and persistent effects on GVA and labour productivity. Without the COVID-19 and Brexit shocks, Northern Ireland would have had the highest incidence of destitution. However, a strong response to the two shocks implies that these impacts in Northern Ireland are reversed.

Nearly a year has now passed since lockdown was first imposed due to the COVID-19 pandemic. This inevitably brought about distortions to many businesses, lives of employees and their households, particularly the self-employed. With the Coronavirus Job Retention Scheme (CJRS), or furlough scheme, further extended until the end of April 2021, and lockdown measures in place across most parts of the UK, there is a persistent effect of COVID-19 on the British economy (Lenoël et al., 2021). In addition, since the last quarterly NIESR Review, an agreement has been reached between the UK and the EU and projections about the effects of Brexit (Hantzsche and Young, 2019; Küçük et al., 2020) need to be revised. There is need to identify segments of society and the economy where the impacts are most devastating and to devise policy targeted at such segments.

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11 With inputs from Jagjit Chadha, Cyrille Lenoël, Hande Küçük, Adrian Pabst and Garry Young.

12 Destitution is defined as extreme poverty, that is, income so low that a household is likely to lack the provision of essentials such as shelter, food, heating, lighting, clothing/footwear and basic toiletries in the immediate future. Specifically, we use the income component of Joseph Rowntree Foundation's definition and consider a single person household as being destitute when their income falls below £70 per week, with any additional adult requiring another £30 per week and an additional child needing £20 per week.

Table 3.1   Regional Economies in 2015 (ONS 2015)

Region	Employment Share (%)	Weekly Earnings, relative to UK	Annual GVA share (%)
NE	3.8	85	3.0
NW	10.7	89	9.6
YH	8.0	90	6.6
EM	7.2	91	5.8
WM	8.4	91	7.3
EA	9.6	104	8.4
LON	14.0	124	23.4
SE	14.2	113	15.1
SW	8.6	94	7.4
WA	4.5	89	3.5
SC	8.4	95	7.7
NI	2.6	83	2.2
UK	100.0	100	100.0

Notes: Regions: NE = North East, NW = North West, YH = Yorkshire & The Humber, EM = East Midlands, WM = West Midlands, EA = East of England, LON = London, SE = South East, SW = South West, WA = Wales, SC = Scotland, NI = Northern Ireland, UK = United Kingdom.
Source: ONS, 2015.

Figure 3.1   Regional population in the UK

The NIESR has recently highlighted regional and sectoral impacts of the shocks (Aitken et al., 2019; Bhattacharjee and Lisauskaite, 2020a; Chadha, 2020; Küçük et al., 2020; Verikios et al., 2020), especially as compared against a levelling-up agenda (Bhattacharjee et al., 2020; Gathergood et al., 2020; NIESR, 2020a; UK 2070 Commission, 2020). Now is the time to bring more clarity to our forecasts and projections, particularly from regional and distributional perspectives. For this purpose, we have embarked upon an ambitious and challenging programme to develop, for the first time, a regional model capable of producing nowcasts and projections of regional economic performance in the UK.

This regional model, NiReMS (National Institute Regional Modelling System) is aligned to the NIESR's global macroeconomic model NiGEM (National Institute Global Econometric Model) (NIESR, 2018), dynamic microsimulation model LINDA (Lifetime Income Distributional Analysis) (NIESR, 2016) and Dynamic Sectoral Model (Lenoël and Young, 2020, 2021). This is a unique regional model for the UK in that it is structural and enables modelling spatial spillovers of global and local shocks. The development of NiReMS is in progress, but currently produces projections for the 12 NUTS1 Government Office Regions in the UK. This includes nine regions of England (London, the South East, the South West, the East of England, East Midlands, West Midlands, the North West, Yorks. & the Humber and the North East) together with the three nations (Northern Ireland,

Scotland and Wales). A brief economic snapshot of these 12 regions for 2015 is provided in Table 3.1 together with a map showing the locations, boundaries and populations (figure 3.1). On most economic indicators, London and the South East dominate, and there is large regional variation.

The two major current shocks to the economy – COVID-19 and Brexit – have had significant impacts, affecting a range of sectors and regions differently (Küçük et al., 2020). In this paper, we use NiReMS (NIESR, 2021) to present an overview of the regional short to medium run impacts on a number of economic indicators. These are: gross value added (GVA), employment, labour productivity, as well as income distribution and destitution.

Methodology for the National Institute Regional Modelling System (NiReMS)

The methodology for NiReMS (NIESR, 2021) is under development. The current projection exercise employs a combination of three approaches. The first is a new generation econometric spatial panel data model, accommodating spatial (regional) heterogeneity together with effects of global shocks (factor structure) and local shocks (inter-regional spillovers). We model regional impacts of the combination of COVID-19 and Brexit

shocks using an estimated model with global shocks. Past data reflect that the regions have varying responses to these aggregate shocks, which then results in different trajectories for regional GVA (output) and employment.

Secondly, we combine the above econometric model with a growth accounting approach exploiting regional variations in sectoral composition as evident from current ONS data and latest data (for 2017) from Round 6 of the UK Wealth and Assets Survey (WAS6, 2019). This approach builds upon the NIESR's current projections of sectoral trends the using Dynamic Sectoral Model (Lenoël and Young, 2020, 2021). We take projections from the sectoral decomposition of aggregate UK GVA and employment reported in Lenoël and Young (2021), and use past data on differences in sectoral profiles across regions to obtain a second set of estimates for regional GVA and employment. This exercise is founded upon the well-established structural macroeconomic model NiGEM (NIESR 2018) as well as input-output tables (Lenoël and Young, 2020). The above estimates of regional output, employment and productivity are then used to obtain projections of wages and unemployment at the regional level.

The third approach is based on dynamic microsimulation using the NIESR's microsimulation model LINDA (Lifetime Income Distributional Analysis) (NIESR, 2016; van de Ven, 2017). This approach is closely related to ONS (2020), who provide nowcasts of income inequality using a microsimulation model based on Living Costs and Food Survey data, together with information on tax and benefit policy. We take regional wages and unemployment rates into LINDA to estimate regional profiles of distributional structures. Finally, projections from the three approaches are combined and calibrated against aggregate projections from the latest NiGEM (NIESR, 2018) data projections; see Lenoël et al. (2021). Further details are available in NIESR (2021).

Gross value added

The UK has had large variation in regional GVA (Ebell, 2017). COVID-19 and Brexit shocks are projected to have substantial impacts upon this distribution of GVA across regions. Without any exceptions, all regions have experienced decline in GVA starting in 2020Q1 and continuing throughout 2020 (see figure 3.2). NIESR has previously argued that "COVID-19 was never the best leveller" (NIESR, 2020b). Some regions suffered substantially more than others. In the immediate aftermath of COVID-19, the biggest slumps in GVA can be observed for London with almost 29% decrease in GVA between 2020Q1 and 2020Q2.

Table 3.2 presents regional comparison of GVA in 2020Q4-2023Q4 relative to 2019Q4, while figure 3.2 plots the regional downturn and recovery. The decline is prominent in all regions, varying from 4.1% in the South East to 12.6% in the London area. The quickest

recovery is experienced by the South East and the South West following relatively smaller declines. Our projections reflect that the sharply declined GVA in London will bounce back much quicker than other regions (figure 3.2) catching up with East Midlands by 2023Q4. In the medium run, London is projected to witness among the largest growth in GVA. This evidence may be viewed against large regional variations in GVA in the past (see Ebell (2017) and Table 3.1) as well as substantial variation in economic resilience (Sensier and Devine, 2020), highlighting the highest recovery, particularly for GVA, in the South East, the South West, and London.

Large medium run falls in GVA are also projected for East of England and Wales. Poor growth in GVA in the long run will also continue in the North East and the West Midlands. Sustained regional policy, such as transport (HS2) and regional policy focusing on jobs and skills, may mitigate against such protracted adverse impacts. The impacts upon Northern Ireland are devastating, with persistently lower levels of GVA in comparison to 2019Q4. These, however, may be partly mitigated by its continued role as part of the EU's Single Market and Customs Union. Therefore, effects of trade and potential regional redistribution of trading activities is an important issue to monitor closely moving forward.

Northern Ireland and London, and to lesser extent, East of England, West Midlands and Wales, have experienced declines in their share of total UK's GVA in 2023Q4 relative to 2019Q4 (figure 3.3). On the other hand, the share of the South East and South West will likely rise. This may be related to short run reallocation of economic activity following the COVID-19 shock. In the medium run, the share of London recovers, however, East of

Figure 3.2 Regional GVA relative to 2019Q4
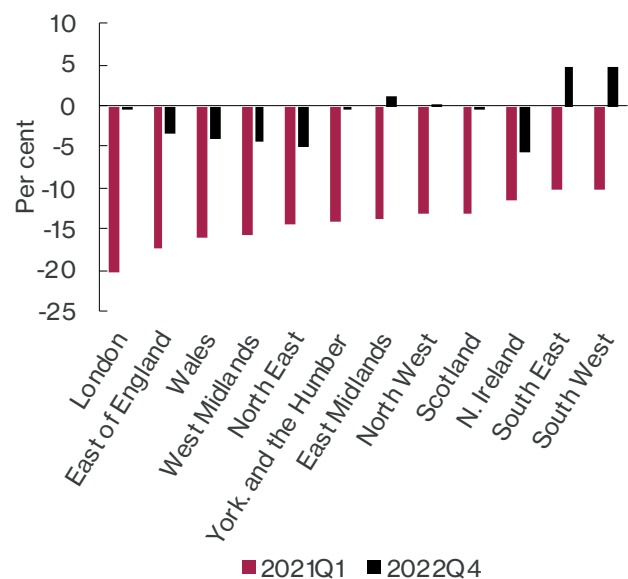
Source: ONS and NiReMS.

Table 3.2 Regional GVA relative to 2019Q4

	East Midlands	East of England	London	North East	North West	N. Ireland	Scotland	South East	South West	Wales	West Midlands	York. and the Humber
2020Q4	-6.1%	-10.8%	-12.6%	-9.9%	-8.5%	-8.1%	-8.5%	-4.1%	-5.1%	-10.6%	-9.9%	-6.7%
2021Q4	-2.0%	-6.1%	-5.3%	-6.5%	-2.9%	-6.1%	-3.6%	0.7%	0.6%	-6.3%	-6.1%	-2.9%
2022Q4	1.0%	-3.5%	-0.5%	-5.0%	0.3%	-5.7%	-0.6%	4.7%	4.8%	-4.1%	-4.2%	-0.5%
2023Q4	4.3%	-0.8%	4.4%	-3.6%	3.6%	-5.2%	2.6%	8.8%	9.0%	-1.9%	-2.4%	2.3%

Figure 3.3 Regional/total GVA in 2019Q4 and 2023Q4
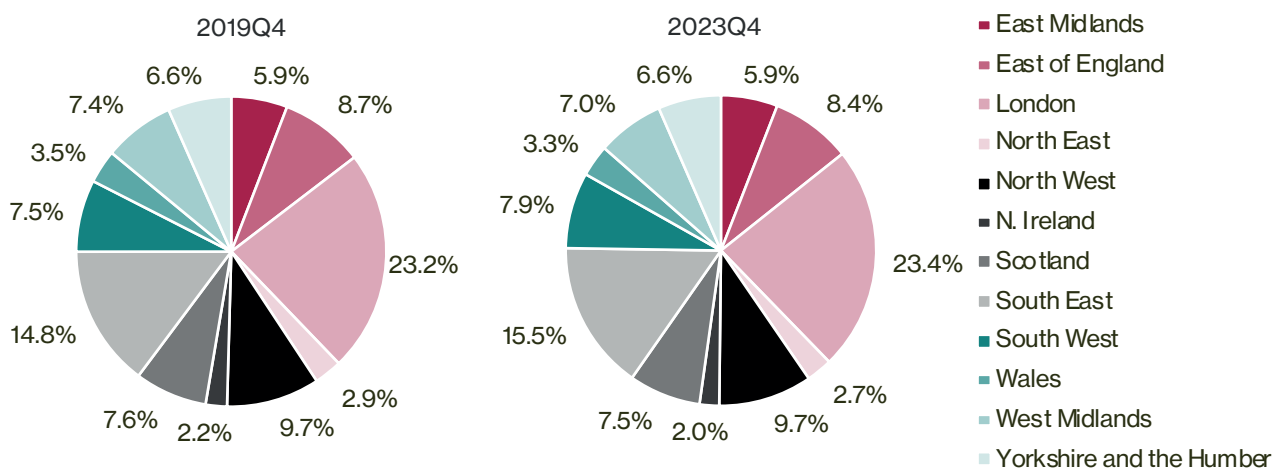
Source: ONS, NiGEM and authors' calculations

England, West Midlands and Wales still capture lower shares of total GVA than in pre-COVID-19 period (see figure 3.3). The trends reported in nowcasts published by ESCoE (2020), for quarters up to 2020Q3, are similar.

As one might expect, regional trends in GVA projection can be partly explained by sectoral projections, given that the regions of the UK vary substantially in their exposure to different sectors. Then, diverse sectoral influences are observed. Whereas, the Northern Ireland experience largely mirrors fall in public sector GVA, the West Midlands is strongly affected by Private Non-Traded Services and to some extent Manufacturing. By contrast, GVA in London is affected by a combination of Finance & Insurance, Real Estate, and Private Traded Services. These sectoral patterns are similar to Lenoël and Young (2021).

Employment

Regional employment is linked to local demand, which in turn is related to regional and aggregate UK GVA through an inter-regional model. Projections of regional employment is briefly discussed in the Methodology section, and further details of the model and methodology are reported in NIESR (2021). Following the COVID-19 shock, employment decline was partly moderated by the CJRS. In the medium run, our projections suggest slightly higher concentration of employment in London. However, we view this trend as contingent upon progress in Brexit negotiations relating to the service sectors, particularly financial services.

Regional trends in employment, relative to a no COVID-19 or Brexit scenario, are shown in figure 3.4. The largest shortfall in persons employed is concentrated in the South East and the South West, and to lesser extent, East Midlands and the North West. Most of this decreased employment occurs in the period 2021Q3 to 2022Q2, with employment recovering relatively after lockdown is expected to be withdrawn.

Figure 3.4 Projected Regional Employment (2019Q4=100) compared to Non-Covid/Non-Brexit Path
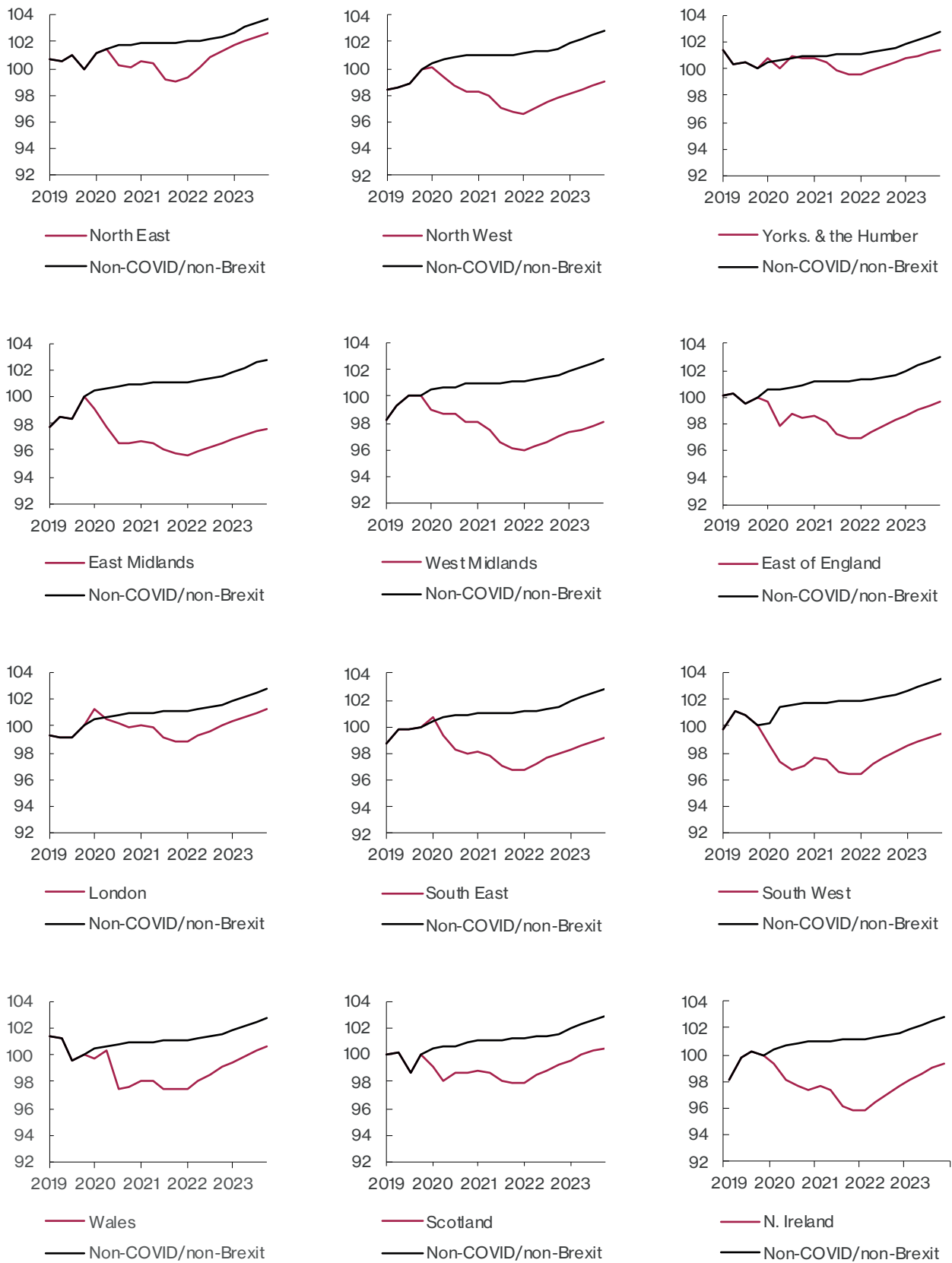
Source: ONS and NiReMS.

Table 3.3 Regional level of employment relative to 2019Q4

	East Midlands	East of England	London	North East	North West	N. Ireland	Scotland	South East	South West	Wales	West Midlands	York. and the Humber
2020Q4	-3.5%	-1.5%	0.0%	0.1%	-1.7%	-2.6%	-1.4%	-1.9%	-2.9%	-2.3%	-1.9%	0.7%
2021Q4	-4.3%	-3.1%	-1.1%	-1.0%	-3.3%	-4.1%	-2.1%	-3.2%	-3.6%	-2.6%	-3.9%	-0.3%
2022Q4	-3.5%	-1.7%	0.0%	1.3%	-2.2%	-2.4%	-0.7%	-2.0%	-1.9%	-0.9%	-3.0%	0.5%
2023Q4	-2.3%	-0.3%	1.3%	2.7%	-1.0%	-0.6%	0.6%	-0.8%	-0.5%	0.7%	-2.0%	1.5%

Source: ONS and NiReMS.

Over time, the fall in employment was most pronounced in the East Midlands, Northern Ireland and West Midlands, falling around 4 percent or more in 2021Q4 relative to 2019Q4 (see Table 3.3). This is followed by the South West, the South East and the East of England. The impact on employment levels was comparatively lower in London, the North East and Yorkshire and the Humber. To what extent such trends reflect remote and home working is an issue that requires further investigation. Negative impacts on employment are sustained in the medium run in the East and West Midlands. However, employment in most regions take until 2024 to recover to 2019Q4 levels.

This suggests an extremely lengthy and painful period of structural adjustment, which gives urgency to strong mitigation policy. In the short run, regional transfers and benefit payments targeted to the highly affected and vulnerable populations are likely the most effective measures. The government is already targeting specific councils and boroughs and encouraging them to receive coronavirus relief funds. Likewise, the most vulnerable households have been receiving enhanced Universal Credit support and small business support. These measures should be continued in the short to medium run.

In the medium to long run, careful regional planning would be required. Progress on the levelling up agenda has already been strongly urged; see, for example, Bhattacharjee et al. (2020) NIESR (2020a) and UK 2070 Commission (2020). The urgent need for policy has since been enhanced by COVID-19 and Brexit. Regional planning for infrastructure (transport, communications, etc.), education, skills and employment opportunities must be underpinned by careful and extensive study of regional variations in needs and resources. This would then provide planning solutions based on regional (and local) matches of skills and productivity, to create the best opportunities for specialisation and agglomeration economies. The path is both urgent and challenging.

Labour productivity

Alongside the worrying trends in output, productivity levels in Northern Ireland are projected to remain persistently lower following the COVID-19 crisis compounded by Brexit. As mentioned before, this may be partly offset by continued membership of the EU's Single Market and Customs Union. This is a matter that deserves continuous monitoring. The other regions with persistently lower and only slowly recovering productivity are the North East and Wales. London suffers a very sharp short-run downturn in productivity immediately following the COVID-19 crisis, contributed by a high proportion of employees on furlough, but productivity bounces back relatively quickly (figures 3.5 and 3.6).

Figure 3.5 reflects that across the whole of the UK, it takes productivity levels four years to return to 2019Q4 levels, but also that productivity variation across the regions are large and quite persistent. This implies that regional policy to bring about structural changes in skills and regional specialisations would take a long time.

Table 3.4 Regional labour productivity relative to 2019Q4

	East Midlands	East of England	London	North East	North West	N. Ireland	Scotland	South East	South West	Wales	West Midlands	York. and the Humber
2020Q4	-2.7%	-9.4%	-12.5%	-10.0%	-6.8%	-5.6%	-7.2%	-2.2%	-2.3%	-8.5%	-8.2%	-7.4%
2021Q4	2.4%	-3.0%	-4.2%	-5.6%	0.4%	-2.1%	-1.5%	4.1%	4.3%	-3.8%	-2.3%	-2.6%
2022Q4	4.8%	-1.8%	-0.6%	-6.3%	2.6%	-3.4%	0.2%	6.8%	6.8%	-3.2%	-1.2%	-0.9%
2023Q4	6.8%	-0.4%	3.0%	-6.1%	4.7%	-4.6%	2.0%	9.6%	9.6%	-2.6%	-0.4%	0.8%

Source: ONS and NiReMS.

Figure 3.5   Regional labour productivity (£/hour)
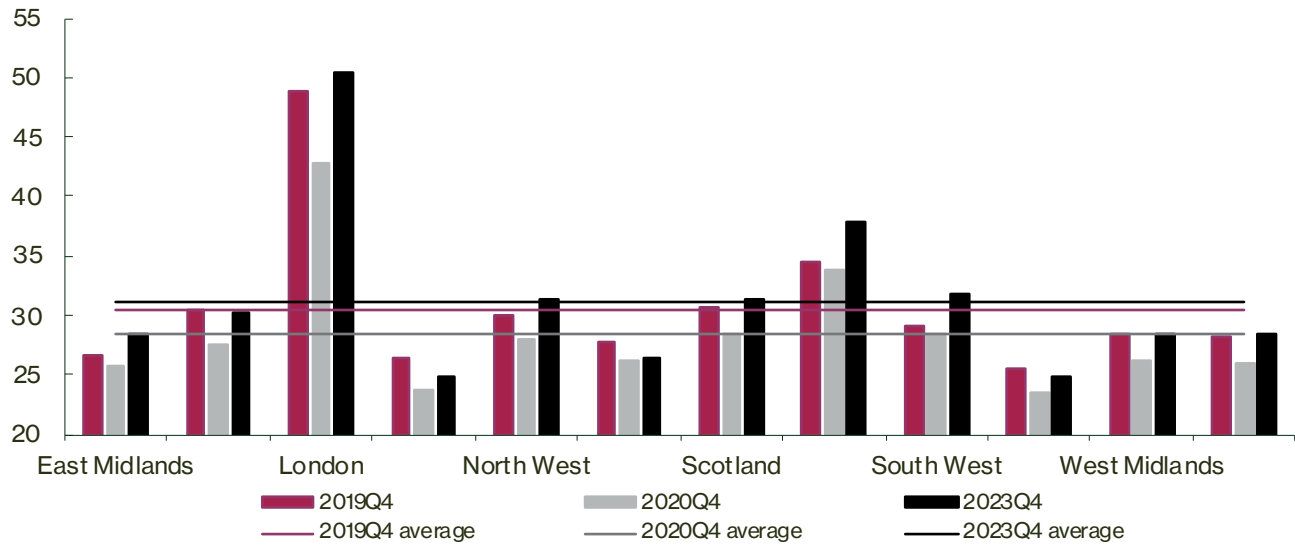
Source: ONS and NiReMS.

Figure 3.6   Regional patterns in labour productivity (short run downturn and recovery)

2020 relative to 2019   2023 relative to 2010
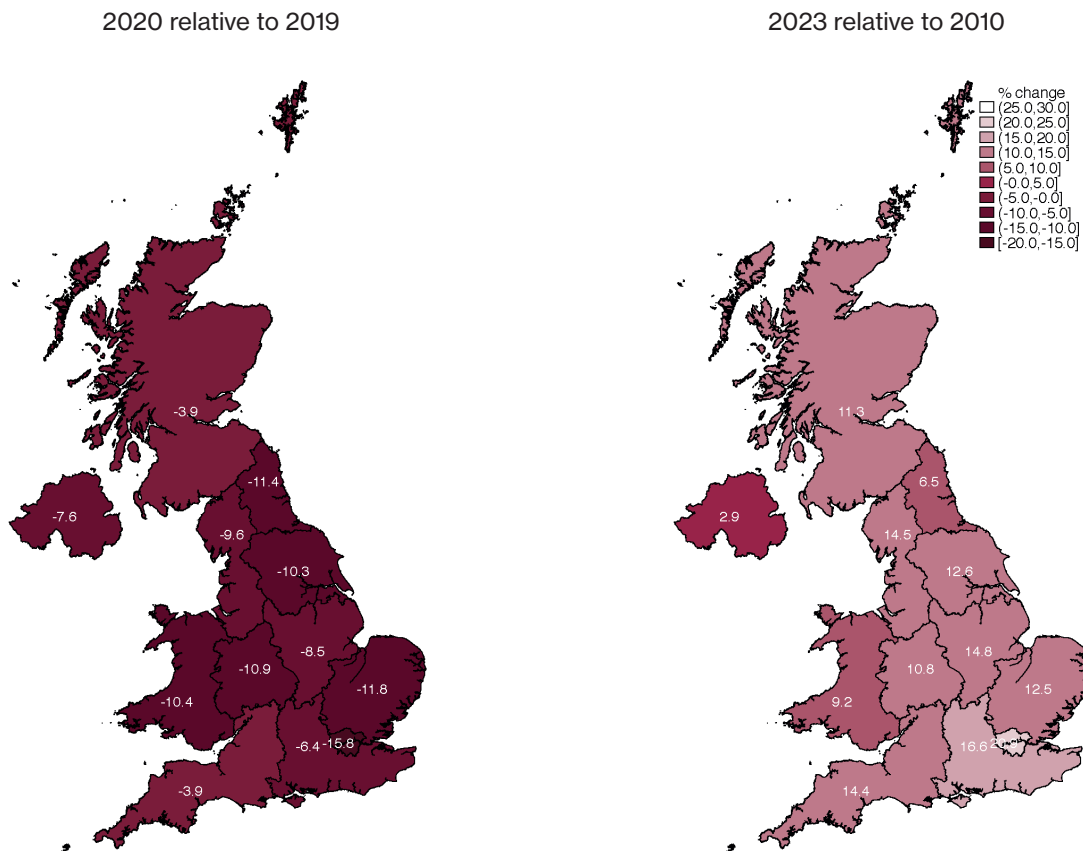
Source: ONS and NiReMS.

Short run productivity losses are moderate in the South East and the South West. In the medium run, the South East and the South West, together with East Midlands, make the greatest gains to productivity. Looking into the longer run (2024Q4 and beyond), London gains from the sharp increase in productivity and is at the top of regional productivity levels together with the South East and the South West, while Northern Ireland shows persistent decline. The left panel of figure 3.6 shows the percentage change in labour productivity between years 2019 and 2020, highlighting the effects of the two major shocks to the economy: COVID-19 and Brexit. The most affected regions are London and Northern Ireland. The panel on the right of the figure shows the recovery between years 2020 and 2023. Even though London seems to have suffered the most, the recovery brings the region to new highs with an over 21% increase in labour productivity over the three-year period. Northern Ireland, however, recovers the slowest and will see its productivity in 2023 at only 2.9% higher level than at the peak of the recession in 2020, but still much lower than before the shocks hit the economy.

It is important to isolate the effects brought by the COVID-19 and Brexit shocks as they affect different sectors in the economy. Regions with higher share of GVA in Private Services (Traded, Non-traded and Financial) are projected to recover much quicker, whereas regions where Manufacturing and Public sectors are dominant will do relatively worse; these sectoral patterns are also consistent with Lenoël and Young (2021). Further analysis into the sectoral composition of the UK regions is necessary to answer some of the outstanding questions; this will be developed in due course.

Income distribution and poverty

Aggregate regional distributions and trends in output, employment and productivity do not necessarily reveal the implications of such large shocks upon the most vulnerable part of the population. NIESR has consistently highlighted the adverse consequences of the COVID-19 and Brexit shocks for the poorest in society (Bhattacharjee and Lisauskaite, 2020a,b; Chadha, 2020; NIESR, 2020). Severe adverse effects have been projected for sections of society and the economy where multiple impacts are coincident, such as poorer regions and sectors that are lower paid or heavily affected by lockdowns and trade disruptions.

We employ dynamic microsimulation modelling, using the LINDA model (NIESR, 2016), based on a representative population from the 6th Round of the UK Wealth and Assets survey in order to explore impacts on destitution and household income at the bottom decile (P10). A higher P10 income would mean that a household with

income marginally at this threshold would still be poor relative to others in society, but have greater resources to afford basic necessities. Destitution is a measure of extreme poverty, that is, income so low that a household is likely to lack the provision of essentials such as shelter, food, heating, lighting, clothing/footwear and basic toiletries in the immediate future. Whereas, by definition, 10% of households have income lower than P10, the Joseph Rowntree Foundation estimated that 0.71% of households were destitute in 2019 (Bramley et al., 2020; Fitzpatrick et al, 2020). The approach follows from the above analysis, taking the regional impacts forward into wages and unemployment, using a methodology similar to ONS (2020). While there is large uncertainty associated with the numbers, some key and somewhat surprising findings emerge.

First, without the COVID-19 and Brexit shocks, household income at the 10th percentile would have been the lowest in Wales and London. While Wales is affected relatively moderately, the COVID-19 and Brexit shocks exacerbate this sharp decline of the North West for bottom decile income levels. On the other hand, the South West would have had relatively stronger average household incomes of their poor residents. Despite relatively poor projections in aggregate GVA, employment and productivity, Northern Ireland's relatively robust COVID-19 healthcare response and continued connections with the EU's Single Market and Customs Unions as part of the Brexit deal appears to be beneficial in sustaining the poorest in society.

Second, while regional variations in P10 would have been high in any case in 2020, even without COVID-19 or Brexit, these differences are much more pronounced after the two shocks. Among the regions, without the shocks, household incomes at the bottom decile in 2022 would have been lowest for the West Midlands (£11,500) and highest for the South West (£17,200), a difference of £6,300 per year. By contrast, with COVID-19 and Brexit shocks, this difference is now projected to be £10,900, reflecting a very large 73% increase. This suggests very substantial increase in inter-regional inequality, which is highly alarming.

Third, the impacts upon destitution, based on the income component of the Joseph Rowntree Foundation's definition[13], are devastating. This also builds on earlier analysis by NIESR (Bhattacharjee and Lisauskaite 2020a,b), where we find a very high correlation between destitution and the demand for food banks. Without the COVID-19 and Brexit shocks, Northern Ireland would have had the highest incidence of destitution affecting 1-1.5% of the households, which needs to be viewed against the overall estimated destitution incidence of 0.71% in 2019. However, a strong response to the two shocks implies that the impacts in Northern Ireland are the smallest. On the other hand, whereas London, the South

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13 A single person household is considered as being destitute when their income falls below £70 per week, with any additional adult requiring another £30 per week and an additional child needing £20 per week.

Table 3.5   Income at the 10th Percentile (P10)

	P10, non-COVID non-Brexit			P10, COVID & Brexit		
	2020	2021	2022	2020	2021	2022
North East	£13,600	£13,900	£15,400	£14,700	£15,100	£15,700
North West	£12,800	£12,700	£13,100	£10,100	£9,900	£10,200
Yorkshire & The Humber	£12,200	£12,600	£14,000	£13,100	£13,300	£14,000
East Midlands	£13,300	£13,300	£15,300	£14,500	£16,500	£17,000
West Midlands	£12,100	£12,200	£11,500	£13,100	£12,800	£12,900
East of England	£14,600	£14,500	£14,600	£13,200	£13,400	£13,300
London	£11,800	£12,100	£13,300	£10,900	£11,400	£11,200
South East	£15,000	£15,400	£15,600	£15,300	£15,900	£16,000
South West	£17,100	£16,000	£17,200	£20,000	£19,100	£21,100
Wales	£11,700	£12,800	£12,600	£14,800	£14,400	£14,500
Scotland	£13,200	£13,700	£14,300	£14,600	£13,800	£14,000
Northern Ireland	£15,400	£12,600	£14,600	£14,000	£10,800	£13,600

Source: ONS, WAS6, NiReMS, LINDA

Figure 3.7   COVID+Brexit/No shocks ratio of destitution for 2020 and 2022

2020   2022
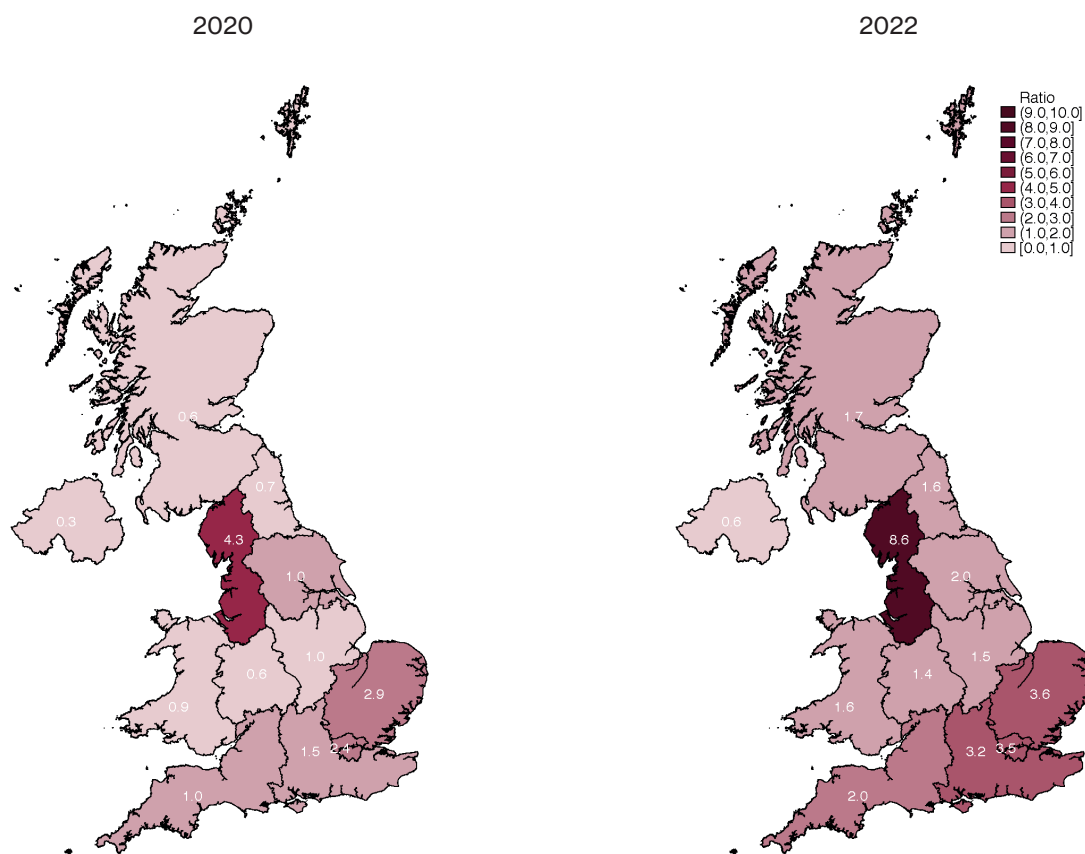
Source: ONS, WAS6, NiReMS, LINDA

East, East of England (and to a limited extent the South West) would have otherwise had the lowest destitution incidence, this strong regional advantage is wiped out by the twin crises. The emerging regional pattern follows along the lines of our previous analyses (Bhattacharjee and Lisauskaite, 2020a).

Figure 3.7 presents regional distribution of ratios of destitution in case of COVID-19 and Brexit to the alternative destitution levels in the absence of these economic shocks. The difference between the two is increasing in all regions with the exception of Northern Ireland. By contrast, the largest impacts are projected for the North West. Overall, across the whole of the UK, incidence of destitution is projected to be 2.8 times higher than the non-COVID and no-Brexit scenario. Although these results are shocking, the estimated figures need to be considered carefully. Further developments of the model together with more clarity about future government actions might alter the results. In fact, we would recommend higher rates of Universal Credit payments and targeted relief to selected local areas to continue in the medium run.

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Appendix

Table A1   Exchange rates and interest rates

	UK exchange rates			FTSE All-share index	Interest rates			
	Effective 2017=100	Dollar	Euro		3-month rates	10-year gilts	World[a]	Bank Rate[b]
2015	117.3	1.53	1.38	2605	0.60	1.80	0.80	0.50
2016	105.8	1.35	1.22	2565	0.50	1.30	0.90	0.25
2017	100.0	1.29	1.14	2930	0.40	1.20	1.20	0.41
2018	101.9	1.34	1.13	2937	0.70	1.40	1.90	0.75
2019	101.6	1.28	1.14	2898	0.80	0.90	2.10	0.75
2020	102.0	1.28	1.13	2537	0.30	0.30	0.90	0.10
2021	104.0	1.37	1.12	2876	0.10	0.40	1.00	0.10
2022	104.1	1.37	1.12	3031	0.20	0.50	0.90	0.10
2023	104.3	1.37	1.12	3124	0.20	0.70	0.80	0.10
2024	104.6	1.37	1.12	3199	0.30	0.90	0.80	0.25
2025	104.8	1.38	1.12	3350	0.40	1.00	0.80	0.40
2020 Q1	103.2	1.28	1.16	2766	0.70	0.50	1.40	0.61
2020 Q2	101.4	1.24	1.13	2395	0.40	0.20	0.70	0.10
2020 Q3	101.4	1.29	1.11	2447	0.10	0.10	0.70	0.10
2020 Q4	102.2	1.32	1.11	2538	0.00	0.30	0.80	0.10
2021 Q1	103.9	1.37	1.12	2764	0.00	0.30	1.00	0.10
2021 Q2	103.9	1.37	1.12	2844	0.20	0.30	1.00	0.10
2021 Q3	103.9	1.37	1.12	2911	0.20	0.40	1.00	0.10
2021 Q4	104.0	1.37	1.12	2983	0.20	0.40	1.00	0.10
2022 Q1	104.0	1.37	1.12	2989	0.20	0.50	0.90	0.10
2022 Q2	104.1	1.37	1.12	3014	0.20	0.50	0.90	0.10
2022 Q3	104.1	1.37	1.12	3043	0.20	0.50	0.90	0.10
2022 Q4	104.2	1.37	1.12	3077	0.20	0.60	0.80	0.10
Percentage changes								
2015/2014	6.3	–7.2	11.1	0.4				
2016/2015	–9.8	–11.4	–11.2	–1.5				
2017/2016	–5.5	–4.9	–6.7	14.2				
2018/2017	1.9	3.6	–1.0	0.3				
2019/2018	–0.3	–4.4	0.9	–1.3				
2020/2019	0.5	0.5	–1.3	–12.5				
2021/2020	1.9	6.6	–0.1	13.4				
2022/2021	0.2	0.1	–0.1	5.4				
2023/2022	0.2	0.1	–0.1	3.1				
2024/2023	0.2	0.1	–0.1	2.4				
2025/2024	0.2	0.2	–0.1	4.7				
2020Q4/2019Q1	–1.0	2.6	–4.7	–13.6				
2021Q4/2020Q1	1.7	3.5	1.4	17.5				
2022Q4/2021Q1	0.2	0.1	–0.1	3.2				

Notes: [a] Weighted average of central bank intervention rates in OECD economies. [b] End of period.

Table A2   Price indices (2018=100)

	Unit labour costs	Imports deflator	Exports deflator	World Oil Price ($)[a]	Consumption deflator	GDP deflator (market prices)	Consumer prices		
							RPI[b]	CPI[c]	CPIH[d]
2015	92.9	88.0	88.3	52.1	94.4	93.9	98.3	94.4	94.4
2016	95.0	91.9	92.4	42.9	95.7	95.9	100.0	95.0	95.3
2017	97.3	97.6	97.0	54.0	97.7	97.8	103.6	97.6	97.8
2018	100.0	100.0	100.0	70.4	100.0	100.0	107.0	100.0	100.0
2019	103.3	102.3	101.7	63.7	101.4	102.1	109.8	101.8	101.7
2020	118.1	100.5	102.0	43.0	102.4	107.3	111.6	102.7	102.7
2021	111.3	101.1	103.7	52.2	103.0	106.9	114.6	103.7	103.5
2022	110.1	100.9	104.7	52.3	104.9	108.3	118.2	105.7	105.4
2023	112.6	100.6	105.6	53.3	106.9	111.0	121.2	107.4	107.4
2024	115.4	101.1	106.8	54.2	108.9	113.5	124.2	109.2	109.4
2025	118.4	102.5	108.4	55.2	111.1	116.0	127.3	111.1	111.6
Percentage changes									
2015/2014	0.5	–5.6	–3.1	–47.0	0.0	0.7	1.0	0.1	0.4
2016/2015	2.2	4.5	4.7	–17.7	1.4	2.1	1.7	0.7	1.0
2017/2016	2.4	6.2	5.0	25.8	2.1	1.9	3.6	2.7	2.6
2018/2017	2.8	2.5	3.1	30.5	2.4	2.2	3.3	2.4	2.3
2019/2018	3.3	2.3	1.7	–9.6	1.4	2.1	2.6	1.8	1.7
2020/2019	14.3	–1.7	0.3	–32.5	1.0	5.1	1.7	0.8	1.0
2021/2020	–5.8	0.6	1.7	21.4	0.5	–0.5	2.7	1.0	0.8
2022/2021	–1.0	–0.2	0.9	0.3	1.9	1.3	3.2	1.9	1.8
2023/2022	2.2	–0.3	0.9	1.8	1.9	2.5	2.5	1.6	1.9
2024/2023	2.5	0.5	1.1	1.8	1.9	2.3	2.4	1.7	1.9
2025/2024	2.6	1.3	1.5	1.8	2.0	2.3	2.5	1.8	2.0
2020Q4/2019Q1	11.6	–3.4	2.1	–27.5	0.5	2.2	1.8	0.5	0.6
2021Q4/2020Q1	–6.6	0.2	0.9	12.0	1.1	1.2	2.9	1.3	1.0
2022Q4/2021Q1	1.7	–0.1	1.2	4.6	2.2	2.9	3.1	2.0	2.2

Notes: [a] Per barrel, average of Dubai and Brent spot prices. [b] Retail price index. [c] Consumer price index. [d] Consumer prices index, including owner occupiers' housing costs.

Table A3   Gross domestic product and components of expenditure (£ billion, 2018 prices)

	Final consumption expenditure		Gross capital formation		Domestic demand	Total exports[c]	Total final expenditure	Total imports[c]	Net trade	GDP at market prices[d]
	H-Holds & NPISH[a]	General govt.	Gross fixed investment	Changes in inventories[b]						
2015	1306	389	354	12	2078	593	2672	627	–34	2044
2016	1351	393	370	10	2121	609	2731	652	–42	2079
2017	1366	396	380	15	2142	642	2784	669	–27	2115
2018	1386	398	381	2	2167	662	2829	687	–26	2142
2019	1401	414	387	1	2203	679	2882	706	–27	2173
2020	1238	377	344	–3	1956	581	2537	568	13	1958
2021	1271	397	371	19	2059	599	2657	621	–22	2025
2022	1354	415	390	19	2177	650	2827	703	–52	2113
2023	1399	419	393	19	2230	695	2925	750	–56	2163
2024	1438	424	394	19	2275	728	3003	789	–60	2203
2025	1474	428	395	19	2315	756	3071	820	–64	2240
Percentage changes										
2015/2014	3.0	1.8	5.3		3.1	2.8	3.1	5.4		2.4
2016/2015	3.4	1.0	4.4		2.1	2.7	2.2	3.9		1.7
2017/2016	1.1	0.7	2.8		1.0	5.4	1.9	2.6		1.7
2018/2017	1.4	0.6	0.4		1.2	3.0	1.6	2.7		1.3
2019/2018	1.1	4.0	1.5		1.6	2.7	1.9	2.7		1.4
2020/2019	–11.6	–9.1	–11.2		–11.2	–14.5	–12.0	–19.5		–9.9
2021/2020	2.6	5.5	8.0		5.2	3.1	4.8	9.2		3.4
2022/2021	6.5	4.4	4.9		5.7	8.6	6.4	13.2		4.3
2023/2022	3.3	1.1	0.9		2.4	6.8	3.5	6.8		2.4
2024/2023	2.8	1.0	0.3		2.0	4.9	2.7	5.1		1.9
2025/2024	2.5	1.0	0.2		1.8	3.8	2.3	4.0		1.7
Decomposition of growth in GDP (percentage points)										
2015	1.9	0.3	0.9	–0.2	3.2	0.8	4.0	–1.6	–0.8	2.4
2016	2.2	0.2	0.8	–0.1	2.1	0.8	2.9	–1.2	–0.4	1.7
2017	0.7	0.1	0.5	0.3	1.0	1.6	2.6	–0.8	0.8	1.7
2018	0.9	0.1	0.1	–0.6	1.2	0.9	2.1	–0.9	0.1	1.3
2019	0.7	0.7	0.3	–0.1	1.7	0.9	2.5	–0.9	–0.1	1.4
2020	–7.5	–1.7	–2.0	–0.1	–11.4	–4.6	–15.9	6.4	1.8	–9.9
2021	1.7	1.1	1.4	1.1	5.2	0.7	6.2	–2.5	–1.8	3.4
2022	4.1	0.9	0.9	0.0	5.8	2.5	8.4	–4.0	–1.5	4.3
2023	2.1	0.2	0.2	0.0	2.5	2.1	4.6	–2.3	–0.2	2.4
2024	1.8	0.2	0.1	0.0	2.1	1.6	3.6	–1.8	–0.2	1.9
2025	1.6	0.2	0.0	0.0	1.8	1.3	3.1	–1.4	–0.2	1.7

Notes: [a] Non–profit institutions serving households. [b] Including acquisitions less disposals of valuables and quarterly alignment adjustment. [c] Includes Missing Trader Intra–Community Fraud. [d] Components may not add up to total GDP growth due to rounding and the statistical discrepancy included in GDP.

Table A4   External sector

	Exports of goods[a]	Imports of goods[a]	Net trade in goods[a]	Exports of services	Imports of services	Net trade in services	Export price com-petiveness[c]	World trade[d]	Terms of trade[e]	Current balance
	£ billion, 2018 prices[b]						2018=100			% of GDP
2015	329	456	–127	265	171	94	103.5	88.8	100.3	–5.0
2016	329	476	–147	281	176	104	98.0	92.0	100.5	–5.4
2017	350	487	–137	293	183	110	95.9	96.6	99.4	–3.8
2018	351	488	–137	311	199	111	100.0	100.0	100.0	–3.7
2019	367	499	–131	312	207	104	98.2	103.8	99.5	–3.1
2020	311	415	–104	270	153	117	98.0	93.8	101.5	–3.3
2021	324	474	–150	274	147	128	102.0	99.5	102.6	–3.5
2022	355	538	–183	296	165	131	103.2	107.5	103.8	–4.5
2023	380	573	–194	315	177	138	104.0	114.6	105.0	–4.3
2024	397	601	–204	331	187	144	104.3	120.2	105.6	–4.4
2025	412	625	–213	344	196	149	104.6	124.7	105.8	–4.7
Percentage changes										
2015/2014	3.6	4.0		1.8	9.6		–3.6	5.5	2.7	
2016/2015	–0.1	4.3		6.0	3.1		–5.3	3.5	0.2	
2017/2016	6.4	2.3		4.3	3.6		–2.2	5.0	–1.1	
2018/2017	0.4	0.3		6.1	9.1		4.3	3.5	0.6	
2019/2018	4.6	2.1		0.4	4.2		–1.8	3.8	–0.5	
2020/2019	–15.3	–16.7		–13.5	–26.3		–0.2	–9.6	2.0	
2021/2020	4.3	14.2		1.6	–4.2		4.1	6.1	1.1	
2022/2021	9.4	13.5		7.8	12.3		1.1	8.0	1.1	
2023/2022	7.0	6.6		6.7	7.5		0.8	6.6	1.2	
2024/2023	4.7	4.9		5.0	5.8		0.4	4.9	0.6	
2025/2024	3.6	3.8		4.0	4.6		0.3	3.8	0.2	

Notes: [a] Includes Missing Trader Intra–Community Fraud. [b] Balance of payments basis. [c] A rise denotes a loss in UK competitiveness. [d] Weighted by import shares in UK export markets. [e] Ratio of average value of exports to imports

Table A5   Household sector

	Average[a] earnings	Employee compensation	Total personal income	Gross disposable income	Real disposable income	Final consumption expenditure	Saving ratio[c]	House prices[d]	Net worth to income ratio[e]
	£ billion, current prices				£ billion, 2018 prices		Per cent		
2015	92.0	930	1674	1322	1400	1306	10.1	102.9	6.5
2016	94.7	967	1717	1348	1408	1351	7.6	110.1	7.0
2017	97.6	1007	1766	1376	1409	1366	5.7	115.1	7.0
2018	100.0	1048	1846	1441	1441	1386	6.1	118.8	6.7
2019	104.2	1099	1915	1487	1466	1401	6.5	120.0	6.8
2020	106.2	1127	1939	1505	1469	1238	17.1	123.7	7.2
2021	105.0	1102	1960	1524	1480	1271	15.2	128.4	7.5
2022	108.8	1139	2030	1577	1503	1354	11.0	129.9	7.3
2023	111.8	1192	2116	1644	1538	1399	10.1	131.5	7.1
2024	115.3	1245	2205	1713	1573	1438	9.6	132.6	6.9
2025	119.1	1298	2299	1786	1607	1474	9.3	133.7	6.7
Percentage changes									
2015/2014	0.8	2.9	5.7	6.0	6.0	3.0		6.0	
2016/2015	3.0	4.0	2.6	1.9	0.6	3.4		7.0	
2017/2016	3.0	4.2	2.8	2.1	0.1	1.1		4.5	
2018/2017	2.5	4.1	4.5	4.7	2.3	1.4		3.3	
2019/2018	4.2	4.8	3.8	3.2	1.8	1.1		1.0	
2020/2019	1.9	2.5	1.2	1.2	0.2	–11.6		3.1	
2021/2020	–1.1	–2.2	1.1	1.3	0.7	2.6		3.8	
2022/2021	3.6	3.4	3.6	3.5	1.6	6.5		1.2	
2023/2022	2.8	4.7	4.2	4.2	2.3	3.3		1.3	
2024/2023	3.1	4.4	4.2	4.2	2.3	2.8		0.8	
2025/2024	3.4	4.3	4.3	4.2	2.2	2.5		0.8	

Notes: [a] Average earnings equals total labour compensation divided by the number of employees. [b] Deflated by consumers' expenditure deflator. [c] Includes adjustment for change in net equity of households in pension funds. [d] Office for National Statistics, mix–adjusted. [e] Net worth is defined as housing wealth plus net financial assets.

Table A6   Fixed investment and capital (£ billion, 2018 prices)

	Gross fixed investment				User cost of capital (%)	Corporate profit share of GDP (%)	Capital stock	
	Business investment	Private housing[a]	General government	Total			Private	Public[b]
2015	206	85	63	354	13.7	24.5	3437	728
2016	217	89	64	370	13.3	24.3	3548	755
2017	220	94	66	380	13.2	24.4	3685	705
2018	215	104	63	381	12.9	24.1	3732	719
2019	217	105	65	387	12.5	23.6	3783	737
2020	185	95	65	344	12.4	22.7	3782	750
2021	198	104	69	371	13.3	23.6	3805	767
2022	210	106	74	390	13.0	23.8	3840	787
2023	213	105	76	393	13.2	24.2	3876	807
2024	215	103	76	394	13.4	24.3	3910	827
2025	216	102	77	395	13.6	24.1	3942	846
Percentage changes								
2015/2014	7.7	5.1	–1.5	5.3			0.1	1.1
2016/2015	5.5	4.7	0.7	4.4			3.2	3.7
2017/2016	1.5	5.6	3.1	2.8			3.9	–6.6
2018/2017	–2.5	11.0	–5.0	0.4			1.3	2.0
2019/2018	1.1	1.2	3.5	1.5			1.4	2.5
2020/2019	–15.0	–10.0	–0.1	–11.2			0.0	1.8
2021/2020	7.2	9.9	7.5	8.0			0.6	2.3
2022/2021	6.0	1.7	6.3	4.9			0.9	2.6
2023/2022	1.3	–1.1	2.4	0.9			0.9	2.6
2024/2023	0.9	–1.3	0.9	0.3			0.9	2.4
2025/2024	0.6	–1.3	1.0	0.2			0.8	2.3

Notes: [a] Includes private sector transfer costs of non–produced assets. [b] Including public sector non–financial corporations.

Table A7   Productivity and the labour market (thousands unless otherwise stated)

	Employment		ILO unemployment	Labour force[b]	Population of working age[c]	Productivity (2018=100) per hour	ILO unemployment rate
	Employees	Total[a]					
2015	26504	31285	1781	33066	40879	98.6	5.4
2016	26771	31744	1633	33377	41062	98.8	4.9
2017	27065	32057	1476	33533	41169	99.5	4.4
2018	27494	32439	1380	33819	41260	100.0	4.1
2019	27652	32799	1306	34105	41344	100.2	3.8
2020	27826	32628	1564	34209	41438	102.0	4.6
2021	27533	32122	2251	34373	41522	103.6	6.5
2022	27462	32070	2446	34517	41595	101.3	7.1
2023	27956	32583	2076	34659	41661	101.9	6.0
2024	28315	32961	1843	34805	41727	102.4	5.3
2025	28575	33242	1712	34954	41795	103.2	4.9
Percentage changes							
2015/2014	2.1	1.7	–12.1	0.9	0.5	0.7	
2016/2015	1.0	1.5	–8.3	0.9	0.4	0.3	
2017/2016	1.1	1.0	–9.6	0.5	0.3	0.7	
2018/2017	1.6	1.2	–6.5	0.9	0.2	0.5	
2019/2018	0.6	1.1	–5.4	0.8	0.2	0.2	
2020/2019	0.6	–0.5	19.8	0.3	0.2	1.8	
2021/2020	–1.1	–1.6	43.9	0.5	0.2	1.6	
2022/2021	–0.3	–0.2	8.7	0.4	0.2	–2.3	
2023/2022	1.8	1.6	–15.1	0.4	0.2	0.6	
2024/2023	1.3	1.2	–11.2	0.4	0.2	0.6	
2025/2024	0.9	0.9	–7.1	0.4	0.2	0.7	

Notes: [a] Includes self–employed, government–supported trainees and unpaid family members. [b] Employment plus ILO unemployment. [c] Population projections are based on annual rates of growth from 2018–based population projections by the ONS.

Table A8 Public sector financial balance and borrowing requirement (£ billion, fiscal years)

		2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
Current receipts:	Taxes on income	470.3	483.7	479.8	492.0	509.7	532.5	555.9	580.4
	Taxes on expenditure	274.1	274.9	147.2	277.8	295.7	310.8	325.3	340.0
	Other current receipts	70.0	69.3	120.9	70.1	73.9	77.3	80.5	83.7
	Total	814.4	827.9	747.9	839.9	879.3	920.6	961.7	1004.0
	(as a % of GDP)	37.7	37.2	36.1	38.2	37.9	38.0	38.1	38.3
Current expenditure:	Goods and services	402.7	428.3	494.3	459.1	476.9	494.8	513.5	533.8
	Net social benefits paid	242.4	242.1	270.3	283.8	280.8	282.8	289.8	299.8
	Debt interest	54.8	54.7	44.9	45.9	45.3	44.9	45.0	44.9
	Other current expenditure	61.2	65.9	188.8	67.7	69.7	72.7	75.4	78.1
	Total	761.1	791.0	998.3	856.4	872.6	895.3	923.8	956.5
	(as a % of GDP)	35.2	35.6	48.2	39.0	37.6	36.9	36.6	36.5
Depreciation		49.8	51.3	52.2	54.5	57.5	60.2	62.6	65.1
Surplus on public sector current budget[a]		3.5	–14.4	–302.6	–71.1	–50.8	–34.9	–24.7	–17.6
(as a % of GDP)		0.2	–0.6	–14.8	–3.2	–2.2	–1.4	–1.0	–0.7
Gross investment		92.3	94.4	113.6	118.4	124.2	128.7	133.0	137.5
Net investment		42.5	43.1	61.4	63.9	66.7	68.5	70.3	72.4
(as a % of GDP)		2.0	1.9	3.0	2.9	2.9	2.8	2.8	2.8
Total managed expenditure		853.5	885.4	1111.8	974.8	996.9	1024.0	1056.8	1094.0
(as a % of GDP)		39.5	39.8	53.7	44.3	43.0	42.2	41.9	41.7
Public sector net borrowing		39.0	57.5	364.0	135.0	117.6	103.4	95.1	90.0
(as a % of GDP)		1.8	2.6	17.6	6.1	5.1	4.3	3.8	3.4
Public sector net debt (% of GDP)		81.9	81.1	107.9	109.9	110.7	110.9	106.6	106.1
GDP deflator at market prices (2018=100)		100.5	103.0	108.3	106.5	109.0	111.6	114.1	116.7
Money GDP (£ billion)		2163	2224	2071	2198	2318	2426	2525	2624

Notes: These data are constructed from seasonally adjusted national accounts data. This results in differences between the figures here and unadjusted fiscal year data. Data exclude the impact of financial sector interventions, but include flows from the Asset Purchase Facility of the Bank of England. [a] Public sector current budget surplus is total current receipts less total current expenditure and depreciation.

Table A9   Saving and investment (as a percentage of GDP)

	Households		Companies		General government		Whole economy		Finance from abroad[a]		Net national saving
	Saving	Investment	Saving	Investment	Saving	Investment	Saving	Investment	Total	Net factor income	
2015	7.2	4.2	6.7	11.0	–1.2	2.5	12.7	17.7	5.0	2.2	–1.6
2016	5.4	4.3	7.1	11.1	–0.1	2.5	12.4	17.9	5.4	2.4	–2.0
2017	3.9	4.7	9.5	11.0	1.0	2.6	14.5	18.2	3.8	1.2	–0.2
2018	4.2	4.6	8.8	10.7	1.2	2.6	14.2	17.9	3.7	1.2	–0.5
2019	4.5	4.7	9.6	10.9	1.2	2.7	15.2	18.3	3.1	0.6	0.5
2020	12.7	4.3	11.4	10.0	–10.0	3.0	14.1	17.3	3.3	2.6	–1.9
2021	10.9	4.6	10.5	12.2	–5.0	3.1	16.4	19.9	3.5	1.7	0.8
2022	7.7	4.4	8.7	12.3	–1.0	3.2	15.4	19.9	4.5	1.8	–0.2
2023	7.0	4.2	8.4	12.1	–0.2	3.1	15.2	19.4	4.3	1.9	–0.5
2024	6.6	4.1	7.8	11.9	0.3	3.1	14.7	19.1	4.4	2.2	–0.9
2025	6.4	4.0	7.1	11.8	0.7	3.1	14.2	18.9	4.7	2.4	–1.4

Notes: Saving and investment data are gross of depreciation unless otherwise stated. [a] Negative sign indicates a surplus for the UK.

Table A10   Medium– and long–term projections (percentage change unless otherwise stated)

	2019	2020	2021	2022	2023	2024	2025	2026-30
GDP (market prices)	1.4	–9.9	3.4	4.3	2.4	1.9	1.7	1.4
Average earnings	4.2	1.9	–1.1	3.6	2.8	3.1	3.4	3.2
GDP deflator (market prices)	2.1	5.1	–0.5	1.3	2.5	2.3	2.3	2.0
Consumer Prices Index	1.8	0.8	1.0	1.9	1.6	1.7	1.8	1.6
Per capita GDP	0.9	–10.4	2.9	3.8	1.9	1.4	1.2	1.0
Whole economy productivity[a]	0.2	1.8	1.6	–2.3	0.6	0.6	0.7	1.0
Labour input[b]	1.4	–11.4	2.0	6.4	1.7	1.2	0.9	0.3
ILO Unemployment rate (%)	3.8	4.6	6.5	7.1	6.0	5.3	4.9	4.8
Current account (% of GDP)	–3.1	–3.3	–3.5	–4.5	–4.3	–4.4	–4.7	–4.7
Total managed expenditure (% of GDP)	39.8	53.7	44.3	43.0	42.2	41.9	41.7	42.1
Public sector net borrowing (% of GDP)	2.6	17.6	6.1	5.1	4.3	3.8	3.4	2.7
Public sector net debt (% GDP)	81.1	107.9	109.9	110.7	110.9	106.6	106.1	104.3
Effective exchange rate (2017=100)	101.6	102.0	103.9	104.1	104.3	104.6	104.8	105.6
Bank Rate (%)	0.8	0.2	0.1	0.1	0.1	0.2	0.3	0.8
3 month interest rates (%)	0.8	0.3	0.1	0.2	0.2	0.3	0.4	0.9
10 year interest rates (%)	0.9	0.3	0.4	0.5	0.7	0.9	1.0	1.5

Notes: [a] Per hour. [b] Total hours worked.