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Brexit and the OBR's forecasts

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Foreword

The Office for Budget Responsibility was created in 2010 to provide independent and authoritative analysis of the UK public finances and the impact that government policy has on them. To that end we produce two medium-term forecasts each year – at the time of the Budget and Spring/Autumn Statement – and long-term projections once every two years.

Following the June 2016 referendum vote to leave the European Union, we adjusted our forecasts to reflect the fact that leaving the EU was now government policy. With no basis on which to judge the precise outcome of the negotiations between the UK and the EU on their future relationship, the judgements we made in that forecast were not predicated on any specific outcome but instead were broad-brush assumptions consistent with a range of possible outcomes.

With attention increasingly focused on the content of the forthcoming Withdrawal Agreement with the EU – or on the possibility of the UK leaving the EU with ‘no deal’ – we felt it would be helpful to set out some of the judgements we will have to make when the details of Brexit become clearer in order to incorporate them in our forecasts. That said, it is far from certain that the Withdrawal Agreement itself (or any accompanying political declaration) will be firm and detailed enough regarding the future trade and migration relationship to update our current assumptions. And it would certainly be too late to do so in our forthcoming Budget forecast on 29 October.

As ever, our main aim in this paper is to be as open and transparent as we can be about the judgements and thinking underpinning our economic and fiscal forecasts. We hope that it will provide useful background information before we make any further forecast adjustments. We would be pleased to receive any feedback on the approach set out here at feedback@obr.uk. Please indicate whether you are happy for us to cite your submissions publicly.

In preparing this paper we have benefitted greatly from the insights of many people from outside the OBR. We have discussed the cross-Whitehall analysis of Brexit with the relevant departments, who helpfully provided more detail on some of the underlying judgements in that work. And from outside Whitehall, we had valuable discussions with a range of experts, including Julian Jessop from the Institute of Economic Affairs, Graham Gudgin and Ken Coutts of the Centre for Business Research at Cambridge University, Jonathan Portes of Kings College London, Swati Dhingra of the London School of Economics and Political Science and Alan Winters of the UK Trade Policy Observatory at the University of Sussex. We are very grateful to all of them.



Robert Chote



Sir Charles Bean



Andy King

The Budget Responsibility Committee

1 Introduction

- 1.1 The Office for Budget Responsibility has been charged by Parliament with producing regular medium-term forecasts and long-term projections for the economy and public finances. We are required to produce these based on current stated Government policy – as best we can define it – rather than on how we or others think policy will develop. And while we devote much time and effort to illustrating the inevitable uncertainties around these forecasts and projections, we are not allowed to posit the impact of alternative policies when doing so.
- 1.2 This is challenging enough at the best of times, but has become more so following the referendum vote to leave the European Union. One important reason is that – in its impact on the economy and public finances – Brexit is not a momentary policy event, with well-defined content and a clean separation in terms of impact between the pre- and post-Brexit eras. Rather it is an extended process of policy development to which the economy and the public finances are already responding in real time – based not just on concrete policies implemented, but also (especially to date) on how decision makers in both the public and private sectors expect policy to evolve.
- 1.3 In this paper we explain how we expect to approach the task of making forecasts and projections in this environment. We also look at some of the specific challenges that forthcoming policy decisions and developments will pose for us.

The Brexit policy process and the forecast

- 1.4 The ultimate timescale and content of the Brexit policy process remain unknowable for the time being. But, in terms of the forecasting task it poses, we can think of the process unfolding in several stages.

The decision to call the referendum

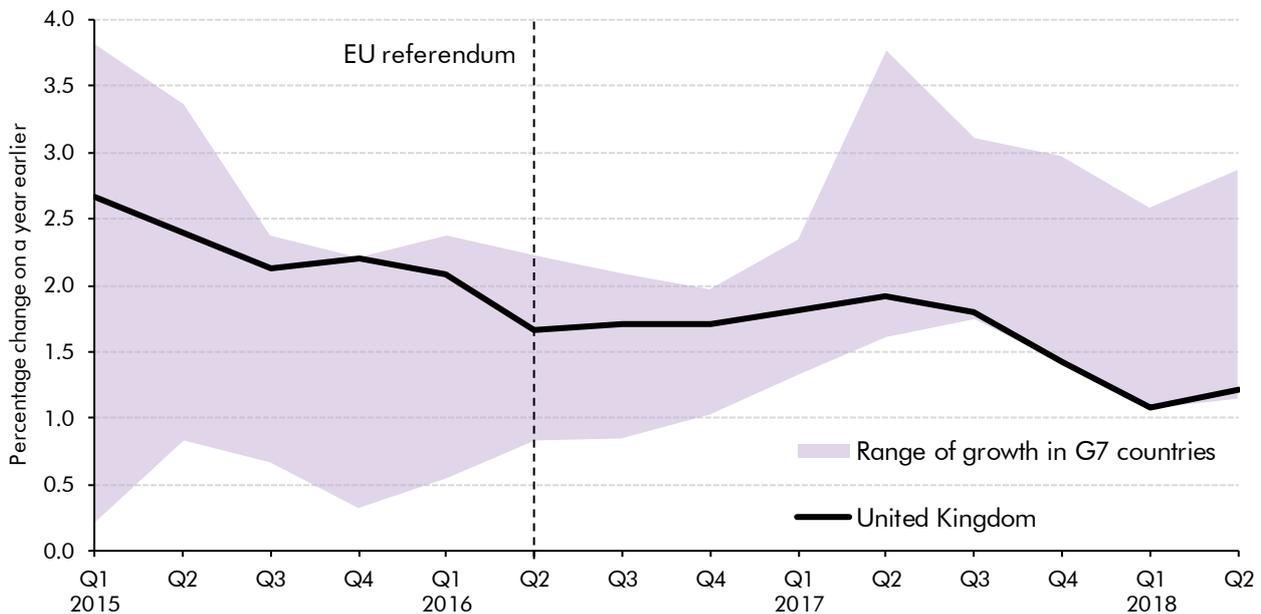
- 1.5 The decision to call the advisory referendum in June 2016 – announced in February 2016 – is likely to have had an economic and fiscal impact in anticipation of the result, reflecting the possibility of a vote to leave and the Government's likely acceptance of the result. For example, it seems reasonable to believe that, as a result of the uncertainty created by the vote, business investment was weaker and the exchange rate lower in the run-up to the referendum than they would have been had the vote not been called. This will have had knock-on effects on public spending and receipts.
- 1.6 These real-time effects on economic and fiscal outturns, and on the market prices on which we base some of our conditioning assumptions, were picked up in our March 2016 forecast. But in framing the medium-term outlook, we assumed explicitly that the UK would

remain in the EU, in line with what was then Government policy. Given Parliament's previous instruction to us in legislation that we should not produce forecasts based on alternative policy scenarios, we did not provide an estimate of the potential impact of leaving the EU (in contrast to the Treasury and some other forecasters).

The result of the referendum

- 1.7 Once the result of the referendum was declared, it became Government policy to leave the EU and our subsequent forecasts needed to reflect this. But at that stage the Government's desired terms of departure were not clear. Moreover, even if they had been, with post-Brexit agreements still a matter for negotiation, the Government could not commit unilaterally to achieving them.
- 1.8 With no meaningful basis on which to predict the precise outcome of the exit negotiations, we based our November 2016 forecast on a few broad-brush assumptions about the medium-to-long-term impact of Brexit that would be consistent with a variety of possible outcomes. Our three subsequent forecasts have been based on these same assumptions. We assumed that the referendum result would generate uncertainty about investment returns that would cause some investment to be postponed or cancelled. We also assumed that, over time, Brexit would lead to reduced trade intensity (i.e. imports and exports lower as a share of GDP) and lower net inward migration. We also assumed that the weaker investment and lower net migration would result in weaker potential output (i.e. a lower sustainable level of activity in the economy) than would otherwise have been the case. We made similarly sized revisions to both export and import growth, so the revisions to gross trade flows were broadly neutral in their effect on net trade and GDP growth in our forecast horizon.
- 1.9 The result has also affected the economy and the public finances in anticipation of the outcome of the negotiations, magnifying the effect seen ahead of the vote. We cannot know for sure what would have happened had the vote gone the other way, but it seems likely that the economy and public finances have been weaker than they otherwise would have been. As shown in Chart 1.1, four quarter GDP growth in the UK slowed in the period after the EU referendum, the UK moved from being close to the top of the G7 GDP growth range in early 2016 to close to the bottom in 2018.

Chart 1.1: GDP growth in the UK and other G7 countries



Source: OECD

- 1.10** Some studies have attempted to estimate how fast the UK would have grown in the absence of the referendum. They do this by constructing the post-referendum GDP growth path of a ‘synthetic’ or ‘doppelgänger’ UK, based on a weighted average of the growth rates of countries that had similar growth and other economic features to the UK prior to the referendum. The studies then compare growth in the doppelgänger with actual growth in the UK. The Centre for European Reform found that cumulative UK growth was lower by 2.5 percentage points between the second quarter of 2016 and the second quarter of 2018 than the comparator.¹ Born *et al* (2018) found that the shortfall in GDP growth was 2.0 percentage points over the same period.² It is noteworthy that the estimates are broadly similar, despite the composition of the doppelgängers differing significantly.
- 1.11** The recent relative weakness of growth in the UK reflects several factors. Business investment appears to have been depressed by uncertainty regarding the outcome of the negotiations, while the prospect of worsened access to foreign markets has pushed the exchange rate lower, raising inflation and reducing the contribution to economic growth from real consumer incomes and spending. The net trade contribution to GDP growth has received a partially offsetting boost from sterling’s weakness, but this has been limited by the internationalisation of many supply chains (which means many UK exports have a high import content), the uncertainty for exporters created by the referendum result (which may have inhibited investment in new capacity), and resilient consumer demand for imports. These effects have been broadly in line with those we anticipated in our early post-referendum forecasts. In our initial post-referendum forecast, we revised down cumulative GDP growth between the second quarter of 2016 and the second quarter of 2018 from 4.4 to 3.0 per cent. The ONS currently estimates that growth over this period was 3.2 per cent.

¹ Springford, J., *Insight: The cost of Brexit to June 2018*, Centre for European Reform, 30 September 2018.

² Born, B., Mueller, G., Schularick, M., Sedlacek, P., *£350 million a week: The output cost of the Brexit vote*, Vox-CEPR Policy Portal, 1 October 2018.

Draft agreement on the financial settlement with the EU

- 1.12 On 8 December 2017, the EU and the UK Government published a joint report on phase one of the exit negotiations, including provisional agreement on the terms of the financial settlement for our departure – the so-called ‘divorce bill’. This comprises three elements. Just under half reflects the UK continuing to make payments as though we were still a member during the current Multi-annual Financial Framework (MFF) that ends in December 2020. Around half relates to our share of outstanding payments at the end of the current MFF. And the remaining fraction reflects pension liabilities less assets returned to the UK.
- 1.13 We felt that the agreement was sufficiently firm and detailed to estimate the cost of the prospective settlement on these terms and incorporate it in our March 2018 central forecast. We estimated the total cost of the settlement at £37.1 billion (€41.4 billion), with most of this sum due to be paid over the next eight years (as described in Annex B of the March 2018 *Economic and fiscal outlook*).
- 1.14 Incorporating the provisional settlement did not though affect the bottom line of our forecast for the public finances. In each forecast since the referendum, we have made the fiscally neutral assumption that any reduction in the UK’s direct contribution to the EU budget – which we estimate at around £13.3 billion in 2022-23 if we were still a member – would be recycled into other domestic spending or continued voluntary contributions to the EU rather than used to reduce the budget deficit. So the settlement eats into that cushion of potential spending – to the tune of £7.5 billion in 2022-23 – rather than adding to our forecast for government borrowing.

Future trading, customs and migration relationship with the EU

- 1.15 The long-term impact of Brexit on the size and structure of the UK economy will depend to a considerable degree on the agreement we reach with the EU on our future trade, customs and migration relationship with the bloc. The most important – and difficult – judgement that we and any other medium-to-long-term economic forecaster must make is how these elements together will affect potential output. As we discuss in Chapters 2 and 3, the primary channels through which they could do so are various barriers affecting the trade intensity and efficiency of the UK economy and through changes in migration flows.
- 1.16 The broad-brush provisional forecast adjustments that we made in November 2016 reduced cumulative potential GDP growth between 2016 and 2021 by 2.4 percentage points relative to the level we would have assumed had the UK been set to remain in the EU. (Largely as a result, our forecast for net borrowing was £15.2 billion higher than it otherwise would have been in 2020-21.) Needless to say, we emphasised at the time the considerable uncertainty around these estimates. The judgements were not conditioned on any specific hypothetical outcome to the negotiations, but rather on the potential impact of a range of possible outcomes. For example, our judgement on the impact of Brexit on trade intensity was based on three studies that looked at future trading relationships between the UK and EU, ranging from WTO rules to membership of the European Economic Area.

- 1.17 We have not updated these judgements since November 2016, while we await the result of the negotiations. When concrete agreement is reached, we will make further adjustments as necessary. In doing so, we will be able to draw on the considerable volume of additional analysis conducted inside and outside government since November 2016 – key elements of which we review in this paper.
- 1.18 As regards the likely impact of Brexit on underlying productivity and potential output, we have focused to date on shorter-run effects. Our November 2016 adjustment was predicated largely on heightened policy uncertainty weakening business investment (we also refrained from raising our migration projection). Over time, impediments to the exploitation of comparative advantage are likely to become more important, while greater restrictions on migration are likely to weigh on labour supply growth. Both will have a direct adverse impact on the path of potential output.
- 1.19 Some studies suggest that barriers to trade, migration and foreign direct investment are also likely to have unfavourable dynamic effects on productivity, for example by impeding technology transfer and slowing innovation and technological progress. There is little consensus on the size of such effects and they are likely to interact. So rather than quantify them individually, we will probably take them into account in a broad-brush fashion in our top-down judgements on productivity and potential output, in addition to the static effects associated with reduced trade and inward migration.
- 1.20 As we discuss in Chapter 3, we will have to assess the likely impact of any new migration regime on the economy and public finances via its effect on both the volume and composition of flows. After the referendum, the Government indicated that it would set new criteria for prospective European Economic Area (EEA) and Swiss immigrants. It has since outlined that the new regime will be *“based on what skills you have to offer, not which country you come from”* and will *“reduce the numbers”* of migrants coming to the UK.³
- 1.21 To summarise, other things being equal, the greater the barriers to trade and migration flows with the EU as a result of Brexit, the more adverse the prospective impact on the economy and the public finances. Of course, other things may not be equal; in particular, the government might take advantage of new policy opportunities arising from Brexit, which we would be able to take on board as and when they occur. Moreover, it is important to emphasise that we are tasked with judging the outlook for the economy and the public finances under current policy, not the merits of Brexit or any other policy *per se*. Such judgements would not be confined solely to their economic or fiscal impact.
- 1.22 Given concrete details of the new trade, customs and migration regimes, we will also have to decide what to assume about the timeliness and effectiveness with which they will be implemented in practice. This will be particularly important if the new arrangements depend on the development and operation of new IT systems and processes, as experience suggests that reforms of this type are rarely as swift or as smooth as governments hope.

³ Prime Minister's speech to the Conservative Party conference, October 2018.

The possibility of a disorderly exit

- 1.23 Our forecasts to date have assumed that the negotiations between the UK and the EU lead to an orderly transition to a new long-term relationship, whatever that relationship might be. This implies reaching a Withdrawal Agreement in time for it to be ratified by the UK and European Parliaments before the UK is due to leave the EU at 11pm on 29 March 2019. The draft agreement in March 2018 contained a transition period until the end of 2020, during which time the trading relationship would essentially remain as it is now.
- 1.24 But if an agreement is not reached in time, the Government expects the EU to “*treat the UK as a third country [i.e. as a non-member] for all purposes*”.⁴ It would apply “*regulation and tariffs at borders with the UK as a third country, including checks and controls for customs, sanitary and phytosanitary standards and verification of compliance with EU norms*”.
- 1.25 The Government has published more than 75 ‘technical notices’ giving advice for this eventuality. It will “*prioritise stability for citizens, consumers and business, to ensure the smooth operations of business, infrastructure and public services and to minimise any disruption to the economy*”. Nonetheless, an abrupt and disorderly exit could have a severe short-term impact on the economy – weaker activity and higher prices – and on the public finances.
- 1.26 A disorderly exit might well result in temporary constraints on the supply of some imported products and domestic goods that contain imported components. That might occur, for instance, if a lack of customs preparedness led to significant delays at the border or if an agreement were not reached to allow British aircraft to fly within the EU (and vice versa). Should these bottlenecks turn out to be significant, it might prompt households and businesses to attempt to stockpile goods in advance, further aggravating the shortages. In a scenario where the UK and EU are unable to agree to the continued mutual recognition (‘grandfathering’) of existing product standards and professional qualifications, all existing goods may need to be re-approved before sale and services trade would be severely restricted by the loss of market access.
- 1.27 The quantitative significance of such effects would depend not only on the extent of such shortages, but also on their duration. The Government would presumably eventually get the staff and systems in place to cope with the changes in the trading relationship, while it is likely that the UK and EU authorities would try to mitigate some of the most disruptive consequences. It is next to impossible to calibrate with any confidence the potential impact of this sort of scenario in advance, because of the lack of any relevant precedent. However, while not a direct parallel, it is worth noting that the ‘Three-Day Week’ introduced in early 1974 in response to energy shortages and increased militancy on the part of the miners, was associated with a fall in output of a little under 3 per cent that quarter.

⁴ Department for Exiting the European Union, *UK Government's preparations for a 'no deal' scenario*, August 2018.

- 1.28 UK asset prices – including the sterling exchange rate – could fall sharply in a disorderly exit, reflecting the likely deterioration in financial market participants’ views about the future economic outlook and heightened risk premia. These market movements would have an adverse impact on the balance sheets of households, firms and financial intermediaries. Together with heightened uncertainty about future prospects, that would be likely to lead households and businesses to rein back their spending, while banks and other financial intermediaries would be likely to tighten the supply of credit, further reducing demand.
- 1.29 A depreciation of the exchange rate would also raise domestic prices, squeezing households’ real incomes and spending, much as we saw in 2017 after the depreciation that followed the referendum result. This upward pressure on prices would be exacerbated if tariffs were applied on imports from the EU, as implied by a move to WTO trading rules. The UK could reduce tariffs unilaterally (if it did so in a non-discriminatory way), but this could have a significant impact on some domestic producers, especially in agriculture.
- 1.30 As with most shocks in an open economy with independent monetary policy and a floating exchange rate, equilibrating forces would eventually take hold and the economy would start to recover (although the effects on output could be very long-lasting). In this case, the monetary policy response will depend on the balance between changes in the exchange rate, demand and supply. In the wake of the 2016 referendum, the Bank of England cut interest rates and implemented other measures to support activity, but the inflationary consequences of the fall in supply, a lower exchange rate (and potentially new tariffs) could limit the Monetary Policy Committee’s ability to support demand in this instance.
- 1.31 In our 2017 *Fiscal risks report*, we looked at the potential fiscal consequences of a shock to the UK economy that combined significant falls in GDP, asset prices and the exchange rate with higher inflation and interest rates – i.e. negative shocks to both demand and supply. This led to sharply higher public sector deficits and debt and highlighted in particular the potential pressures from a rise in debt interest costs from current low levels. This analysis was based on the Bank of England’s 2017 stress test for the UK banking system.⁵ These formed the basis of the Bank’s June 2018 *Financial stability report*, in which the Bank’s Financial Policy Committee noted that this scenario “encompassed a wide range of UK macroeconomic outcomes that could be associated with [a disorderly] Brexit.”

The public expenditure consequences of Brexit

- 1.32 Once the terms of the UK’s new relationship with the EU have been agreed, the Government will have several Brexit-related decisions to take on public expenditure. This reflects the fact that in 2016-17 the UK made a net contribution of £8.8 billion to the EU budget.
- 1.33 Since the referendum, the Government has made several commitments – some firm, some less so – to continue support for specific activities at the funding levels that would have been received from the EU, to recycle the savings into similar activities, or to continue to make

⁵ As set out in Bank of England, *2017 stress test scenarios explained*, March 2017.

payments to retain access to specific schemes. In her March 2018 Mansion House speech, the Prime Minister referred to potential spending on farm support, on projects that would have been covered by EU structural funds, on maintaining cooperation with the EU on science and innovation, on continued participation in EU regulatory agencies, and on replacing overseas aid payments made by the EU that are attributed to the UK.

- 1.34 As noted above, so far we have made the fiscally neutral assumption that any reduction in our direct contribution to the EU budget as a member will be recycled into alternative domestic spending or voluntary contributions to the EU budget. In the near term, the Government will also have to make the withdrawal settlement payments described above. The Treasury has stated that firm decisions about post-Brexit spending will only be made in the forthcoming multi-year Spending Review, due in 2019. So to date we have not included them in our forecast or attempted to estimate how costly they would be.

Further policy changes made possible by Brexit

- 1.35 We do not have detail on many of the other possible policy consequences of Brexit. For example, any new trading arrangements with non-EU countries are still to be determined. We can only include these in our forecasts once they have been agreed and spelt out in sufficient detail for their effects on the economy and public finances to be estimated.
- 1.36 Many indirect taxes are governed by EU rules, including value added tax, the EU emissions trading system, and excise taxes on fuels, alcohol and tobacco. After leaving the EU these rules will no longer apply. If governments use their freedom to modify these tax regimes, we will incorporate the effects once the decisions are sufficiently firm and detailed.
- 1.37 The same is true for regulations governed by the EU's Single Market. Outside the EU, and subject to the terms of the Withdrawal Agreement, UK governments will be able to pursue different regulatory policies. So far, the Government has stated that it aims to *"maintain high regulatory standards for the environment, climate change, social and employment, and consumer protection – meaning we would not let standards fall below their current levels"*.⁶ Any changes and their economic and fiscal effects would only be incorporated into our forecasts once they had been announced and their effects could be estimated. In practice, it has been rare for any single regulatory change to warrant an explicit adjustment to our economy forecasts.

Where do we go from here?

- 1.38 As this and future governments continue to work their way through this policy agenda, we will update the policy assumptions underpinning our forecasts accordingly as the different elements are put into place. In doing so, we will follow the same principle that guides our approach to other policy changes – namely to take them into account when they are sufficiently firm and detailed for us to make a reasonable estimate of their impact on the economy and public finances in each year of our five-year forecast.

⁶ The Government's 'Chequers Statement' on 6 July 2018.

- 1.39 Not surprisingly, attention is currently focused on the possible content of the Withdrawal Agreement and any associated political declaration – or on the possibility of the UK exiting with ‘no deal’. But it is important to emphasise that this will be just one additional milestone in the Brexit process, and it is not clear what substance the Agreement and any accompanying political declaration will contain about the UK’s future trade and migration relationship with the EU. As regards migration, the Government has indicated that its post-Brexit regime – which could have implications for non-EU as well as EU migration – will be developed domestically over the next two years, beginning with a Home Office white paper expected later this year. In any event, much of importance for the economy and the public finances will remain to be determined.
- 1.40 Whenever further Brexit policy developments do become firm enough to include in our forecasts, we will be faced with various analytical choices when incorporating them. Many studies of the impact of different elements of Brexit were published in the run-up to the referendum and more have followed since. These include the cross-Whitehall analysis that was leaked to the media and subsequently supplied to, and released by, the Exiting the EU Select Committee in March 2018. We have been reviewing this material in recent months. These external and government analyses should help us to decide the best approach to take on particular issues and in determining the central judgements to make in each case. In reviewing the studies to date, we have focused on identifying the key judgements and inputs that drive the main results.
- 1.41 Most substantive analyses of the long-term impact of Brexit – including the cross-Whitehall analysis – are based on ‘computable general equilibrium’ modelling or other techniques that focus on the ‘steady state’ impact rather than describing the trajectory the economy would take in moving from its pre-Brexit state to its post-Brexit equilibrium. In order to move from steady-state analysis to a year-by-year forecast, one therefore needs to take a view on the shape and duration of the transition. As we note in Chapter 2, judgements made on this in existing studies have generally been fairly arbitrary.
- 1.42 In some cases, there may be a modelling approach that is clearly best suited to our purposes of producing medium-term economic and fiscal forecasts. In others, it may be less clear cut. In all cases, we will need to make judgements about what represents a reasonable and central assumption of the scale and intensity of the effects of different policy changes within what is likely to be a range of plausible outcomes.
- 1.43 In this discussion paper, we review different modelling approaches and the assumptions upon which they rely, and highlight the most important decisions we will need to take when the time comes. For example, when looking at how non-tariff barriers to trade between the UK and the EU might change, we review the approaches taken in the Whitehall analysis and other studies, identify areas of agreement and disagreement across them, and pick out the key assumptions that we would need to focus on when incorporating them into our forecasts.

- 1.44 When we update our economy and fiscal forecasts, we aim to be as transparent as possible in explaining how and why we think the outlook has changed since our previous forecast. In doing so, we produce an updated forecast assuming no change in policy and then explain the additional impact of any newly announced policy measures. So, when it comes to incorporating new policy developments related to Brexit, we will explain as clearly as we can what impact they have had relative to the assumptions underpinning the previous forecast. But it is not our role explicitly to assess how the path of the economy would have differed if the referendum had never been held or what would happen were Brexit to be abandoned. (In passing, it is important to note that studies that do attempt to answer these questions may make different judgements about policy settings in the ‘with Brexit’ and ‘without Brexit’ worlds.)
- 1.45 Future researchers will confront similar challenges when they try to evaluate the impact that Brexit had on the economy and public finances. They will know how the economy and the public finances have performed in practice, but they will need to compare that to a counterfactual history of what would have happened had the UK never contemplated leaving the EU. In doing so, they will need to decide what policy developments over the intervening period were a direct consequence of Brexit and should be attributed to it, and which were incidental or variants of what would have happened anyway. This is likely to be open to considerable debate – for example, if future governments use the additional room for policy manoeuvre created by Brexit in a way that either harms or improves the performance of the economy and the public finances, should that outcome be deemed a consequence of Brexit *per se* or should it be regarded as a separate policy development?
- 1.46 Any judgements about the potential effect of any given Brexit outcome will be subject to very considerable uncertainties. And these uncertainties will be in addition to the significant ones that already surround our current forecast – not least the outlook for trend productivity growth. This will make assessing the impact of Brexit – even long after the event – even more difficult.

Structure of the paper

- 1.47 The remainder of this paper focuses on the key Brexit-related decisions and developments that we are likely to have to incorporate in our forecasts as the policy process unfolds:
- Chapter 2 discusses the effect of changes to **tariffs** and **non-tariff barriers** to trade.
 - Chapter 3 looks at changes in the level of net inward **migration**.
 - Chapter 4 discusses other Brexit-related considerations – including **macroeconomic and regulatory policies** and **wider economic developments**.
 - Chapter 5 draws some preliminary **conclusions**.

2 Trade barriers

Introduction

2.1 The post-war period has seen trade barriers falling, economies becoming more closely integrated with each other and trade volumes increasing significantly, although growth in trade flows have been weaker since the global financial crisis of 2008. Economic theory and empirical evidence suggest that greater trade intensity – increases in exports and imports relative to the size of the economy – leads to increases in GDP over the long term, for example, by allowing economies to specialise more in their areas of comparative advantage. Accordingly, any change in trade barriers and trade intensity that results from Brexit would be expected to have lasting consequences for the UK economy.

2.2 This chapter:

- describes recent **trends in UK trade**;
- presents **our current approach** to forecasting trade flows and how we have incorporated the effect of Brexit so far;
- outlines **potential changes in trade barriers after Brexit**;
- explains how the **economic impact of changes in trade barriers** are typically estimated;
- presents options for how we might **incorporate the effects of changes in trade barriers within our five-year forecast period**; and
- talks about the impact that such effects could have on our **fiscal forecast**.

Current trade policy

Tariffs

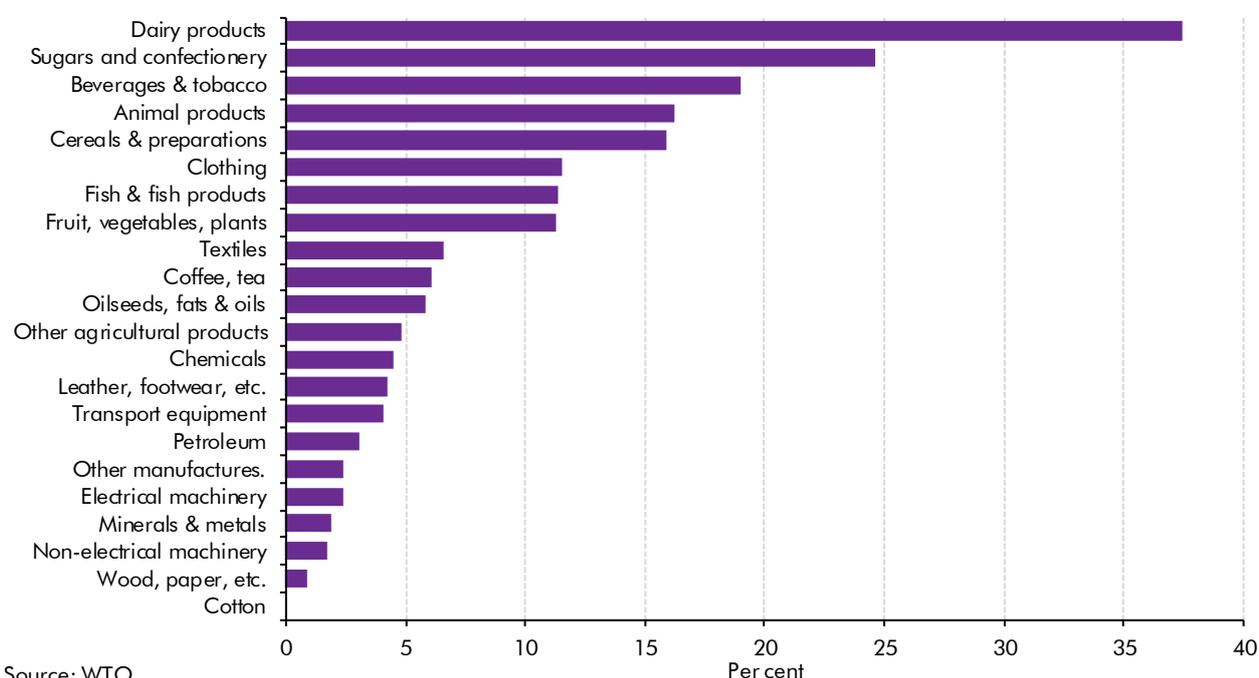
2.3 Tariffs are taxes on imported goods and can be specific – a fixed sum per unit imported – or ad valorem – a percentage of the value of the import. Average global tariff rates have fallen significantly since the Second World War.

2.4 As a member of the EU Customs Union, the UK faces no tariffs or quotas¹ on exports to other countries within the EU and imposes no tariffs or quotas on imports from other EU members. The UK also applies the EU's common external tariff to non-EU countries.

¹ Quotas are covered in more detail in the Non-tariff barrier section.

2.5 For countries with which the EU does not have a trade agreement, imports into the UK are taxed at product-specific most-favoured nation (MFN) rates.² EU MFN tariff rates on imports have fallen slightly in recent times, with the unweighted average reaching 5.7 per cent in 2016.³ But the trade-weighted-average MFN tariff rate is lower – at 3.2 per cent in 2016. UK exports to countries that the EU does not have a trade agreement with will be taxed at that country’s product-specific MFN rate. For example, on exports to the US, the weighted average MFN tariff rate for agricultural products is 2.2 per cent and for non-agricultural products it is 1.6 per cent. While the EU, and other countries, have lowered MFN tariff rates over time, they remain high in some areas – especially in agriculture (Chart 2.1).

Chart 2.1: Current EU MFN rates by sector



2.6 Much of the UK’s trade with non-EU countries is not subject to MFN tariff rates:

- The **Crown Dependencies and Gibraltar** are all in the EU Customs Union (despite not being in the EU) and account for around 2 per cent of UK trade.
- The EU has tariff-free trade in goods other than agriculture and fisheries with the non-EU members of the **European Economic Area (EEA)** – Iceland, Norway and Liechtenstein. These countries account for around 2 per cent of UK trade.
- The EU has implemented **other free trade agreements (FTAs) and customs unions** – that reduce or eliminate tariffs on two-way trade in goods – with Albania, Andorra, Chile, Israel, Mexico, Morocco, Russia (currently subject to sanctions), San Marino,

² The MFN principle states that members of the WTO cannot treat any trading partner more favourably than any other trading partner, unless they have a trade agreement – including for tariff rates on goods imports.

³ World Bank DataBank. In calculating the average MFN rate, specific duties are converted into ad-valorem equivalent rates by dividing the specific duty by the average unit price (calculated as import value divided by import volume). The unweighted average covers all products subject to tariffs calculated for all traded goods. Data are classified using the Harmonized System of trade at the six- or eight-digit level. Tariff line data were matched to Standard International Trade Classification revision 3 codes to define commodity groups.

Serbia, South Africa, South Korea, Switzerland and Turkey. These countries account for about 8 per cent of UK trade.

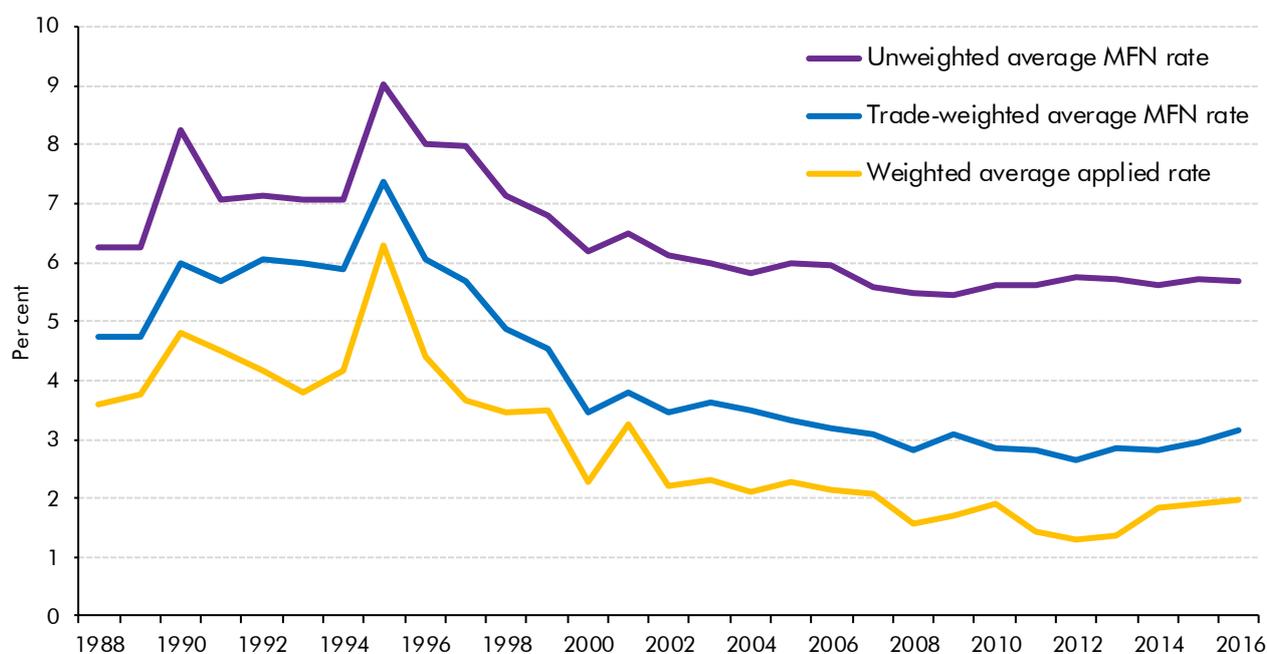
- The EU has **partly implemented FTAs** with Canada, Colombia, Ghana and Ukraine – which account for about 2 per cent of UK trade.
- The EU has **negotiated, but not yet implemented, FTAs** with Japan, Kenya, Singapore, Tanzania, Uganda and Vietnam – which account for about 4 per cent of UK trade.

When added to the 49 per cent share of UK trade accounted for by members of the EU, altogether trade agreements reduce or eliminate tariffs for around 66 per cent of UK trade.

2.7 The EU also has agreements that unilaterally allow freer access to its markets for some countries. The ‘everything but arms’ scheme allows tariff-free access to the EU for all goods (except weapons and ammunition) for those countries deemed by the UN to be ‘least developed countries’.⁴ This covers 49 countries, including 34 in Africa. The EU also has a ‘generalised scheme of preferences’ that either reduces or eliminates tariffs on imports of around 65 per cent of products from 27 other low-income countries.⁵

2.8 Together, these agreements mean that the weighted average tariff rate applied to imports into the EU is lower than the average MFN rate. In 2016, it was 2.0 per cent versus the unweighted average MFN rate of 5.7 per cent and the trade-weighted average of 3.2 per cent (Chart 2.2).

Chart 2.2: Most-favoured nation versus average applied tariff rates in the EU



Source: World Bank

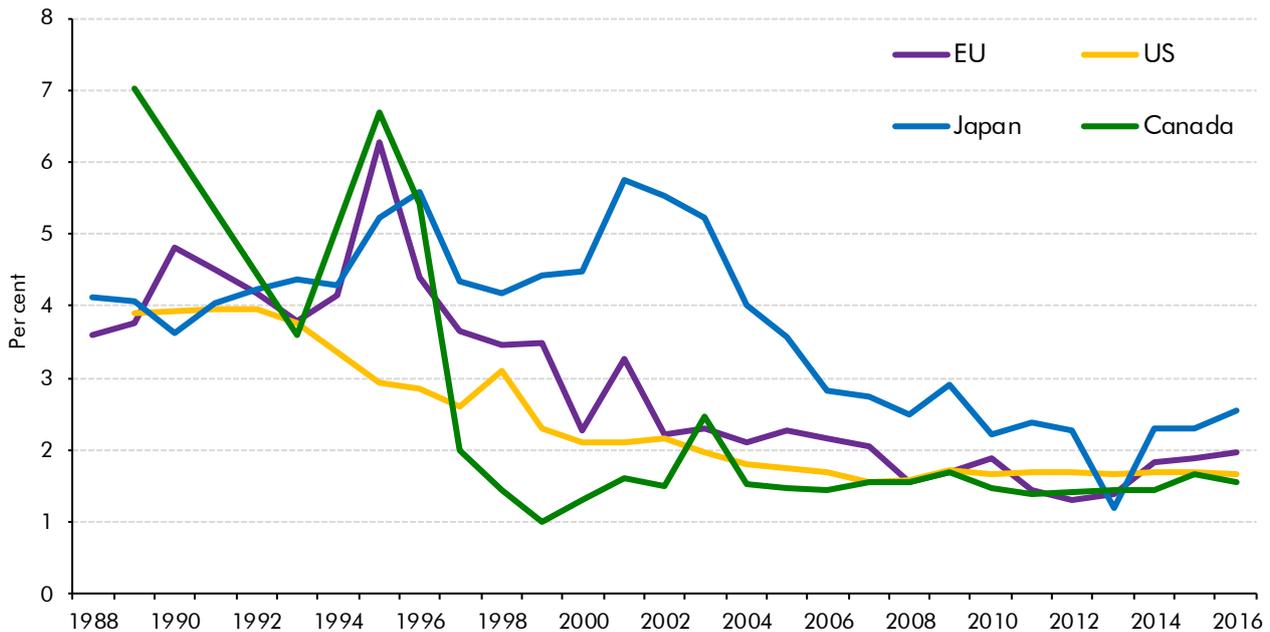
⁴ See European Commission Trade Helpdesk, *Everything But Arms*, accessed October 2018.

⁵ See European Commission Trade Helpdesk, *Standard GSP*, and European Commission Trade Helpdesk, *GSP+*, both accessed October 2018.

Trade barriers

2.9 The average tariff rate applied by the EU has fallen in recent times, as has been the case in other major countries (Chart 2.3). The evidence on whether these lower average tariff rates have been passed through to lower retail prices is slightly mixed. Some studies find that the main benefit for households is in greater variety and quality of products rather than lower retail prices.⁶ We explore the economic impact of reductions in trade barriers more generally from paragraph 2.44.

Chart 2.3: Weighted average applied tariff rates by country



Source: World Bank

Non-tariff barriers

2.10 'Non-tariff barriers' (NTBs) is a catch-all term for measures that restrict trade but do not involve tariffs. These include regulatory barriers, rules of origin, customs checks and administration costs (these are explained further in paragraph 2.30). With average tariff rates on goods having fallen in recent years, along with a significant increase in the intensity of services trade (which are not subject to tariffs), most studies find that NTBs are now a much greater hindrance to trade than tariffs.⁷

2.11 NTBs can occur either at the border (including customs checks and controls) or as the result of behind-the-border regulations that mean imports are treated differently to domestically-produced products. As a member of the EU's Single Market, NTBs on trade between the UK and other EU countries have been reduced significantly, particularly for goods (the Single Market in services is not fully developed⁸). Goods traded between EU member states are not subject to any border inspections. Behind-the-border barriers for both goods and services

⁶ For example, see Berlingieri, S., Breinlich, H., Dhingra, S., *The Impact of Trade Agreements on Consumer Welfare - Evidence from the EU Common External Trade Policy*, Journal of the European Economic Association, February 2018.

⁷ For example, see Kee, H.L., Nicita, A., Olarreaga, M., *Estimating Trade Restrictiveness Indices*, The Economic Journal, January 2009.

⁸ For example, see Fernández Corugedo, E., Perez Ruiz, E., *The EU Services Directive: Gains from Further Liberalisation*, International Monetary Fund Working Paper No. 14/113, July 2014.

are minimised by aligning and jointly recognising product standards, as well as by other measures that aim to create a level playing field by removing competitive distortions and discrimination between imports and domestically-produced goods and services. For example, Article 34 of the Treaty on the Functioning of the European Union states that “*quantitative restrictions on imports and all measures having equivalent effect shall be prohibited between Member States*”. Such restrictions can only be introduced for non-economic reasons, for example, public security.

- 2.12 Some of the FTAs mentioned in paragraph 2.6 aim to reduce NTBs as well as tariffs. For example, the FTA with Canada allows EU companies to bid on public procurement contracts in Canada (and vice versa), eases product testing requirements on traded goods and aims to reduce customs delays. The EU’s FTA with Japan will align safety and environmental standards on cars and allow for greater temporary movement of people between the EU and Japan for business purposes. The EU has many other product-specific agreements with individual countries and country groups to help facilitate trade. (For example, the EU has 59 bilateral agreements and amendments to these agreements with the US, including agreements on aviation, insurance and data transfer.⁹) But these agreements are on nothing like the scale or scope of the Single Market and they leave most NTBs in place.

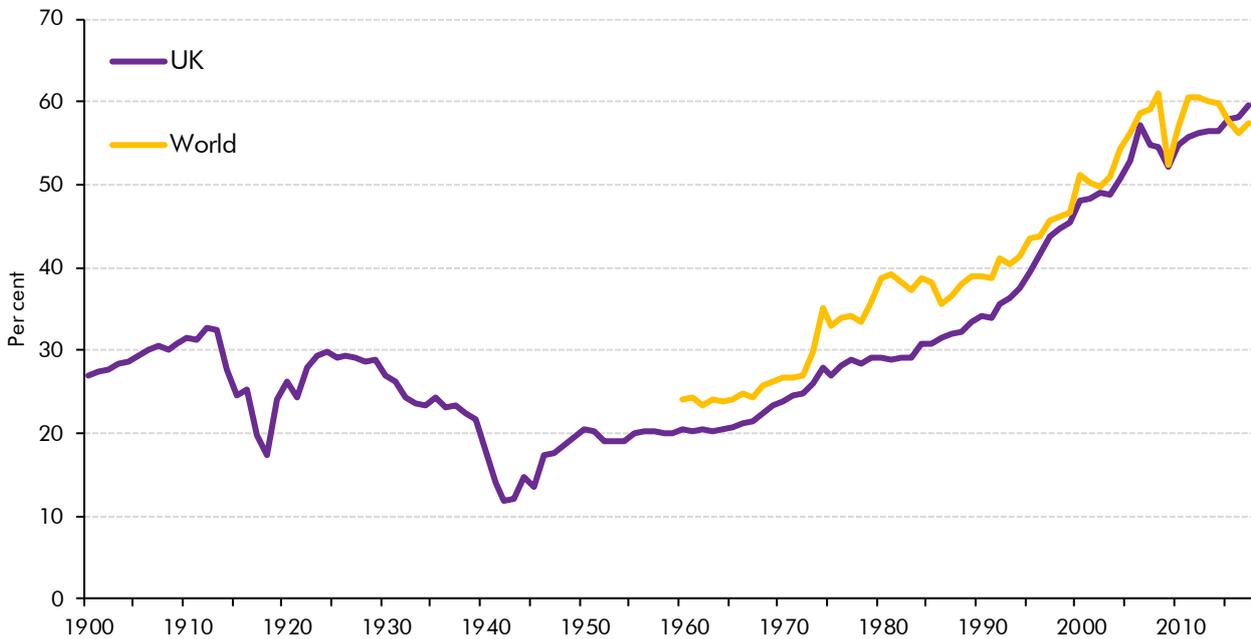
Trends in UK trade

- 2.13 Global trade intensity – exports plus imports as a share of GDP – has risen significantly in recent decades, although not since the financial crisis in 2008 (Chart 2.4). Jacks *et al* (2011) find that most of the rise in global trade since 1950 has been due to output growth, with falls in trade costs contributing less than a third of the increase. In contrast, more than half the increase in intra-EU trade flows over the same period been driven by falls in trade costs within the EU. Since 1990, EU economies have seen the largest rise in trade openness in the OECD.¹⁰ This appears to have contributed to a rise in the trade intensity of the UK economy. (Ways of modelling these effects are discussed from paragraph 2.33). In 1948, imports and exports combined were equivalent to 19 per cent of UK GDP. By 1972, on the eve of the UK joining the European Economic Community it had reached 25 per cent of GDP. In 2017, that figure was 60 per cent.

⁹ European Union Treaties Office Database.

¹⁰ See Annex 3 of *EU membership and the Bank of England*, 2015.

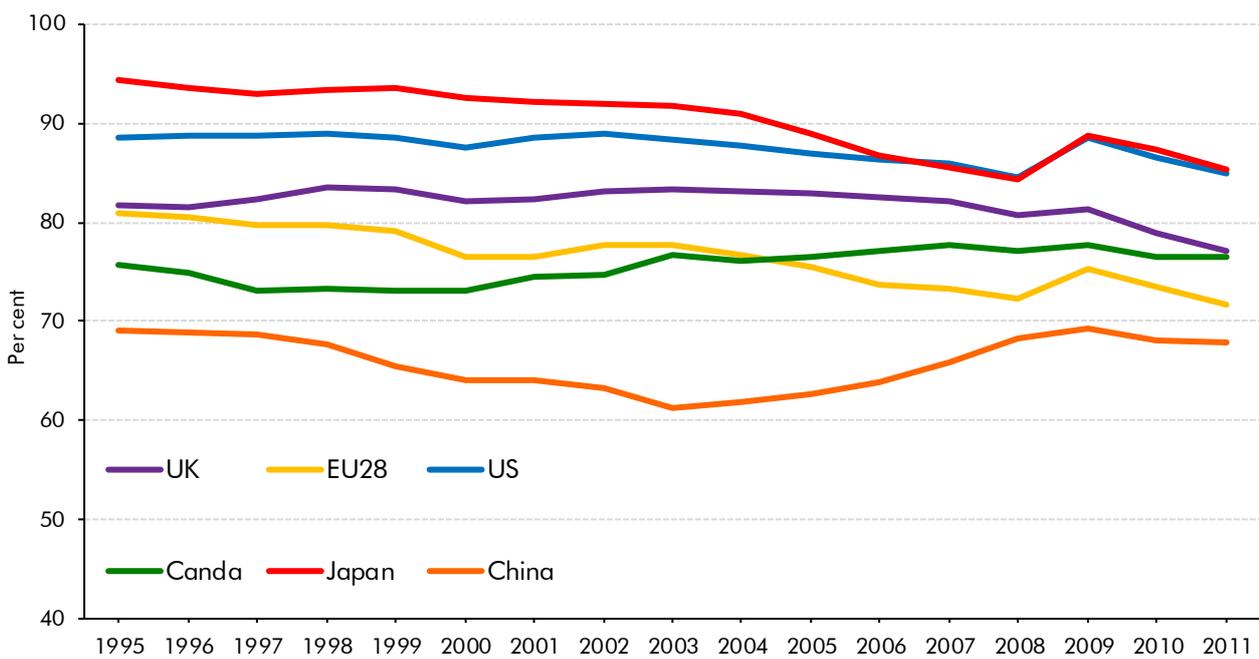
Chart 2.4: Trade as a share of nominal GDP



Sources: Bank of England, World Bank

2.14 One feature of the integration of global supply chains has been a rising import content of exports. The ONS estimates that 39 per cent of the value of UK goods exports reflected imported intermediate goods and services in 2013, up from 29 per cent in 1995. The OECD estimates that domestic value added in UK exports – i.e. the wages and profits generated for households and companies in the UK – has fallen from 82 per cent in 1995 to 77 per cent in 2011 (Chart 2.5).

Chart 2.5: Domestic value added in exports



Source: OECD

2.15 In terms of the geographical composition of UK trade, the first 14 countries (other than the UK) to join the predecessors of the EU¹¹ accounted for 24 per cent of nominal UK trade in goods in 1948 (Chart 2.6). That share rose to 43 per cent in 1972 and peaked at 60 per cent in 1991. Based on available data, total trade peaked at 57 per cent in 2001. This share has fallen back slightly in recent years – reaching 47 per cent of goods and 44 per cent of total trade in 2017. But the EU remains by far the UK’s largest trading partner – accounting for 49 per cent of total UK trade when adding the remaining members of the EU27.

Chart 2.6: EU15 share of nominal UK trade

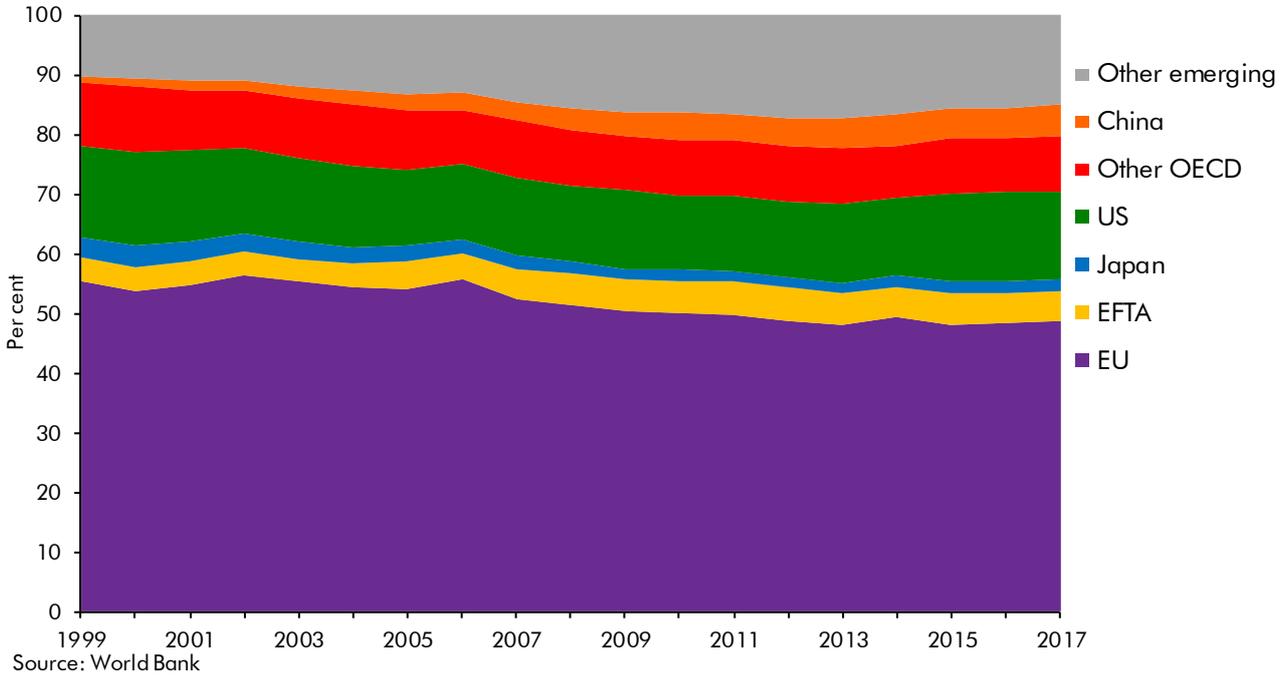


Source: Bank of England

2.16 The recent decline in the share of UK trade with the EU has reflected the growing importance of emerging market economies. As Chart 2.7 shows, the share of nominal UK trade taking place with China increased from 1.6 per cent in 2001, the year China joined the World Trade Organisation, (when China accounted for 2.3 per cent of UK imports and was the destination for 0.9 per cent of UK exports) to 5.4 per cent in 2017 (when China made up 7.0 per cent of UK imports and 3.6 per cent of UK exports). The share of UK trade with other emerging economies has increased from 10.8 to 14.7 per cent over the same period. Other EU countries have experienced similar trends over the same period; for example, the share of Germany’s trade with China increased from 2.7 to 8.1 per cent.

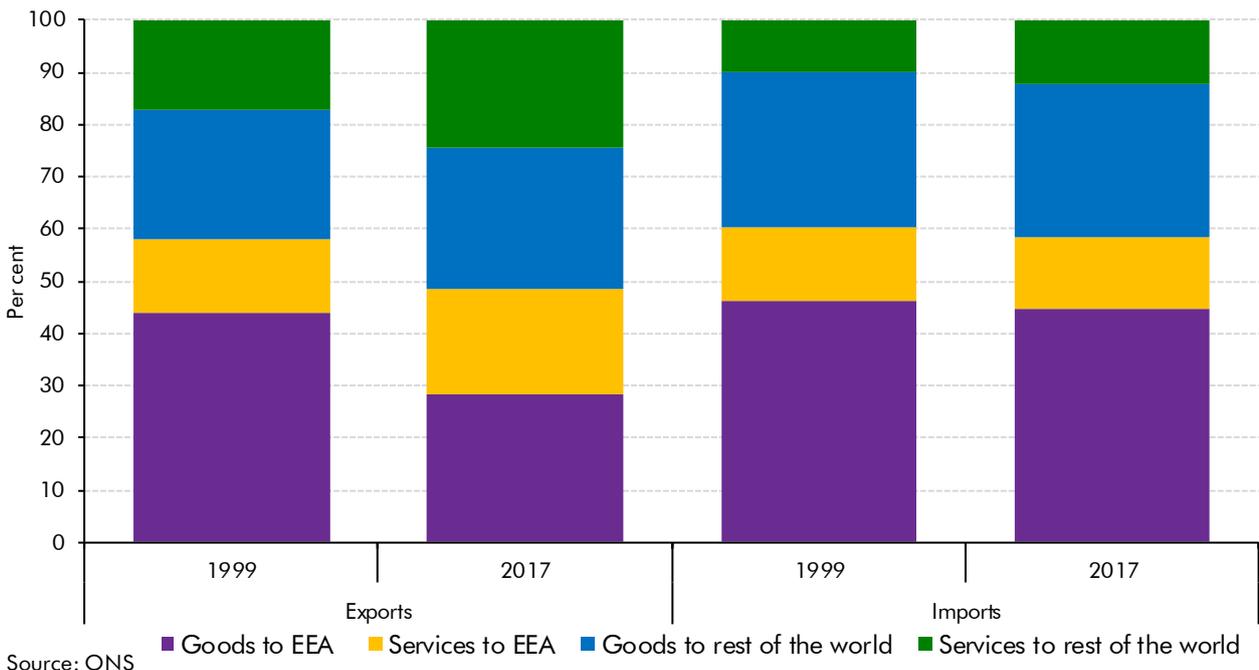
¹¹ 13 countries have joined the EU since 2004.

Chart 2.7: Share of nominal UK trade by destination or source



2.17 In terms of trade in goods and services, recent growth in the UK's trade intensity has been led by growth in services exports, with the increase split fairly evenly between countries inside and outside the European Economic Area (EEA)¹² (Chart 2.8). In contrast, the slower growth in goods exports has been concentrated in exports to EEA countries. Around 51 per cent of the UK's goods exports and 45 per cent of service exports went to the EEA in 2017.

Chart 2.8: Composition of UK exports and imports



¹² The 27 other members of the EU plus Norway, Iceland and Lichtenstein – who have been subject to EU Single Market's four freedoms and the principles of non-discrimination and equal rules of competition since 1994.

- 2.18 Recently, goods exports to non-EU countries have been boosted by non-monetary gold exports thanks to the dominance of the London Bullion Market in global gold trading. This phenomenon means that the growth in exports to non-EU countries is flattered somewhat relative to exports to EU countries (see Box 2.3).

Our current approach to forecasting

Forecasting trade flows

- 2.19 We forecast aggregate export and import flows top-down, rather than bottom-up by country or industry. Our export forecast reflects two main judgements: first, our expectations for growth in the UK's export markets; and second, the share of that growth that we expect to be satisfied by UK exporters. Our forecast for the UK's export market share takes into account the propensity of other countries to trade, along with exchange rate movements and changes in barriers to trade that affect the relative profitability of exporting compared to supplying the domestic market. In recent years, the UK's export market share has fallen – mainly due to the growth in export intensity in emerging markets – and our recent forecasts for total exports have assumed that this trend will continue.
- 2.20 Our import forecasts also reflect two main judgements. First, our expectation for import-weighted domestic demand, calculated by weighting our forecasts for the other expenditure components of GDP according to their respective import contents. These weights are derived from detailed ONS data that estimate the inputs and outputs of all sectors of the economy. Second, the likely import intensity of that demand over the forecast period. This will be affected by the propensity of other countries to export, as well factors such as exchange rate movements and trade barriers, which affect the prices of domestically produced goods and services relative to imported alternatives. Many of our recent imports forecasts have assumed that a continued upward trend in the import intensity of demand.

Brexit-related forecast adjustment

- 2.21 In our November 2016 EFO, we incorporated an adjustment into our trade forecasts for the effects of the UK leaving the EU. We have retained the same assumptions in subsequent forecasts. With no meaningful basis to predict the outcome of the negotiations determining the UK's future trading arrangements, we have applied a broad-brush assumption that export and import growth will both be lower than they otherwise would have been for a decade or so. This adjustment was calibrated to match the average effect estimated in three pre-referendum external studies that assessed the impact of leaving the EU on the UK economy, including on trade.¹³ These considered the effects of both tariff and non-tariff barriers. We made a similar-sized revision to both export and import growth, so the downward revisions to gross trade flows were broadly neutral in their effect on net trade and GDP growth.

¹³ We took the average estimated effect from studies by NIESR (Ebell, M., Warren, J., *The long-term economic impact of leaving the EU*, National Institute Economic Review, May 2016), the OECD (Organisation for Economic Co-operation and Development, *The economic consequences of Brexit: a taxing decision*, OECD Economic Policy Paper No. 16, April 2016) and LSE/CEP (Dhingra, S., Ottaviano, G., Sampson, T., Van Reenen, J., *The consequences of Brexit for UK trade and living standards*, London School of Economics and Political Science/Centre for Economic Performance Brexit Paper 2, March 2016).

Trade barriers

2.22 The Brexit adjustment to our export forecast reinforced our baseline assumption that the UK's export market share will fall over the forecast period (Chart 2.9). The adjustment to our import forecast means that it now involves a temporary, but protracted, reversal of the trend of rising import intensity of final demand (Chart 2.10). We have not yet included a transition period in our forecasts. If we did, this would simply delay the hit to trade intensity.

Chart 2.9: Export market share

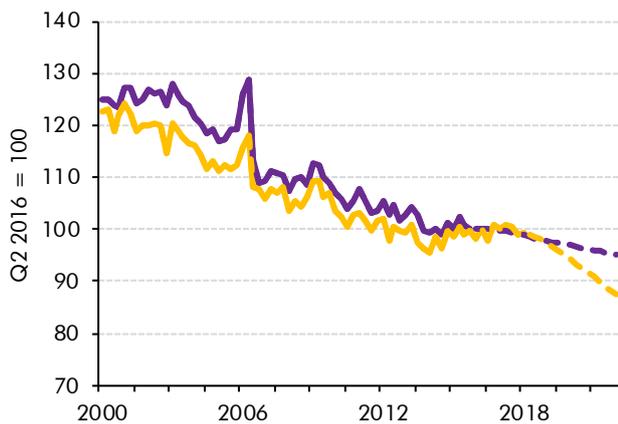
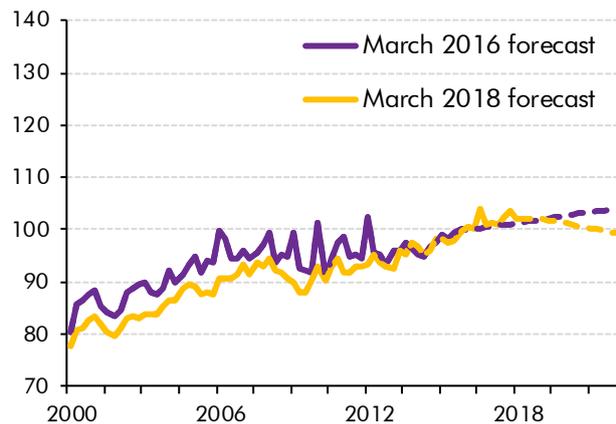


Chart 2.10: Import penetration



Note: UK export share defined as exports divided by UK export markets, where exports series have been adjusted to account for the effect of VAT Missing Trader Intra Community (MTIC) fraud, although there is uncertainty around MTIC data prior to 2007.
Source: OECD, ONS, OBR

Potential changes in trade barriers after Brexit

2.23 In March 2018, the European Commission published a draft Withdrawal Agreement between the UK and the EU.¹⁴ It contained provision for a transition period until 31 December 2020 – which, if agreed, would result in no changes in the trading relationship between the UK and the EU until then. Trading conditions beyond the end of the transition period would depend on negotiations during the transition period. The type of relationship that both parties aim to achieve may be signalled in the final Withdrawal Agreement, but this is unlikely to be sufficiently firm or detailed to reflect in our forecast and details may emerge only slowly over time. Even with a Withdrawal Agreement, the UK and EU might not conclude a trade agreement for implementation beyond the transition period.

2.24 Of more immediate significance, if the UK and the EU were to fail to finalise a Withdrawal Agreement, and there was therefore no transition period, then the trading relationship between the UK and EU would be governed primarily by WTO rules on 30 March 2019. (Some aspects of the trading relationship – such as aviation – are not covered by WTO rules.)

¹⁴ See European Commission, *Draft Agreement on the withdrawal of the United Kingdom of Great Britain and Northern Ireland from the European Union and the European Atomic Energy Community*, 2018.

Tariffs

- 2.25** If no Withdrawal Agreement were signed, and the UK fails to replicate the EU's existing trade agreements, then UK exports to the EU and to countries that the EU currently has a trade agreement with would face the MFN rates that the EU and these countries apply. If a Withdrawal Agreement were signed, but the UK failed to agree a free trade deal with the EU (or were not to replicate the EU's existing trade agreements with third countries), UK exports to these countries would face these MFN rates at the end of the transition period. Alternatively, if the UK does agree a free trade deal with the EU and replicates the EU's existing trade agreements with third countries, then tariff rates on the UK's exports of most products would stay at their current rates.
- 2.26** For imports into the UK, the UK Government will have to decide on its MFN tariff schedule – these will be the rates that all countries that do not have a trade agreement with the UK are subject to on their exports into the UK. On 23 July this year, the UK submitted a draft schedule for its “bound” tariff rates – the upper limit of MFN rates that can be charged – to the WTO. These “bound” tariff rates match current EU tariff rates – including specific tariffs denominated in euros rather than pounds – although the UK could decide to charge lower rates as long as they were applied in a non-discriminatory way.¹⁵ WTO members have three months to review the schedule and it will only be ratified if there are no objections. If the UK and EU fail to finalise a Withdrawal Agreement, then MFN rates would be charged on imports into the UK from the EU from 30 March 2019. Indeed, the head of the WTO has stated that *“It is very unlikely that you’re going to have 100 per cent agreed outcome for all WTO members between now and March.”*¹⁶ If there was a Withdrawal Agreement but the UK did not conclude a free trade agreement with the EU, then these MFN rates would be charged on imports into the UK from the EU from the end of the transition period. The average ad-valorem MFN rates that would be charged on trade between the UK and EU in either situation, if the UK retains the same MFN rates as the EU, are shown in Table 2.1.

¹⁵ WTO, *Rectifications and modifications of schedules: Schedule XIX – United Kingdom*, 2018.

¹⁶ Financial Times, *WTO warns on disruption to UK of no-deal Brexit*, 24 August 2018.

Table 2.1: EU ad-valorem MFN tariffs by sector for UK trade

Sectors	Per cent	
	Imports	Exports
Agriculture, Hunting, forestry and fishing	5.9	5.6
Mining and quarrying	0.0	0.0
Food, beverages and tobacco	7.3	5.0
Textiles and textile products, Leather	9.6	9.7
Wood and products of wood and cork	2.4	3.6
Pulp, paper, printing and publishing	0.0	0.1
Coke, refined petroleum and nuclear fuel	2.7	2.8
Chemicals and chemical products	2.7	2.2
Rubber and plastics	5.4	5.1
Other non-metallic minerals	3.8	3.3
Basic metals and fabricated metal	2.1	1.9
Machines, etc	2.1	2.1
Electrical and optical equipment	2.0	1.6
Transport equipment	8.1	7.2
Manufacturing, etc.	1.7	1.7
Weighted average (by UK-EU trade)	4.4	3.3

2.27 MFN rates would also be charged on imports to the UK from non-EU countries, including those that currently have tariff-free access to the UK through deals negotiated by the EU on the UK's behalf – unless the UK were to replicate those deals. The draft Withdrawal Agreement states only that the EU will ask third countries to replicate their trade agreements with the UK, which would require the individual agreement of these third countries. Details about any such agreement may only emerge slowly while failure to negotiate a Withdrawal Agreement would remove the EU's commitment to help with these. To date, the UK Government has reached one provisional agreement on such a deal, with the Southern African Customs Union and Mozambique.¹⁷

2.28 Clarke *et al* (2017) estimate that the imposition of MFN tariff rates on UK imports from the EU would increase consumer prices by around 1 per cent, including 2.4 per cent for clothing prices, 5.5 per cent for the price of transport vehicles, 5.8 per cent for meat products and 8.1 per cent for dairy products.¹⁸ Alternatively, if the UK were to eliminate all tariffs that the EU currently charges on imports from third countries, and charge zero tariffs on imports from the EU, the IFS (2018) estimates that consumer prices would be reduced by around 1 per cent.¹⁹ If the UK and EU fail to conclude either a Withdrawal Agreement or a trade agreement, the effect of a fall in sterling could outweigh the effect of tariffs on prices (exchange rate considerations are discussed in Chapter 4).

¹⁷ Gov.uk, *Joint statement on UK, SACU and Mozambique EPA*, 29 August 2018.

¹⁸ Clarke, S., Serwicka, I., Winters, L.A., *Will Brexit Raise the Cost of Living?*, National Institute Economic Review, October 2017.

¹⁹ Levell, P., *The Customs Union, tariff reductions and consumer prices*, IFS Briefing note 225, March 2018.

Non-tariff barriers

2.29 Under any Brexit scenario, the UK will face greater non-tariff barriers on its trade with the EU. Leaving the Customs Union would result in UK trade with the EU being subject to rules of origin requirements, customs delays, administration costs, tariff rate quotas and potential anti-dumping duties that are not currently faced. Leaving the Single Market could see UK-EU trade subject to a variety of regulatory barriers and loss of access to some product markets, in contrast to current practice where most UK regulations are either aligned to EU ones or mutually recognised by other EU countries. The speed with which these barriers take effect will be influenced by whether the UK and EU finalise a Withdrawal Agreement that contains a transition period. Some NTBs could be mitigated through the signing and implementation of a trade deal. If the UK were not to replicate the trade agreements that the EU currently has with other countries, UK trade with non-EU countries could also be subject to additional NTBs. But these effects would not be as significant, because these trade agreements have done less than the EU's Single Market to reduce non-tariff barriers and the trade flows involved are much smaller. Potential changes to trade barriers with non-EU countries are discussed further in Chapter 4.

2.30 There are a wide variety of non-tariff barriers that might change after Brexit:

- **Regulatory barriers to trade** are likely to rise after Brexit due to potential divergences in health, safety, labelling, packaging and environmental standards. As a member of the Single Market, the UK has to comply with EU-wide regulations and its products therefore meet the standards required to sell into any EU country. Following Brexit some goods produced within the UK could not be sold into the EU without an agreement to recognise UK standards as equivalent to EU ones. For example, UK organic farmers would need to be certified by a UK control body that was recognised by the European Commission. Approval for such recognition can take up to nine months and can only be made once the UK leaves the EU.²⁰ Certain products traded between the UK and EU would probably require an import license. Military goods and medicines would all need to be licensed by the appropriate EU regulatory body. Sanitary and phyto-sanitary regulations might restrict imports of certain animal and plant species. Also, if the EU and UK regulatory regimes diverge over time, certain products will need to be altered to meet EU standards if they are to be sold into the Single Market.
- **Rules of origin** require firms exporting to the EU from outside it to prove which country the product originated from in order to certify the domestic content of exports. After Brexit, if the UK and the EU negotiate an FTA, UK firms may be required to prove the origin of exports into the EU – generally where over 50 per cent of the value of the product was added – to determine whether it can receive potential preferential tariff treatment. For products that have components produced or compiled in different countries, proving origin can be a costly process, to the extent that some firms choose to pay tariffs rather than meet the rules of origin requirement. For example, Nilsson

²⁰ Department for Environment and Rural Affairs, *Producing and processing organic food if there's no Brexit deal*, 2018.

(2016) estimated that only around 75 per cent of EU exports to countries with an FTA take advantage of the preferential tariff rates provided under these agreements.²¹ Rules of origin requirements exist to prevent exporters in a country without an FTA with the EU exporting their product first to a country that does have an EU FTA and then re-exporting it to the EU at the EU's preferential tariff rates.

- Outside the Customs Union and Single Market, trade between the UK and the EU would be subject to **customs checks**. Products may have to undergo checks by customs officials for several reasons, including assessment of rules of origin requirements, assessment of whether the appropriate tariff rate is being applied and whether it meets EU regulatory requirements, for example in respect of product safety standards. While some of these costs may not be incurred at the border itself, the UK Trade Policy Observatory (2018)²² drew on a variety of studies to estimate that these will increase trade costs by 3.5 per cent on manufactured products.²³
- Trade **administration costs** with the EU are likely to rise after Brexit. For example, if the UK leaves the Customs Union, a UK business importing products from the EU would, among other tasks, have to register for an economic operator registration and identification number, submit an import declaration to HMRC and pay import VAT.²⁴ Ciuriak *et al* (2015) estimate that these administration costs will increase total trade costs by 0.33 per cent.²⁵
- **Import quotas** are restrictions on the imported volume or value of a particular product and can be applied to certain countries or to certain imports coming from all countries. WTO countries have mostly agreed to end the use of outright quotas, but tariff-rate quotas (TRQs) (which only allow a certain volume or value of a products to be imported at a reduced tariff rate) remain relatively common. Trading outside these quotas is possible, but generally expensive. The EU has TRQs on around 100 (mostly agricultural) products for countries that do not have a trade agreement with the EU. These TRQs will need to be split between the UK and the rest of the EU, with the method to be approved unanimously by WTO members. The UK and the rest of the EU have proposed splitting these based on their recent shares of the imported products, although several countries have already objected to this.²⁶ If the UK and EU fail to

²¹ Nilsson, L., *EU Exports and Uptake of Preferences: A First Analysis*, Journal of World Trade, 2016.

²² Gasiorek, M., Serwicka, I., Smith, A., *Which manufacturing sectors are most vulnerable after Brexit?*, UK Trade Policy Observatory Briefing Paper 16, February 2018.

²³ The UKTPO combined estimates from Centre for Economic Policy Research, *Estimating the Economic Impact on the UK of a Transatlantic Trade and Investment Partnership (TTIP) between the European Union and the United States*, March 2013; Francois, J., Manchin, M., Norberg, H., Pindyuk, O. And Tomberger, P., *Reducing Transatlantic Barriers to Trade and Investment: An Economic Assessment*, March 2013; Carrère, C., de Melo, J., *Are Different Rules of Origin Equally Costly? Estimates from NAFTA*, Developing Countries in the World Economy, 2015; Anson, J., Cadot, O., Estevadeordal, A., de Melo, J., Suwa-Eisenmann, A., Tumurchudur, B., *Rules of Origin in North-South Preferential Trading Arrangements with Application to NAFTA*, Review of International Economics, 2005; Cadot, O., Estevadeordal, A., Suwa-Eisenmann, A., *Rules of Origin as Export Subsidies*, CEPR Discussion Paper No. 4999, 2005; Hayakawa, K., *Measuring Fixed Costs for Firms' Use of a Free Trade Agreement: Threshold Regression Approach*, IDE Discussion Paper No. 275, 2011; and Cadot, O., Gourdon, J., *Non-Tariff Measures, Preferential Trade Agreements and Prices: New Evidence*, Review of World Economics, 2016.

²⁴ HM Revenue and Customs, *Trading with the EU if there's no Brexit deal*, 2018.

²⁵ Ciuriak, D., Xiao, J., Ciuriak, N., Dadkhah, A., Lysenko, D., Badri Narayanan, G., *The Trade-related Impact of a UK Exit from the EU Single Market*, Ciuriak Consulting, April 2015.

²⁶ For more information see House of Commons International Trade Committee, *Continuing application of EU trade agreements after Brexit*, 2018.

negotiate a Withdrawal Agreement or future trade deal, then bilateral trade will be subject to these TRQs.

- EU membership gives UK firms equal footing in bidding for **state procurement contracts** in other EU countries. Without provision for this in a potential free trade agreement with the EU, UK firms could be discriminated against in bidding for these contracts. The opposite could be true of EU firms bidding for contracts in the UK.
- The EU's freedom to provide services allows for '**mode 4' service provision** – business travel to another country in order to provide a service in that country – across borders. Without an equivalent provision for this in a potential free trade agreement with the EU – such as that contained within the EU-Japan free trade agreement – UK workers' travel to EU countries to provide services might be restricted. Brexit's possible effects on long-term migration are covered in Chapter 3.
- **Anti-dumping duties** could be applied to goods that are exported from the UK to the EU at a price deemed to be below cost, if the EU judges that this damages its domestic industry through no fault of the EU or of the industry. As a member of the EU, UK firms are exempt from anti-dumping duties in relation to trade within the EU.

2.31 Some services firms may lose access to the EU market altogether, as some services cannot be sold into the EU without the direct authorisation of an authority within a member state. For example, some UK qualifications might no longer be recognised as equivalent by the EU – lorry drivers, for instance, are required to hold a certificate of professional competence issued by the authorities of an EU member state in order to drive within an EU country. After Brexit, and in the absence of a replacement agreement, certificates issued by the UK would no longer be valid in the EU.²⁷

2.32 Access is particularly important in the case of financial services, with the UK hosting around 50 per cent of global turnover in interest rate derivatives and around 40 per cent of turnover in global foreign exchange trading. It is also the largest centre for cross-border bank lending, accounting for 19 per cent of the outstanding value of global lending. The banking systems of EU countries have become more integrated than in other parts of the world, with intra-EU banking rising from 17 per cent of all reported cross-border bank claims in 1990 to 36 per cent by 2008, falling back slightly since then.²⁸ In 2017, the UK had a surplus on financial services trade of £44 billion (2.2 per cent of GDP) of which 47 per cent was accounted for by trade with the EU. Trade in financial services with the EU is facilitated by the 'passporting' regime, which allows firms authorised in one country within the Single Market to sell certain financial products into any other country within the single market. Outside the Single Market, UK regulation would need to be recognised as equivalent by the European Commission for UK-based firms to continue selling particular types of financial services into the Single Market. Moreover, this equivalence can be withdrawn at short notice.

²⁷ European Commission, *Withdrawal of the United Kingdom and EU rules in the field of road transport*, 2018.

²⁸ Bank of England, *EU membership and the Bank of England*, 2015.

Implications of trade barriers for the economy

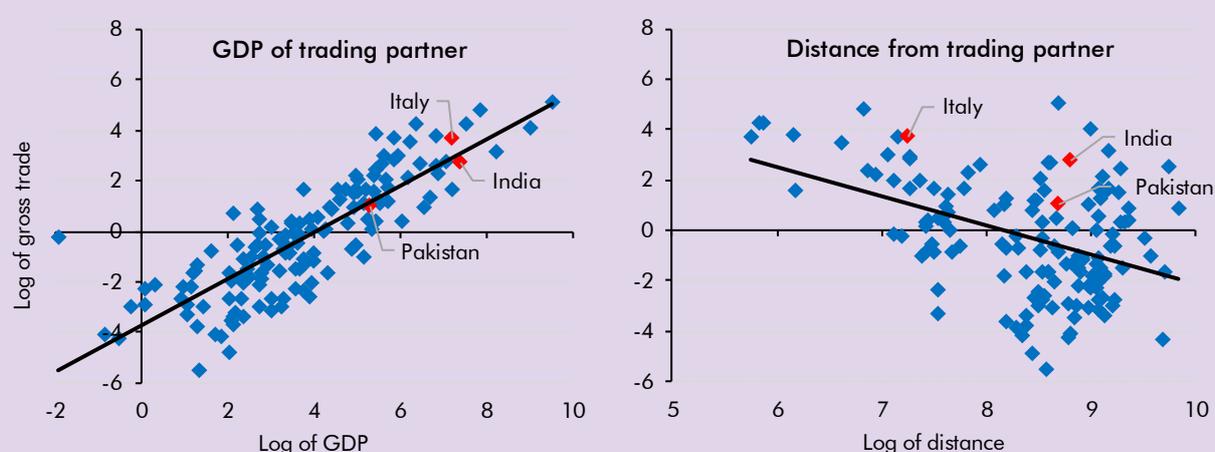
Estimating the tariff equivalent of non-tariff barriers

- 2.33 Putting a value on tariff barriers is relatively straightforward, but the diversity of NTBs makes it difficult to express their total value in a common unit. They can either increase the cost of doing business – either monetary or in terms of time lost – or they can completely cut off access to a market. Identifying each NTB and estimating the impediment to trade from each in isolation before aggregating into an overall effect would be extremely demanding. Even if it were possible, the results would probably be misleading as there are likely to be interactions between different barriers that mean the overall effect on trade is different to that derived by summing the estimated impacts for individual measures.
- 2.34 Given this, the additional NTBs that the UK may face on leaving the EU are generally inferred indirectly from their trade outcomes and then converted to an ad-valorem equivalent (AVE) value – the rate of an ad-valorem tariff that would have an equally trade-restricting impact. The most common method of estimating these NTBs is through ‘gravity’ models of trade patterns (Box 2.1).

Box 2.1: Gravity models

In physics, the force of gravity between two objects is proportional to their masses and inversely proportional to the square of the distance between them. A similar empirical relationship appears to describe international trade flows: the value of trade between two countries generally rises in proportion to each country's GDP and falls in proportion to the distance between them (Chart A). Demonstrating this relationship, the value of UK trade with India is almost six times as large as UK trade with much-smaller Pakistan, despite their similar distances from the UK. But even though the Indian and Italian economies are similarly sized, UK trade with Italy is twice as large as with India – as a result of India being much further away from the UK.

Chart A: Gravity in UK trade: the effects of size and distance



Source: IMF, ONS

'Gravity models' of international trade capture this relationship by regressing bilateral trade against both countries' GDP, the distance between them and trade costs (with all variables expressed in logarithms). The fit of the regressions can be improved by including other factors that affect trade, such as whether the two trading partners share a language, colonial links or a land border. These regressions have a well-established track record and typically explain between 60 and 90 per cent of regional variation in trade flows – for both aggregate and sectoral data and for both goods and services.^a

In recent years, gravity equations have also been shown to have solid theoretical foundations. They emerge from several microeconomic frameworks, with the gravity relationship generated either by differences in countries' preferences,^b comparative advantages^c or other factors.

'Structural' gravity models – regressions that incorporate insights from these theoretical frameworks – correct for unobserved variables that would otherwise bias coefficients (often by accounting for predictors of *relative* trade costs via fixed effects estimation).

By controlling for other factors that affect trade, gravity models can also help isolate the effects of trade policy. Much pre-referendum analysis estimated the extra trade created by UK membership of the EU by comparing coefficients on dummy variables for EU and free trade agreement (FTA) membership. For instance, on the assumption that the majority of this extra trade would eventually vanish after leaving, the Treasury estimated that moving to an FTA with the EU would lower trade by 18 per cent relative to where it would have been.^d Under the same assumption, a

similar gravity model for foreign direct investment (FDI) flows implied a shortfall of between 15 and 20 per cent.^e

Since the referendum, an extension of this approach has been used to assess the potential impact of future increases in non-tariff barriers. If the model includes both a measure of tariffs and a dummy variable for EU membership, then any estimated effect from the latter can be attributed to a reduction in non-tariff barriers. (Some studies calculate corresponding sectoral impacts by carrying out the same exercise for trade in individual goods and services.) These can then be converted into ad-valorem tariff equivalents using econometric estimates of the different sectors' trade responsiveness to price changes.

Although most gravity models give broadly comparable results, they are naturally sensitive to the precise specification and data adopted by the researchers. Some researchers have criticised the gravity modelling technique used by the Treasury before the referendum and in other studies. For example, Coutts et al (2018) argue that the Treasury study overstates the UK trade created by EU membership by calculating the average impact for all EU countries rather than the UK specifically.^f But other studies find that the UK has benefited as much or more than average from EU membership. The IMF (2016) found that the UK trade created from membership of the EU has been larger than the average effect in the Treasury study. Similarly, Campos (2014) found that per capita GDP and labour productivity increased more in the UK as a result of EU membership than in several other countries such as Sweden, Greece and Finland. Gravity modelling at the sectoral level generally yields estimates similar to those from aggregate modelling. The sectoral modelling should provide a more UK-specific estimate as the sector results that receive the highest weight would be those where the UK makes up a larger portion of EU trade.

^a Yotov, Y., Piermartini, R., Monteiro, J.A., Larch, M., *An Advanced Guide to Trade Policy Analysis: The Structural Gravity Model*, World Trade Organization, 2016.

^b Anderson, J., van Wincoop, E., *Gravity with Gravitas: a Solution to the Border Puzzle*, *American Economic Review*, March 2003.

^c Eaton, J., Kortum, S., *Technology, Geography, and Trade*, *Econometrica*, February 2004.

^d The authors presented a range of results and the bottom of the range assumed that only half of the extra trade created by being a member of the EU would disappear after 15 years.

^e HM Treasury, *HM Treasury Analysis: The Long-term Economic Impact of EU Membership and the Alternatives*, April 2016.

^f For example, see Coutts, K., Guggdin, G., Buchanan, J., *How the economics profession got it wrong on Brexit*, Centre for Business Research Working Paper No. 493, January 2018.

- 2.35** The gravity modelling approach generally produces an estimate of the impact from being a member of the EU or by having an 'average' FTA with another country. So a key question when analysing the possible trade effects of Brexit is whether or not the change in NTBs will be symmetrical i.e. will the increase in NTBs associated with exiting the EU be the same size as the reduction from joining. With UK and EU regulations already harmonised, the full benefits from this would not disappear immediately. For example, supply chains would take time to adjust. There are few examples of countries leaving trading blocs or of FTAs breaking down on which to base an empirical conclusion.

- 2.36 In judging whether increasing and decreasing trade barriers have symmetrical effects on trade, Fidrmuc and Fidrmuc (2003) looked at the trade flows within the former multinational federations in Eastern Europe in the 1990s.²⁹ They found that trade flows between the Czech and Slovak Republics, the Baltic states, and Belarus, Russia and Ukraine all significantly exceeded the normal level predicted by a gravity model in 1990. As these economies became less integrated, and trade barriers rose, there was a sharp decline in the trade intensity among the affected countries, reaching more normal levels over the next few years.
- 2.37 Head *et al* (2010) study the impact that the breaking of colonial ties has on trade flows using gravity modelling.³⁰ The authors looked at the impact that the independence of 174 countries since 1900 had on bilateral trade flows between 1948 and 2006. The authors found that trade fell after the breaking of ties and that there was no statistically significant evidence that trade was higher 60 years after breaking the tie than it would have been if there had never been a colonial relationship. This suggests that the full trade effect of lowering trade barriers is reversed as they rise again.
- 2.38 Given the limited number of studies on the symmetry of joining and leaving trade blocs, the effects of currency unions – which could lower trade costs by removing the transaction costs associated with currency exchange – might provide some insight. Glick and Rose (2016) looked at data between 1948 and 2013 for currency unions including the CFA franc zone in Africa, the East Caribbean Currency Union, and the European Monetary Union, as well as situations where two countries use the Australian dollar, the British pound, the French franc, the Indian rupee or the US dollar.³¹ Their results did not provide statistically significant evidence that the effects on trade of joining and leaving a currency union are asymmetric.
- 2.39 In their Brexit modelling work, NIESR (2016)³² and the Netherlands CPB (2016)³³ both assume full symmetry – i.e. that the lowering of NTBs resulting from membership of the EU will be fully reversed when leaving. In contrast, the University of Bonn (2017) assumes that only half the lowering of NTBs will be reversed.³⁴ When looking at the effect of moving from an EEA to an FTA relationship or from an EEA to a WTO relationship, HM Treasury (2016) assumed 50 per cent symmetry at the bottom end of its range of estimates and 100 per cent at the top end; when looking at moving from an EU to an EEA relationship they assumed 100 per cent symmetry.³⁵
- 2.40 In the cross-Whitehall modelling work (published by the House of Commons Committee on Exiting the EU in March 2018), it was assumed that most of the lowering of NTBs arising from membership of the EU would be reversed after Brexit.³⁶ These adjusted NTB estimates were then fed as inputs into a computable general equilibrium model, of the type we discuss in Box 2.2.

²⁹ Fidrmuc, J., Fidrmuc, J., *Disintegration and Trade*, Review of International Economics, November 2003.

³⁰ Head, K., Mayer, T., Ries, J., *The erosion of colonial trade linkages after independence*, Journal of International Economics, May 2010.

³¹ Glick, R., Rose, A., *Currency unions and trade: A post-EMU reassessment*, European Economic Review, 2016.

³² Ebell, M., Warren, J., *The long-term economic impact of leaving the EU*, National Institute Economic Review, May 2016.

³³ Rojas-Romagosa, H., *Trade effects of Brexit on the Netherlands*, CPB Netherlands Bureau for Economic Policy Analysis Background Document, June 2016.

³⁴ Born, B., Mueller, G., Schularick, M., Sedlacek, P., *The economic consequences of the Brexit vote*, CEPR Discussion Paper No. 12454, November 2017.

³⁵ HM Treasury, *HM Treasury Analysis: The Long-term Economic Impact of EU Membership and the Alternatives*, April 2016.

³⁶ Committee on Exiting the EU, *EU Exit Analysis: Cross Whitehall Briefing*, March 2018.

2.41 Some studies have adopted alternative methods to estimate the extent of additional NTBs that the UK might face after Brexit:

- The Netherlands CPB (2016)³⁷, Dhingra *et al* (2017)³⁸, Jafari and Britz (2017)³⁹ and Rabobank (2017)⁴⁰ use **estimates of NTBs between the US and the EU** from other studies as a basis for estimating the additional NTBs the UK will face after Brexit. Dhingra *et al* use the estimates of NTBs between the US and EU from Berden *et al* (2009), where the authors use a combination of gravity modelling, business surveys and other studies.⁴¹ They then estimate the share of NTBs between the US and EU that could potentially be reduced. The Netherlands CPB, Jafari and Britz, and Rabobank use estimates of NTBs between the US and EU from Egger *et al* (2015).⁴² In this study, the authors use gravity modelling to estimate goods-related NTBs and World Bank calculations for services NTBs.⁴³ Berden *et al* and Egger *et al* estimate similar levels of reducible NTBs on trade between the US and EU of between 11 and 13 per cent in AVE terms. Therefore, the main difference in the size of the additional NTBs that the Brexit studies estimate that the UK would face after leaving the EU lies in the authors' assumptions about the share of US barriers that the UK would face (Table 2.2).
- Other studies have estimated the additional NTBs to UK trade **bottom up**, although only for goods trade. Ciuriak *et al* (2017) add estimates for the sterling cost of customs administration to estimates from the literature for the costs of border delays and conforming with rules of origin requirements and get a total initial AVE of 3.3 per cent.⁴⁴ The authors assume that other NTBs will increase over time, but do not provide AVE estimates of these. The UKTPO (2018) provided estimates of a more comprehensive, but not necessarily complete, list of NTBs – combining others' estimates for the cost of border inspections, sanitary and phytosanitary measures, technical barriers to trade and other measures – and get an AVE of 11.8 per cent on manufacturing products.⁴⁵
- The AVE of NTBs can also be estimated using a **price-based approach**. While gravity modelling attempts to estimate the volume of trade forgone due to NTBs and then converts them into a price equivalent, some studies have tried to estimate the price difference due to NTBs directly. In this case, the difference in price for products is regressed against other variables that should explain price differences – including distribution margins, transport costs and tariffs – with the gap not explained by these variables assumed to be the result of NTBs. Dean *et al* (2009) used this method for a

³⁷ See prior reference to the Netherlands CPB (2016).

³⁸ Dhingra, S., Huang, H., Ottaviano, G., Pessoa, J.P., Sampson, T., Van Reenen, J., *The Costs and Benefits of Leaving the EU: Trade Effects*, CEP Discussion Paper No. 1478, April 2017.

³⁹ Jafari, Y., Britz, W., *Brexit: an economy-wide impact assessment on trade, immigration, and foreign direct investment*, *Empirica: Journal of European Economics*, 2018.

⁴⁰ Erken, H., Hayat, R., Heijmerikx, M., Prins, C., de Vreede, I., *The permanent damage of Brexit*, RaboResearch, Rabobank, October 2017.

⁴¹ Berden, K., Francois, J., Thelle, M., Wymenga, P., Tamminen, S., *Non-Tariff Measures in EU-US Trade and Investment – An Economic Analysis*, ECORYS Nederland BV, December 2009.

⁴² Egger, P., Francois, J., Manchin, M., Nelson, D., *Non-tariff barriers, integration and the transatlantic economy*, *Economic Policy*, July 2015.

⁴³ Jafari, Y., Tarr, D., *Estimates of ad valorem equivalents of barriers against foreign suppliers of services in eleven services sectors and 103 countries*, World Bank Policy Research Working Paper No. 7096, November 2014.

⁴⁴ Ciuriak, D., Dadkhah, A., Xiao, J., *Brexit Trade Impacts: Alternative Scenarios*, GTAP Resource Paper No. 5252, June 2017.

⁴⁵ See prior reference to UK Trade Policy Observatory (2018).

cross section of countries, including the UK, but only for a selection of products.⁴⁶ The only Brexit study to have exploited this method is Economists for Free Trade (2018), which looks at the potential to lower NTBs with the rest of the world rather than the increase in NTBs on trade with the EU.⁴⁷ Estimates of the effect of removing trade barriers with non-EU countries are discussed in Chapter 4.

2.42 Estimates from various studies of the additional NTBs that UK trade would be subject to after Brexit are summarised in Table 2.2. They fall in a range of a 7 to 13 per cent additional AVE for a situation where the UK and the EU end up trading on WTO terms – at least twice the size of the average tariff rate in the case where the UK and EU negotiate a trade deal (Table 2.1). For the situation where there is a trade deal, the values range from 6 to 7 per cent. For an EEA-style relationship the range is 3 to 4 per cent.

Table 2.2: Estimates of the increase non-tariff barriers after Brexit

Study	Method	Assumption	NTBs (per cent)
Whitehall study	Sectoral gravity modelling	World Trade Organisation (WTO)	10
		Free Trade Agreement (FTA)	7
		European Economic Area (EEA)	4
Netherlands CPB	Study of EU-US non-tariff barriers	WTO (100% of EU-US)	12.9
		FTA (50% of EU-US)	6.4
Jafari & Britz	Study of EU-US non-tariff barriers	WTO (50% of EU-US)	6.5
UKTPO	Bottom-up estimates for manufacturing from literature	WTO	11.8
		EEA	3.5
Dhingra et al ¹	Study of EU-US non-tariff barriers	Pessimistic (75% of EU-US)	8.3
		Optimistic (25% of EU-US)	2.8
Rabobank	Study of EU-US non-tariff barriers	WTO (2/3 of EU-US)	8.7
		FTA (45% of EU-US)	5.9
		EEA (25% of EU-US)	3.3
Range		WTO	6.5 to 12.9
		FTA	5.9 to 7.0
		EEA	2.8 to 4.0

¹ The authors also assume that the UK misses out on further EU integration.

2.43 One problem in estimating the AVE of the increase in NTBs after Brexit is that most of the model estimates are top-down and for standard trading relationships. This means that we would have to make additional assumptions about the share of these estimated NTBs that the UK would face if it achieved a bespoke non-standard relationship with the EU, as proposed in the Chequers White Paper.⁴⁸ In that specific instance, the expected impact might lie between that of an FTA and the EEA.

⁴⁶ Dean, J., Feinberg, R., Signoret, J., Ferrantino, M., Ludema, R., *Estimating the Price Effects of Non-tariff Barriers*, The B.E. Journal of Economic Analysis & Policy, 2009.

⁴⁷ Economists for Free Trade, *What if we can't agree? Why a world trade deal exit from the EU will be best for the UK*, June 2018.

⁴⁸ HM Government, *The future relationship between the United Kingdom and the European Union*, 2018.

Estimating the effects of trade barriers on the economy

- 2.44 As the potential increase in NTBs associated with Brexit is generally estimated in AVE terms, it can be combined with measurable increases in tariffs to get an overall rise in trade barriers. These figures can then be used as inputs into an economic model to estimate the effects of changes in trade barriers on the UK economy.
- 2.45 The framework used most commonly for this purpose is a computable general equilibrium (CGE) model (Box 2.2). Ciuriak Consulting (2017)⁴⁹, the Centre for Economic Studies (2017)⁵⁰, PWC (2016)⁵¹, the IMF (2018)⁵², University of Bonn (2017)⁵³ and the Netherlands CPB (2016)⁵⁴ all used CGE models in their Brexit analyses of the effects of trade barriers on the economy.

⁴⁹ See prior reference to Ciuriak *et al* (2017).

⁵⁰ Felbermayr, G., Groeschl, J., Heiland, I., Braml, M., Steininger, M., *Brexit's economic effects on the German and European economy*, CESifo Forschungsberichte 85, October 2017.

⁵¹ PricewaterhouseCoopers, *Leaving the EU: Implications for the UK economy*, March 2016.

⁵² International Monetary Fund, *Euro Area policies: selected issues*, IMF Country Report No. 18/224, July 2018.

⁵³ See prior reference to University of Bonn (2017).

⁵⁴ See prior reference to the Netherlands CPB (2016).

Box 2.2: Computable general equilibrium (CGE) models and trade analysis

Following the EU referendum, several government departments – including the Treasury, the Department for International Trade; the Department for Exiting the EU; the Department for Business, Energy and Industrial Strategy; and the Department for Environment, Food and Rural Affairs – developed a computable general equilibrium (CGE) trade model to analyse the economic impacts of different potential post-Brexit relationships with the EU. Provisional results were initially leaked to the media before subsequently being published in March 2018.^a

All CGE models share certain features.^b They are large-scale, stylised representations of an economy comprising optimising households and businesses in which relative prices move to ensure that the supplies and demands for goods, services and factors of production are all matched. While partial equilibrium models focus on particular markets by fixing prices and volumes in others, the CGE approach models all markets together, and so takes full account of second-round and knock-on effects. These models are calibrated to be consistent with a wide range of economic data, although how they respond to shocks will reflect the modeller's assumptions about how firms and consumers respond to incentives.

CGE models can thus be used to provide estimates of the ultimate effects of interventions like Brexit that simultaneously affect multiple sectors of the economy. They not only yield estimates of the long-term shift in GDP from a policy change but also demonstrate the mechanisms through which the shift occurs, as firms and households alter their production and consumption plans in response to the policy change. These mechanisms account for trade diversion, so higher barriers to trade with one country will cause some of the lost trade to move to others. They also account for sectoral interlinkages, so if production in a particular sector falls, output in upstream and downstream sectors will also be affected.

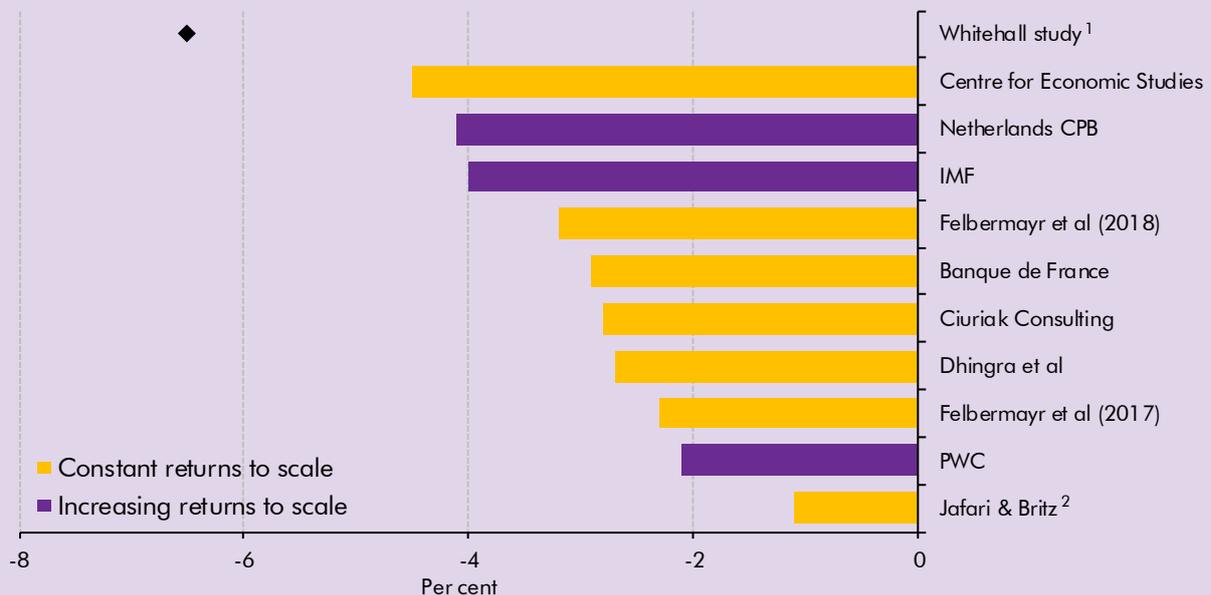
CGE models are designed to calculate the ultimate equilibrium of the economy and not to identify the path the economy follows to get there. Consequently, they are not particularly useful for real-time forecasting, and evaluating their past performance is necessarily difficult.

Trade lets countries specialise production in activities where they are *relatively* most efficient. By distorting these decisions (as well as by directly increasing the costs of trade), trade barriers lower an economy's overall productivity. Increasing returns to scale (IRS) models (as opposed to the standard constant returns to scale models) assume *further* trade-productivity links. In Krugman's model (1979, 1980), firms' average costs are lower in larger markets, so the world economy can support greater product variety when trade is freer.^c Product differentiation can help explain large trade flows between seemingly similar economies, such as Belgium and the Netherlands.

More productive firms export significantly more than less productive ones.^d This is largely because only the most productive firms choose to export (although learning-by-exporting or the pressures of international competition may also drive firm-level productivity increases). In Melitz's model (2003), this leads to higher whole-economy productivity under free trade: import competition eliminates uncompetitive firms and rewards competitive ones by providing additional export markets, raising the productivity of the average surviving firm.^e

Despite the theoretical attraction of IRS models, and the solid empirical evidence underpinning the broad direction of their assumptions, their implementation in CGE settings is less well studied and relies on uncertain parameter estimates. Incorporating Krugman or Melitz-like increasing returns in CGE models moves their predictions more into line with empirical evidence of the longer-term impact of trade on output, although the exact results depend on the size of trade barriers used as inputs into the model (Chart B). But by generating larger steady-state effects of changes in trade barriers on GDP, they increase the importance of judgements about the symmetry of effects from joining or leaving a trade bloc and of determining the path from the current situation to the new equilibrium.

Chart B: Effect on long-run GDP from increased trade barriers in CGE-type modelling of a WTO-style scenario



¹ The Whitehall study did not specify what assumptions were used in its CGE model.

² Increasing returns to scale for manufacturing sectors, constant returns to scale for other sectors.

In a CGE modelling framework, the most important components of Brexit modelling scenarios are sectoral barriers to trade between the EU and the UK. These include tariffs and non-tariff barriers, which are typically estimated through gravity modelling and expressed in ad-valorem equivalent terms (See Box 2.1). Other channels can also be incorporated relatively easily – in the cross-Whitehall analysis the WTO-style relationship modelled also involved lower net inward migration, a new trade deal with the US, and “regulatory and other domestic policy optimisation” (although this had a comparatively negligible effect). In this scenario, the eventual shortfall in GDP relative to a scenario of remaining in the EU was estimated to be 7.7 per cent, compared to 4.8 per cent in an FTA-style scenario and 1.6 per cent in an ‘EEA-type’ scenario.

Most CGE analyses of Brexit have reached similar conclusions: leaving the EU is predicted to reduce the level of GDP from where it otherwise would have been, and the weaker the integration of the UK and the EU, the larger the loss. Relatively trade-intensive sectors – like motor vehicles – would be most heavily affected. As UK-EU trade constitutes a much larger share of output in the UK than in the EU, the impact on the UK is greater than the impact elsewhere

(except for Ireland where some studies show a similarly sized impact). These models illustrate the likely direction and magnitude of the impact of Brexit on the economy. However, it is important to emphasise that the precise impacts will depend on the modeller's assumptions regarding the structure of the world economy and are subject to uncertainty.

^a Committee on Exiting the EU, *EU Exit Analysis: Cross Whitehall Briefing*, March 2018.

^b CGE models can also be used for other purposes. We discussed the series of analyses published by the Government on the economic effects of major tax cuts in our 2014 *Forecast Evaluation Report*.

^c Krugman, P., *Increasing returns, monopolistic competition, and international trade*, *Journal of International Economics*, November 1979; Krugman, P., *Scale Economies, Product Differentiation, and the Pattern of Trade*, *American Economic Review*, December 1980.

^d Bernard, A., Bradford Jensen, J., *Exceptional exporter performance: cause, effect, or both?*, *Journal of International Economics*, February 1999.

^e Melitz, M., *The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity*, *Econometrica*, October 2003.

^f The authors assume that there are no tariffs on agricultural products under this scenario, whereas EEA countries can charge tariffs on agricultural and fisheries products.

- 2.46 'New quantitative trade models' have also been used to estimate the economic effects of increased trade barriers following Brexit. These combine gravity modelling and the basic equations from CGE models, generally assuming constant returns to scale. This involves much less complexity than full-blown CGE modelling, including less sectoral detail. This type of model was used by Dhingra *et al* (2017)⁵⁵, Felbermayr *et al* (2018)⁵⁶ and Banque de France (2018).⁵⁷ Their results are shown in Chart B in Box 2.2.
- 2.47 The models discussed so far estimate the 'static' effects of Brexit – a one-off shift in the potential level of output in the economy associated with the less effective exploitation of comparative advantage. These one-off shifts will affect the growth rate of the economy, perhaps for several years, as the economy adjusts to the new equilibrium.
- 2.48 On top of these static effects, there may be additional dynamic effects whereby changes in openness have a longer-lasting effect on the potential growth rate of an economy. These arise from factors like changes in the competitive environment that affect the incentive to innovate, as well as the impact on the international diffusion of technology and knowledge, particularly through FDI (see Chapter 4). Some ex-post analysis of static CGE modelling suggest that the impact of trade on productivity has been underestimated, implying the existence of these dynamic effects. Kehoe (2003) shows that several early studies greatly underestimated the eventual benefit of the North American Free Trade Agreement (NAFTA) by failing to account fully for this additional trade-productivity link.⁵⁸
- 2.49 Some Brexit studies have attempted to allow for such additional dynamic effects. OECD (2016)⁵⁹, Netherlands CPB (2016)⁶⁰ and Dhingra *et al* (2017)⁶¹ first estimated the fall in trade intensity that the UK would experience after Brexit and then combined this with an

⁵⁵ See prior reference to Dhingra *et al* (2017).

⁵⁶ Felbermayr, G., Groeschl, J., Heiland, I., *Undoing Europe in a New Quantitative Trade Model*, ifo Working Paper No. 250, January 2018.

⁵⁷ Mayer, T., Vicard, V., Zignago, S., *The Cost of Non-Europe, Revisited*, Banque de France Working Paper No. 673, April 2018.

⁵⁸ Kehoe, T., *An Evaluation of the Performance of Applied General Equilibrium Models on the Impact of NAFTA*, Federal Reserve Bank of Minneapolis Research Department Staff Report 320, August 2003.

⁵⁹ See prior reference to OECD (2016).

⁶⁰ See prior reference to the Netherlands CPB (2016).

⁶¹ See prior reference to Dhingra *et al* (2017).

econometrically estimated elasticity from the literature to calculate the total effect on GDP growth (from both static and dynamic effects) as a result of this lower trade intensity. Rabobank (2017) combined NIGEM (a widely-used international macro-econometric model) with their own model of total factor productivity (TFP) – the amount of output an economy can produce from a given level of labour and capital inputs – where one of the explanatory variables in the TFP model was trade openness.⁶² These dynamic models generally find that Brexit would have a much larger negative effect on UK GDP.

- 2.50 In thinking about the likely impact of Brexit on productivity performance and potential output, we have focused to date on short-run effects. Our November 2016 adjustment was predicated largely on heightened policy uncertainty weakening business investment. Over time, impediments to the exploitation of comparative advantage are likely to become more important and the estimates of the size of these effects are similar.
- 2.51 There is little consensus regarding the size of dynamic effects from trade. The empirical evidence regarding the dynamic impact of openness on productivity is mostly drawn from cross-country growth regressions, where much of the variation in the data derives from increasing trade intensity in developing countries. That experience may not be applicable to an advanced economy like the UK. There are also econometric qualifications attached to many of these studies, including the possibility that the openness measures may be picking up the influence of omitted factors that drive cross-country productivity growth differences.⁶³ Also, the dynamic effects from trade are likely to interact with the dynamic effects of migration and FDI (discussed in Chapters 3 and 4). So, rather than quantify them individually in any future forecast adjustments, we would probably take them into account in a broad-brush fashion in our top-down judgements on productivity and potential output, together with an allowance for the static effects associated with reduced trade and inward migration.
- 2.52 We will make these judgements as we get more detail about the future relationship between the UK and the EU and as our forecast period moves forward so it becomes more likely to contain these effects. Issues with incorporating the trade intensity-productivity growth link within our forecast period are discussed further from paragraph 2.55 onwards.
- 2.53 Table 2.3 shows estimates of the long-run effects of increased trade barriers with the EU on UK GDP under different scenarios. The results from the static models are relatively similar, with those that assume increasing returns to scale generally finding a somewhat larger GDP hit than those that assume constant returns to scale. The largest GDP effects come from those studies that include dynamic trade effects.
- 2.54 The one study that does not find a negative effect from additional NTBs on trade with the EU is Economists for Free Trade (2018).⁶⁴ They assume that the UK would not face any additional NTBs on its trade with the EU because “creating new such barriers would be

⁶² See prior reference to Rabobank (2017).

⁶³ For more information of the problems with these studies see Rodriguez & Rodrick, *Trade Policy and Economic Growth: A Skeptic's Guide to the Cross-National Evidence*, 2001.

⁶⁴ See prior reference to Economists for Free Trade (2018).

illegal under WTO rules.” This appears to be based on their interpretation of the WTO’s MFN requirements. But most trade experts interpret these rules as meaning that the EU would be forced to impose the same NTBs that the rest of the world currently faces, unless the UK and EU sign a trade deal to lessen them.

Table 2.3: Effects on GDP of additional barriers on trade with the EU

Organisation	Model	Assumptions	Per cent		
			WTO	FTA	EEA
Economists for Free Trade	CGE	Assume zero NTBs ¹	0.0 ²	0.0	
Jafari & Britz	CGE	IRS (Melitz) & CRS ³	-1.1		
PWC	CGE	IRS (Krugman)	-2.1	-0.5	
Felbermayr <i>et al</i> (2017)	CGE	CRS	-2.3		-0.6
Dhingra <i>et al</i>	NQTM	CRS	-2.7		-1.3
Ciuriak <i>et al</i>	CGE	CRS	-2.8		-1.0
Banque de France	NQTM	CRS	-2.9	-2.4	
Felbermayr <i>et al</i> (2018)	NQTM	CRS	-3.2	-1.8	
IMF	CGE	IRS (Krugman)	-4.0	-2.5	
Netherlands CPB	CGE	IRS (Krugman)	-4.1	-3.4	
Centre for Economic Studies	CGE	CRS	-4.5		-1.2
Whitehall Study	CGE	Not specified	-6.5	-4.5	-1.5
OECD	NIGEM	Dynamic productivity	-7.7	-2.7	
Netherlands CPB	CGE	Dynamic productivity	-8.7	-5.9	
Dhingra <i>et al</i>	Gravity	Dynamic productivity	-9.4		-6.3
Rabobank	NIGEM	TFP model ⁴	-18.0	-12.5	-10.0
Average (excluding largest and smallest estimates)			-4.4	-3.0	-2.3

Notes: CGE = computable general equilibrium model NQTM = New quantitative trade model
 IRS = Increasing returns to scale CRS = Constant returns to scale
¹Their NTB value is based on an assumption rather than modelling work (see paragraph 2.54) and is excluded from the average.
²This study assumes that the burden of tariffs falls on the EU rather than the UK.
³IRS (Melitz) for manufacturing sectors and CRS for other sectors.
⁴This also assumes effects from lower FDI, R&D, technology transfer and management quality (and is excluded from the average).

Incorporating the effects of trade barriers in our forecast

2.55 Once a sufficiently firm and detailed agreement on the UK’s future trading relationship with the EU is in the public domain, we can modify the broad-brush assumptions about the impact of higher trade barriers that are currently in our forecast as necessary. In our November 2016 *EFO*, we reduced our forecast for growth in both import penetration and export market share by around about 15 percentage points to take account of the combined effect of tariffs and NTBs, spread evenly over a 10-year period. Following an agreement, we might be able to use more specific estimates of changes in tariffs and NTBs that the UK will face on its trade with the EU and the rest of the world.

2.56 Information on the future trading relationship could be contained alongside a potential forthcoming Withdrawal Agreement, but it seems unlikely that it will be sufficiently firm and detailed to incorporate explicitly in our forecasts in the near term. In due course, we would also want to take into account the effects of any trade agreements that the UK makes with

non-EU countries, if they were expected to have a sufficiently-large effect, and this is discussed in more detail in Chapter 4.

Initial forecast adjustments

- 2.57 The various published estimates of how the economy would be affected by Brexit generally compare one steady-state version of the world with another – in this case being a member of the EU and not being a member of the EU. They do not give a sense of how long any transition to a new steady-state is likely to take or the evenness of the path between here and there. Depending on the withdrawal and future trade agreements, some trade could be cut off immediately, some barriers would arise immediately but will take time to have an impact, and other barriers would only arise over time. The overall impact will probably only emerge quite slowly. Since we only forecast five years ahead in the *EFO*, the full impact is unlikely to be felt until well beyond our usual forecast horizon, particularly if the transition period extends to the end of 2020. We will need to address this in our next long-term projections, which on a normal timetable would be produced in the summer of 2020.
- 2.58 Unfortunately, there is only a limited amount of literature relevant to the transition and it is mostly based on episodes of falling barriers to trade rather than increasing ones, as would be the case with Brexit. And, as discussed in paragraph 2.35, the effects could be asymmetric between barriers rising and falling, and also between good and services.
- 2.59 There are a few studies that have looked at the transition following changes in trade barriers. Baier and Bergstrand (2005) studied the effects of free trade agreements on trade flows across 90 countries at five-year intervals between 1960 and 2000.⁶⁵ In their favoured regression specification, they found that around 50 per cent of the effect occurred in the first five-year period, 35 per cent in the second and 15 per cent in the third. Beyond the third five-year period, the trade agreement was found to have statistically insignificant effects on trade flows. Glick and Rose (2016) found that the effect of entering or exiting currency unions on trade flows shrinks gradually over time, but still has a statistically and economically significant effect 14 years later.⁶⁶ However, it is not clear that the evidence relating to currency unions can be carried across to trading blocs.
- 2.60 Head *et al* (2010) find that the breaking of a colonial link leads to a steady reduction of bilateral trade over a 40-year period, after which the effect levels out.⁶⁷ The authors believe the most plausible explanation is “*the depreciation of trade-promoting capital embodied in institutions and networks of individuals with knowledge of trading opportunities*”, which would be a type of NTB. Their analysis suggests that the effects could be slow at first, then gathering pace, then slowing again as complete diffusion nears – following the sigmoid curve usually associated with the diffusion of innovations. Very little of the trade adjustment occurred in the first five years, but about 35 per cent of the adjustment had occurred after ten years, 65 per cent after 20 years, 85 per cent after 30 years and just under 100 per cent after 40 years.

⁶⁵ Baier, S., Bergstrand, J., *Do Free Trade Agreements Actually Increase Members' International Trade?*, Federal Reserve Bank of Atlanta Working Paper No. 2005-03, February 2005.

⁶⁶ See prior reference to Glick and Rose (2016).

⁶⁷ See prior reference to Head *et al* (2010).

- 2.61 The cross-Whitehall study assumes an illustrative 15-year linear transition period to the new steady state. Rabobank and the OECD assume that the transition to the new steady state would be complete or almost complete by 2030, although they did not provide evidence to back up this assumption.
- 2.62 While most CGE models are static in nature, some are recursively dynamic, which means that they are solved sequentially, usually one year at a time, allowing variables to be estimated over different periods. Several organisations have used recursive dynamic CGE models to study the effects of different Brexit scenarios. Ciuriak Consulting’s modelling suggests that all the impacts of the scenarios will have worked their way through the economy by 2030, with an assumption that Brexit occurred in 2018. Between 80 and 90 per cent of the effect on GDP was expected to have occurred by 2025, depending on the scenario. Using a Brexit year of 2020, PWC modelling suggests that the adjustment would have taken place fully by 2030. In a WTO scenario, around 90 per cent of the GDP impact from lower trade intensity had occurred by 2025. The Netherlands CPB estimate their Brexit scenarios out to 2030 and 2040, with an assumed Brexit year of 2019. The authors find that 80 to 90 per cent of the GDP impact from increased trade barriers experienced in 2040 would have occurred by 2030, depending on the scenario.
- 2.63 If the draft Withdrawal Agreement between the UK and EU is fully agreed and ratified, there will be a transition period until 31 December 2020 – with all trading arrangements between the UK and the EU remaining as they are now until then.⁶⁸ The draft Withdrawal Agreement also says that the EU will ask third countries to replicate the trade agreements currently in place with the EU over the transition period. That suggests that we should start phasing in the Brexit trade adjustment slightly in advance of the end of the transition period as firms with UK-EU supply chains take steps to disintermediate UK firms in advance, especially if their products are likely to encounter rules of origin limits. Demonstrating these anticipatory changes, Glick and Rose (2016) find that there is a statistically and economically significant impact on trade flows before joining or leaving a currency union.⁶⁹ Also, Gnutzmann-Mkrtchyan and Henn (2018) found that trade patterns were affected between the announcement and implementation of the WTO Information Technology Agreement which eliminated tariffs on a near-global basis for around half of all IT products.⁷⁰
- 2.64 Even with some small anticipatory effects, most of the trade adjustment would begin in the first quarter of 2021 and much of the impact of Brexit-related rises in trade barriers on trade flows and GDP growth would probably occur beyond our current forecast horizon.
- 2.65 It is important to emphasise that any adjustment we make to our potential output forecast as a result of Brexit is likely to be relatively small compared to the degree of uncertainty surrounding the underlying path of future productivity growth. Estimates in external studies of the long-run hit to GDP from leaving the EU to trade solely on WTO terms, compared to

⁶⁸ See European Commission, *Draft Agreement on the withdrawal of the United Kingdom of Great Britain and Northern Ireland from the European Union and the European Atomic Energy Community*, 2018.

⁶⁹ See prior reference to Glick and Rose (2016).

⁷⁰ Gnutzmann-Mkrtchyan, A., Henn, C., *Peeling Away the Layers: Impact of Durable Tariff Elimination*, CESifo Working Paper Series No. 7172, October 2018.

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staying in the EU, are concentrated around 2 to 7 per cent. These effects might manifest themselves over a period likely to be greater than 10 years.

- 2.66 In our initial post-referendum forecast, we lowered potential productivity growth by around 0.2 percentage points a year reflecting the dampening effect on capital deepening of the downward revision to our business investment forecast. In the short term, this reflected the uncertainty generated by the referendum result, which was already apparent in the data at the time. We did not assume that this shortfall in business investment would be recovered within our forecast horizon. The extent of the medium-term revision we made was broadly consistent with GDP effects from greater impediments to the exploitation of comparative advantage posited by external studies – assuming those effects build up fairly evenly.
- 2.67 Our November 2016 trend productivity growth forecast downgrade of around 2 percentage points compares with the estimated shortfall of 17½ per cent in the 10 years since the global financial crisis relative to a continuation of the pre-crisis trend.⁷¹ Indeed, in our November 2017 *EFO* alone, we downgraded our forecast for productivity growth over five years by 3.7 percentage points as the continued weakness of productivity growth since the crisis prompted us to revisit the judgements underpinning our assumption that growth would pick up towards pre-crisis rates over the medium term.⁷² This was unrelated to Brexit.
- 2.68 If there is no Withdrawal Agreement, then trade between the UK and EU would only be covered by WTO rules on the Brexit date (although it is possible that smaller deals on specific areas would be negotiated quickly, for example, allowing UK-based airlines to fly within the EU). In this case, we would phase in the estimated Brexit effects from 2019Q2. We would also have to make a judgement regarding the size and duration of any immediate disruption effects (discussed further in Chapter 1).

Subsequent forecast issues

- 2.69 Having made any initial adjustment to reflect the Brexit agreement, a significant challenge in subsequent forecasts will be to track whether our initial judgements on the reduction in trade intensity and GDP as a result of the Brexit-induced increase in trade barriers are on track or need to be revised. This should be relatively straightforward for trade intensity, as we can track movements in the UK's export market share and import penetration, although the signal from these variables might be obscured by exchange rate movements or other developments. Depending on the withdrawal and future trade agreements, some trade could be cut off immediately, for example by the loss of passporting rights and the mutual recognition of service sector qualifications. Some barriers will arise immediately but will take some time to have an impact – for example, in government procurement as contracts roll over. And some barriers will only arise over time, for example, due to regulatory divergence. We can track these factors as time goes on and adjust our forecast accordingly.

⁷¹ See ONS, *Labour productivity, UK: January to March 2018*.

⁷² For more information on the general uncertainty surrounding forecasts for productivity growth, see Chapter 2 of our 2017 *Forecast evaluation report*. For a discussion of the rationale for our November 2017 forecast revision, see Chapter 3 of that *EFO*.

2.70 It will be much harder to track the effects of Brexit-related trade barriers (and reductions in migration and FDI) on GDP growth. If potential output seems to be growing faster or slower than in our central forecast, it will be difficult to know whether this is the result of differences in the effects of Brexit or because the underlying path of productivity growth is stronger or weaker than we expected. The ‘synthetic’ or ‘doppelganger’ UK analysis discussed in Chapter 1 might help keep track of the effect that Brexit has had on the UK. But this will probably become less reliable over time as the growth in the countries used to produce the synthetic UK are more likely to diverge from the UK for reasons other than Brexit.

Key uncertainties and judgements

2.71 As we have discussed, there are many uncertainties surrounding the scale and impact of any change in trade barriers as a result of Brexit:

- In the first instance, significant uncertainty remains about **the UK’s future trading relationship with the EU and non-EU countries** – and hard information may only emerge slowly. We will have to decide when we have enough firm and detailed information to estimate and incorporate the effects of these changes into our forecasts.
- **No major country has ever left the EU or a similar trading bloc**, which means that estimating the effect on trade from Brexit is without precedent.
- **Quantifying the potential increase in NTBs** on trade with the EU after Brexit in a bottom-up way is difficult, as the diversity of NTBs makes it hard to express their total value in a common unit. Instead, NTBs generally have to be inferred indirectly, which involves deciding on the precise specification of the model and comes with significant uncertainties. In effect, the NTB estimates drawn from these approaches are measures of what cannot otherwise be modelled. If other factors beyond NTBs are relevant, and are not captured in the modelling, they may be wrongly attributed to NTBs and could therefore bias any estimates of the economic effects of changes in NTBs.
- Econometric estimates of the **trade’s responsiveness to price changes** that result from changes in trade barriers is subject to significant uncertainty.⁷³ These estimates generally come from cross-country studies and might not be fully appropriate for the UK.
- Splitting out top-down modelling of NTBs based on standard trade arrangements to fit a potential **bespoke trading arrangement** with the EU could be challenging. A bespoke deal in which only some of the barriers that have been lowered as a member of the EU are reintroduced would require an additional judgement on the relative size of the barriers that have been introduced compared to those that have not.
- It is by no means obvious that leaving a trade bloc has a **symmetric effect** to joining one. There is very little evidence on which to base a judgement regarding the likely degree of asymmetry or how that might evolve over a five-year forecast horizon.

⁷³ For example, see Hertel *et al*, How Confident Can We Be in CGE-Based Assessments of Free Trade Agreements?, 2003.

- A **range of models** estimate the responsiveness of GDP to trade intensity. Models that assume perfect competition and constant returns to scale tend to show smaller effects than those with monopolistic competition and increasing returns to scale. And there may be additional dynamic effects from trade intensity onto innovation and technology transfer. We will have to decide which specifications to place most weight on when forming our overall judgement.
- Most modelling of Brexit involves estimating how the steady state of the economy will change and not how it **transitions** to the new steady state. We will need to decide what share of the effect will occur within our five-year forecast horizon and the path of the effect within that period – once again, based on very limited evidence.

Implications for the fiscal forecast

2.72 The most important fiscal effects of changes in tariff and non-tariff barriers are likely to be the indirect ones via changes in nominal economic growth and its composition. These would be incorporated into our fiscal forecast automatically through the economic determinants that are fed into our standard tax and spending models. But, in addition to these, there would be direct fiscal consequences resulting from changes in tariff policy (referred to as customs duties in the UK). These are outlined in this section.

Current treatment

Existing policy

- 2.73 Customs duties are taxes levied on imports by all EU member states under the common external tariff. In the UK, these taxes are collected by HMRC and then passed to the EU. When calculating the UK's contribution to the EU budget, a fixed share of UK customs duties (currently 20 per cent) is netted off, in effect to cover the cost of collecting those duties. This proportion is set by the European Commission and applies to all member states – it does not vary with the actual administrative cost incurred.
- 2.74 Under the current regime, customs duties do not affect public sector current receipts, because they are treated as a source of revenue for the EU. The only way customs duties affect borrowing is via the proportion netted off for cost of collection in the calculation of EU contributions, which reduces spending.⁷⁴
- 2.75 As a member of the EU Customs Union, the UK faces no tariffs on exports to other EU member states and levies no tariffs on imports from them. After leaving the EU, and in the absence of any agreement for the UK to remain a part of the EU Customs Union, any revenue from tariffs on imported goods (referred to henceforth as customs duty⁷⁵) would add to public sector current receipts.

⁷⁴ See Box 4.4 of our March 2017 *Economic and fiscal outlook*.

⁷⁵ Customs duties is the technical name for the tariffs collected by member states on behalf of the EU. The terminology for post-Brexit tariff revenues in the UK could change, but it would seem unlikely that the system itself would operate in a materially different fashion.

Baseline forecast

- 2.76** Our baseline customs duty forecast is currently produced using a simple time-series model in which the historical relationship between imports and revenue has been estimated. This generates a forecast for the effective duty rate paid on total imports, which in turn are part of our economy forecast. This means that the effect on customs duties of changes in the total value of imports is incorporated via determinants drawn from our economy forecast, while the effect of changes in the composition of imports or trade policy is captured via the fiscal forecasting model. This includes off-model adjustments to capture the effect of trade deals whose effect is not yet reflected in the data – for example, our March 2018 forecast included a small adjustment for the EU-Canada trade deal.
- 2.77** In the absence of firm details about post-Brexit tariff policy, the approach we have taken so far in our forecasts is to retain the fiscally neutral impact of customs duties. In effect this means that we assume that the additional revenue that would be retained by the UK from customs duties is recycled into domestic spending. This is consistent with our broader approach to the potential direct fiscal effects of leaving the EU – in particular, the contributions the UK makes to the EU budget – where we have assumed that any reduction in transfers to the EU would be recycled into additional domestic spending.

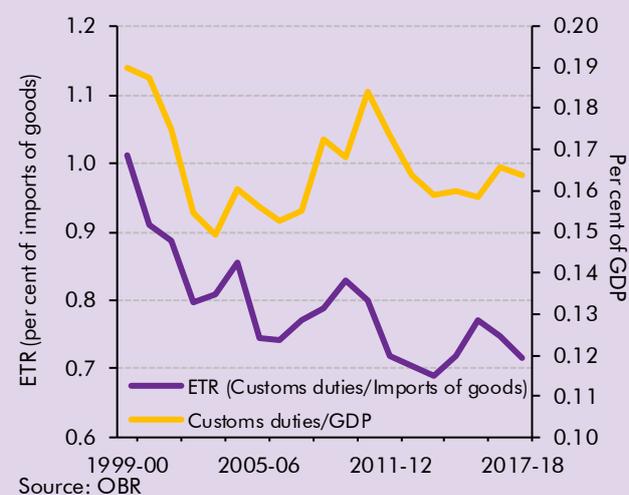
Box 2.3: Trends in customs duty revenue

Customs duties revenues have increased by 67 per cent in cash terms over the past 18 years, but have fallen slightly relative to GDP (Chart C). This decline was more than accounted for by a fall in the effective tax rate on goods imports, which fell from 1.01 per cent in 1999-00 to 0.72 per cent in 2017-18 (Chart D). Goods imports increased as a share of GDP over that period, so, if the effective tax rate had remained constant, customs duties would have risen relative to GDP too. The declining effective tax rate follows the trend in the weighted-average tariff rate applied across the EU, shown in Chart 2.2 at the start of this chapter.

Chart C: Customs duty revenues



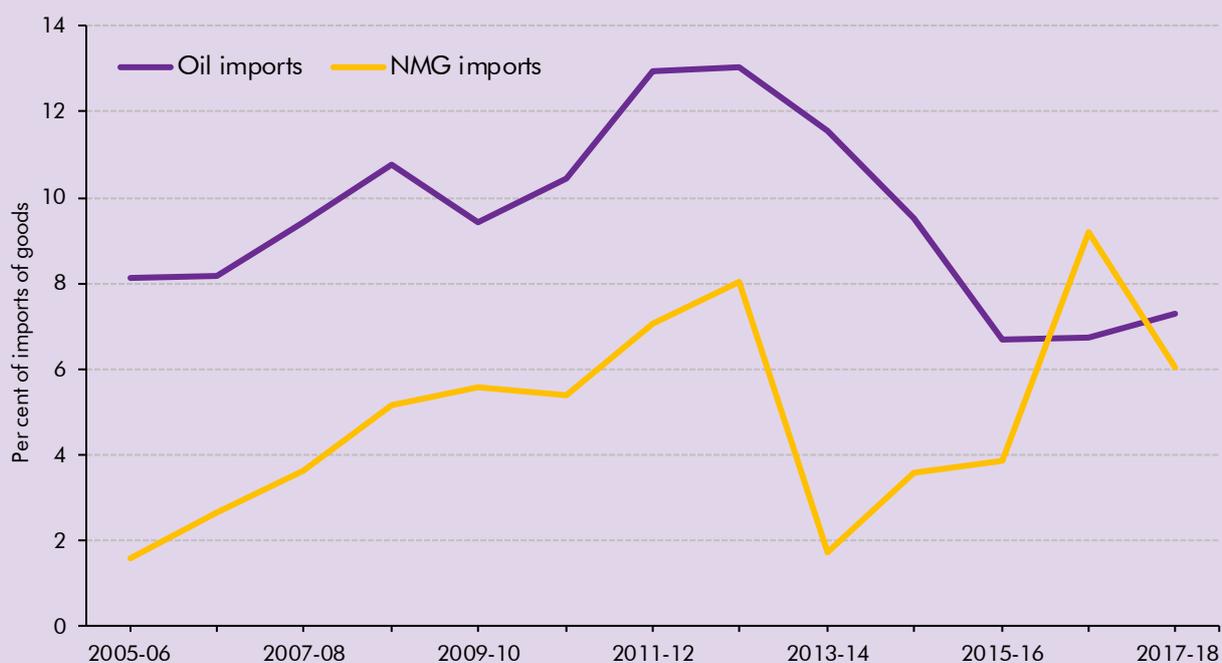
Chart D: Customs duty as a share of GDP and effective tax rate



Much of the yearly volatility in the effective tax rate has been due to the rising importance of oil and non-monetary gold imports. Both commodities attract a zero rate for customs duties, so rises and falls in oil and gold imports as a share of the total result in rises and falls in the effective tax rate. Chart E shows how the share of goods imports accounted for by oil and non-monetary gold has fluctuated over time. This reflects:

- **Oil imports:** The UK moved from being a net exporter of oil to a net importer in 2004-05, since when the proportion of UK oil consumption met by imports has risen from 68 per cent to 83 per cent in 2017^a, reflecting the long-term decline in North Sea production. The value of oil imports has also fluctuated significantly due to oil price movements.
- **Non-monetary gold imports:** the vast majority of the world’s over-the-counter trading in gold takes place on the London Bullion Market. This generates significant cross-border gold flows that affect measured goods trade and the effective tax rate. As with oil, the value of gold imports is sensitive to gold prices, which can fluctuate greatly across years.

Chart E: Oil and non-monetary gold imports



Source: ONS

^a Department for Business, Energy & Industrial Strategy, *Digest of UK Energy Statistics (DUKES) 2018: petroleum*

Initial forecasting approach

2.78 Once the future trading relationship with the EU is sufficiently clear, we will need to incorporate its direct effects into our fiscal forecast. To do this, we will need to generate a policy costing for the marginal effect on customs duty receipts of trading under the UK’s future customs regime relative to the regime underpinning the baseline forecast.

2.79 The Government’s future tariff plans will almost inevitably include more granular changes to customs duty rates than we currently model in our forecast. It is not unusual for policy costings to require more detailed models than those used to generate our baseline

forecasts, although in this instance it could require a *much* more detailed model. It will be important that any modelling is done on a consistent basis with the forecasting model.

- 2.80 For policy costings in this area, we would need to generate a detailed baseline forecast for imports at a more disaggregated level. Historical data on this is relatively timely – HMRC publishes monthly data on imports obtained through its non-EU declarations system (currently ‘CHIEF’, the Customs Handling of Import and Export Freight system, which is due to be replaced in April 2019 by a new system) and through ‘Intrastat’ for intra-EU trade. These goods trade data are disaggregated according to the Harmonised System ‘HS’ codes. At the most detailed level, this includes around 5,000 different commodities. It is also recorded for over 200 countries and territories with which the UK trades.⁷⁶
- 2.81 If the UK’s tariff schedules were to be changed – either by imposing tariffs on imports from the EU or changing those imposed on imports from the rest of the world, we would need to forecast the volume and/or value of the affected imports to estimate the first-round fiscal effects of the policy change. In our economy forecast, we currently focus on prospects for total imports, not their composition (even between goods and services), so any disaggregation required for a policy costing would necessitate new forecast judgements.
- 2.82 It would be impractical to try to forecast imports at the highly disaggregated level at which changes in customs duties might take place – so we might well be left assuming that the composition of imports by country and product would remain constant, in which case all components would be assumed to grow in line with total imports in our economy forecast. Some adjustments may be required for particularly volatile imports that are material to the total, such as oil and non-monetary gold (see Box 2.3), but there would be too many items to consider trying to adjust for all potentially affected products.
- 2.83 Calculating the fiscal impact of moving to a new tariff regime would require two steps, as is the case for all policy measures. First, we would calculate the static effect of the policy change, that is, the direct impact of applying new customs duty rates to the baseline imports forecast. Second, we would estimate the behavioural response of households and business due to the changes in import prices and/or costs to businesses. These would be summed to reach a final estimate, which would then be incorporated into our fiscal forecast.
- 2.84 The calculation of the static effect of the measure is computationally simple. The disaggregated figures for imports are multiplied by the customs duty rates under the new and baseline tariff schedules. This would essentially be a static microsimulation model. The static costing is obtained by subtracting the baseline revenue from the revenue estimate under the new tariff schedule.
- 2.85 Estimating the behavioural effect would be both complex and subject to considerable uncertainty. Changes in tariffs could affect prices for certain goods, which could lead to a change in consumers’ behaviour. For example, if the price of a good increases due to a higher tariff, people could choose to buy less of that good or to buy a substitute instead. To

⁷⁶ World Customs Organisation, *What is the harmonized system?*, accessed October 2018.

Trade barriers

estimate this type of behavioural response, we would need estimates of the price elasticities of demand for imported goods and cross-price elasticities of demand for relevant goods and services, both in the short and the long run as consumers and firms adjust to the implications of the new tariff regime.

- 2.86 There would be other issues to consider, including which effects to capture through the economy forecast and which to estimate separately. Some of the more substantive impacts – such as any effects on total imports, import intensity and productivity – are likely to be better captured via economic determinants, whereas effects on the composition of UK imports are likely to be better captured through a costings model.

Issues for subsequent forecasts

- 2.87 As with any similar policy costing, we would initially continue to update both the baseline forecast and our estimate of the impact of the regime change at each forecast for things like changes in our imports forecast. This is standard practice for costings of policy changes that have been announced but have yet to be implemented.

- 2.88 As implementation occurs, outturn data will become available on the amount of revenue collected from the new customs regime. Eventually we would be able to move to a forecasting model that relied only on data from the post-regime-change period and that no longer included a role for the updated policy costing. The decision when to switch to such a model would involve trade-offs between the uncertainty that comes with modelling something for which there are relatively few observations and the uncertainty that comes with trying to maintain a baseline forecast for a regime that no longer exists. Again, this is a common forecasting challenge after major policy changes. Recent examples include changes to stamp duty land tax, disability benefits and the introduction of universal credit.

Key sensitivities and uncertainties

- 2.89 There is significant uncertainty regarding the detail we will see in the deal between the UK and the EU. This will affect when we will be able to cost the fiscal impact of a new regime.
- 2.90 There are also substantial uncertainties regarding the modelling of the effect of changes in tariffs policy on the fiscal forecast. Most of these stem from the fact that Brexit is likely to involve a step change in the tariff regime. Estimates of the effects of large changes like these often differ significantly from outturn due to their rarity, which makes it challenging to calibrate their effects. Most economic forecasting models are calibrated for small changes.
- 2.91 There is considerable uncertainty regarding the impact of tariffs on particular goods and services, and how price increases due to changes in tariffs and non-tariff barriers might lead to changes in quantities imported. Price elasticities of demand (which measure percentage quantity changes in response to a 1 per cent price change) will have to be estimated or drawn from existing studies. This will include both own and cross-price effects, for both EU

and non-EU originated goods and services. One such study estimates over 5,000 elasticities, which vary from 0 to minus 25 across different categories of products.⁷⁷

- 2.92 The Northern Ireland border could present specific challenges to estimating post-Brexit customs revenues. The land border is 310 miles long with over 200 formal crossing points and reportedly the same number again of informal ones,⁷⁸ with 110 million crossings made a year.⁷⁹ The UK Government and the EU have both committed to avoiding a hard border with physical infrastructure and related customs checks. It is possible that this could be achieved through technological solutions, although having studied this the Northern Ireland Affairs select committee stated that it had not seen “any technical solutions, anywhere in the world, beyond the aspirational, that would remove the need for physical infrastructure at the border.”⁸⁰ The costs of installing and implementing border infrastructure, either at or away from the border, would place considerable pressure on HMRC and the Home Office’s border resources.⁸¹ Moreover, the Chief Constable of the Police Service of Northern Ireland has stated where border checkpoints were re-established they would become “static and obvious targets” for disruption.⁸²
- 2.93 If a future tariff regime were not fully applied at the Northern Irish border, either by design or for operational reasons, then we would need to consider the extent of the associated reduction in customs revenues. This effect could be large if tariffs could be avoided relatively easily by routing goods through Northern Ireland. It could also have knock-on effects on other taxes collected at the border such as import VAT and excise duties.

⁷⁷ Ghodsi, M., Gruebler, J., Stehrer, R., *Import Demand Elasticities Revisited*, Vienna Institute of International Economic Studies (WIIW) Working Paper No. 132, November 2016.

⁷⁸ Curtis, J., Bowers, P., McGuinness, T., Webb, D., *Brexit negotiations: the Irish border question*, House of Commons Briefing Paper No. 8042, July 2017.

⁷⁹ HM Government (2017) *The UK's exit from the European Union: Northern Ireland and Ireland – position paper. Additional Data Paper: Common Travel Area Data and Statistics*.

⁸⁰ Northern Ireland Affairs Committee House of Commons Second Report of Session 2017–19 *The land border between Northern Ireland and Ireland*, 29 March 2018.

⁸¹ In 2017 HMRC trade statistics show there were only 106 (air)port of entry locations in Great Britain through which non-EU goods were imported, with just 14 locations accounting for three quarters of the value of imports.

⁸² Question 178 George Hamilton QPM, Chief Constable, and Will Kerr OBE, Assistant Chief Constable, Police Service of Northern Ireland, Northern Ireland Affairs Committee Future of the land border with the Republic of Ireland, Oral evidence December 2016.

3 Migration

- 3.1 Migratory flows have waxed and waned over time, both within and between nations. Just as international trade allows countries to specialise in the production of goods and services in which they have a comparative advantage, so migration allows workers to move to where their labour is most valued, thus delivering greater overall economic efficiency. But – unlike trade in goods and services – migration can be driven by social and political, as well as economic, factors. Moreover, migration may have an impact on the receiving communities that extends beyond their immediate economic impact.
- 3.2 Net inward migration to the UK turned positive in the early 1990s, and rose to an all-time high of 336,000 over the year ending June 2016. This rise reflected the easing of restrictions facing European migrants, as the UK labour market became more integrated with the EU's, as well as a changing mix of 'push' and 'pull' factors. After the referendum, the Government indicated that it would set new criteria for prospective European Economic Area (EEA) and Swiss immigrants. It has since outlined that the new regime will “reduce the numbers” of migrants coming to the UK and that it will be “based on what skills you have to offer, not which country you come from”.¹
- 3.3 The primary effect of a stricter regime on our forecast would be to reduce growth in the population and labour force. Changes to the composition of migrants are likely and would also generate static effects on our economic forecasts. The dynamic effects of migration on productivity and potential output are uncertain in size, but likely to interact with those of trade and foreign direct investment (FDI) (discussed in Chapters 2 and 4). As a result, rather than quantify them individually, we would probably take them into account in a broad-brush fashion in our top-down judgements on productivity and potential output.
- 3.4 This chapter:
- describes current **migration policy**;
 - outlines **recent trends and evidence** on the economic and fiscal effects of migration;
 - presents our **current approach** to incorporating migration in our forecasts;
 - explains how we have changed migration in **previous forecasts**; and
 - discusses how we might incorporate the effects of post-Brexit changes in migration policy in **future forecasts**.

¹Prime Minister's speech to the Conservative Party conference, October 2018.

Policy pre- and post-Brexit

- 3.5 Current agreements on ‘freedom of movement’ give citizens of the European Economic Area and Switzerland the right to live, study and work in the UK, with only limited exceptions. By contrast, permission to come from outside the EEA for work is decided on a case-by-case basis by the Home Office, based on a five-tier points-based visa system.
- 3.6 The largest category of non-EEA work-based visas are for skilled workers and their dependents. These ‘Tier 2’ visas accounted for 93,000 of the 164,000 visas issued in 2016. Of these, the Tier 2 (General) visa subcategory is available to individuals with a job offer that would pay an ‘appropriate’ salary of at least £30,000 a year in an occupation considered degree-level or above. Applicants must also have proven knowledge of English and sufficient personal savings to support themselves when they arrive in the UK. While these individuals can bring their families with them, this is subject to restrictions. Other visa categories for non-EEA immigrants include high-value entrepreneurs, temporary workers and students. The rules are different for foreign nationals seeking asylum: to be accepted as refugees, they must have left their country of nationality and be unwilling to return to it due to a well-founded fear of persecution.
- 3.7 Most non-EEA nationals subject to immigration control have limited leave to remain and no access to welfare payments during their stay in the UK. Once a non-EEA national is granted settled status, usually after five years, they have no time limit on their right to stay and can access benefits and tax credits on the same basis as UK nationals. Several further restrictions have also been made to EEA nationals’ access to welfare payments in recent years, including measures announced by the Coalition Government in March 2014 that were expected to save £125 million a year by 2018-19.²
- 3.8 The Government says that freedom of movement must end after Brexit, enabling the UK to set new (and presumably tighter) immigration requirements for EEA and Swiss citizens (although the Government has promised to continue to allow free access from Ireland).³ It has also said that immigrants from the EU who are already in the UK – around 3.8 million in 2017 – will be allowed to stay whether they meet the new requirements or not (as will those from the other EEA countries and from Switzerland). The EEA members and Switzerland will in turn have to decide what requirements to place on UK nationals wishing to come to their countries.
- 3.9 In recent years, short-term mobility agreements have become increasingly common in free trade agreements. These ease restrictions on short-term business travel to facilitate the ‘Mode 4’ provision of services – i.e., the service provider being physically present in the country while providing the service that is being exported, but leaving once it has been provided. The Government has already indicated it may “seek reciprocal mobility arrangements with the EU”.⁴ But long-term migrants are most important for our economic and fiscal forecasts, so they are the main focus of this chapter.

² Kennedy, S., *Measures to limit migrants' access to benefits*, House of Commons Library, June 2015.

³ *Prime Minister's speech to the Conservative Party conference*, October 2018.

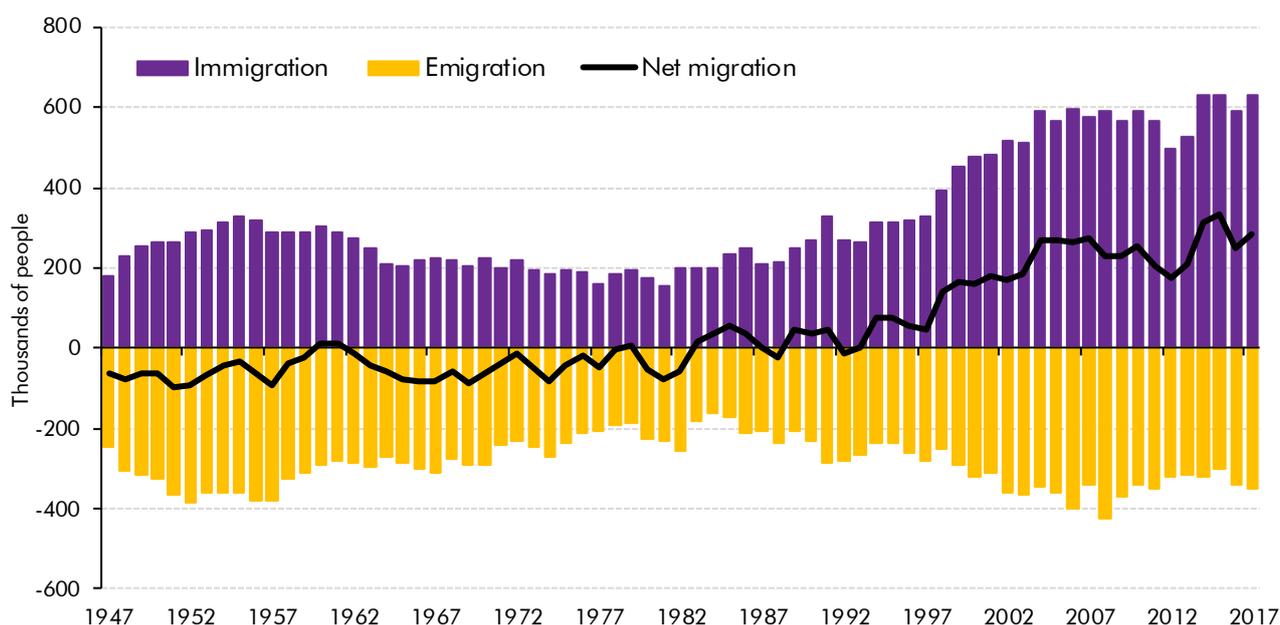
⁴ HM Government, *The future relationship between the United Kingdom and the European Union*, July 2018.

3.10 With long-term net inward migration to the UK from the EEA and Switzerland currently exceeding outward migration from the UK to those countries, tighter restrictions on flows in both directions are likely to reduce the net flow into the UK. In the absence of changes to the non-EEA/Swiss rules, this is likely to reduce total net inward migration to the UK and therefore the number of people working, paying taxes and benefiting from public spending. Depending on the criteria adopted, a new EEA visa regime could also change the composition of the flow in ways that affect the economy and the public finances, for example by altering the employment rate and the average per capita level of wages, payment of taxes, receipt of welfare payments and consumption of public services. Similarly, tighter restrictions on UK nationals migrating to EU Member States could reduce and alter the composition of outflows.

Recent trends and evidence

3.11 Through most of the second half of the 20th century, UK net migration flows were small and emigration exceeded immigration.⁵ The net outflow averaged a little under 25,000 people a year from 1966 to 1991. But since the early 1990s, as shown in Chart 3.1, immigration has increased significantly while emigration has increased only modestly. This has led to positive and increasing net inward migration, exceeding 100,000 every year since 1998.

Chart 3.1: Historical migration flows



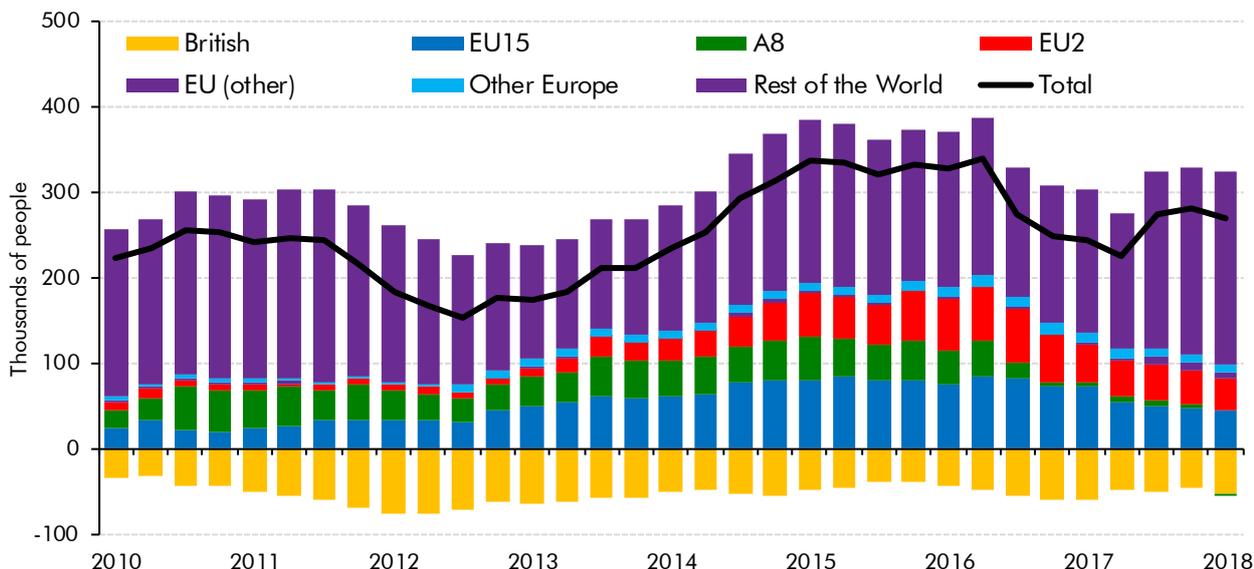
Source: Bank of England, ONS

3.12 Total and net inward migration flows stepped up in 2004, when ten new Member States joined the EU, including eight central and eastern European countries (the so-called 'A8' countries). This was followed by a significant further rise in net inward migration from the EU and from the A8 in particular. Net inward migration from the EU averaged 15,000 a year in the decade up to 2003, but 105,000 a year between 2004 and 2015.

⁵ We use the same UN-recommended definition of a long-term international migrant as the ONS – someone who changes their country of usual residence for a period of at least a year, so the country of destination effectively becomes the country of usual residence.

3.13 Looking over the past decade, there are notable differences in the trends for EU and non-EU citizens. As Chart 3.2 shows, net inward migration from the EU rose sharply in 2014 and 2015, largely reflecting higher inflows from Bulgaria and Romania after transitional restrictions on migrants from those countries were lifted. It has then fallen sharply since the referendum in mid-2016, reflecting both a fall in the number of EU citizens moving to the UK (down by nearly 60,000 since the twelve months leading up to the referendum) and an increase in the number emigrating (up by more than 40,000 over the same period). Net inward migration from outside the EU increased relatively sharply in 2014 and 2015, after which it stabilised before jumping again – thus partly offsetting the recent fall in the flow from the EU. In aggregate, net inward migration stood at 270,000 in the year to the first quarter of 2018 – down from the peaks of 2015 and 2016, but relatively stable over recent quarters. All these figures should be treated with caution, given past revisions and concerns over the robustness of the data.

Chart 3.2: Nationalities of net long-term migrants to the UK



Note: EU2 is Bulgaria and Romania, EU (other) is Malta, Cyprus and Croatia, and EU15 is the remaining 15 other EU member states (excluding the A8 and Britain).

Source: ONS

3.14 The referendum vote has probably contributed to the recent fall in net inward migration from the EU, reflecting both ‘push’ and ‘pull’ factors ahead of any concrete policy change. For example, the depreciation of sterling will have made the UK a less attractive destination relative to other EEA countries, as wages here will be worth less than they otherwise would have been in the migrant’s home currency. Potential migrants may also feel less welcome in the UK and uncertain about their status under any new policy regime.

Recent economic trends and evidence

3.15 The impact of net migration on the economy and the public finances depends on its composition as well as its volume. In particular, it depends on how likely net inward migrants are to be in employment, how productive they are and what wages they receive,

relative to the native population. This can be predicted in part from observable characteristics like their age, gender and skill levels.

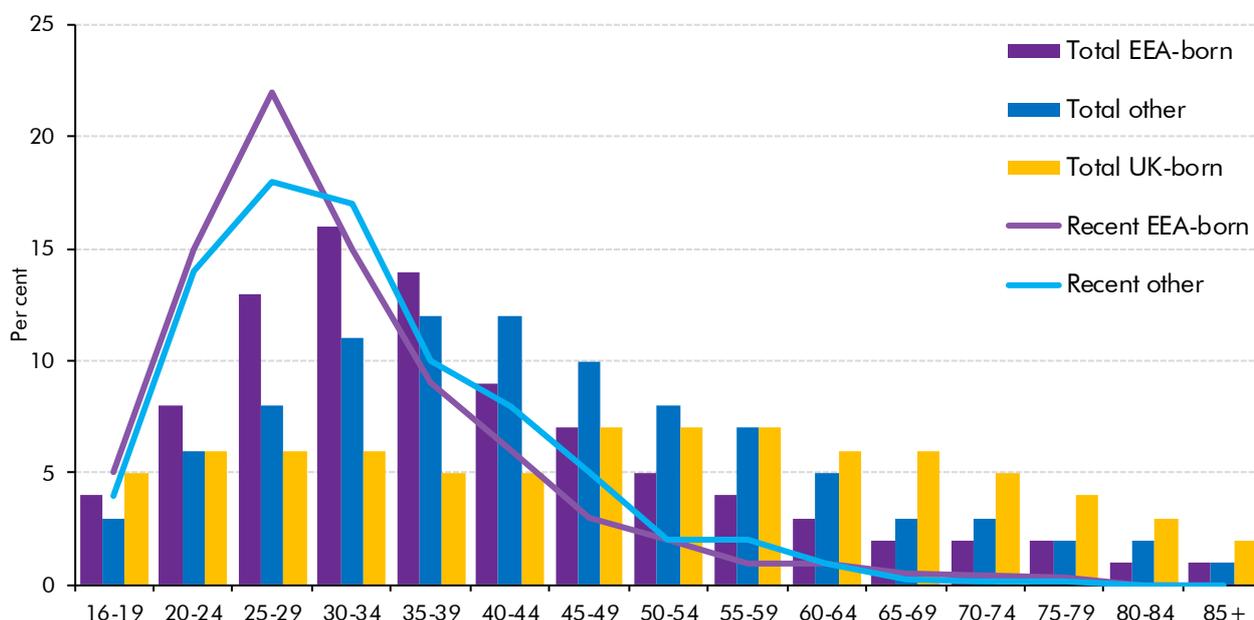
- 3.16 In this regard, our forecasts and projections to date have reflected the broad conclusions that we reached in our *2013 Fiscal sustainability report*, from a review of the evidence available at the time. In paragraphs A.30 and A.31 we noted that:

“The evidence is mixed on the contribution of migrants to productivity. On the one hand, a higher proportion of immigrants have degree-level qualifications, which may indicate higher skills relative to the UK-born labour force. The non-UK born also earn, on average, higher salaries. This evidence may suggest that immigrants have a positive impact on productivity. But, on the other hand, the latest LFS data suggest that there is a mismatch between qualifications and occupations, which may suggest that migrants’ skills are not deployed efficiently in the economy and hence their potential contribution to productivity may not materialise fully. There is no consensus in the literature on the size of any contribution to productivity and GDP per capita. In our projections, migrants are assumed to have the same economic characteristics as natives, but are more concentrated in the working-age group than the overall population.”

- 3.17 More recent evidence is discussed below. But in terms of the potential impact of post-Brexit policy changes, we also need to judge if these conclusions hold specifically for the EEA/Swiss migrants who would be affected by an end to freedom of movement. (For simplicity, we generally look at the evidence for the EU27 countries, but they accounted for the majority of net European migration flows in 2018.)

- 3.18 As shown in Chart 3.3, net inward migration is concentrated at younger working ages, slightly more so for EEA-born migrants than for others. Given high net inward migration in recent years, the non-UK-born population is also relatively concentrated at younger working ages, relative to the comparatively flat UK-born population. The share of the UK-born population who are of working age is 60 per cent, compared to around 80 per cent for those born in the EEA and elsewhere. (The EEA-born are more concentrated at younger working ages and the rest of the foreign-born population at older working ages.)

Chart 3.3: Age-distribution of total and recently-arrived UK populations

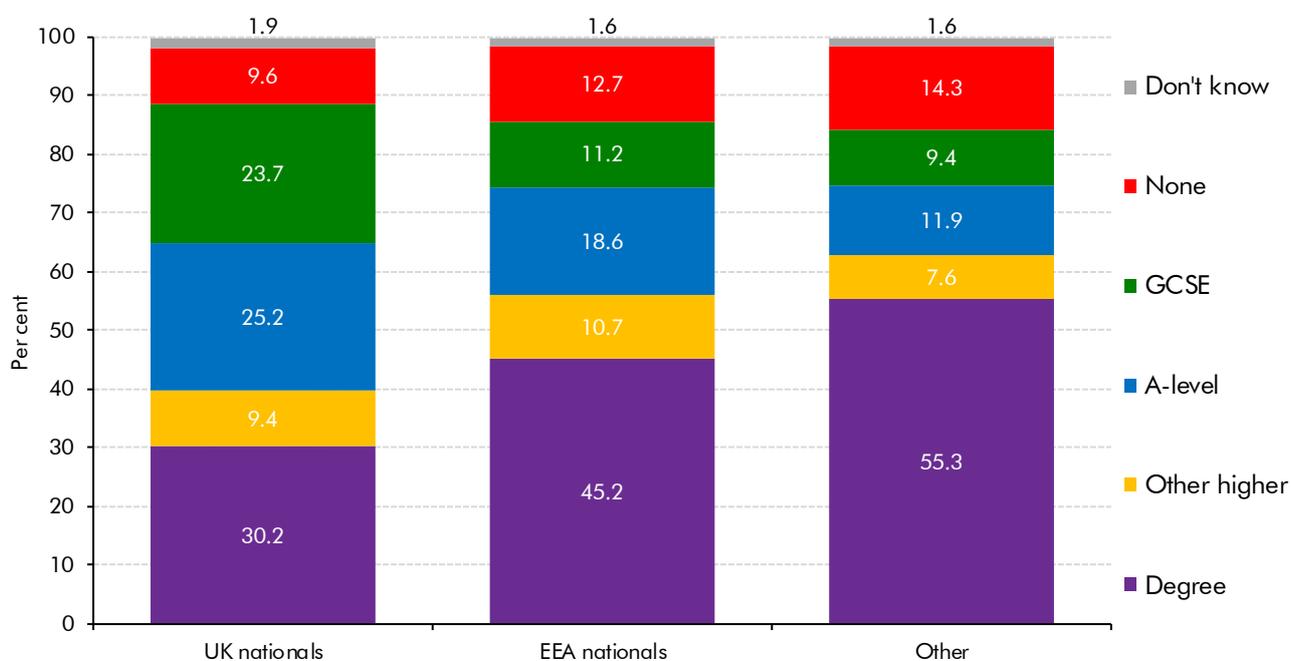


Note: Recent migrants are defined as those that arrived after 2012.
Source: ONS

- 3.19 Men make up a greater proportion of both the migrant and native working populations than women, partly because they are more likely to participate in the labour force and partly because there are more male than female migrants. Nonetheless, average differences in gender composition are not too large – 55 per cent of all working migrants are male, compared to 53 per cent of the EU migrant and UK working populations. Again, there are significant differences within the migrant population – 59 per cent of working migrants from the EU2 are male, compared to 51 per cent of EU14 migrants.
- 3.20 In 2017, around 43 per cent of migrants coming to the UK said they were doing so primarily for work, 30 per cent to study and 27 per cent for other reasons. But the relative importance of the explanations differed by origin. Among EU migrants, over 60 per cent came for work and around 25 per cent for study. Among non-EU migrants, 30 per cent came for work and 45 per cent to study.
- 3.21 The Annual Population Survey (APS) suggests that migrants on average work longer hours than UK nationals and this is even more the case for EU migrants. In 2016, 47 per cent of working EU migrants worked 40 or more hours per week compared to 39 per cent of all non-EEA working migrants and 32 per cent of UK workers. EU migrants also have a higher employment rate than the UK nationals. The employment rate of EU27 migrants aged 16 to 64 was 83 per cent in the second quarter of 2018 compared to 63 per cent for other migrants and 76 per cent for UK nationals.
- 3.22 The APS suggests that the current stock of EEA migrants is also more skilled than UK workers in terms of the highest UK-recognised educational qualifications they hold (although not as skilled as non-EEA migrants). However, EEA migrants’ skill levels appears to be more polarised than the UK nationals, with a slightly greater proportion having no qualifications

at all. The picture is further complicated by the fact that more migrants report in the Labour Force Survey that they have 'other' qualifications, which include foreign ones not recognised in the UK as well as some additional professional and work-related qualifications.

Chart 3.4: Highest equivalent UK-recognised qualifications

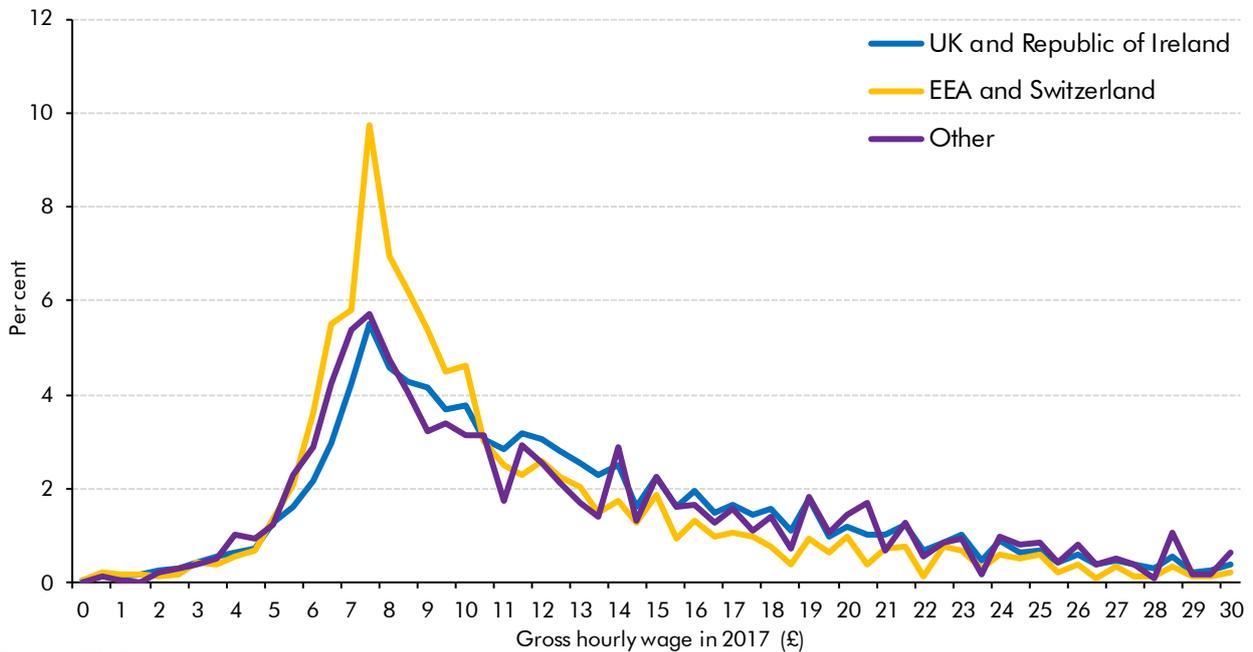


Source: ONS

3.23 Migrants are more than twice as likely to be in jobs that they are overqualified for as UK workers and this is also true for EU migrants. Partly as a result, the APS shows that migrants from the EEA on average receive a lower hourly wage than UK workers – suggesting that they are on average in lower productivity jobs. But this depends on where in the EU they come from. Migrants from the EU14 countries have higher hourly wages than UK workers but those from the A8 and EU2 are significantly less well paid.⁶ This probably reflects the relative concentrations of these workers in high- and low-skilled jobs.

⁶ The EU14 are Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain and Sweden.

Chart 3.5: Wage distribution of UK- and foreign-nationals



Source: ONS

3.24 Empirical studies suggest that the overall impact of migration on average UK wages is negligible, with small effects for specific groups and sectors. Nickell and Saleheen (2015) estimate that a 1 percentage point increase in the proportion of migrants relative to UK workers only lowers average wages by 0.1 per cent.⁷ Dustmann *et al* (2012) find that immigration into the UK depresses native wages below the 20th percentile of the wage distribution, but slightly increases them in the upper part of the distribution.⁸

3.25 Migration affects the housing market in several ways. In general, increases in the adult population raise housing demand. Given the relatively unresponsive supply, this might be expected to raise house prices and rents slightly, but in the case of migration there are several offsetting effects. Housing demand increases with age, and migrants are relatively young, so their demand for housing is likely to be relatively low.⁹ And the average household size of migrants may have risen over recent years, especially in London, further muting the impact of extra migrants on housing demand.¹⁰ Finally, migrants working in the construction sector may bring complementary skills or reduce construction costs by alleviating shortages. By increasing the supply of homes, this would put downward pressure on prices. Analysis from the Ministry of Housing, Communities and Local Government (2018) suggests that migration marginally raises house prices, but the effect is small compared to other factors.¹¹

⁷ Nickell, S., Salaheen, J., *The impact of immigration on occupational wages: evidence from Britain*, Bank of England Staff Working Paper No. 574, December 2015.

⁸ Dustmann, C., Frattini, T., Preston, I., *The Effect of Immigration along the Distribution of Wages*, *The Review of Economic Studies*, January 2013.

⁹ Eichholtz, P., Lindenthal, T., *Demographics, human capital, and the demand for housing*, *Journal of Housing Economics*, December 2014.

¹⁰ Mulherin, I., *Why is household size growing?*, Medium.com, March 2018.

¹¹ Ministry of Housing, Communities and Local Government, *Analysis of the determinants of house price changes*, Ad hoc publication, April 2018.

- 3.26 To date we have assumed that changes in net migration flows do not affect the structural rate of unemployment, although relatively easy access to migrant labour may help firms deal with shortages of skilled or unskilled labour – keeping structural unemployment lower than it otherwise would be and making wage growth less responsive when actual unemployment moves above or below it.
- 3.27 Some migrants will be substitutes for domestic workers, potentially crowding them out of employment, or at least putting downward pressure on their wages. But others are likely to be complements, crowding in the employment of domestic workers, or putting upward pressure on their wages. A review of the literature in 2014 suggested that immigration from the EU had not significantly depressed domestic workers' employment.¹² Becker and Fetzer (2018) report similar findings for post-2004 migration – the effect on natives' unemployment was statistically significant but economically small.¹³
- 3.28 Access to a large supply of migrant labour may reduce the incentive for employers to invest in capital and technology, reducing productivity growth in aggregate. But migrants may also have positive spill-over effects on productivity – for example, if they have scarce skills or introduce better ways of doing things. The Migration Advisory Committee (MAC) commissioned two studies on the impact of migration on training,¹⁴ concluding in their *Final Report* that there is no evidence that migration has negatively affected the training of UK-born workers.¹⁵ However, some evidence points to high-skilled migration increasing the quantity of training available to UK nationals.
- 3.29 Empirical studies generally suggest that migration increases productivity.¹⁶ Three recent pieces of work, commissioned by the MAC, also support this finding. Campo, Forte, and Portes (2018) find a 1 percentage point increase in the proportion of immigrants in a local authority raises productivity by almost 3 percentage points.¹⁷ Costas-Fernández (2018) suggest that the marginal migrant is about 2.5 times more productive as an extra UK-born worker.¹⁸ And Smith (2018)¹⁹ finds that a 1 percentage point rise in the migrant share raises total factor productivity by 1.6 per cent. The MAC argue that these estimates are “implausibly large” (although all three studies do use different approaches).²⁰ So, while past migration appears more likely than not to have had a positive impact on productivity, the magnitude of the relationship is unclear. It is also not clear whether EEA and non-EEA migrants have had the same effect on productivity.

¹² Devlin, C., Bolt, O., Patel, D., Harding, D., Hussain, I., *Impacts of migration on UK native employment: An analytical review of the evidence*, Department for Business, Innovation and Skills and Home Office Occasional Paper 109, March 2014.

¹³ Becker, S., Fetzer, T., *Has Eastern European Migration Impacted UK-born Workers?*, The Warwick Economics Research Paper Series 1165, June 2018.

¹⁴ Campo, F., Forte, G., Portes, J., *The impact of migration on productivity and native-born workers' training*, Submission to the Migration Advisory Committee, September 2018, and Mountford, A., Wadsworth, J., *Jumping someone else's train? Does immigration affect the training and hiring of native-born workers (and are there different effects from the EEA and non-EEA migrants)?*, Submission to the Migration Advisory Committee, September 2018.

¹⁵ Migration Advisory Committee, *EEA migration in the UK: final report*, September 2018.

¹⁶ See: Rolfe, H., Rienzo, C., Lalani, M., Portes, J., *Migration and productivity: employers' practices, public attitudes and statistical evidences*, National Institute of Economic and Social Research, November 2013, and Boubtane, E., Dumount, J.-C., Rault, C., *Immigration and Economic Growth in the OECD Countries, 1986-2006*, IZA Discussion Paper No. 8681, November 2014.

¹⁷ See prior reference to Campo *et al* (2018).

¹⁸ Costas-Fernández, J., *Examining the Link between Migration and Productivity*, Submission to the Migration Advisory Committee, September 2018.

¹⁹ Smith, J., *Migration, Productivity and Firm Performance*, Submission to the Migration Advisory Committee, September 2018.

²⁰ See prior reference to Migration Advisory Committee (2018).

- 3.30 It remains the case that migrants are significantly more concentrated at working ages than UK nationals, although EEA-born immigrants are not markedly different to migrants from elsewhere. Our 2013 FSR conclusion that migration has had little impact on native employment rates also appears to look reasonable, at least in aggregate.
- 3.31 Taking demographic characteristics into account, the evidence suggests that migrants' other labour market characteristics are *on average* not dramatically different to the evidence for the UK-born. For instance, EEA migrants are slightly more likely to have degree-level qualifications, but appear to command slightly lower hourly wages. EEA migrants are also slightly more likely to come to the UK in order to work than migrants from elsewhere. And while they have higher employment rates than the native-born population, much of the difference can be explained by controlling for age.²¹ In any case, EEA migration has fallen sharply since 2016 and it is still not entirely clear how the composition and characteristics of migration flows has been affected over that period.

Recent fiscal trends and evidence

- 3.32 HMRC statistics show that, in 2015-16, EEA nationals paid £15.5 billion more income tax and National Insurance than they received in tax credits and child benefit.²² DWP statistics suggest that EU nationals are a little less likely to claim out-of-work benefits (such as jobseekers' allowance) than UK nationals, but a little more likely to claim in-work benefits (like tax credits).²³ These estimates are partial. Estimating the *overall* fiscal impacts of immigration requires several judgements, such as how to combine data sources and whether and how spending on public goods should be allocated to migrants. That said, studies have generally found that immigration has a small but positive effect on the public finances.
- 3.33 Most UK-specific studies follow 'static' accounting approaches, which estimate immigrants' net contributions in a particular year. Dustmann and Frattini (2014) report that between 2001 and 2011 immigrants (and especially EEA nationals) made a greater fiscal contribution than UK natives.²⁴ Similarly, analysis commissioned from Oxford Economics by the Migration Advisory Committee concluded that the net per capita contribution made by EEA immigrants in 2016-17 exceeded the UK average by around £2,300.²⁵ Rowthorn (2014) notes that recent EEA migrants' net fiscal contributions were positive prior to the financial crisis, but then deteriorated in line with the public finances as a whole.²⁶ However, migrants still "*either paid their way or generated a modest surplus*".
- 3.34 OECD (2013) provides international comparisons of the static impacts of migration. Their baseline suggests a net fiscal contribution to the UK of 0.46 per cent of GDP between 2007

²¹ See prior reference to Migration Advisory Committee (2018).

²² HMRC, *Income Tax, NICs, Tax Credits and Child benefit Statistics for EEA Nationals, 2014 to 2015*, August 2017.

²³ Sumption, M., Altorjai, S., *EU Migration, Welfare Benefits and EU Membership (pre-referendum)*, The Migration Observatory at the University of Oxford, May 2016.

²⁴ Dustmann, C., Frattini, T., *The Fiscal Effects of Immigration to the UK*, The Economic Journal, November 2014.

²⁵ Oxford Economics, *The Fiscal Impact of Immigration on the UK*, Submission to the Migration Advisory Committee, June 2018.

²⁶ Rowthorn, R., *A Note on Dustmann and Frattini's Estimates of the Fiscal Impact of UK Immigration*, Civitas, April 2014.

and 2009, 0.11 per cent of GDP larger than the OECD average.²⁷ Nyman and Ahlskog (2018) look specifically at EU migrant households and suggest that EEA migrants make a positive contribution in almost all EU Member States.²⁸ These impacts tend to be relatively small: 0.3 per cent of GDP in the UK, for instance.

- 3.35 Immigrants may pay lots of tax today, and have had their education paid for in their home countries, but the UK will still have to fund future healthcare and some pension costs for them. And although recent immigrants have been relatively concentrated at working ages, the current stock will gradually age (although some may leave the UK). As a result, considering only the static impact migrants have on the public finances today might overstate their contributions. In our *FSRs*, we find that immigration partly alleviates upward pressures on public debt over our 50-year projection period. (This assumes a constant flow of new net migrants that, conditional on age and gender, have the same average characteristics as the native population.)
- 3.36 ‘Dynamic’ accounting approaches calculate the lifetime contributions of a particular cohort of migrants, discounted to their present value. These studies make several further assumptions, including around migrants’ life expectancies and duration in the UK. Oxford Economics (2018) find a £78,000 discounted lifetime net contribution per European migrant.²⁹ Other migrants make a smaller – but still positive – contribution, with a net present value of £28,000. The total lifetime impact of the 2016 cohort of migrants was calculated as £26.9 billion, with £19.3 billion coming from EEA migrants.
- 3.37 Accounting approaches provide a useful guide to the likely direction and magnitude of the fiscal impacts of migration. General equilibrium approaches, however, also account for the effect of labour supply shocks on the native population’s behaviour.³⁰ Using this approach, Chojnicki and Ragot (2011) examine the effects of migration in France, showing that it generally improves the public finances. However, in their model migration increases returns to capital and puts downward pressure on the wages of the less-skilled native population.³¹
- 3.38 General equilibrium models can help demonstrate the channels through which migration affects the economy and public finances. However, they do not account for short-term trends and fluctuations. To capture these, while still incorporating several of the important channels through which migration affects the economy, our approach to date has been to feed demographic projections through our macroeconomic model. We use the resulting macroeconomic forecast as the base on which our fiscal forecasts are made.

²⁷ Organisation for Economic Co-operation and Development, *International Migration Outlook 2013*, OECD Publishing, June 2013.

²⁸ Nyman, P., Ahlskog, R., *Fiscal effects of intra-EEA migration*, REMINDER Project Working Paper, March 2018.

²⁹ See prior reference to Oxford Economics (2018).

³⁰ We discuss (computable) general equilibrium (trade) models in Box 2.2.

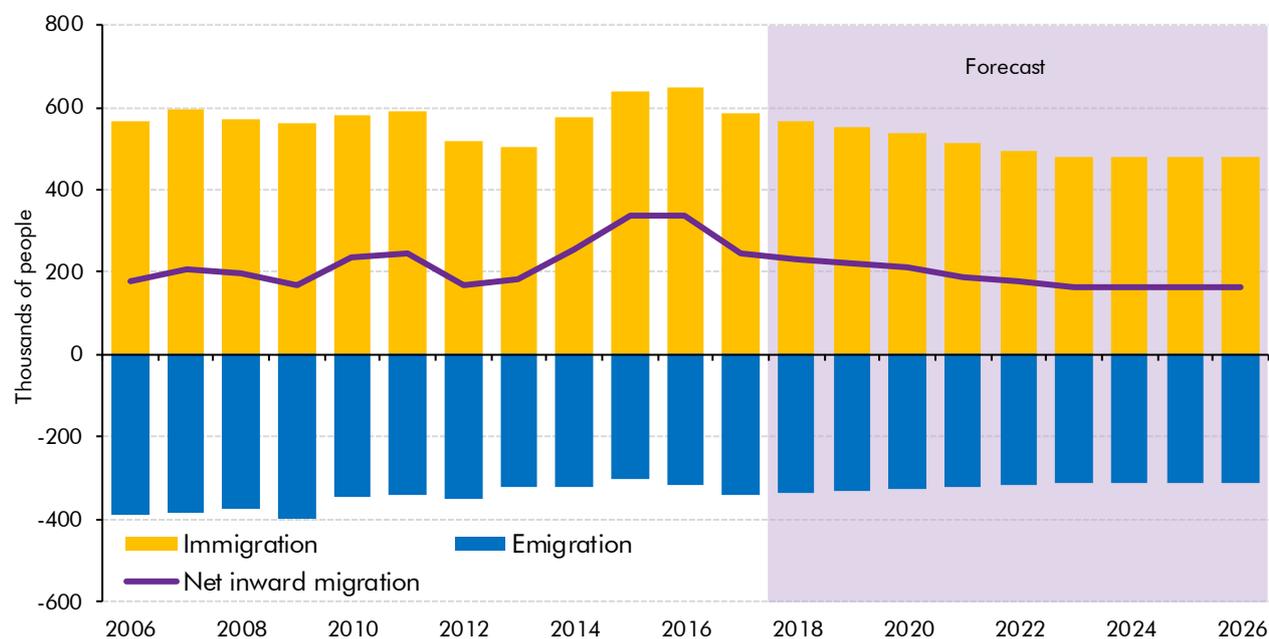
³¹ Chojnicki, X., Ragot, L., *Impacts of Immigration on Aging Welfare-State: An Applied General Equilibrium Model for France*, Centre d’Études Prospectives et d’Information Internationales Working Paper No. 2011-13, May 2011.

Reflecting changes in our forecasts

Population projections

- 3.39 Our assumption to date that inward migrants to the UK have the same age- and gender-specific economic characteristics as the native population means that our migration assumptions only affect our economic and fiscal forecasts to the extent that they affect the projected size of the population and its structure by age and gender.
- 3.40 In preparing our forecasts, we do not produce our own population projections. Instead we rely on those produced every other year by the Office for National Statistics. These are based on outturn population estimates and alternative assumptions regarding fertility, mortality and migration rates. The ONS's central (or 'principal') projection is based on relatively mechanistic migration assumptions – namely that flows will move over time from an average of relatively recent outturn rates towards a relatively arbitrary historical average – rather than on an explicit assessment of current policy. The ONS's 'high' and 'low' migration variants are equally mechanistic, assuming flows tens of thousands higher or lower than the principal projection in both the near- and long-term, rather than representing alternative policy scenarios. The ONS does not make any explicit assumptions about the origin and mix of migration.
- 3.41 Of the 18 forecasts we have produced to date, alongside Budgets and Autumn/Spring Statements, five have incorporated changes to assumed migration flows. In our November 2011, December 2013, November 2015 and November 2017 forecasts, this reflected the ONS updating its population projections and the associated migration assumptions. In our March 2015 forecast, it reflected our decision to move from the ONS's low migration variant to the principal projection. Given the outturn data available at the time, and absent the referendum result, we would have moved from the principal to the high migration variant in our November 2016 forecast. But given our assessment of the impact of the referendum vote on 'push' and 'pull' factors, we have stuck to the principal projection. This currently assumes that net inward migration falls to 165,000 a year by 2023.

Chart 3.6: Recent outturn net inward migration and the 2016-based ONS projection



Source: ONS

The economy forecast

- 3.42** When changes in expected migration flows affect the projected size and structure of the population, this affects our economic forecast primarily via our forecast for the path of ‘potential output’ – the sustainable level of activity consistent with stable inflation to which we assume that the economy will tend as the Bank of England pursues its mandated inflation target. Potential output is the product of potential productivity (output per hour) and potential hours worked. As we assume that migrants are on average as productive as the native population, the impact of changes in migration comes entirely through hours worked. In practice, average productivity varies with age and other household characteristics, and therefore potential productivity should be affected by changes in the structure of the population.
- 3.43** Potential hours worked depend on the size of the working-age population, the proportion in employment and average hours worked. Net inward migration directly increases the working-age population (proportionately more than the total population, because migrants are more likely to be of working age). We assume that migrants have the same age- and gender-specific employment rates as natives, so – as migrants tend to be younger and are more likely to be male than the resident population – net inward migration modestly increases the working-age employment rate. We assume that it does not affect average hours. (As we discuss in paragraph 3.21, there is some evidence that migrants work longer average hours than natives, but not enough to have a material effect on our overall forecast.) So net inward migration increases potential output primarily by increasing the working-age population.

- 3.44 When changes in the outlook for migration change the outlook for potential output, this changes the actual levels of output, income and spending that we expect the economy to tend to when running at its sustainable capacity. In each forecast we make judgements about how far away activity in the economy lies from potential and how quickly it will return to it. A larger population means more people producing output, receiving wages, profits and rents, and spending money, either directly or through the firms they own (mostly via their pensions).
- 3.45 The housing market is also affected by net migration. In general, if the population increases, and housing supply is relatively fixed, then prices would be expected to increase.

The fiscal forecast

- 3.46 When changes in net inward migration alter the projected size and structure of the population, this feeds into different parts of our fiscal forecast in different ways:
- **Receipts:** changes in the population projections feed into most of our receipts forecasts indirectly, via their effects on our economy forecast. This is reflected in the components of national income and spending (e.g. wages and salaries and consumer spending) and other variables like employment and house prices. These 'economic determinants' drive most of our tax forecasting models, which tend to project growth from a within-year estimate based on our assessment of recent outturn data. Put simply, a larger population means more taxpayers, bigger tax bases and more revenue. In some cases, the projections have more direct effects – our inheritance tax forecast depends on projections for deaths and our forecasts for several Scottish taxes adjust for differences in population growth between Scotland and elsewhere in the UK.
 - **Welfare spending:** for some benefits, particularly pensioner and disability benefits, changes in the population projections feed directly into the forecast. For working age benefits, population changes feed through indirectly, either through economic determinants (particularly employment and unemployment), or through the continuation of recent trends that will have been influenced by recent movements in population size and structure. Were future trends to be significantly different over the forecast horizon this latter approach would require modification.
 - **State pensions:** while the main driver of state pension spending is the size of the population aged above the state pensions age, it is also paid to over a million overseas residents, of whom 41 per cent live in the EEA. (This group accounts for half of all overseas spending, as unlike recipients of UK state pension in some other countries their pensions are not frozen in cash terms.) If outward migration declined, all else equal this would increase the number of pensioners resident in the UK. But a corresponding reduction would need to be made in EEA resident pensioners.
 - **Departmental spending:** Parliament requires us to produce our forecasts on the basis of current stated government policy – which includes the cash plans it sets out for Resource Departmental Expenditure Limits (RDEs, which cover day-to-day spending

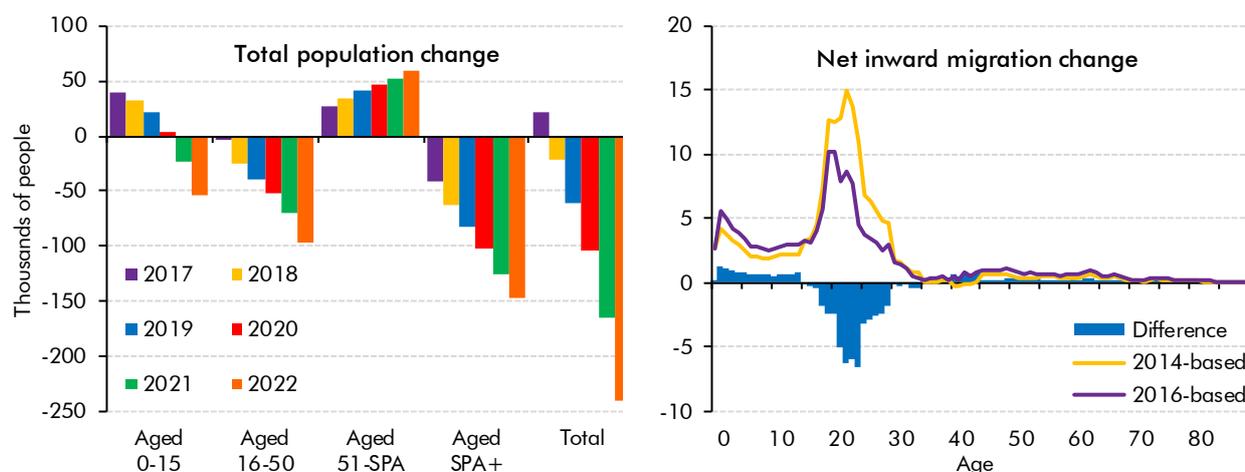
on public services, grants and administration) and Capital Departmental Expenditure Limits (CDELs, which cover capital investment).³² This means that if changes in the outlook for net inward migration change the projected population, departmental spending plans are assumed to remain fixed in cash terms until the Government changes its policy, so the public finances are unaffected. An alternative interpretation of unchanged current policy – which we use in our longer-term projections – would be to assume that departmental spending remains constant as a share of GDP, adjusted for changes in the age and gender structure of the population. Under this interpretation, higher net inward migration would increase departmental spending in cash terms in line with its effects on GDP.

Illustrating the impact of migration changes

3.47 Our most recent forecast to incorporate a change in the ONS’s migration and population projections was published in November 2017. This took on board the 2016-based projections published by the ONS that October, which replaced the 2014-based projections used in our previous four forecasts.

3.48 The principal population projection we used in that forecast assumed that net inward migration would decline to 165,000 a year by 2023, down from 185,000 by 2021 assumed in the previous projections. The age composition of the immigrants also changed, with a higher proportion under 18 and fewer aged 18 to 34. As well as the change to migration, the projections also assumed slightly higher mortality rates. Taken together, this left the adult population in 2022 0.4 per cent smaller than in the previous projections. That meant 202,000 fewer adults, with 66,000 of the revision due to migration and 136,000 to other factors. Chart 3.7 shows how the population size was revised at different ages across the five-year forecast and the change in the assumed age structure of net inward migration.

Chart 3.7: Changes to the age structure in the latest population projections



Note: Both charts show differences between the 2016-based population projections and the 2014-based projections that preceded them.

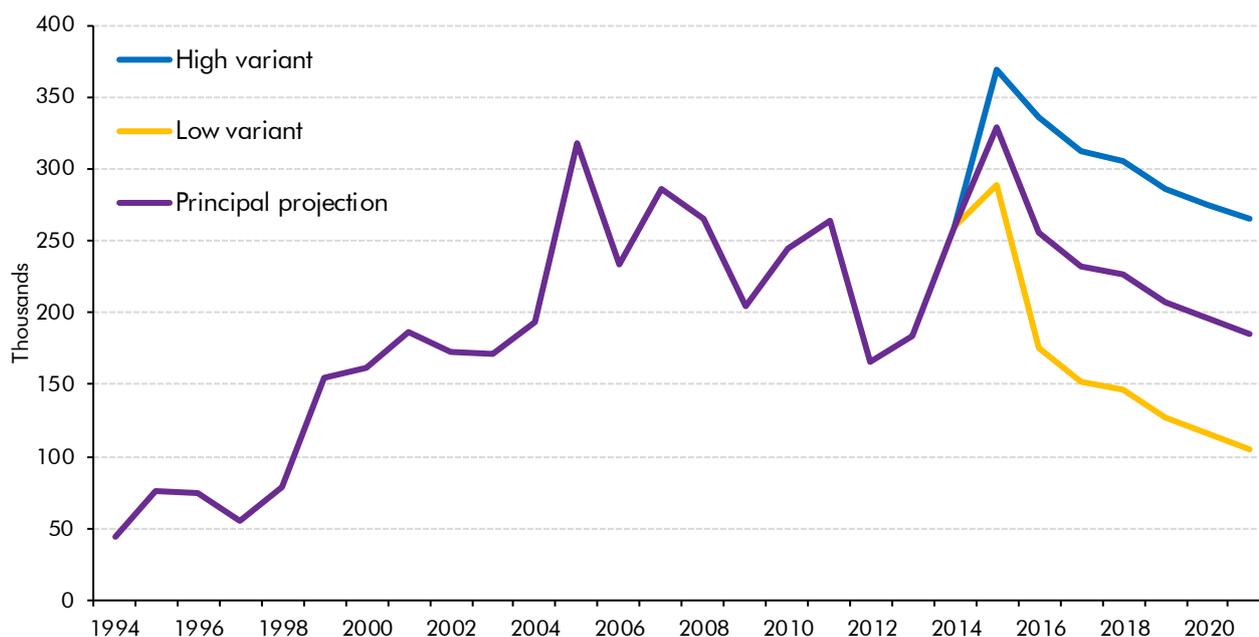
Source: ONS

³² These are specified department-by-department for the period covered by the current Spending Review (to 2019-20 for most departments) and in aggregate for the remaining years of the forecast.

3.49 The change to the expected adult population reduced potential output in 2021-22 by 0.2 per cent, partially offset by a slower decline in the labour market participation rate. The overall fiscal impact was to raise projected borrowing by £0.7 billion in 2021-22. The combination of a less favourable age structure for migration and more deaths reduced receipts by £2.2 billion, by reducing GDP, employment and house prices. This was partly offset by £0.3 billion more inheritance tax and £1.2 billion less spending on pensioner benefits and other welfare spending thanks to the extra deaths.

3.50 In our March 2016 *EFO*, we examined the potential implications of moving from the 2014-based principal population projection to the high or low migration variants. As noted above, that principal projection assumed that net inward migration would drop to 185,000 in 2021. The high and low migration variations assumed that it would reach 265,000 and 105,000 respectively – differences of 80,000 in each direction and therefore much larger than the revision made moving to the 2016-based projection. The variants did not incorporate significant changes to the age and gender distributions of net inward migrants.

Chart 3.8: Past and projected migration in our March 2016 *EFO*



Source: ONS, OBR

3.51 The fiscal impact of moving to the high or low migration variant was found to be broadly symmetric. Moving to the low migration variant reduced the adult population by 0.7 per cent at the end of the five-year horizon, lowering potential output by 0.9 per cent and employment by 0.8 per cent (273,000). By 2020-21, the last year of our forecast at the time, this reduced receipts by £6.2 billion, lowered welfare spending by £0.7 billion, and raised other spending by £0.3 billion. The net effect was to increase the budget deficit by £5.9 billion or 0.3 per cent of GDP (taking into account both the impact on cash receipts and spending and the reduction in GDP).

- 3.52 Once again, the fiscal impact of reduced migration reflected not just a reduction in the overall size of the population, but also a shift to a less favourable age structure as the foregone inward migrants were more likely to be of working age than the native stock.

Challenges of estimating the impact of Brexit-related migration changes

- 3.53 It seems likely that after Brexit the Government will introduce a more restrictive regime governing migrants from the EU (though this may be offset by some relaxation of the regime governing migrants from other countries). Those extra impediments will have an effect on UK output, productivity and the public finances. But the nature and magnitude of those impacts will necessarily depend on the precise nature and scope of the new rules.
- 3.54 The Government has recently set out some of the broad principles of its post-Brexit migration policy, with more details to follow in a white paper now expected in autumn 2018. Once the Government has announced firm plans for its new EEA/Swiss immigration regime – plus any accompanying changes to the non-EEA rules – we will be able to judge whether and how we need to adjust our forecasts in response. We might also wish to reflect the impact of changes in EEA/Swiss rules regarding migration from the UK. This will involve two steps. First, judging how the new rules are likely to affect the size and structure of migration flows over time. Second, reflecting any such changes in our economy and fiscal forecasts.

The impact of new rules on migration flows

- 3.55 In terms of the direct impact of any new rules on migration, we will need to consider how the change is likely to affect the size of the flows and their composition by age and gender. Importantly, we would also need to consider whether the new rules mean that it is no longer appropriate to assume that inward migrants on average have the same economic characteristics as the native population, in particular whether they are likely to end up in equally productive jobs.
- 3.56 This is likely to be a material issue if the new rules aim to shift the composition of inward migration from the EEA from unskilled to skilled labour, particularly because more EEA migrants than non-EEA migrants come to the UK specifically to work. Shifting policy towards favouring higher-skilled migrants was one of the key recommendations of the Migration Advisory Committee (MAC),³³ which published its *Final report* in September 2018. Box 3.1 discusses the MAC report's broad conclusions and key recommendations. The Government has indicated that it supports several of the MAC's broad recommendations, with concrete details to follow.
- 3.57 The Government's new immigration rules will set criteria that would-be EEA migrants will have to satisfy. These might specify migrants' occupations or ages or the sectors and regions in which they are allowed to work and or requiring migrants to hold concrete job

³³ Migration Advisory Committee, *EEA migration in the UK: final report*, September 2018.

offers. The Government will have to choose how to weight these criteria. Once these criteria are decided, yet more choices must be made – such as whether thresholds are imposed on migrants' pay (as recommended by the MAC), whether there are limits on the number of jobs available to migrants, or restrictions on whether jobs can be offered on temporary or permanent bases.

Box 3.1: The Migration Advisory Committee's Final Report

The Migration Advisory Committee (MAC) was set up in 2007 to provide independent advice on migration policy. After the referendum, the Government commissioned the MAC to provide evidence and advice on *"EU and European Economic Area (EEA) migration and the role of migration in the wider economy and society"*. It requested that this advice be aligned with *"a modern industrial strategy"*.^a As well as a review of the evidence on the impacts of EEA migration, the MAC's response, published in September 2018, contained fourteen recommendations for the future course of migration policy.^b

The MAC's findings regarding the economic and fiscal impacts of migration are similar to our own, although the report considers a broader range of effects than the relatively narrow economic and fiscal issues that fall within our remit. EEA migrants are found to have had relatively little effect on the average labour market outcomes of native workers, but a positive impact on the public finances. The MAC argues that although studies suggest that migration raises productivity, particularly when migrants are high-skilled, many estimates are *"implausibly large"* and all are extremely uncertain. The MAC observes that immigration has distributional consequences and appears to have raised the wages of the highly skilled while lowering those of the less skilled.

Consequently, the MAC recommended that – if migration is not part of the negotiations with the EU when freedom of movement ends – policy should no longer aim to give EU workers special treatment, but should instead prioritise attracting high-skilled migrants. The report recommends that the scope of the Tier 2 (general) scheme – which currently applies to skilled migrants from outside the EEA – should be expanded (on the assumption that it will also be apply to EEA migrants in future). It proposes removing the current 20,700 annual quota for Tier 2 (general) visas, increasing the scheme's coverage to include medium- as well as high-skilled jobs, and getting rid of the resident labour market test that currently forces some employers to advertise jobs domestically. However, the MAC suggested sticking to the Tier 2 scheme's £30,000 general salary threshold (and £20,800 threshold for new entrants) and retaining (but reviewing) the Immigration Skills Charge that employers hiring non-EEA migrants currently face.

Several recommendations concern the lower end of the skill distribution. When freedom of movement ceases, the MAC does not favour 'carve outs' for sectors that currently rely on low-skilled EEA workers, with the possible exception of a seasonal agriculture workers scheme (SAWS). (Relatedly, in September 2018, the Government announced a pilot scheme that will permit the fruit and vegetable sector to employ up to 2,500 migrant workers from outside the EU on a temporary basis each year.) The MAC recommends that even a SAWS scheme should be limited by an agricultural minimum wage to avoid undercutting wages. Instead the report suggests filling low-skilled roles through an extension to the Tier 5 youth mobility scheme.

As noted above, the MAC's overall recommendation that EU citizens lose their preferential treatment is conditional "on the assumption that UK immigration policy is not included in an agreement with the EU". In the past, the EU has emphasised the "indivisibility of the four freedoms" – that the free exchange of goods, services, and capital go hand in hand with free movement of labour.^c When the UK negotiates its new trading agreement with the EU, it will need to consider what is compatible with its preferred migration policies.

^a Home Secretary, *Home Secretary's commissioning letter to the chair of the MAC*, July 2017.

^b Migration Advisory Committee, *EEA migration in the UK: final report*, September 2018.

^c Speech by Michel Barnier, *Protecting Citizen's Rights in the Negotiations with the UK*, May 2017.

- 3.58 How any framework is operationalised also matters. Schemes that impose significant costs on would-be migrants, such as large visa-processing fees, or that are extremely complex, will discourage migration – including that of skilled EU migrants. Employees are important for the economic outlook, but the Government will also need to consider how to treat migrants in other parts of the labour market, like the self-employed. Rules with less immediate effect on the labour force, such as the conditions under which students, refugees and the families of migrants are permitted to enter and then remain in the UK could have more significant effects over the longer term.
- 3.59 It is also illustrative to consider how migration would be affected if the rules that currently apply to non-EEA migrants were applied to those from the EEA. The Institute for Public Policy Research has suggested that if the requirements of the existing Tier 2 scheme (that is applied to non-EU migrants) were applied to *all* migrants, 83 per cent of current EEA employees would be ineligible.³⁴ Indeed, the design of the UK's current migration regime ensures that most low-skilled migration is from the EEA.
- 3.60 Once the Government has set out its migration regime, we will have to decide whether – and how – to alter the size and composition of migration flows assumed in our forecasts. Portes and Forte (2016) illustrate the size of the potential reduction using a gravity-modelling-style approach.³⁵ This estimates the increase in economic migration (as proxied by National Insurance number registrations) that followed various extensions to freedom of movement. It concluded that freedom of movement increased flows roughly sixfold. The leaked cross-Whitehall analysis took a different approach, calculating the proportion of the existing stock of migrants that would fail to satisfy various illustrative migration requirements, and reduced future flows by these proportions.
- 3.61 The Government is required to accompany changes to regulations with a regulatory impact assessment (RIA).³⁶ If it produced or commissioned a similar assessment for its new migration regime, we could use that to inform our judgments. For instance, RIAs were used to estimate the reduction in migration resulting from the increase in the threshold salary at which migrants on Tier 2 visas are allowed to settle in the UK to £35,000³⁷ as well as when

³⁴ Institute for Public Policy Research, *IPPR analysis: Post-Brexit impacts on migration restrictions*, September 2017.

³⁵ Portes, J., Forte, G., *The Economic Impact of Brexit-induced Reductions in Migration*, National Institute of Economic and Social Research, December 2016. See Box 2.1 for more information on gravity modelling.

³⁶ Department for Business, Energy, and Industrial Strategy, *Better Regulation Framework: Guidance*, August 2018.

³⁷ Home Office, *Changes to Tier 2 Settlement Rules*, March 2012.

changing the income threshold for settling partners.³⁸ When considering the impact of increasing the threshold from £20,800 to £30,000 for experienced hires, the Government commissioned the MAC to analyse the economic impact; it suggested that the change could affect up to 14 per cent of applications across Tier 2.³⁹

- 3.62 Net migration is difficult to predict even without policy changes. Patchy data can make it difficult to determine what has driven past changes in flows. And the wide range of push and pull factors make it hard to extrapolate trends. In any case, geopolitical events – which are inherently hard to foresee – often drive the biggest changes in flows. New rules would certainly be an important influence on future flows, but Brexit may also affect migration through a broader range of channels. For instance, as we have discussed in Chapter 2, higher trade barriers would be likely to lower the steady state real wages migrants could obtain in the UK relative to elsewhere and this might weigh on migration. New rules might also amplify or dampen the effect of other push and pull factors. For instance, Lewis and Swannell (2018) find that migration is more responsive to changes in macroeconomic conditions under freedom of movement.⁴⁰
- 3.63 This means that the full steady-state impact of Brexit on migration is unlikely to materialise over our forecasts' five-year horizon. Designing and implementing a new system will also be a complex and lengthy business and the Migration Observatory notes that before any new system comes into operation it will be necessary to hire staff and set up frameworks to guide applicants and process visas.⁴¹ Moreover, *"the operational complexity of introducing an entirely new work permit system could be compounded by the large-scale challenge of processing residence applications for EU citizens already living in the UK."*
- 3.64 Although we focus mainly on inward migration flows, Brexit will also affect emigration. The Government has indicated that the new regime will enable EEA and Swiss migrants currently residing in the UK to remain in place, but changes in the macroeconomic environment or other factors could alter the level or pattern of outflows. The EU might also mirror restrictions on the migration of EU nationals to the UK by imposing their own restrictions on the migration of UK nationals.
- 3.65 In time, we might consider incorporating the endogeneity of migration flows into our forecast process. Migration is partly determined by economic factors, as migrants are more likely to move where job and pay prospects are better. Studies typically find that flows are affected by relative GDP per head, relative unemployment rates and (in some) the real exchange rate.⁴² A model of migration might also affect the way we think about labour market capacity and drivers of wage inflation. Unfortunately, estimating the relationships underpinning such a model as a basis for forecasting would be more than usually challenging at the time of a major policy shift like Brexit.

³⁸ Home Office, *Changes to Family Migration Rules*, June 2012.

³⁹ Migration Advisory Committee, *Review of Tier 2: Balancing migrant selectivity, investment in skills and impacts on UK productivity and Competitiveness*, December 2015.

⁴⁰ Lewis, J., Swannell, M., *The macroeconomic determinants of migration*, Bank of England Staff Working Paper No. 729, May 2018.

⁴¹ Sumption, M., *Labour Immigration after Brexit: Trade-offs and Questions about Policy Design*, The Migration Observation at the University of Oxford, January 2017.

⁴² For instance, see prior reference to Portes and Forte (2016).

Reflecting the impact in our economic and fiscal forecasts

- 3.66 Having made a judgment about the impact of a new EEA immigration regime on the size and composition of migration flows, the next step would be to reflect this in our economy and fiscal forecasts. Alongside the impact on EEA flows, we would also need to consider any potential changes to levels of non-EEA migration. Following our practice to date, the simplest adjustment would be to choose a different variant population projection from those published by the ONS. With the overall migration regime likely to tighten, the obvious candidates would be the low migration variant – which currently assumes annual net inward migration of 85,000 in the long-run – or the ONS’s ‘50 per cent lower net EU migration’ scenario.⁴³ If this was deemed too blunt an instrument, we could scale the impact of moving to one of the other variants or ask the ONS to produce a bespoke projection for us.
- 3.67 Changing our population projection would only address the impact of the new policy regime on the size of the population and its structure by age and gender. We might wish to make alternative assumptions about the average productivity of net inward migrants, for example if the new regime – like the current non-EEA regime – prioritised migration by skilled people with relatively well-paid job offers. Average hours could be adjusted too.
- 3.68 One simple thought experiment would be to assume that the projected volume of migration in our latest forecast will be unaffected, but that future net inward migrants from the EEA will be 20 per cent more productive than we currently assume and than the native population. Abstracting from all differences between individuals *other* than productivity and their propensity to migrate to the UK, after five years this would make the stock of EEA migrants 1.8 per cent more productive, the stock of all migrants 0.7 per cent more productive and the employed labour force 0.1 per cent more productive. This would therefore increase potential output by 0.1 per cent over five years.
- 3.69 Perhaps the most likely outcome of a new policy regime is that net inflows will be smaller on average than they otherwise would have been, but on average more highly skilled and productive. Table 3.1 below shows some illustrative scenarios. We estimate that if migration policy prioritised higher-skilled workers by ‘cutting off’ only the bottom half of the immigrant skill distribution, the level of potential output would be 0.2 percentage points lower by 2023 – although in practice visa requirements and other disincentives would reduce skilled migration too. (The fall would be 0.1 percentage points larger if composition was unchanged.)
- 3.70 Like the example above, this is a simplified case that assumes that migration has no impact on the employment and productivity of native workers. In reality, lower-skilled workers might help facilitate increases in higher-skilled employment – for instance, migrants working in childcare might allow higher-skilled women to (re)enter employment. We have discussed evidence for the possible effects of migration on productivity in paragraphs 3.28 and 3.29.

⁴³ The Scottish Fiscal Commission used this scenario in their May 2018 forecast. See Scottish Fiscal Commission, *Scotland’s Economic and Fiscal Forecasts*, May 2018.

3.71 More broadly, evidence suggests that inward migration may boost productivity indirectly through dynamic effects, as do trade flows and FDI. But, as explained in Chapter 1, we expect to capture such dynamic effects in our overall top-down judgement on potential productivity growth – which is already highly uncertain given recent history – rather than by attempting to quantify the three elements separately.

Table 3.1: Illustrative scenarios of changes in number and composition of migrants

50 per cent fall in EEA net inward migration from mid-2019 onwards	Percentage change relative to baseline by 2023 in:			
	Future EEA migrant productivity	Overall potential productivity	Working population	Potential output
Equal across migrant skill distribution	0.0	0.0	-0.3	-0.3
All reduction at bottom of skill distribution	39.3	0.1	-0.3	-0.2

3.72 Adjusting our forecast for potential output to reflect the impact of new migration rules on the size, structure and productivity of the population would feed through to our public finance forecasts via the relevant economic determinants: the main components of national income and spending, plus employment and possibly house prices (in the short term). As discussed above, the population forecasts would also feed through directly into our welfare spending forecasts via projected caseloads. We would also need to take into account the impact of any change in the entitlement of EEA migrants to particular welfare benefits.

Conclusions

3.73 Reflecting a change in migration policy in our forecasts will not be straightforward. Flows are hard to forecast and any change in visa rules for EEA/Swiss citizens would be logistically complex, time-consuming to implement and uncertain in its impact on the number and type of people entering and leaving the country – especially over a five-year forecast horizon during which any new system would be bedding in.

3.74 The most likely consequence of any new regime is that the net inflow of migrants will be smaller, but likely on average to end up in relatively more productive jobs. (Low skilled migration will almost certainly fall, but we cannot tell in advance whether skilled migration will rise or fall.) These changes in volume and composition would have partly offsetting effects on our projections for the economy and the public finances. We will need to adjust our forecasts to take account of this, although in doing so we might favour a simple and transparent approach.

3.75 Compared to some of the non-Brexit related forecast changes we have made in recent years, this policy change would probably modestly reduce output (although the impact on output per head is ambiguous), relative to the levels we would otherwise expect. Given that much of public spending is fixed over the near term, the reduction in tax revenues would worsen the public finances. And it would take place in an environment of considerable underlying uncertainty around the prospects for migration, the economy and public finances.

- 3.76 The more restrictive the regime in terms of numbers – and more prescriptive in terms of the characteristics of migrants – the easier the job of forecasting net inward migration itself. In essence, we would just need to forecast the extent to which the new rules were observed. But in these circumstances, the importance of judgements about the indirect effects of changes in migration on the productivity of the rest of the workforce could well be much greater. If the Government picked numbers or conditions that differed significantly from those that market forces would have generated, the associated effects on the economy and public finances would tend to be larger.

4 Other considerations

4.1 Neither the Withdrawal Agreement nor the subsequent negotiations regarding the future relationship between the UK and EU will cover all the consequences of Brexit. In particular, current and future UK governments are likely to wish to exploit the greater freedom they have outside the EU to change domestic policy, while market participants, businesses and households will alter their behaviour in response to the changed economic and legal environment. We may need to incorporate such developments into our forecasts, either as they occur or when there is sufficient detail to allow us to do so. They include:

- Future **trade agreements with non-EU countries** and their effect on the economy.
- The **scope for domestic regulatory changes** and their effect on the economy.
- **Macroeconomic policy** responses to the economic consequences of Brexit.
- Other changes to **tax and spending policy**.
- Any changes in **foreign direct investment** and their effect on the economy.
- **Exchange rate** movements and their effect on trade and inflation.
- The impact of Brexit on wider economic developments.

Future trade agreements with non-EU countries

4.2 As a member of the EU, UK trade with other countries in the EU does not face any tariffs and is subject to much-reduced non-tariff barriers. The UK also benefits from the free trade agreements (FTAs) with third countries that the EU has negotiated on behalf of its members, for example with South Korea, Mexico and Canada. The EU currently accounts for 49 per cent of UK trade, with a further 10 per cent accounted for by countries with which the EU has an existing FTA that has been fully or partially implemented. Countries with which the EU has concluded deals, but where implementation has not yet begun (such as Japan and Singapore) account for a further 4 per cent of UK trade. More information on these trading relationships can be found in Chapter 2.

4.3 The draft Withdrawal Agreement says that the EU will ask third countries with which it has trade deals to replicate them with the UK, but there is no guarantee that the countries concerned would be willing to do so. Even if a third country were willing to begin negotiations, they may not follow a smooth path to an identical outcome – one or both parties might seek to extract further concessions.

Other considerations

- 4.4 Replicating the benefits of existing deals is also subject to technical challenges, such as those around rules of origin. Without a three-way agreement between the EU, UK and the respective third country on 'diagonal cumulation' – in effect the relaxation of some rule of origin requirements in recognition of separate FTAs between the three parties – a bilateral FTA may not be as beneficial to the UK as the current arrangement.¹ For example, a car exported from the UK to South Korea with over 45 per cent of the value of the inputs from other EU countries might not qualify for tariff-free access under an FTA that the UK signs with South Korea, whereas it currently does under the EU's trade agreement with them.
- 4.5 Also, some of the EU's FTAs stipulate that if the other party signs a trade deal giving better terms to a third party – and if that affects the EU's market for any products – then those same terms must be offered to the EU.² This suggests that third countries might not be willing to grant better trade terms in any future bilateral deals with the UK than it does as a member of the EU and, if they do, the benefit would also be granted to the remaining members of the EU.
- 4.6 The UK Government will also be free to pursue trade deals with countries which the EU currently does not have an FTA. The Government has signalled its intention to “*enter into meaningful trade agreements with partners across the world*”³ including the United States, China and India. But successfully concluding those negotiations is likely to prove far more difficult than replicating existing agreements, as there is no immediate blueprint to draw upon. And those trade deals that are finalised are likely to take a considerable time to do so. The US has taken an average of almost four years to negotiate and implement its trade deals,⁴ China has taken an average of almost six years and India almost seven years.⁵ The EU's own exploratory talks with the US and India stalled after three and six years respectively. The EU-Canada Comprehensive Economic and Trade Agreement (CETA) provides a useful exemplar. This took more than eight years from the beginning of negotiations to the provisional start date, with full implementation taking longer still. Its full text (in English) runs to 1,600 pages. Switzerland's FTA with China involved four years of negotiations, with a subsequent implementation of up to 15 years for certain products. There is little reason to believe that negotiations would be easier for the UK Government, particularly given the relative lack of experienced UK trade officials and the smallness of the UK market relative to the EU.
- 4.7 This means that trade deals with the rest of the world are unlikely to have a significant impact within the five-year horizon of our current medium-term forecast and may not for many years to come. The OBR's remit from Parliament means that we would be unable to incorporate a policy change, such as a trade agreement, that has yet to be negotiated.

¹ See European Commission website on Common Provisions.

² For example, see paragraph 4 on page 23 of the *Agreement between the European Union and Japan for an Economic Partnership*, December 2017.

³ The Secretary of State for International Trade, *At the crossroads: Britain and global trade*, speech to Federation of Small Businesses on 18 July 2018.

⁴ See Freund, C., McDaniel, C., *How long does it take to conclude a trade deal with the US?*, Peterson Institute for International Economics, July 2016.

⁵ See Open Britain, *Trade deals with five key countries could take 26 years to negotiate*, April 2018.

- 4.8 As well as being challenging to negotiate, the evidence suggests that the benefits of additional bilateral trade deals are likely to be relatively modest – and the impact of any individual deal may not be material for our forecast. The US is the UK’s second largest trading partner – accounting for about 15 per cent of UK trade – but, despite this, the cross-Whitehall analysis of the benefits of a UK-US FTA suggested a boost to UK GDP of only between 0.1 and 0.3 per cent over the long run. The corresponding estimate in CEPR (2013) was between 0.1 and 0.4 per cent over the long term.⁶ Ciuriak *et al* (2015) estimate an even smaller gain from a US FTA of just an eventual 0.05 per cent.⁷
- 4.9 The cross-Whitehall analysis also suggested that additional FTAs with the Trans-Pacific Partnership (11 countries located around the Pacific), the Association of South East Asian Nations (10 countries in Asia), the Gulf Cooperation Council (six countries in the Middle East), plus China, India, Australia and New Zealand would only add a further 0.1 to 0.4 per cent to GDP over the long run. These estimated gains are low compared to those from EU membership because these countries are either economically smaller and/or geographically more remote than the EU, and FTAs generally reduce trade barriers by much less than has taken place within the EU under the Single Market. For example, despite its name CETA is mostly an agreement to lower tariffs on goods and has only a few provisions lowering non-tariff barriers (for instance opening access for public procurement contracts). Over time, it is likely that the larger, faster growing economies, in particular China and India, will account for an increasing share of UK export markets, but their current shares of UK exports are below those of much less populous, but geographically closer economies, such as Ireland.
- 4.10 Some other studies that assume more comprehensive FTAs show slightly greater benefits, typically because of the effects that lower NTBs have on trade and GDP growth. For example, Berden *et al* (2009) estimated that eliminating 25 to 50 per cent of reducible NTBs between the US and EU would boost EU GDP by 0.3 to 0.7 per cent over the long-run.⁸ But even these estimates are significantly lower than the majority of estimates of the loss of GDP that would be caused by a less open trading relationship with the EU.
- 4.11 Some studies have advocated and/or modelled the effects of unilateral free trade (UFT) on the UK economy after Brexit. These studies have different interpretations of UFT. In one scenario, Ciuriak *et al* (2015) assume that the UK lowers its tariffs on the importation of all products from all countries to zero. They also assume the removal of all rules of origin requirements, as there are no longer any qualifying requirements for preferential tariff rates. The authors find that this scenario would boost UK GDP by 0.75 per cent in the long run. The cross-Whitehall study⁹ and Dhingra *et al* (2017)¹⁰ found that unilaterally dropping tariffs to zero would boost long-term GDP by 0.2 per cent and 0.3 per cent, respectively. The effects of these sorts of scenarios are generally quite small as the UK (through its

⁶ Centre for Economic Policy Research, *Estimating the Economic Impact on the UK of a Transatlantic Trade and Investment Partnership (TTIP) between the European Union and the United States*, March 2013.

⁷ Ciuriak, D., Xiao, J., Ciuriak, N., Dadkhah, A., Lysenko, D., Badri Narayanan, G., *The Trade-related Impact of a UK Exit from the EU Single Market*, Ciuriak Consulting, April 2015.

⁸ Berden, K., Francois, J., Thelle, M., Wymenga, P., Tamminen, S., *Non-Tariff Measures in EU-US Trade and Investment – An Economic Analysis*, ECORYS Nederland BV, December 2009.

⁹ Committee on Exiting the EU, *EU Exit Analysis: Cross Whitehall Briefing*, March 2018.

¹⁰ Dhingra, S., Huang, H., Ottaviano, G., Pessoa, J.P., Sampson, T., Van Reenen, J., *The Costs and Benefits of Leaving the EU: Trade Effects*, CEP Discussion Paper No. 1478, April 2017.

membership of the EU) already has relatively low effective tariff rates on its imports (as explained in Chapter 2). Unilaterally lowering tariff rates would also give up leverage in negotiating the lowering of other countries' trade barriers, and could have a significant impact on some domestic producers, especially in agriculture. Economists for Free Trade (2018) look at a wider definition of UFT.¹¹ They assume that the UK would unilaterally abolish all tariff and non-tariff barriers (NTBs) on imports. However, they do not say how NTBs would be eliminated. Some non-tariff barriers would be impossible to eliminate, for example distance from trading partners and differences in language spoken. The removal of some others would likely not be politically acceptable, for example dropping product safety and environmental standards that would require customs checks and allowing the freedom of movement required for the provision of certain services. In its proposals for its future relationship with the EU, the Government has stated its aims to “*maintain high regulatory standards for the environment, climate change, social and employment, and consumer protection – meaning we would not let standards fall below their current levels*”.¹²

- 4.12 In the model that Economists for Free Trade use, output also appears to be more responsive to trade barriers than in most other models. The removal of barriers to trade equivalent to a 10 per cent tariff on just the import of manufacturing and agricultural products from the rest of the world is estimated to boost GDP by 4 per cent in the long run. As discussed in Chapter 2, most models find a similar effect on GDP as a result of much more comprehensive changes in trade barriers. The studies that we looked at showed an average 4 per cent reduction in long-run GDP from the addition of trade barriers equivalent to 10 per cent on both exports and imports on all agricultural, manufacturing and services products from the EU. (The share of trade with the EU is about equal to that with the rest of the world.)
- 4.13 Given the small and gradual positive impact on GDP of most individual trade deals that could be reached in the wake of Brexit, it is unlikely that we would adjust our forecasts significantly to reflect them case by case. If there were a cumulative impact over time, we would expect them to show up in the outturn data and feed into our forecasts that way. If the average estimates summarised above were to prove a reasonable guide to what transpires – adding tenths of a per cent to the level of GDP over several years – it is unlikely that the gains would be readily observable even as they built up, given the volatility of trade data and the importance of broader global trends in determining the path of UK trade and GDP.

Scope for regulatory changes

- 4.14 Membership of the EU has resulted in a significant reduction in non-tariff barriers (NTBs) to trade with other members of the EU. The creation of the Single Market and customs union has led to the removal of all at-the-border barriers, such as customs inspections, as well as many behind-the-border regulatory barriers. As we explain in Chapter 2, the UK will face higher NTBs under any Brexit scenario.

¹¹ Economists for Free Trade, *What if we can't agree? Why a world trade deal exit from the EU will be best for the UK*, June 2018.

¹² The Government's 'Chequers Statement' on 6 July 2018.

- 4.15 Most goods sold within the EEA¹³ are subject to the harmonisation of national legislation or common regulatory rules. These rules – governing everything from ‘toy safety’ to ‘explosives for civil uses’ – preclude the adoption of divergent national legislation. The adoption of a common regulatory framework has been an important step towards completing the Single Market. It has promoted the free circulation of goods across countries while furthering competition in the bidding for public procurement contracts and curbing the tendency of governments to award contracts to local companies.
- 4.16 Harmonisation means that producers in any country of the EEA can compete on a level playing field with domestic producers in any other country of the EEA. Divergent domestic legislation is allowed for some goods, with access to the Single Market governed by a ‘mutual recognition’ principle. This states that Single Market participants must recognise the standards set by other countries as equivalent to their own. The Single Market for services is less comprehensive than for goods, but elements like financial sector passporting and mutual recognition of service-sector qualifications lower NTBs on services trade (as discussed more fully in Chapter 2).
- 4.17 The European Union Withdrawal Act 2018 enables all current EU law to be transferred into UK law, in order to ensure a smoother Brexit path. This ensures that common standards between the UK and the EU will be retained on day one after the UK leaves the EU. The Government has also signalled its intent to press for *“a common rulebook for all goods including agri-food, with the UK making an upfront choice to commit by treaty to ongoing harmonisation with EU rules on goods, covering only those necessary to provide for frictionless trade at the border”*.¹⁴ Even if such an agreement is reached with the EU, it is not clear how this will work in practice. For example, which rules would be deemed necessary for frictionless trade at the border and which would be deemed only to generate behind-the-border frictions? Would the UK continue to adopt EU regulations and remain under the jurisdiction of the European Court of Justice? Would the UK set up counterparts of EU regulatory agencies and will these be recognised by the EU? How, and how quickly, would the UK adopt changes in EU regulations in order to maintain ‘ongoing harmonisation’?
- 4.18 For services output and other areas not covered by the Government’s proposal – or indeed if the proposal is not agreed – it seems likely that regulations will, over time, diverge from those in the EU. The current or future Governments may choose to take advantage of greater regulatory autonomy to change domestic legislation if they believe the changes would make regulation more appropriate for the domestic economy. Some commentators argue that reducing regulatory barriers can remove market distortions, improve competition and efficiency and boost GDP. Proposals include changing financial sector regulation (including capital requirements for domestically-focused banks, MIFID II and curbs on short selling), amending the Working Time Directive requirements that restrict the amount of time people are allowed to work and specify a minimum amount of paid annual leave and reducing regulation on the digital economy – such as the General Data Protection

¹³ European Economic Area, consisting of all EU countries plus Norway, Iceland and Lichtenstein – who are subject to the EU’s four freedoms.

¹⁴ The Government’s ‘Chequers Statement’ on 6 July 2018.

Other considerations

Regulation designed to protect individuals' personal data.¹⁵ Others suggest that any such opportunities are likely to be outweighed by the associated costs, such as those from regulatory uncertainty and the increase in trade barriers that might be created.¹⁶

- 4.19 Evidence suggests that the UK is already relatively lightly regulated. The OECD's indicator of economy-wide product market regulation (PMR) provides a useful metric. The PMR is a bottom-up measure constructed from 18 low-level indicators that aggregate to three high-level ones – state control, barriers to entrepreneurship and barriers to trade and investment. The PMR is the average across these three.¹⁷ Chart 4.1 shows that the UK has the second lowest PMR across OECD countries, behind only the Netherlands.
- 4.20 The OECD also has an indicator of employment protection, as measured by the regulations relating to dismissals and the use of temporary contracts. This is constructed from 21 different items relating to the protection of employees.¹⁸ Chart 4.1 shows that the UK has the fourth lowest level of regulation in one of the key measures – 'the protection of permanent workers against individual and collective dismissals'. This rises to third place when looking at the rights of temporary workers. This and the PMR suggest that the potential GDP gains from deregulation in the UK may be less than in other countries.
- 4.21 We might also expect there is a limit to the public's appetite for deregulation. Parents are unlikely to sign up to lower standards around 'toy safety', let alone 'explosives for civil uses'. As mentioned in paragraph 4.12, the Government has already committed to maintaining high regulatory standards. This suggests there may not be a great political appetite for deregulation either.

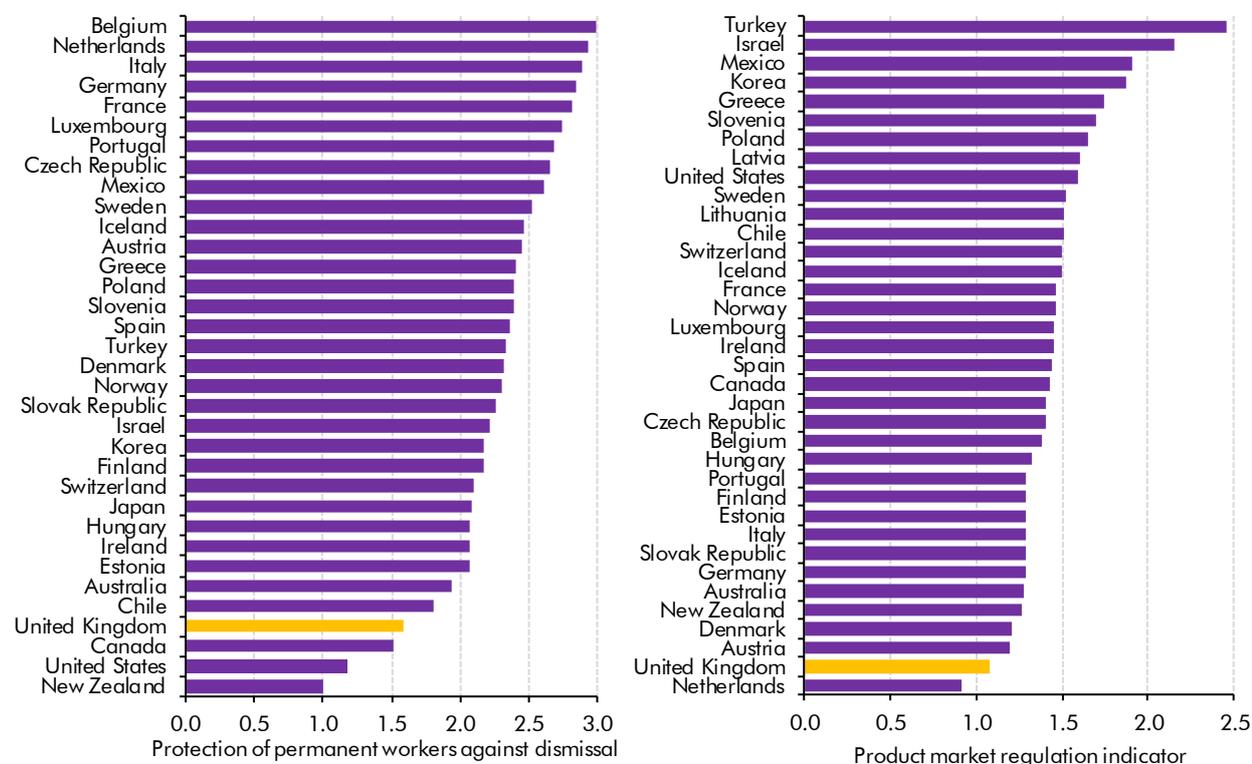
¹⁵ See, for example, Singham, S., Tylecote, R., Hewson, V., *Freedom to Flourish: UK regulatory autonomy, recognition, and a productive economy*, IEA Discussion Paper No. 91, July 2018.

¹⁶ See, for example, Confederation of British Industry, *Smooth operations: An A-Z of the EU rules that matter for the economy*, CBI, April 2018.

¹⁷ For a detailed explanation of the methodology see Koske, I., Wanner, I., Bitetti, R., Barbiero, O., *The 2013 update of the OECD's database on product market regulation: Policy insights for OECD and non-OECD countries*, OECD Economics Department Working Paper No. 1200, March 2015.

¹⁸ The detailed methodology is available on the OECD website.

Chart 4.1: Current level of regulation: comparing the UK with the rest of the OECD



Source: OECD

4.22 The OBR's remit does not allow us to base our central forecast on possible future changes in regulatory policy. We would only include any estimate of their effect once firm details are available. In practice, regulatory divergence is likely to evolve slowly rather than as a single event, while the economic consequences could emerge even more slowly – and would probably comprise the net effect of partly offsetting positives and negatives. So, as with future trade deals, it is unlikely that we would adjust our forecasts significantly to reflect individual regulatory decisions. We have never adjusted an economic forecast to date for changes in EU regulation and the only occasion on which we adjusted our medium-term growth potential forecast for a regulatory policy decision was the introduction of the 'National Living Wage'. Again, as with trade deals, if there were a systematic cumulative impact – positive or negative in this instance – we would expect it to emerge gradually in outturn data, at which point it would be difficult to distinguish from other economic developments.

Macroeconomic policy response

Monetary policy response

4.23 Although it can have a highly significant impact in the short term, monetary policy should not have a lasting influence on potential output. It therefore cannot offset any long-term change in productivity associated with a change in the trading regime. But during the transition to the new equilibrium, monetary policy changes could be used to boost or subdue growth.

Other considerations

- 4.24 After the referendum, the Bank of England’s Monetary policy committee (MPC) concluded that the higher import prices resulting from sterling’s depreciation would temporarily push inflation above the MPC’s 2 per cent target. However, elevated uncertainty would depress economic activity below its potential level, placing downward pressure on domestically-generated inflation. Facing this trade-off, the MPC tolerated a temporary overshoot of its inflation target and focused on supporting activity. It cut Bank Rate by 25 basis points to 0.25 per cent, expanded quantitative easing, and supported the pass-through of lower interest rates to households and businesses by introducing the Term Funding Scheme. As it judges domestic pressures on inflation to have risen, the MPC has since raised Bank Rate twice, to stand now at 0.75 per cent.
- 4.25 Since the vote, the MPC has continued to explain how it expected to respond to the evolving Brexit outlook. Conditional on a smooth transition to a ‘central’ Brexit corresponding to the average of a range of possible outcomes, it would consider a gradual tightening “appropriate”.¹⁹ It has stated that under a Brexit at the ‘harder’ end of the range of possible outcomes (or under a more disorderly transition path) it would again need to trade off deviations in inflation from target against deviations of output from potential.²⁰ The Governor of the Bank of England has stressed that in this scenario “*the appropriate policy response is not automatic and will depend on the balance of the effects on demand, supply, and the exchange rate.*”²¹
- 4.26 We have not made any explicit judgement about the effect of this forward guidance on the future path of interest rates. Instead, our assumed future path is conditioned on the expectations of financial market participants as embodied in market prices. At the time of our March 2018 *EFO*, these expectations implied that Bank Rate would gradually increase over the next five years, reaching almost 1.5 per cent by 2022. Because this reflects a weighted average view of various possible outcomes, our first post-exit forecast is likely to be conditioned on a different path for monetary policy. Future forecasts will be affected by Brexit-related developments if these differ from what market participants previously expected (or if the yield curve currently used to generate our current path includes an uncertainty premium which dissipates).

Fiscal policy response

- 4.27 Our forecasts are conditioned on current Government policy, so if the Government were to choose to loosen or tighten fiscal policy in the short or medium term after Brexit, we would need to factor that into our subsequent economic and fiscal forecast. The effect of fiscal policy changes on the economy depends not just on their size but also on their composition in terms of the specific types of tax or spending policy changes deployed. To assess the impact of fiscal policy changes on GDP growth, we have used estimates of ‘fiscal multipliers’. These imply that a discretionary fiscal policy change equivalent to 1 per cent of GDP would affect output by amounts ranging from 1.0 per cent in the case of capital

¹⁹ Carney, M., *Guidance, Contingencies, and Brexit*, speech at the Society of Professional Economists, May 2018. See also Broadbent, B., *Brexit and interest rates*, speech at the London School of Economics and Political Science, November 2017.

²⁰ See prior reference to Carney (May 2018).

²¹ Carney, M., *The future of work*, speech at the Central Bank of Ireland, September 2018.

spending to 0.3 per cent for income tax and NICs, in the first instance. We assume that these effects reduce gradually over time, so that stimulating or reducing demand in the short term does not generate permanent effects on supply.²²

- 4.28 This framework would provide the starting point for how we would think about any post-Brexit changes in fiscal policy – although we would, as always, consider whether it was appropriate to the precise package of measures announced.
- 4.29 Given the approach we have adopted to date, the direct effect on the public finances of fiscal policy changes that are large enough to shift our economy forecast are partly (but only partly) offset by the induced effects on GDP. So a fiscal policy loosening with a direct cost of 1 per cent of GDP would increase borrowing by slightly less than 1 per cent of GDP. In the event that a short-term fiscal loosening were announced to cushion the effects of a worsening economic environment, the effect of the policy change would be added to the fiscal consequences of that less favourable economic backdrop.

Other tax and spending policy changes

- 4.30 Within an unchanged fiscal policy stance, the Government could choose to make any number of tax or spending policy changes as a result of Brexit – either to replace spending previously linked to EU membership or to do things that were previously constrained by EU rules. As with any other policy change, we cannot anticipate the effects of such changes until new policies have been announced in sufficient detail.

Brexit-related spending commitments already announced

- 4.31 In Annex B of our March 2018 *EFO*, we published an assessment of the cost of the EU financial settlement, which we will be updating at our next and subsequent forecasts. We have so far made the fiscally neutral assumption that any reductions in transfers to the EU after factoring in this settlement would be instead recycled into other spending.
- 4.32 Until the Government sets out detailed spending plans that extend beyond Brexit, we will continue to make this assumption in light of the list of more or less firm spending commitments that the Government has announced since the referendum. These include potentially costly commitments on farm support (equivalent to the EU's Common Agricultural Policy), support for industry (equivalent to the EU's structural funds spending) and science spending (equivalent to the EU's Horizon programme), as well as various other smaller commitments.²³
- 4.33 The Treasury has stated that decisions regarding post-Brexit spending will be made at the next Spending Review in 2019, at which point we will incorporate them explicitly in our forecast. At that point we may be able to discern whether the net direct effect on public spending of reduced contributions to the EU budget and increased substitute spending is

²² See box 2.3 of our 2013 *Forecast evaluation report* and box 3.2 of our July 2015 *Economic and fiscal outlook* for further discussion on estimates of the fiscal multipliers.

²³ See paragraph B.45 of our *Economic and fiscal outlook – March 2018*.

positive or negative for the UK public finances, although this would only ever represent a narrow and partial assessment of the true fiscal effects of leaving the EU.

VAT and other EU directive-based taxes

- 4.34 The operation of several indirect taxes is affected by European directives applied in national legislation. These are mostly taxes that have been harmonised across EU member states to ensure effective functioning of the Single Market.²⁴ These include VAT and excise duties on tobacco, alcohol and fuels and the emissions trading system.
- 4.35 After Brexit, some changes to these taxes will be necessary (for example in relation to VAT) while changes to others will become possible once it is no longer necessary to meet the requirements of EU directives. The Government will therefore have increased policy options in these areas. We will incorporate any changes to indirect tax policy as and when they are announced in sufficient detail to do so.
- 4.36 VAT is of particular importance as it is one of the largest sources of tax revenues. For example, goods arriving from outside the EU are liable for import VAT immediately on arrival,²⁵ rather than just after a sale occurs as is the case for goods and services supplied from the EU. A move to a UK-only VAT regime would mean that goods arriving from the EU would also be liable to import VAT.
- 4.37 In a number of areas, the Government will have to make policy decisions as a consequence of Brexit that could have a significant impact on VAT receipts:
- The Government has said it will explore ways of **supporting traders** affected by becoming liable for import VAT before the subsequent sale of the relevant goods, which could have significant cashflow implications for some of them.²⁶ The Government has said if the UK leaves without an agreement, it would introduce postponed accounting for import VAT for goods from all countries. Import VAT would be paid via a VAT return, mitigating cash flow issues.²⁷ If such a scheme was introduced, we would have to consider whether this could become a source of increased fraud, reducing VAT receipts.
 - HMRC has been able to reduce the incidence of **fraudulent VAT schemes**, such as carousel fraud, by relying on cross-EU mechanisms, namely the reverse charge (which stops traders claiming VAT back in advance) and access to VAT data from other countries.²⁸ These may no longer be applicable after Brexit, increasing the risk that this type of fraud will increase again. At its peak in 2005-06, carousel fraud was estimated

²⁴ See European Parliament, *Indirect taxation*, retrieved 18 September 2018.

²⁵ HMRC operates a duty deferment arrangement with known traders, but that merely allows a company to file a single return per period of accounting – it does not change the fact that the liability and payment still occur regardless of whether an onward sale has happened.

²⁶ See paragraph 3.62 of the *Autumn Budget 2017* statement.

²⁷ See HMRC, *VAT for businesses if there's no Brexit deal*, published 23 August 2018.

²⁸ HMRC define missing trader intra-community fraud (MTIC) in their *Measuring tax gaps 2018 edition* as “an organised criminal attack on the European Union’s VAT system involving fraudulent traders acquiring goods or services VAT-free from EU member states. They charge VAT on their onward sale and go ‘missing’ to avoid paying the VAT charged to the relevant tax authorities. One form of the fraud — known as carousel fraud — involves a series of contrived transactions within and beyond the EU, with the aim of creating large unpaid VAT liabilities and in some cases invalid VAT repayment claims”.

to account for £19.5 billion of imports to the UK (4.8 per cent of total imports) and to have cost the Exchequer around £3 billion in fraudulently reclaimed VAT receipts.²⁹

- The UK and the EU have issued a joint declaration that allows HMRC to pursue VAT **debts** across the EU only until December 2024, which means that HMRC could have to write off some debts outstanding beyond that date if the agreement were not extended.

4.38 The **Northern Ireland border** could pose significant problems for tax collection. The land border is 310 miles long with over 200 formal crossing points and reportedly the same number again of informal crossing points,³⁰ with 110 million crossings a year.³¹ The UK Government and the EU have both committed to avoiding a hard border with physical infrastructure and related customs checks. It is possible that a hard border could be mitigated by technological solutions or ‘maximum facilitation’. The Northern Ireland Affairs select committee have ‘heard numerous proposals (...) using tools such as joint policing, mobile patrols, risk analysis, cameras and digital customs declarations’, but have had ‘no visibility of any technical solutions, anywhere in the world, beyond the aspirational, that would remove the need for physical infrastructure at the border.’³² The costs of installing and implementing border infrastructure, either at or away from the border, would place considerable pressure on HMRC and the Home Office’s border resources.³³ Moreover, the Chief Constable of the Police Service of Northern Ireland has stated where border checkpoints are re-established they would be ‘static and obvious targets’ for disruption.³⁴

4.39 If a future tax regime is not fully applied at the Northern Irish border, either by design or for operational reasons, then a key judgement we will need to take would be on the extent of the associated reduction in tax revenues. This effect could be large if taxes could be easily avoided by routing goods through Northern Ireland, and in turn weaken the effect of some of the trade barriers we discuss in Chapter 2.

Foreign direct investment (FDI)

4.40 Foreign direct investment (FDI) refers to that made by residents and businesses from one country in another, with the aim of establishing a lasting interest in the recipient country. The IMF defines an investment as FDI when a foreign investor owns equity in a firm that entitles it to 10 per cent or more of the voting power of its shareholders. Acquiring ownership of less than 10 per cent is deemed portfolio investment. There is considerable literature suggesting that higher FDI has a positive effect on GDP growth, as well as being a leading indicator of

²⁹ See ONS series OFNN (MTIC fraud trade £ million) and IKBI (Balance of Payments: Trade in Goods & Services: Total imports: CP SA £m), and table 2.1 of HMRC’s *Measuring tax gaps 2018* edition.

³⁰ Curtis, J., Bowers, P., McGuinness, T., Webb, D., *Brexit negotiations: the Irish border question*, House of Commons Briefing Paper No. 8042, July 2017.

³¹ HM Government, *The UK’s exit from the European Union: Northern Ireland and Ireland - position paper*, 2017. Additional Data Paper: *Common Travel Area Data and Statistics*

³² Northern Ireland Affairs Committee House of Commons Second Report of Session 2017–19 *The land border between Northern Ireland and Ireland*, 29 March 2018.

³³ In comparison to Northern Ireland, HMRC trade statistics show there were only 106 (air)port of entry locations in Great Britain through which non-EU goods were imported, with just 14 locations accounting for three-quarters of the value of imports.

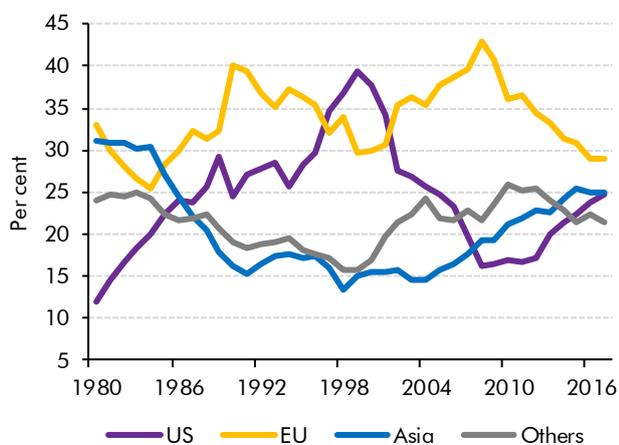
³⁴ Question 178 George Hamilton QPM, Chief Constable, and Will Kerr OBE, Assistant Chief Constable, Police Service of Northern Ireland, Northern Ireland Affairs Committee Future of the land border with the Republic of Ireland, Oral evidence December 2016.

the path of GDP growth. The main channels through which this occurs are human capital, development of financial markets and increased openness to trade.³⁵

4.41 The UK has generally been seen as an attractive destination for foreign investors, though it has fallen in measures of attractiveness. EY’s UK attractiveness survey ranked the UK as the second most attractive destination for FDI in Europe in 2015,³⁶ behind Germany, but by 2017 the UK was only the third most attractive destination for FDI in Europe, slipping behind France.³⁷ In 2017, the stock of inward FDI in the UK was estimated to be over £1 trillion, about half from other members of the EU.³⁸ Several factors are cited as making the UK an attractive destination for foreign investment, including the legal system, the availability of particular skills and services, and the English language.³⁹

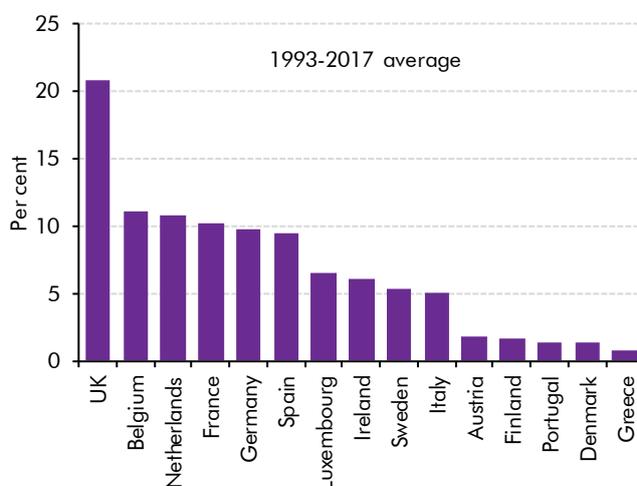
4.42 One attraction has been the access the UK provides to the EU’s Single Market. Between 2013 and 2017, 69 per cent of foreign investors thought access to the European market made the UK very attractive or fairly attractive for FDI, according to EY’s UK Attractiveness Survey. As shown in Charts 4.2 and 4.3, the EU holds the largest share of the global stock of inward FDI and, since the establishment of the Single Market, the UK has been the largest recipient of FDI inflows into the EU.⁴⁰

Chart 4.2: Stock of global inward FDI



Source: UNCTAD

Chart 4.3: Share of EU FDI flows



4.43 Additional tariff and non-tariff barriers on UK trade with the EU after Brexit could therefore result in a fall in FDI into the UK, but it is unclear how big the impact would be. The 2018 EY UK Attractiveness Survey found that 36 per cent of investors expect the UK’s attractiveness for FDI to decline over the coming three years, but 30 per cent expect it to improve. This is in contrast with the 2016 EY UK Attractiveness Survey, the last pre-referendum edition, which found that only 16 per cent of investors expected the UK’s

³⁵ Almfraji, M.A., Almsafir, M.K., *Foreign direct investment and economic growth literature review from 1994 to 2012*, Procedia-Social and Behavioral Sciences, May 2014.

³⁶ EY UK attractiveness survey, *Positive rebalancing*, 2016.

³⁷ EY UK attractiveness survey, *In transition*, 2018.

³⁸ ONS, *Foreign direct investment involving UK companies: Inward tables*, 2017

³⁹ Bank of England, *EU membership and the Bank of England*, October 2015.

⁴⁰ UNCTAD stat.

attractiveness to FDI to decrease over the following three years while 36 per cent expected it to improve. Beyond this three-year horizon, 30 per cent of investors from across Europe stated in 2018 that they were likely to move assets out of the UK due to Brexit.

- 4.44 The uncertainty created by the referendum result may already have reduced inward FDI from the levels we would otherwise have seen. The UK has retained its place as Europe's number one destination by number of projects and remains the leading recipient of FDI-related employment in Europe, but its market share in Europe has fallen from 20 per cent in 2015 to 17 per cent in 2017.⁴¹
- 4.45 The effect of Brexit on FDI will depend in large part on the final trading arrangement between the EU and the UK. Various studies have tried to estimate the impact of Brexit on FDI, some of which are included in Table 4.1. Most of these studies are based on gravity modelling, which is discussed in more detail in box 2.1. Most of these studies rely on identifying the impact of joining trading areas and arrangements, and assume that the impact of joining and leaving such an area is symmetrical.

Table 4.1: Expected impact of Brexit on FDI

Organisation	Impact
LSE: Centre for Economic Performance	22 per cent fall in FDI inflow over the next decade
HM Treasury	After 15 years, reduction on FDI inflow: 10 per cent under EEA arrangement 15-20 per cent under a bilateral agreement 18-26 per cent WTO scenario
OECD	Central estimate of 30 per cent decline in inward FDI stock over the next decade

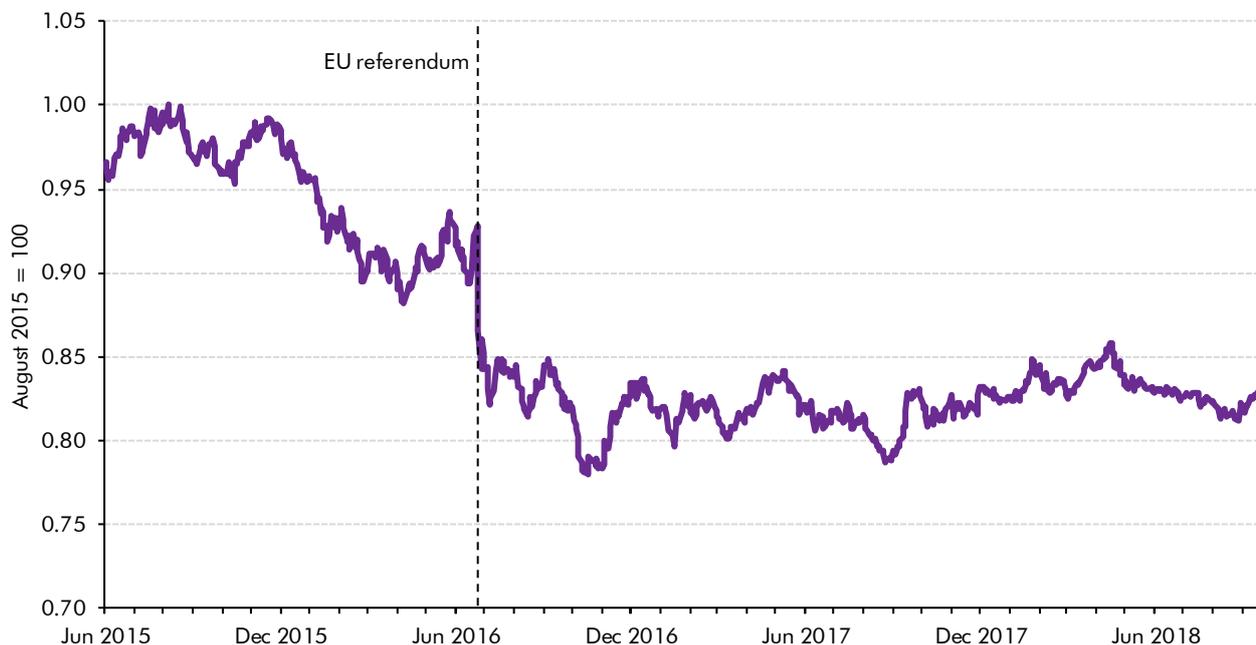
- 4.46 We currently produce forecasts for business investment as a whole and not for its domestic and foreign components. As with trade deals and regulatory decisions, if there were a systematic cumulative impact – positive or negative – of changes to FDI as a result of Brexit, we would need to wait for it to show up in outturn data, at which point it is unlikely that we could distinguish the impact from other economic developments, since the size of this effect is likely to be small relative to the normal fluctuations in the economy.

Exchange rate

- 4.47 Over the 15 months between its peak in late 2015 and its trough in late 2016, sterling fell by 17 per cent, with the sharpest falls occurring in the immediate aftermath of the June 2016 referendum. This is likely to reflect market participants' belief that a real depreciation will be necessary to compensate for the reduced competitiveness associated with a less open trading relationship between the UK and the EU. Investors may also be more pessimistic about the future returns on UK assets and/or attach a higher risk premium to them. Since then, the nominal effective exchange rate has remained broadly stable.

⁴¹ EY UK attractiveness survey, *In transition*, 2018.

Chart 4.4: Sterling effective exchange rates



Source: Bank of England

4.48 Forecasting exchange rates is near impossible, except over long timeframes.⁴² As a result, we generate our exchange rate path by using the future values implicit in the prices of financial instruments, growing rates forwards in line with the uncovered interest parity (UIP) condition. This involves adjusting exchange rates to equalise the expected returns from investments in domestic and global markets. As UK interest rates are expected to be slightly below the asset-weighted average rates abroad, the sterling effective exchange rate appreciates incrementally in our March 2018 forecast. If developments in the Brexit negotiations result in the ultimate trading relationship between the UK and EU – or the transition to this new relationship – differing from that which market participants currently expect, then the current exchange rate and interest rate expectations would change, altering our assumed path for the exchange rate – potentially very significantly.

4.49 Exchange rates affect our forecast in several ways, including via their effect on consumption through changes in inflation and on net trade. Historically, a weaker pound has tended to increase export and import prices by similar amounts in sterling terms, as UK firms are generally price takers in most product markets. The rise in sterling export prices increases the profitability of UK exporters, which should encourage them to expand production, if they have sufficient spare capacity, or to increase investment. The rise in sterling import prices lowers the profitability of firms that use imported products, which encourages substitution to domestically-produced alternatives and can result in lower imports. Part of the increase in sterling import prices will also be passed onto consumers, which depresses real household incomes and dampens real consumer spending.⁴³

⁴² For instance, Cheung, Y.-W., Chinn, M., Garcia Pascual, A., Yi, Z., *Exchange rate prediction redux: new models, new data, new currencies*, European Central Bank Working Paper No. 2018, February 2017, and Cheung, Y.-W., Chinn, M., Garcia Pascual, A., *Empirical exchange rate models of the nineties: Are any fit to survive?*, *Journal of International Money and Finance*, November 2005.

⁴³ For more information on the effects of exchange rate movements, see Broadbent, B., *Brexit and the pound*, speech at Imperial College London, March 2017.

4.50 In our November 2016 *EFO*, we judged that sterling's depreciation would boost net trade, but that this effect would be muted as elevated uncertainty diminished exporting firms' appetite to invest. Furthermore, the increased openness of the UK economy and the internationalisation of supply chains (discussed in Chapter 2) means that more firms now import a large fraction of their inputs. Consequently, while an exchange rate depreciation boosts export revenue, it also raises production costs more than in the past. The effect of a weaker currency on net trade is thus diluted.⁴⁴ As a result, the downward revision we made to consumption growth in November 2016 as a result of higher exchange rate induced inflation more than offset the boost to net trade. We revisited these judgements in Box 2.1 of our March 2018 *EFO*, and concluded that they remained broadly on track.

Wider economic developments

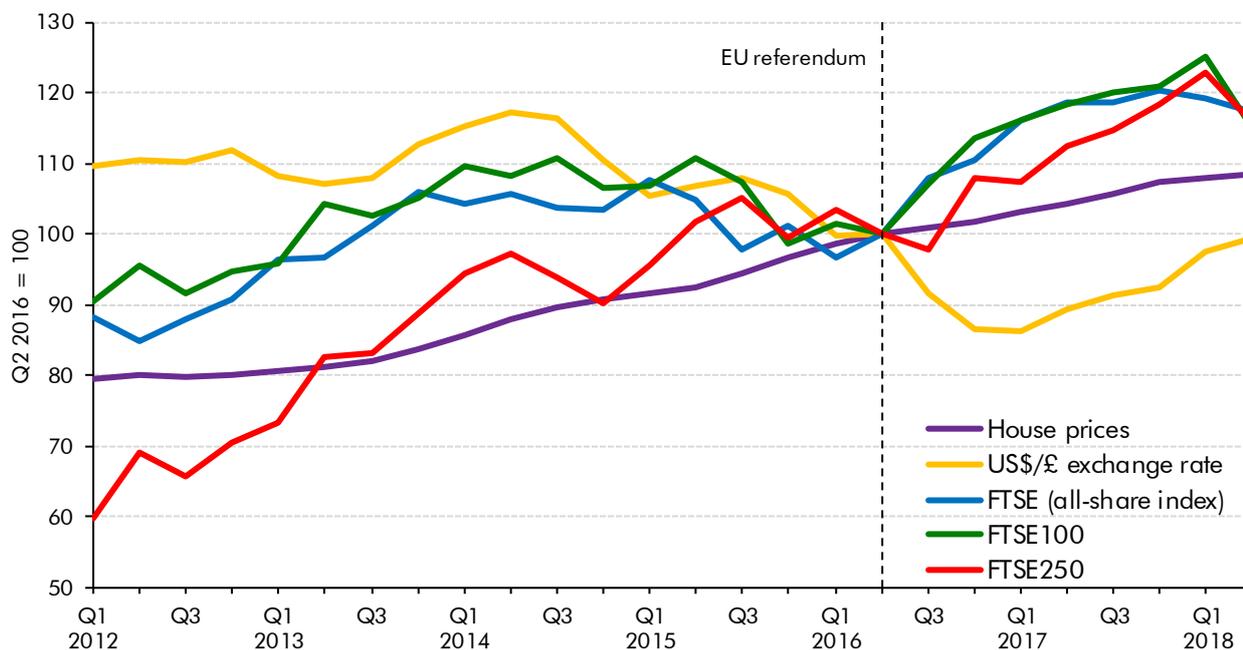
4.51 In our *EFOs* we aim to understand how the economy has developed since our previous forecast and then judge how this has altered the outlook for the economy and public finances. For some developments, such as trade and migration policies, it will be clear what has changed (even if the effect on the macroeconomy is uncertain). But some areas are less straightforward. Determining how much of changes to business and consumer confidence and in financial markets have been caused by Brexit developments will be a matter for future researchers. Nonetheless, we will have to judge how general developments in these areas should affect our forecast as we encounter them.

4.52 Much pre-referendum analysis predicted that a leave vote would lower asset prices relative to a 'remain' counterfactual.⁴⁵ Instead, as Chart 4.5 shows, the prices of several of the fiscally most important assets diverged in the immediate aftermath of the referendum. As predicted, the pound fell, but house prices initially continued rising at a similar rate to that seen before the referendum while the effect on equity prices was mixed.

⁴⁴ See: Amiti, M., Itskhoki, O., Konings, J., *Importers, Exporters, and Exchange Rate Disconnect*, American Economic Review, July 2014, and Albinowski, M., Hagemejer, J., Lovo, S., Varela, G., *The Role of Exchange Rate and Non-Exchange Rate Related Factors in Polish Firms' Export Performance*, World Bank Policy Research Working Paper No. 7899, November 2016.

⁴⁵ For instance, HM Treasury, *HM Treasury Analysis: the immediate economic impact of leaving the EU*, May 2016.

Chart 4.5: Asset prices before and after the referendum



Source: Datastream, ONS

4.53 Part of the initial rise in the FTSE all-share index is attributable to a weaker pound raising the sterling value of overseas earnings. The FTSE 100 – which tracks the 100 largest firms listed on the London stock exchange and so contains several large multinationals – rose sharply. However, the FTSE 250 index (which contains fewer multinationals) fell and UK stocks generally did less well than foreign stocks when expressed in a common currency. Davies and Studnicka (2018) find that the shares of firms focused in UK and EU markets were more affected than others.⁴⁶ Since then, equity markets have been relatively volatile and responsive to news about Brexit.⁴⁷ Looser monetary policy probably supported asset prices in the wake of the referendum, as did stronger global growth.

4.54 House price inflation has been a touch lower than before the referendum, with prices in London slowing more sharply than the rest of the country. The parameters in our house price model suggest that part of this is due to the weakness in real earnings growth associated with the post-referendum fall in the pound. But again, other factors have influenced prices, not least other economic developments and changes to property taxes.

4.55 For other assets, we generally favour simple and transparent approaches to projecting prices. This mainly involves using the future values implicit in the prices of financial instruments or growing them in line with either inflation or nominal GDP. This avoids

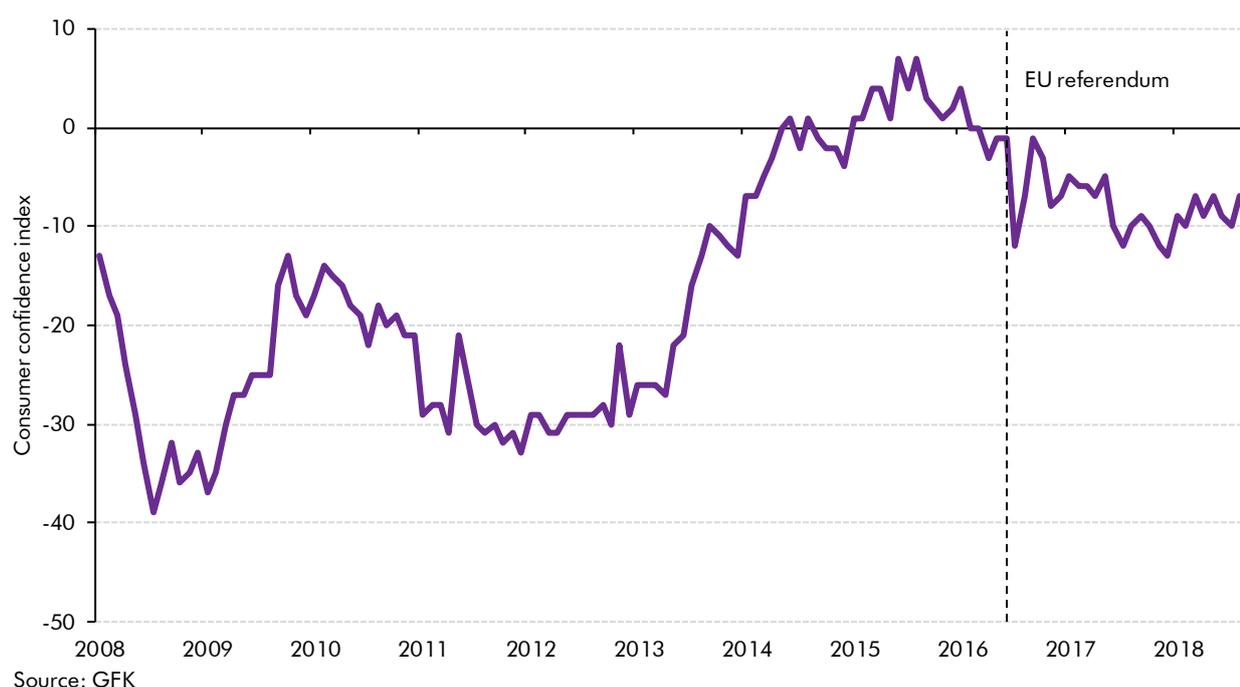
⁴⁶ Davies, R., Studnicka, Z., The Heterogeneous Impact of Brexit: Early Indications from the FTSE, CESifo Working Paper Series No. 6478, June 2017.

⁴⁷ Tatomir, S., Kamisnka, I., Raczko, M., Thwaites, G., Fog in the Channel? How have equity markets reacted to Brexit news?, Bank Underground, August 2018.

placing undue weight on complex models when much of the future variation in prices will ultimately be driven by news.⁴⁸

4.56 In our November 2016 *EFO*, the first we published after the EU referendum, we incorporated a provisional estimate of the impact of the vote to leave the EU based on a series of broad-brush assumptions. We did not incorporate a specific negative effect of the fall in consumer confidence on household consumption. Instead, we judged that the fall in the pound prompted by the vote would raise inflation, squeezing real incomes and real consumer spending. This judgement seems broadly on track. CPI inflation has constrained real household incomes to roughly the extent that we expected in our November 2016 forecast. However, private consumption has held up better than we assumed. Reported levels of consumers' confidence decreased immediately after the referendum. As shown in Chart 4.6, according to the GFK Consumer Confidence Survey, the overall consumer confidence index dropped from -1 in June 2016 to -12 July 2016. But the consumer confidence index bounced back almost immediately and, since then, has remained fairly stable at around -8.

Chart 4.6: Consumer confidence



4.57 We did assume that greater uncertainty surrounding future investment returns would result in some investment projects being postponed or cancelled. This weaker business investment profile (implying less capital deepening) was the main factor behind our downward revision to the future path of potential output in our November 2016 forecast.

⁴⁸ This assumes the return on housing will equal the return on other assets over the long run, while adjusting for other relevant factors in the short term. More information can be found in Auterson, T., *Forecasting house prices*, OBR Working Paper No. 6, July 2016.

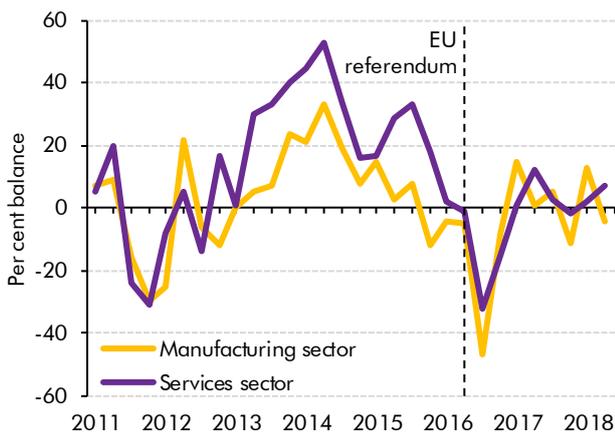
Other considerations

4.58 This assumption seems to be broadly on track. Surveys for business’ optimism reported a noticeable drop immediately after the referendum. As shown in Chart 4.7, the optimism measures in the CBI’s industrial and services surveys dropped from -5 in the second quarter of 2016 to -47 in the third quarter of 2016 in the manufacturing sector and from -1 to -32 during the same period in the service sector. There has been some recovery since then, but overall sentiment remains at a lower level than it was during the three years prior to the referendum. Investment intentions have also dropped – likely due to the heightened uncertainty about investment returns created by the result of the referendum and the expectation that trading with the EU would become more costly in the future. Recent data from the Bank of England’s Decision Maker Panel Survey, which tracks how businesses’ attitudes to Brexit are evolving, show that in the first quarter of 2018 57 per cent of respondents expected to increase their capital expenditure in the following year, down from 72 per cent in the third quarter of 2016.

4.59 ONS data show that business investment growth was almost 10 percentage points lower between the second quarter of 2016 and second quarter of 2018 than our March 2016 forecast and very close to our November 2016 forecast. Bank of England analysis of their Decision Markers Panel Survey suggested that nominal business investment growth has been 3 to 4 percentage points lower than it otherwise would have been over this period as result of the referendum.⁴⁹

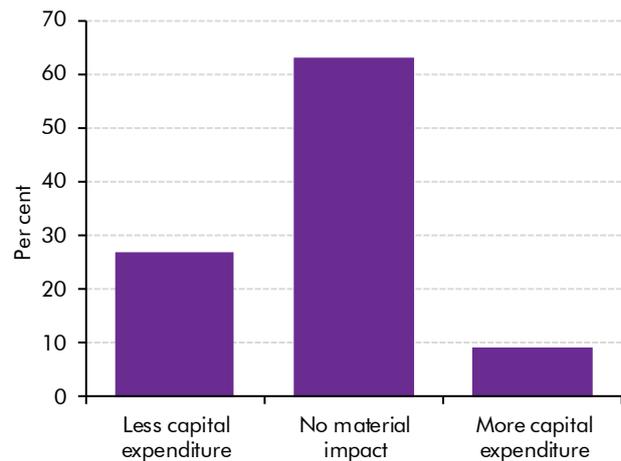
4.60 The ongoing uncertainty around the eventual outcomes of Brexit looks likely to continue to constrain investment. As shown in Chart 4.8, responses from the Decision Maker Panel show that a net 18 per cent of respondents expect Brexit to reduce their capital expenditure in the following three years.

Chart 4.7: Business optimism



Source: CBI

Chart 4.8: Investment intentions



Source: DMP

⁴⁹ Bank of England, *Agents’ summary of business conditions and results from the Decision Maker Panel Survey, 2018Q2.*

- 4.61 As we noted in the Introduction, comparing the UK's performance with a synthetic counterfactual, Born *et al* (2017) estimate that by the third quarter of 2017 the Brexit vote had caused consumption and investment to grow about half as fast in the UK as they would have in the absence of the referendum.⁵⁰
- 4.62 Firms and households are in part basing their current spending decisions on the effect that they expect Brexit to have on their financial situation and the uncertainty surrounding these expectations. Currently, it appears that households expect less disruption than firms – households have reduced their saving to support spending growth whereas firm investment appears to have been reduced by the Brexit vote.
- 4.63 If information emerges suggesting that the future relationship between the UK and EU will be different to that which firms and households currently expect, then they are likely to adjust their investing and spending decisions. Greater clarity could also reduce uncertainty about the future and result in firms becoming more willing to undertake investments that had previously been postponed.
- 4.64 It is hard to predict how information about particular Brexit outcomes will affect measures of confidence and uncertainty and it is also hard to predict how quickly and strongly this will feed through to real activity. The Treasury's pre-referendum study projected a significant increase in measures of uncertainty and this, at least initially, proved broadly correct. But the link to activity was nowhere near as strong as assumed. We will likely incorporate the effects of these developments in our forecasts as they start to show up in measures of confidence and spending intentions and when there are signs that this is beginning to affect actual spending.

⁵⁰ Born, B., Mueller, G.J., Schularick, M., Sedlacek, P. , *The Economic Consequences of the Brexit Vote*, Centre for Macroeconomics Discussion Paper No. 1738, November 2017.

Other considerations

5 Conclusions

Brexit and the OBR's forecasts

- 5.1 This discussion paper has outlined some of the key judgements that we will need to make as we incorporate the consequences of Brexit into our economic and fiscal forecasts.
- 5.2 Parliament requires the OBR to produce its forecasts based on current Government policy. We incorporate policy changes when they are firm, spelt out in sufficient detail and in the Government's power to deliver. One consequence of Brexit is that it will create scope for future changes in policy that are currently proscribed by our membership of the EU. These could have significant consequences – positive or negative – for our forecasts, but we will only be able to incorporate such changes as and when they meet these criteria.

Economic implications

- 5.3 Following the June 2016 referendum vote, we made some broad-brush adjustments to our forecasts in our November 2016 *EFO* to reflect the fact that it was now Government policy to leave the EU: notably that trade intensity, net inward migration, business investment and productivity growth would be weaker than would otherwise have been the case. We also took on board the significant fall in the exchange rate that accompanied the referendum and its outcome. In terms of near-term impact, we reduced our forecast for real GDP growth between the second quarters of 2016 and 2018 from 4.4 to 3.0 per cent; the ONS currently estimates that growth over this period was 3.2 per cent. Studies based on synthetic 'doppelgangers' for the UK economy suggest that output in mid-2018 is around 2 to 2½ per cent lower than it would have been in the absence of the referendum.
- 5.4 The long-term impact of Brexit on the UK economy and public finances will depend to a considerable degree on the agreement that the UK reaches with the EU on its future trade, customs and migration relationship with the bloc. The most important and difficult judgement that we will have to make is how these elements together will affect potential output and how much of the effect will occur within our five-year forecast horizon.
- 5.5 The judgements we made in November 2016 were not conditioned on any specific outcome to the negotiations, but rather on the potential impacts of a range of possible outcomes. Once a firm and detailed agreement on the UK's future relationship with the EU is in the public domain, we will be able to modify those assumptions as necessary. But it is not yet clear that the forthcoming Withdrawal Agreement and any accompanying political declaration about the future relationship will be sufficiently firm and detailed to allow us to do that. In any event, it would be too late to do so in our Budget forecast on 29 October.

Conclusions

- 5.6 Most studies of the impact of Brexit conclude that increased (tariff and non-tariff) trade barriers with the EU will leave output in the UK (and EU) lower than would otherwise have been the case. For the most part, these effects are likely to emerge gradually and extend well beyond our five-year forecast horizon. The limited literature on the adjustment process suggests that the full transition would take more than ten years, although the effect might be somewhat front-loaded in the earlier part of the period. Most studies suggest that the scope for trade deals with non-EU countries to offset these effects is likely to be limited, as the affected trade flows are significantly smaller than UK-EU trade and these trade agreements generally reduce non-tariff barriers by significantly less than the EU's single market. Trade deals also generally take a considerable time to negotiate and implement, meaning that they are unlikely to have a significant impact within the five-year horizon of our medium-term forecast.
- 5.7 In calibrating the potential impact of higher trade barriers, we will be able to draw on the considerable volume of work on this topic conducted within Whitehall and beyond, which we have reviewed in this paper. The range of estimates is wide, which reflects – among other things – their sensitivity to the way in which non-tariff barriers are quantified, to the assumption of constant or increasing returns to scale, to the assumed symmetry or otherwise of joining and leaving a trade bloc, and the extent to which productivity *growth* as opposed to its level is assumed to be affected by changes in trade intensity.
- 5.8 Turning to migration, our current forecasts are based on the principal population projection produced by the Office for National Statistics and we assume that inward migrants have the same average productivity and age-and-gender-specific labour market characteristics as those born in the UK. Once the Government has announced firm plans for its new EEA/Swiss immigration regime – plus any changes to the non-EEA rules – we will be able to adjust these assumptions as necessary and reflect their impact in our forecasts.
- 5.9 The most likely consequence of any new regime is that the net inflow of migrants will be smaller, but more likely to end up in jobs with above average pay and productivity than the current flow. Such changes in volume and composition would have partially offsetting effects on our projections for the economy and the public finances. Overall, the changes would probably reduce output modestly (but with an ambiguous effect on output per head). With much public spending fixed in cash terms, this is likely to weaken the outlook for the public finances – again modestly. This is consistent with a variety of studies that suggest that net inward migration is on average positive for the public finances over the medium term, although the impact is less clear cut in the longer term as migrants age.
- 5.10 In thinking about the likely impact of Brexit on underlying productivity performance and potential output, we have focused to date on shorter-run effects. Our November 2016 adjustment was predicated largely on heightened policy uncertainty weakening business investment. Over time, impediments to the exploitation of comparative advantage are likely to become more important while greater restrictions on migration are likely to reduce labour supply. But studies suggest that barriers to trade, migration and foreign direct investment are also likely to have adverse dynamic effects on productivity and potential output, for example by impeding technology transfer and slowing innovation and technological

progress. There is little consensus on the size of such effects and they are likely to interact, so rather than quantify them individually we would probably take them into account in a broad-brush fashion in our top-down judgements on productivity and potential output, while also allowing for the static effects associated with reduced trade and inward migration.

- 5.11 It is important to emphasise that any adjustment we do make to our potential growth forecast as a result of Brexit is likely to be relatively small compared to the degree of uncertainty surrounding the underlying path. Estimates in external studies of the long-run hit to GDP from leaving the EU to trade solely on WTO terms, compared to staying in the EU, are concentrated around 2 to 7 per cent – with the full effect only felt over a period of greater than ten years. That compares with a productivity shortfall of 17½ per cent in the ten years since the global financial crisis relative to a continuation of the pre-crisis trend. Indeed, in our November 2017 *EFO* alone, we downgraded our forecast for productivity growth over five years by 3.7 percentage points as the continued weakness of productivity growth since the crisis prompted us to revisit the judgements underpinning our assumption that growth would pick up toward pre-crisis rates over the medium term.
- 5.12 Some other consequences of Brexit will not be subject to negotiations between the UK and EU. In particular, current and future UK Governments are likely to wish to use the greater policy freedom they will have outside the EU to change domestic policy, while market participants, businesses and households will also alter their behaviour in response to the changed economic and legal environment. We will incorporate such developments into our forecasts when there is sufficient certainty and detail to do so. It is impossible to know in advance if they would be positive or negative for the economy and public finances.

Fiscal implications

- 5.13 The most important changes to our fiscal forecasts as a result of Brexit will flow from how it changes our economy forecast, through the components of nominal income and spending and other variables such as unemployment and inflation. Changes in these drive changes in tax revenue, as well as components of public spending. In addition, public spending will be affected by the end to full UK contributions to the EU budget, although this will initially be tempered by the cost of the financial settlement. And there are likely to be direct revenue consequences resulting from changes in tariff policy. If the UK were not to remain a part of the EU Customs Union, the UK Government would retain tariff revenues after the end of the transition period, as opposed to remitting them to the EU as it does at present.
- 5.14 The Government will be faced with many more policy choices. As regards spending policy changes, it has already made several commitments in respect of policies previously linked to EU membership – like farm support and funding for industry and science. As regards tax policy, VAT and other taxes that have been harmonised across EU member states to ensure effective functioning of the single market could be changed after Brexit.

The nature of the transition

- 5.15 Currently, our forecasts assume an orderly end to the negotiations between the UK and the EU and so a smooth transition from the pre- to post-Brexit worlds. This would be most likely if the UK and EU finalise the current version of the draft Withdrawal Agreement, which contains a transition period until the end of 2020. But a disorderly exit is not impossible and it could have a severe short-term impact on demand and supply in the economy and on the public finances. UK asset prices could fall sharply which, together with heightened uncertainty, would cause households and businesses to rein in their spending. A fall in the pound would also raise domestic prices, squeezing households' real incomes and spending. And there could be temporary constraints on supply if, for instance, a lack of customs preparedness led to significant delays at the border. It is next to impossible to calibrate this sort of scenario with confidence because of the lack of precedent.
- 5.16 Needless to say, there is significant uncertainty about the effects of Brexit on the UK economy, especially since no major country has left the EU or a similar trading bloc. Some of the effect will only occur gradually over a long period of time – quite possibly well beyond our five-year forecast horizon. We will keep any initial Brexit judgements that we make under review, but as time goes by it will inevitably be difficult to disentangle the impact of Brexit – and the appropriateness of those assumptions – from wider developments in the domestic economy and the impact of changes in the external environment.

