

# THE ECONOMIC EFFECTS OF THE GOVERNMENT'S PROPOSED BREXIT DEAL

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Garry Young

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# THE ECONOMIC EFFECTS OF THE GOVERNMENT'S PROPOSED BREXIT DEAL\*

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## EXECUTIVE SUMMARY

This report estimates the economic effects of the government's proposed Brexit deal that was first published on 14 November 2018, and subsequently expanded.

The impact of any Brexit deal can be broken down into two key components: first, the economic impact of the changes in the trading relationships between the UK, EU and other countries brought about by the deal; second, the economic impact of how the deal affects uncertainty and confidence.

The main focus of our analysis is on how the government's proposed Brexit deal is likely to affect the economy, leaving aside the effect it might have on uncertainty. Our assessment is that trade with the EU, especially in services, will be more costly after Brexit. This is likely to have an adverse effect on living standards in the UK. Our central estimate is that if the government's proposed Brexit deal is implemented, then GDP in the longer term will be around 4 per cent lower than it would have been had the UK stayed in the EU. This is roughly equivalent to losing the annual output of Wales or the output of the financial services industry in London. This is equivalent to a loss of 3 per cent in GDP per head, worth around £1,000 per annum on average to people in the UK. If the UK were to stay in a customs union with the EU, or if the Irish backstop position was to be invoked, there would still be a hit to GDP per capita of 2 per cent.

In addition to the economic impact of the changes in the UK's trading relationships brought about by the deal, is the effect it has on uncertainty and confidence. So far at least, the government's proposed Brexit deal has not gained widespread political support and it is not clear that it will be implemented. Even if the deal is implemented, there will continue to be uncertainty about the precise shape of the future relationship beyond the transition period ending on 31 December 2020. Recent estimates, based on the UK's performance relative to other similar economies, suggest that Brexit uncertainty has already reduced UK GDP by about 2 per cent relative to what it would have been if the UK had stayed in the EU. This uncertainty is a consequence of the 2016 referendum result. We are not able to quantify explicitly the effect of the deal on uncertainty and confidence but to the extent that it does not provide clarity about the UK's future trading relationships then business investment and economic activity in the UK is likely to continue to be lower than it would have been had the UK stayed in the EU, so that the figures in the summary table below may be an underestimate of the economic cost of the government's proposed deal.

The estimates presented represent our considered view of the economic impact of the government's proposed Brexit deal, but they are themselves uncertain as there is no historical precedent of a country leaving a major trading block such as the EU.

**Summary table: Long-run economic impact of different Brexit scenarios**  
*Difference relative to Stay scenario in 2030*

	GDP % difference	GDP £2016 prices	GDP per head % difference	GDP per head £ 2016 prices
Deal + FTA (Proposed deal)	-3.9%	-£100 bn	-3.0%	-£1,090
Deal + Backstop	-2.8%	-£70 bn	-1.9%	-£700
Orderly no deal	-5.5%	-£140 bn	-3.7%	-£1,330

Source: NIESR. The Stay scenario is an estimate of how the economy would develop if the UK were to stay in the EU.

\*This report has been prepared for the People's Vote campaign by the National Institute of Economic and Social Research (NIESR). NIESR is Britain's longest established independent research institute, founded in 1938. The scenarios reported represent NIESR's assessment of the economic effects of the UK's withdrawal from the EU under the assumptions made. NIESR has no institutional position on how or whether the UK should exit the EU.

## I. Introduction

The United Kingdom (UK) is due to leave the European Union (EU) on 29 March 2019. After a long period of doubt about whether a deal would be possible, it was announced on 13 November 2018 that the UK and EU negotiators had reached agreement on the terms of exit. These were then set out in the draft withdrawal agreement and the political declaration (PD) first published on 14 November 2018 and subsequently expanded.

Our aim in this report is to quantify the economic impact of the United Kingdom leaving the EU under the terms of the government's proposed Brexit deal **compared to what would happen if the UK stayed in the EU.**

This is not a straightforward exercise and it is important to be clear why. When the British people voted in the 2016 referendum to leave the EU they did so without there being any clarity about what the new trading relationship with the EU would be or when it would be put in place. This introduced a period of intense uncertainty that has not yet been resolved and may not be resolved by the proposed deal. At present, it appears likely that the UK will agree a Brexit deal with the EU, such as the government's proposed deal, that involves a transition period where the UK effectively stays in the EU until the end of 2020. But there are other plausible possibilities. A key low-probability but high-impact risk at present is that the UK leaves the EU in March 2019 and trades on World Trade Organisation (WTO) rules without a legal basis for many of the relationships that exist between the UK and the EU. This could involve severe congestion in the UK key trade route between Dover and Calais, disruption to air travel, and uncertainty about the status of EU citizens in the UK.

This uncertainty matters because much economic activity is critically affected by what might happen in the future. There is clear evidence, to be discussed later, that economic activity in the UK in the past two years has been harmed by fears of adverse Brexit outcomes even though the UK has not yet left the EU. The effect of uncertainty on economic activity means that the impact of any deal in practice will be determined partly by how it affects hopes and fears about the future as well as the effect it would have if it was fully credible.

So the impact of any Brexit deal can be broken down into two key components: first, the economic impact of the changes in the trading relationships between the UK, EU and other countries brought about by the deal; second, the economic impact of how the deal affects uncertainty and confidence.

Our focus in this report is on the first key component. We analyse the effect of the government's proposed deal on the assumption that it is agreed and credible by comparing it with an estimate of what would happen if the UK decided instead to stay in the EU, again under the assumption that this outcome is completely credible. We are not able to quantify explicitly the second key component, the effect of the deal on uncertainty and confidence, but to the extent that the deal does not provide clarity about the UK's future trading relationships then business investment and economic activity is likely to continue to be even lower than it would have been had the UK stayed in the EU.

We focus on the government's preferred outcome where the UK leaves the EU in March 2019, enters a transition period lasting until December 2020 during which trading arrangements are broadly unchanged, and then leaves the EU Single Market and customs union and moves to a free trade agreement (FTA) with the EU leaving a relatively large degree of sovereignty about country-specific regulation ('Deal + FTA').

We also assess the effect of the backstop case where the whole of the UK stays in a single customs territory with the EU for an extended period of time. In this case there would also be constraints on regulatory divergence set by the backstop of the Protocol on Ireland/Northern Ireland of the withdrawal agreement ('Deal + Backstop').

There have already been a number of analyses of how different Brexit arrangements might affect the UK economy, clearly summarised by Tetlow and Stojanovic (2018). These analyses, carried out at various times, both before and after the 2016 referendum, have generally estimated the effect of different forms of Brexit compared to what would have happened had the UK stayed a member of the EU. For comparability with these other analyses, our 'base case' is also a scenario where the UK stays in the EU. This represents our estimate of how the economy would develop from 2019 onwards if the UK stayed thereafter in the EU and all uncertainty about the future relationship between the UK and EU was resolved.

In addition to our analysis, HM Treasury and the Bank of England, as well as other commentators, will also produce impact assessments of the government's proposed Brexit deal.<sup>1</sup> We understand that HM Treasury will compare the long-term costs and benefits of a no deal scenario, a free trade agreement and the government's proposed deal with today's institutional arrangements with the EU.<sup>2</sup> The Bank of England will provide an analysis of how the EU withdrawal agreement will affect its ability to deliver its statutory remits for monetary and financial stability, including in a 'no deal no transition' scenario. This analysis will reflect the relatively short-term horizons of the Bank's remits and not represent a judgement on the long-term impact.<sup>3</sup>

For comparability, and in order to be as clear as possible, we will also compare the government's proposed deal to our assessment of an orderly no-deal scenario where the UK reverts to trade under WTO rules in March 2019 after the end of the Article 50 period, and emergency arrangements are put into place to avoid disruption to trade and travel.

In setting out our analysis we aim to be as clear as possible about the assumptions that we make about different aspects of the possible Brexit outcomes and why we have made them. As Tetlow and Stojanovic (2018) emphasise, the answers from existing analyses of Brexit 'vary hugely', largely reflecting variation in the assumptions fed into the models used.

As we emphasise further below, our assessment of how the UK economy will develop in the future under the different Brexit scenarios is based on well-grounded, comprehensive analysis that is nevertheless subject to significant uncertainty. This is largely because there is no precedent for any country leaving a major trading block, such as the EU.

It should be stressed that this uncertainty about the impact of leaving the EU is not the same as the uncertainty that typically surrounds forecasts. In particular, forecasts are produced by making judgements about the effects of many possible events, and are known to be subject to wide margins of error often represented by forecast fan charts that show the chances of different possible outcomes at different times. Long-term forecasts are especially uncertain and can be likened to trying to forecast what the income of a school leaver will be in ten years' time, which is likely to be determined by a whole range of unpredictable factors. By contrast, the current exercise aims to compare different scenarios on a consistent basis, holding constant many of the factors that affect the development of the economy, and varying only the economic relationship between the EU and UK. This is more akin to trying to assess how much higher a school leaver's income would be in ten years' time if they gained a degree compared with if they did not. This calculation is much more precise than trying to forecast their income.

Similarly, we are more confident about the effect of different trading arrangements with the EU than we are about the outlook for the economy. This is because we know that the terms on which the UK will trade with the EU after Brexit in the different scenarios will not be as favourable to the UK as they are now. Over time, if the UK was to leave the Irish backstop and the EU customs union, this worsening of the terms with which the UK trades with the EU may be partially mitigated by improved trade arrangements elsewhere as the UK makes new trade deals with other countries. But we do not think that better trade relations with distant economies can make up for less access to the EU market.

Our key finding is that if the government's proposed Brexit deal is implemented so that the UK leaves the EU customs union and Single Market in 2021, then by 2030 GDP will be around 4 per cent lower than it would have been had the UK stayed in the EU. This is largely because higher impediments to services trade make it less attractive to sell services from the UK. This discourages investment in the UK and ultimately means that UK workers are less productive than they would have been if the UK had stayed in the EU.

This report is organised as follows. In section 2, we describe the key economic aspects of the Brexit deal and our assessment of how significant they are likely to be. In section 3, we describe how we have constructed our base case scenario. In section 4, we describe how we model different aspects of the deal. In section 5, we describe our estimates of the economic effects of the Brexit deal and how they compare with previous estimates of the effects of Brexit.

## 2. The key economic aspects of the government's proposed Brexit deal

The key economic aspects of the Brexit deal covering both the withdrawal agreement and the PD guiding the future relationship are:

- The UK will leave the EU on 29 March 2019, but there will be a transition period, during which the EU will treat the UK as if it were a Member State, with the exception of participation in the EU institutions and governance structures. The transition period is set to end on 31 December 2020, coinciding with the end of the current long-term EU budget.
- As part of the withdrawal agreement, there will be a financial settlement, provisionally estimated by HM Treasury at a value of £35 billion to £39 billion, that will honour all financial obligations undertaken while the UK was a member of the EU.<sup>4</sup> The public accounts committee has suggested the financial settlement could be larger. The UK will not be required to pay sooner than if it had stayed a member of the EU.
- There is little clarity on the precise shape of the future relationship beyond the transition period ending on 31 December 2020, though all of the agreed options involve a high degree of alignment between the EU and the UK. The three options are: (a) an extension of the transition period; (b) a free trade agreement; (c) the introduction of a single customs territory between the EU and the UK that would come into force if there was no deal by December 2020 and the transition period had not been extended. These are discussed in turn.

### *Arrangements beyond 31 December 2020*

- (a) Extension of the transition period. There is provision for the transition period to be extended, during which the UK would stay in the customs union and Single Market. The UK would continue to apply the entire body of EU law during the transition. Any trade agreements signed by the UK would not be able to enter into force until the transition ended. Extending the transition period would require a financial contribution from the UK to the EU budget, to be decided by the Joint Committee established by the withdrawal agreement. The European Commission has suggested December 2022 as the maximum possible extension.
- (b) An agreed free trade deal where the UK leaves the EU Single Market and customs union. Beyond the transition period, the UK and EU intend to agree a deal that puts in place comprehensive arrangements that create a free-trade area combining deep regulatory and customs cooperation, underpinned by provisions ensuring a level playing field for open and fair competition.

The free-trade area would include zero tariffs, no fees, charges or quantitative restrictions across all goods sectors.

Alongside this arrangement for goods, there would be 'ambitious, comprehensive and balanced arrangements' on trade in services and investment.

On financial services, there would be commitments to preserve financial stability, while respecting either parties' regulatory and decision-making autonomy, and their ability to take equivalence decisions in their own interest.

On migration, there would be visa-free travel for tourists between the EU and UK, and arrangements on temporary entry for business travel. But free movement would end.

- (c) A single customs territory to avoid the introduction of a hard border on the island of Ireland (the Irish backstop). This would mean that the UK would stay in a customs union with the EU, but not in the Single Market. Under this arrangement, there would be no tariffs or quotas for goods traded between the UK and EU, and no need for proof of origin. But to ensure a level-playing field, the UK would commit to maintaining similar taxation, environmental protection, labour and social standards, and state aid and competition policy as the EU. In order to avoid the need for regulatory checks in Ireland, Northern Ireland would have to stay in line with Single Market rules.

In table 1 we summarise our interpretation of the post-December 2020 arrangements to be negotiated in a free trade agreement and in the backstop, and how that compares with existing trade arrangements between the EU and Norway and Switzerland.

Table 1. Interpretation of key parts of the government's proposed Brexit deal and modelling assumptions

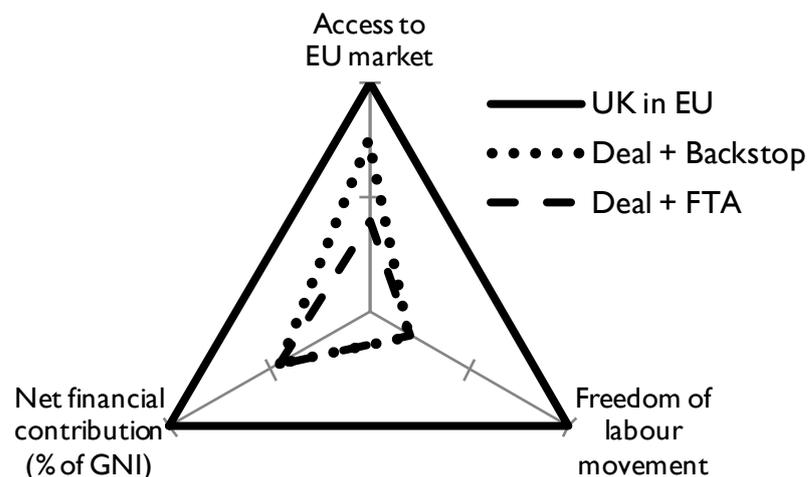
Part of deal	Detail	Economic effect
<i>Goods trade</i>		
Tariffs and quotas	Zero tariffs, fees and quantitative restrictions on EU-UK goods trade in both FTA and backstop.	Comparable to EU membership.
Regulatory alignment	Deep but presumably not full regulatory alignment as UK leaves Single Market. Minimum standards set out in Annex of WA (environmental, labour, social, state aid).	Backstop: more impediments to trade than in EU and Norway as a consequence of being outside Single Market. FTA: more impediments to trade than in backstop.
Rule making	Only indirect influence through Joint Committee, own preferences may be compromised.	Backstop: more frictions than EU membership but less than Switzerland, Norway. FTA: more frictions than in backstop.
Own non-EU trade deals	Cannot offer better conditions than EU 3rd country deals in backstop.	Backstop: less benefit than Norway, Switzerland which are not in EU customs union. FTA: Can improve on EU trade deals.
Access to EU's 3rd country trade deals	Not necessarily available in backstop or FTA. Rules of origins provisions would provide frictions even if access ensured.	Backstop: more frictions than EU, less than Norway, Switzerland. FTA: more frictions than backstop.
Services dependent goods trade	Good trade may be hindered by restrictions on services.	Backstop: More frictions than EU membership, Norway, Switzerland. FTA: More frictions than backstop.
<b>Total goods trade</b>	Backstop: benefits from Customs Territory and potential access to EU's 3rd country trade deals likely offset by non-tariff barriers, constraints to rule-making and own 3rd country deals.  FTA: benefits from being in free trade area and ability to strike new trade deals, but introduces frictions compared with being in Single Market.	Backstop: On balance frictions similar to bilateral agreements between EU and Switzerland.  FTA: on balance more frictions than Norway (access to Single Market) and Switzerland (comprehensive regulatory alignment with Single Market through bilateral agreements).
<i>Services trade</i>		
Regulatory alignment	No services-specific provisions in WA, PD ambitious regarding FTA in services but lack of historical example, broad services agreement likely to require substantial additional amount of alignment, incl. labour mobility.	Backstop: more frictions than Switzerland, Norway, EU due to being outside Single Market. FTA more frictions than in backstop.
Rule making	PD emphasises autonomy to de-align rules, e.g. to reflect own preferences.	Backstop: more freedom than Norway, Switzerland. FTA: more autonomy.
<b>Total services trade</b>	Regulatory divergence likely offsets benefits from autonomy in rule making.	Backstop: more frictions than Switzerland, Norway, EU membership.  FTA: more frictions than under whole-UK backstop.

In our analysis, we contrast the Stay scenario with two scenarios that capture the range of possibilities that could emerge under the withdrawal agreement and subsequent negotiations after the transition period. The first scenario, called 'Deal + backstop' is a comprehensive trading relationship for goods with the UK in a single customs territory for an extended period of time and alongside that an agreement in services trade with some important restrictions. In this scenario, there are constraints on regulatory divergence between the EU and the UK because of the backstop arrangement in the Protocol on Ireland/Northern Ireland of the withdrawal agreement. In the other scenario ('Deal + FTA'), the UK and the EU enter into a free trade agreement which is largely related to goods trade. Trade in services is heavily restricted. Both scenarios assume that labour movement will be curtailed and that the UK will make a smaller financial contribution.

The details of these deals are discussed below, but we can summarise the key economic features of the deal across three dimensions: market access for goods and services, movement of people and financial contributions to the EU. As a Member State, the UK has unfettered access to the EU, allows complete movement of people and the country also makes a financial contribution to the EU. These three dimensions are represented in figure 1 below. The black outer triangle represents the UK as a full member of the EU and the origin point represents a no deal scenario where trading is based on WTO-rules, there are severe restrictions on the movement of people and the UK does not make any fiscal contribution.

As discussed above, the difference between the Backstop and FTA scenarios primarily relates to market access and, in particular, the service sector. We have assumed that labour movement will be heavily restricted under both scenarios and that the financial contribution will also drop substantially from current levels.

Figure 1. The relationship between the UK and the EU



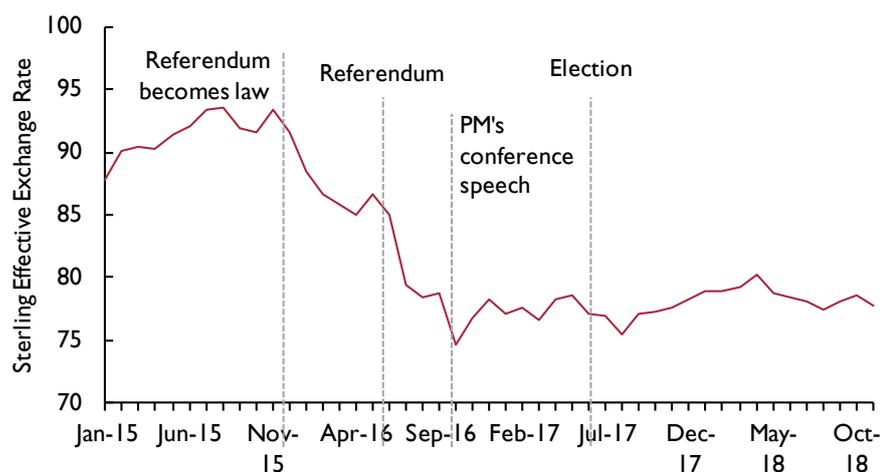
### 3. The base case scenario

In order to analyse the effects of the government's proposed Brexit deal, we need to be clear about the alternative. For the purposes of this analysis the main alternative considered is that the UK decides to stay in the EU. This is different from the 'soft-Brexit' scenario shown in our latest forecast (Hantzsche, Kara and Young, 2018) which assumes that much of the uncertainty associated with Brexit persists over the next two or three years. By contrast, our 'Stay' scenario assumes that there is substantial political agreement not to leave the EU so that the uncertainty is resolved. We also consider an orderly no-deal scenario, where the UK moves directly to WTO rules in the second quarter of 2019 and emerging arrangements are put in place to avoid disruption to trade and travel.

#### The Stay scenario

The economic performance of the UK economy since the EU referendum on 23 June 2016 has been fairly lacklustre and there is evidence from a wide range of indicators that it has been worse than it would have been had the referendum not taken place. This appears to reflect two key factors: the sudden depreciation of the sterling exchange rate immediately after the referendum (figure 2) which affected import prices, and the effect of Brexit-related uncertainty on business investment decisions. The Bank of England Decision Maker Panel (DMP) survey of UK companies, indicates that by Autumn 2018, more than half of businesses reported Brexit as among the top sources of uncertainty they faced. Bloom, Chen and Mizen (2018) estimate that Brexit-related uncertainty was associated with "around 6 percentage points less investment growth (a 3 per cent reduction per year)".

Figure 2. Sterling effective exchange rate (January 2005=100)



Source: ONS, NIESR.

A likely consequence of these developments is that UK economic growth has been weaker than it would otherwise have been since the referendum, and UK inflation has been higher. Figure 3 shows that while UK economic growth had been among the highest in the G7 prior to the referendum, it subsequently dipped below the growth rate of other advanced economies. On the basis of similar evidence, Born, Muller, Schularick and Sedlacek (2018), using synthetic control techniques, estimate that by the second quarter of 2018 the level of UK GDP was 2 per cent lower than it would otherwise have been. They attribute this to the effects of heightened uncertainty and downgrades of expected future output growth. Figure 4 shows that while UK CPI inflation had been towards the bottom of the pack of other countries prior to the referendum, it subsequently rose above that in other countries as the effect of sterling's depreciation passed through to import and consumer prices. One of the effects of higher prices is that household real incomes and consumer spending are also likely to be weaker than they would have been had the referendum not taken place. The Governor of the Bank of England estimated that by May 2018, UK household income was 4 per cent lower than it would otherwise have been as a consequence of the referendum (Carney, 2018): "one third of the 4 per cent shortfall in real wages

Figure 3. UK economic growth relative to other G7

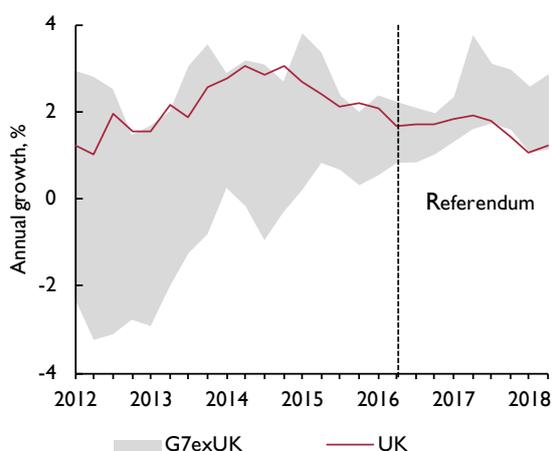
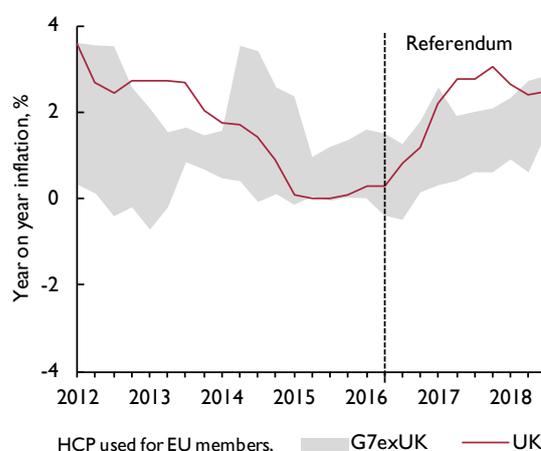


Figure 4. UK inflation relative to other G7



reflects stronger-than-projected inflation, which is almost entirely accounted for by the referendum-related fall in sterling. The remainder reflects weaker-than-expected nominal wages, the majority of which can be accounted for by weaker-than-anticipated productivity growth”.

It is possible that, should the UK decisively decide not to leave the EU after all, some of these negative effects of the EU referendum would unwind. We therefore build a stay scenario that reverses some of these effects. We assume that business investment rebounds from 2019 onwards, growing by 4 per cent per annum for two years before reverting to its long-run growth rate of 1–2 per cent. The sterling-US dollar exchange rate appreciates to \$1.40 by 2020 while growth in trade steadies. Labour productivity growth picks up to just above 1.5 per cent per year.

### Fiscal policy assumptions

Each year, as a member state, the UK makes a financial contribution to fund the EU budget. The size of that contribution depends on the annual expenditure plan of the EU as set out in the seven-year Multiannual Financial Framework (MFF). The current MFF runs from 2014 to 2020, the end date of the current MFF is also the termination date for the transition period that has been set in the withdrawal agreement. The financial contribution is comprised of three categories:

**The size of the economy:** A uniform percentage of the Gross National Income (GNI) is applied to all EU Member States. This is the largest category of funding with an estimated contribution of £11.8 billion in 2017–8.

**Traditional own resource (TOR):** Each Member State collects customs tariff and levies on behalf of the EU. A proportion, 20 per cent, is retained by the country to cover the cost of collection. The UK transferred £3.4 billion to the EU for 2017–8.

**VAT-based payment:** This is set at 0.3 per cent of a ‘harmonised VAT base’ and was estimated to have been £3.0 billion in 2017–18.

These three contributions amounted to around £18 billion in 2017–18 (table 2). As it happens, a large portion of this contribution returns to the UK, either directly to the government or to other agencies in the UK. The best known of these is the rebate known as the ‘Fontainebleau abatement’ which was worth £4.5 billion in 2017–8 which returns to the government. The government also receives funds from the EU for onward payments under the Common Agriculture Policy (CAP), listed as ‘Public sector receipts from the EU’ in table 2. This was worth another £4.5 billion. The EU also directly funds a number of non-government entities such as universities, research centres and others under Erasmus, Creative Europe and Horizon 2020 programme. This amounts to around £2 billion and is not shown in the table.

Table 2. Transactions with the European Union on a 'no Brexit' counterfactual (£, billion)

	2017–18 (outturn)	2018–19	2019–20	2020–21	2021–22	2022–23	2023–24
GNI based contribution	11.8	13.9	15.6	15.4	15.5	15.3	15.4
VAT payments to the EU	3.0	3.1	3.2	3.1	3.2	3.3	3.5
UK abatement	-4.5	-4.6	-4.6	-4.4	-4.5	-4.5	-4.5
Receipts from the EU to cover the costs of collecting Traditional Own Resources	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7
Total expenditure transfers included in AME, TME and PSNB	9.5	11.7	13.5	13.5	13.6	13.5	13.6
Traditional Own Resources	3.4	3.3	3.3	3.4	3.4	3.5	3.5
Public sector receipts from the EU	-4.5	-5.0	-5.3	-6.1	-6.0	-6.1	-6.2
Net contribution to the EU budget	8.4	10.0	11.6	10.8	11.0	10.8	10.9

Source: Office for Budget Responsibility, Supplementary Fiscal Tables October 2018, Table 2.25.

What matters for the fiscal arithmetic are the GNI-based contributions, the VAT-based payment and the rebate and these together amounted to £9.5 billion in 2017. This is clear from table 2 which is the OBR's latest forecast of UK contributions to the EU under a counterfactual stay scenario. Under the baseline stay scenario, we assume that the financial transactions with the EU will stay in line with current practice.

The table shows the other EU transactions that are below the line. Contributions that relate to customs tariffs and levies (TOR) are excluded from government receipts because these are collected on behalf of the EU.

The UK Government and the EU reached an agreement on the financial settlement in December 2017 which is estimated by HM Treasury to be around €42 billion or £37 billion. That settlement or 'divorce bill' is split into three parts. The first part comprises commitments under the current MFF that ends in December 2020. The second part relates to outstanding payments that remain at the end of the current MFF ('reste à liquider' or RAL) and the third part is pension liabilities less assets returned to the UK. The table below, reproduced from the latest *Economic and Fiscal Outlook*, shows the OBR's assessment of the fiscal impact under stay and the counterfactual scenario where the UK Government complies with the terms of the agreed financial settlement. The table clearly shows that a large portion of the final £37 billion settlement is set to be completed by 2024.

Table 3. Forecast of expenditure transfers to the EU under different scenarios (£billion)

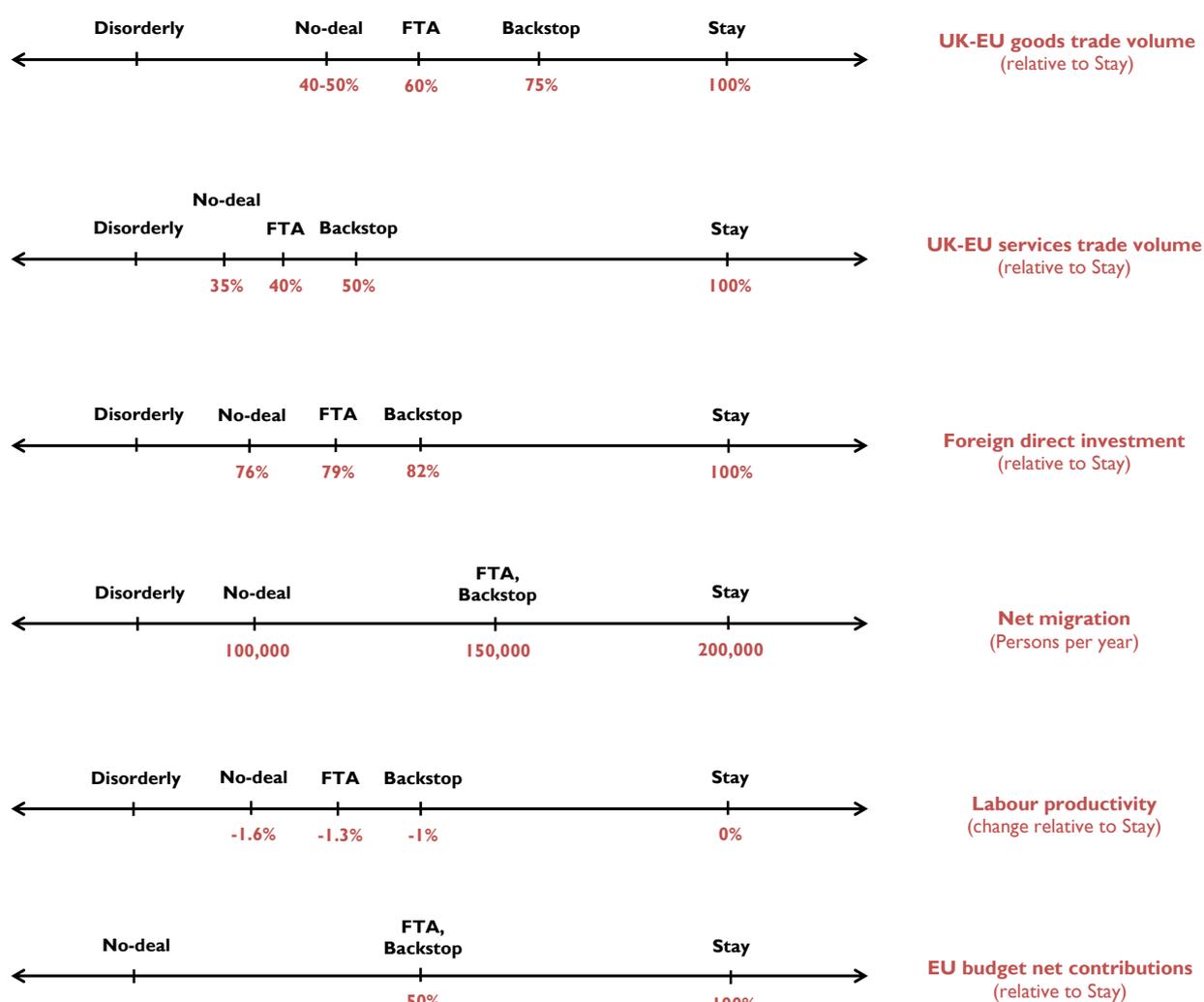
	2017–18 outturn	2018–19	2019–20	2020–21	2021–22	2022–23	2023–24
No Referendum	9.5	11.7	13.5	13.5	13.6	13.5	13.6
Financial settlement	9.5	11.7	13.5	10.5	10.8	7.9	4.2
Assumed spending in UK in lieu of EU transfers		0	0	3.0	2.8	5.6	9.4

Source: Economic and Fiscal Outlook, October 2018, Table 4.30.

## 4. Modelling the Brexit deal

We model the impact of leaving the EU on the UK economy using NiGEM, the National Institute Global Econometric Model, an empirical multi-country economic model. NiGEM's global nature and explicit trade linkages make it particularly well-suited to modelling the impact on the UK economy and other countries of shifts in trade policy. NiGEM is general equilibrium in nature, so that both prices and quantities adjust over time. Moreover, it incorporates endogenous monetary and fiscal policy responses, which are clearly important when dealing with the kinds of adjustments that leaving the EU might bring. It has also been used by the OECD and HM Treasury in their analyses of Brexit.

Figure 5. Modelling assumptions underlying different Brexit scenarios



**Disorderly:** Disorderly exit, trade on WTO terms

**No-deal:** Orderly exit, trade on WTO terms

**FTA:** Nov 2018 deal, followed by UK-EU Free Trade Agreement

**Backstop:** Nov 2018 deal, followed by UK-wide backstop

**Stay:** UK stays in EU

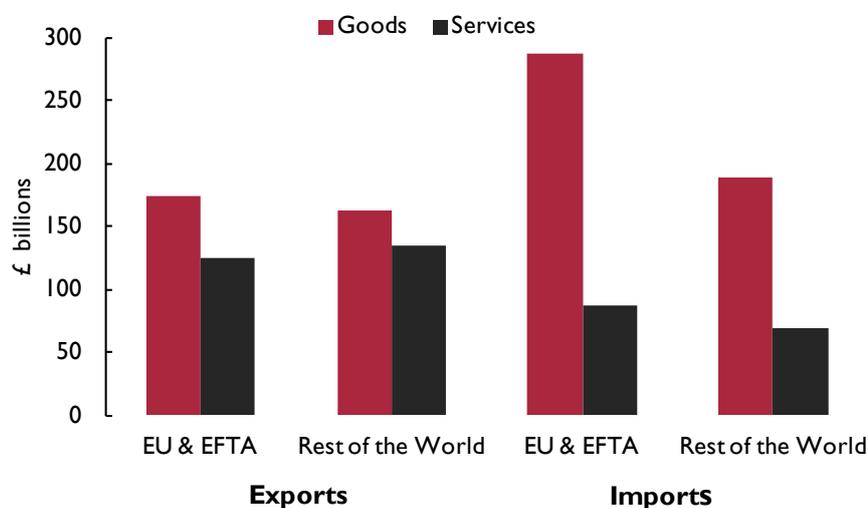
Our modelling approach builds on work published by NIESR prior to the referendum (Ebell *et al.*, 2016) and as an assessment of the proposals subsequently put forward by the British government (Hantzsche and Kara, 2018; Hantzsche *et al.*, 2018). We model the economic impact of the Government's proposed Brexit deal as the combined result of different Brexit-related shocks to the economy, namely through trade, foreign direct investment, net migration, productivity and contributions to the EU budget. Figure 5 provides an overview of our modelling assumptions which are explained in detail in the remainder of this section.

### Trade assumptions

#### Background

Trade liberalisation since the end of the Second World War has led to a reduction in both tariff and non-tariff barriers to trade around the globe and resulted in a substantial increase in the volume of trade (see also discussion in OBR, 2018), especially for countries that are geographically and culturally close. Membership in the EU Customs Union means that goods trade between the UK and EU countries is not subject to tariffs and quotas while the EU's common external tariff is imposed on imports from non-EU countries that do not have a free trade agreement with the EU. Currently, goods trade between the UK and the EU makes up 57 per cent of total trade in goods the UK is engaged in, i.e. exports and imports. As the EU has struck trade deals with third countries and WTO obligations eliminated several tariff barriers, average tariffs on goods trade have fallen. Therefore, recent efforts to integrate markets have focused on removing non-tariff barriers such as regulatory standards, rules of origin and administration costs. The EU's Single Market is one of the most advanced regimes globally in terms of reducing non-tariff barriers. By aligning standards, facilitating mutual recognition and creating a level playing field in several areas such as competition, labour, tax and environmental policies, the Single Market ensures goods can move without considerable friction across countries. Figure 6 shows the existing pattern of UK trade with the EU and the rest of the world.

Figure 6. UK export and imports, EU and rest of the world, 2017

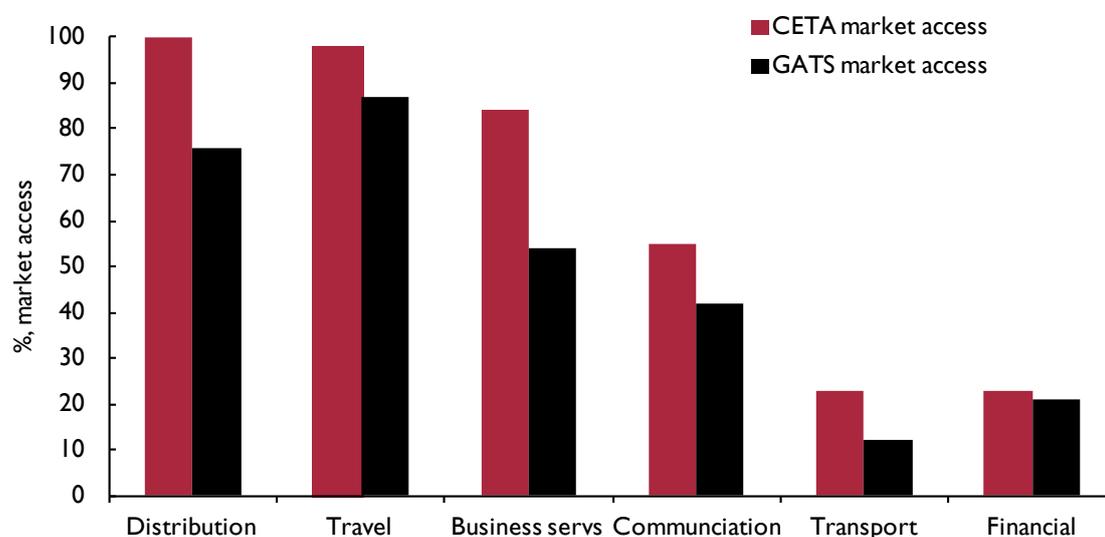


Source: ONS, NIESR calculations.

While global goods trade is substantially liberalised, trade in services with countries outside of the EU continues to face considerable frictions. Although tariffs and quotas are less relevant to global services trade, regulatory burdens play an important role. The service sector accounts for approximately 80 per cent of the UK economy, around 45 per cent of all exports and 40 per cent of all exports to the EU. The share of services trade in total EU trade has grown substantially since 1999 partly because of proximity and also because of various EU agreements that have reduced or eliminated barriers to services trade. The UK runs a trade surplus in services with the EU which was worth £28 billion in 2017, helping offset some of the deficit in goods trade (figure 6).<sup>5</sup>

For services, the PD declares that both parties “should conclude ambitious, comprehensive and balanced arrangements on trade in services and investment” and “aim to deliver a level of liberalisation in trade in services

Figure 7. Market access under CETA and GATS



Source: Magtorn and Winters.

Note: Full market access represented by score of 100%.

well beyond the Parties' WTO commitments, and building on recent Union Free Trade Agreements, the Parties should aim at substantial sectoral coverage”.

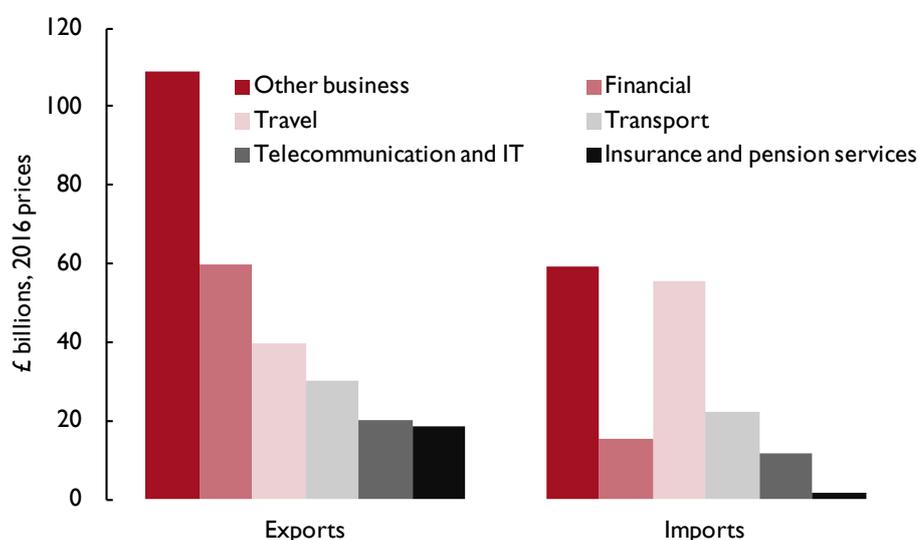
The extent of service sector liberalisation under GATS is low. The number of sectors that the EU is prepared to open to non-EU countries is small and as a result of that the arrangements that are likely to be negotiated for services trade are likely to be less ambitious than the trade in goods. This is illustrated in figure 7, derived from Magtorn and Winters (2018), showing how UK exporters' access to EU markets would be affected if the UK were to move to trading on either GATS terms or a deal like the Comprehensive Economic and Trade Agreement (CETA) between the EU and Canada. While there would be little effect on exports of travel services, there would be a significant loss of access by providers of financial services, transport and communications.

The sections in the PD that cover the service sector are imprecise and therefore open to interpretation, but there is no doubt that the scope of any agreement on services trade is set to fall well short of current arrangements.

It is also worth emphasising that the new round of services negotiations will not force WTO member countries to open all their services sectors to foreign competition, contrary to some claims. When this point was put to the WTO, the response from them was that “There is no obligation on any WTO Member to allow foreign supply of any particular service – nor even to guarantee domestic competition, since it is possible to maintain a monopoly supplier, whether public or private, of any service. Governments are free to choose those services on which they will make commitments guaranteeing access to foreign suppliers. Each Member must have a national schedule of commitments, but there is no rule as to how extensive it should be. Some least-developed Members have made commitments only on tourism, for example, and in general there is great variation in the coverage of schedules, reflecting national policy objectives and levels of economic development. There is agreement among all Governments that in the new round of negotiations the freedom to decide whether to liberalize any given service and the principle of progressive liberalization will be maintained”.

Figure 8 shows the composition of UK service sector trade. The key categories of services exports are financial services, covering mainly retail and investment banking services other than insurance, and ‘other business services’, that covers a range of services including legal, accounting, management consulting and public relations. There are also large contributions from transport, covering sea, air and other transport, and travel, which includes the spending of foreign tourists in the UK.

Figure 8. UK services trade volumes by sector, 2017



Source: ONS, NIESR.

The Single Market enables financial sector firms to carry out activities in other European Economic Area countries by ‘passporting’. Passporting would be withdrawn were the UK to leave the Single Market and trade on GATS terms. The EU can offer similar access to countries outside the EU under EU equivalence, but the certainty and scope of this regime is restricted because the equivalence arrangements are granted on a case-by-case basis and subject to withdrawal by the EU at short notice.

Professional services are covered under the Mutual Recognition of Qualifications Directive and similar specific arrangements cover legal services, telecoms and consumer-protection laws. There is an enormous amount of uncertainty for sectors that rely on professional services because the PD seeks ‘appropriate arrangements on professional qualifications’, without any assurance of the sectors, the overall objective, the regime or the implementation period.

Leaving the European Union will therefore unambiguously result in higher frictions to trade between the UK and the EU. In fact, there is evidence that uncertainty about future trading relationships has already deterred exporters from entering into new trade contracts after the referendum (Crowley *et al.*, 2018).

### Long-run impact on UK-EU bilateral trade

In order to quantify the impact of different Brexit outcomes, we rely on estimates provided by the empirical literature. More specifically, we use measures of the impact on goods and services trade of *joining* trade arrangements with European countries and calculate the implied change in UK-EU trade from reversing membership, accounting for the share of goods and services trade in total UK-EU trade, which in most recent ONS data have been 68.3 per cent and 31.7 per cent, respectively. We therefore assume symmetry in the effects of joining and leaving the EU. Empirical estimates are based on different periods and the average EU member state. It is possible, given the UK’s particularly strong reliance on services, that the overall impact of trade restrictions could be larger on the UK compared with other economies where services is less important. We therefore apply judgement in our application of historical findings.

**Deal + FTA.** How would we expect the proposed deal to affect future trade between the EU and the UK if it were to lead to a new free trade agreement between both trading partners? Based on our judgement of the withdrawal agreement and PD (table 1), we would expect goods trade to face more severe frictions than trade between Norway or Switzerland and the EU. While the PD stresses that no tariffs or quantitative restrictions will be put in place, we would expect non-tariff barriers to be higher than between Norway and Switzerland,

Table 4. Impact of trade agreements on bilateral trade

	Goods trade % reduction in bilateral trade	Services trade % reduction in bilateral trade
Norway	25–38 (BBEM08)	40 (MS13) 19–28 (C06)
Switzerland	25–38 (BBEM08)	40 (MS13) 45–54 (C06)
FTA	35–44 (E16)	61–65 (E16)
WTO	53 (BBEM08) 58–65 (E16)	61–65 (E16)

Notes: BBEM08: Baier *et al.*, 2008, E16: Ebell (2016), MS13: van der Marel and Shepherd (2013), C06: Ceglowski (2006).

given that the former has full access to the EU's Single Market through the European Economic Area and the latter has adopted comprehensive regulatory alignment with the Single Market through bilateral agreements in return for concessions on sovereignty on rule-making and free movement of labour. The empirical literature suggests a reduction in bilateral goods trade under the average EU FTA with third countries of 35 to 44 per cent (table 4). Given the commitment in the PD to “deep regulatory and customs cooperation, underpinned by provisions ensuring a level playing field for open and fair competition” and the ambition to avoid border checks between Northern Ireland and the rest of the UK, we adopt a midpoint assumption of 40 per cent. To date, the global experience with free trade agreements in services is scarce because comprehensive liberalisation requires regulatory alignment similar to that provided by the EU's Single Market. CETA, the EU's free trade agreement with Canada, counts as the EU's agreement with the most advanced commitment to services trade liberalisation, for instance by binding domestic regulation of licensing and authorisation regimes and setting a framework for the mutual recognition of professional qualifications. We therefore assume a reduction in services trade with the EU of 60 per cent, at the lower bound of empirical estimates ranging from 61 to 65 per cent.

This is a substantial reduction, coming mainly from lower services. Using detailed estimates of sector-specific market access under CETA and GATS from Magntorn and Winters (2018) weighted by the volume of UK services exports to the EU by sector, a back-of-the-envelope calculation confirms that total services access to EU markets would be reduced by between 40 per cent (CETA) to 55 per cent (GATS).

Accounting for current shares of goods and services trade, total trade between the UK and the EU is reduced by 46 per cent in the Deal and FTA scenario. We later check the sensitivity of our results to an alternative assumption which considers trade reductions of half that size.

**Deal + Backstop.** The backstop set up in the protocol on Ireland/Northern Ireland of the withdrawal agreement would keep the whole of the UK in a single customs territory with the EU. It would also constrain regulatory divergence between both parties in the areas of taxation, environmental, labour, social, state aid and competition policy. As a result, we think that on balance frictions faced by goods exporters and importers would be similar to goods trade between the EU and Switzerland. Using the midpoint between estimates by Baier *et al.* (2008), we assume a reduction in bilateral goods trade of 25 per cent. Services trade is not subject to tariffs and therefore does not benefit from tariff alignments under the backstop. In addition, most of the regulation tied down by the backstop arrangement applies to goods trade. We assume that services trade under an extended backstop, or similar arrangements, would be lower by 50 per cent compared to EU membership. As a result, total bilateral trade with the EU is lower by around 30 per cent in the long run, compared with EU membership in this scenario.

**No-deal.** We contrast our results with those obtained for an orderly No-deal scenario under which the UK reverts to trade under WTO rules after 30 March 2019. Estimates by Baier *et al.* (2008) and Ebell (2016) suggest that moving from full membership in the EU Customs Union and Single Market to a trade relationship under WTO terms would reduce UK-EU trade in goods by between 53 and 65 per cent in the long run (table 4). Services trade would fall by 43 to 65 per cent, according to estimates provided by Ceglowski (2006), van der Marel and Shepherd (2013) and Ebell (2016). Our no-deal scenario assumes a reduction of 56 per cent in total UK-EU trade using midpoint estimates.

We assume in all our scenarios that existing trade deals between the EU and non-EU countries either remain accessible for the UK or can be negotiated within a relatively short period of time without substantial changes to their quality. By contrast, our main analysis does not assume that comprehensive trade deals will be struck between the UK and non-EU countries not currently covered by free trade agreements with the EU as negotiations typically take a considerable amount of time. However, we later check the sensitivity of our results to a change in this assumption.

### Short-run impact on UK-EU bilateral trade

Most of the presented literature is based on static estimates of EU membership effects and at best apply to the long run (some ten years after the change in the trading relationship). There is a large degree of uncertainty about the transition to the long run. In what follows, we therefore focus predominantly on long-run effects. As regards short-run dynamics, we make the following assumptions:

- **Deal + FTA:** During the transition period, we assume that companies and households expect the UK-wide backstop to apply thereafter for as long as negotiations about the free trade agreement are under way. At the end of the transition period, some share of bilateral trade can no longer take place, for instance because licences for services no longer apply. The economy then gradually adjusts over ten years to trade under the free trade agreement, ie 46 per cent less bilateral trade compared to staying in the EU.
- **Deal + Backstop:** During the transition period, UK-EU trade is lower by 10 per cent as expectations adjust. At the end of the transition period trade is lower by another 10 per cent and then gradually adjusts to the long-run equilibrium of 30 per cent less trade over the course of ten years.
- **No-deal:** We assume that half of the impact in UK-EU trade takes place in the second quarter of 2019 as some goods and services can no longer be traded and others face severe barriers at the border. Trade then adjusts over the course of ten years to reach the long-run trade relationship under WTO rules with bilateral trade 56 per cent lower than under the status quo.

### Assumptions about foreign direct investment

The future trading relationship between the UK and the EU will also determine the amount of foreign direct investment the UK receives. While the PD commits to “ambitious, comprehensive and balanced arrangements” also on investment, any barriers for UK-based companies to access the EU market would make the UK a less attractive investment destination. This is because EU membership enables UK producers to be integrated in EU supply chains. In addition, the opportunity to serve the EU market has in the past contributed to non-EU companies choosing the UK as an investment destination, alongside other factors, such as language and the legal and tax system. Serwicka and Tamberi (2018) find that since the Brexit referendum, the number of FDI projects in the UK has fallen by 16–20 per cent.

Ramasamy and Yeung (2010) find that openness to trade benefits in particular FDI inflows to services sectors, much more than to manufacturing. Ebell and Warren (2016) survey the empirical literature and calculate that reverting to trade under trade arrangements similar to those between the EU and Norway would reduce FDI into the UK by 8–11 per cent, and by 11–23 per cent under a Switzerland-type relationship (table 5). By their estimates, trade under WTO rules would reduce inward FDI by 20–27 per cent, which is similar in magnitude to estimates by Dhingra *et al.* (2017).

Table 5. Impact of trade agreements on FDI

	FDI % reduction in FDI
Norway	8–11 (EW16)
Switzerland	11–23 (EW16)
FTA	
WTO	20–27 (EW16) 24 (DOSR17)

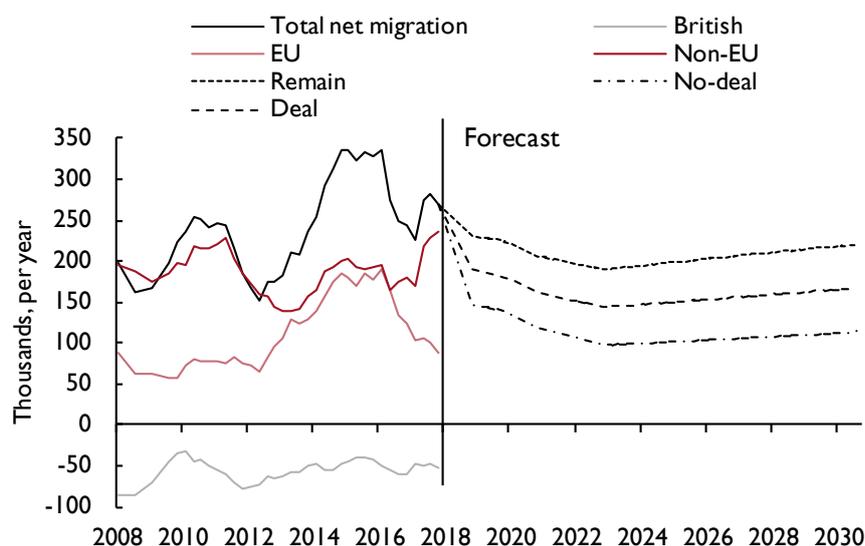
Notes: EW16: Ebell and Warren (2016), DOSR17: Dhingra *et al.* (2017).

Accounting for the importance of trade for FDI in services and the fact that around 36 per cent of all FDI inflows into the UK end up in the services sector, we apply our judgement about the future trade relationship to construct our assumptions about FDI inflows after Brexit. For the scenario in which a free trade agreement between the UK and EU is struck, we assume FDI inflows fall by 21 per cent, relative to continued EU membership. The assumed reduction under a permanent backstop arrangement is 18 per cent, and 24 per cent under 'No-deal'. We implement the change in FDI in NiGEM as a permanent reduction in the business capital stock and adjust balance of payments transfers proportionally.

### Assumptions about net migration

Since the EU referendum, net migration of EU citizens to the UK has fallen from around 200,000 to less than 100,000 per year (figure 9). The withdrawal agreement encompasses a range of provisions to ensure that EU citizens currently living and working in the UK will be able to stay and enjoy similar rights as natives. Regarding the mobility of people who enter the country after the end of the transition period, free movement ends and the OPD hints at a more restrictive immigration system allowing for visa-free travel only for short-term visits. While the recent fall in net migration from the EU was partly offset by a rise in non-EU net migration, the UK may become a less attractive destination for workers from the rest of the world if ties with the EU are loosened.

Figure 9. Net migration and scenarios  
Thousands per year



Source: NIESR.

We assume that total net migration evolves according to the ONS principal population projections under the Stay scenario and stay around 200,000 per year. Under our deal scenarios, we assume that on balance 50,000 fewer people enter the country, 75 per cent of whom are of working age. Our no-deal scenario follows the ONS low migration variant in which net migration falls to around 100,000 per year as the rights of EU citizens currently residing in the UK could be more affected than if the withdrawal agreement is implemented. We assume that net migration that is foregone as a result of Brexit is instead directed to the country's largest trading partners.

### Productivity assumptions

Reductions in trade with the EU, foreign direct investment and migration as a result of Brexit have the potential to worsen the outlook for productivity substantially. However, there is a large degree of uncertainty around the impact. The reduction in trade is likely to reduce competition in the future and thus innovation (Impullitti and Licandro, 2017). A reduction in foreign direct investment could inhibit the inflow of ideas from abroad. Weaker productivity growth might also result from a lack of demand, particularly for exports (Oulton, 2018). A reduced inflow or increased outflow of skilled migrants could lead to lower productivity. Vice versa, a post-Brexit immigration system that favours high-skilled workers over low-skilled ones might increase average labour productivity (OBR, 2018) but could lead to labour shortages in sectors that rely more strongly on less skilled workers with the opposite effect (Rolfe *et al.*, 2018).

We base our assumptions about productivity on Behrens and Mion (2017) who estimate that a no-deal Brexit would reduce labour productivity by 1.6 per cent in the long run. Given that the majority of this effect is due to lower productivity in services sectors, which would be disproportionately more affected by the Brexit deal, we assume that in our Deal + FTA scenario, labour productivity falls by 1.3 per cent, and by 1 per cent in our Deal + Backstop scenario. In NiGEM, we can calibrate a shock to total factor productivity that, all else equal, produces a productivity slowdown of that size.

### *Fiscal policy assumptions*

As discussed above, our baseline Stay scenario assumes business as usual – the UK Government continues to make fiscal transfers as before. Under both deal scenarios (backstop and FTA) as well as the no deal scenario, we assume that the government complies with the terms of the settlement and that a reduction in transfers is recycled into additional government consumption. In the case of No Deal, we assume that around £8–10 billion is recycled each year after the bulk of the divorce settlement has been paid in 2024 whereas under the other two alternative scenarios, Deal with backstop and Deal with FTA, we assume that £4–5 billion is recycled into government spending each year. We further assume that the increase in government spending directed to the domestic economy is offset by a reduction in transfers abroad, and thus fiscally neutral.

### *Monetary policy assumptions*

The path for monetary policy under the different scenarios is uncertain. Whereas in 2016 the MPC had room to stimulate the economy with a reduction in Bank Rate and quantitative easing, the case for another injection is less clear because the economy has less spare capacity now and CPI inflation is above the target level (Broadbent, 2017).

As always, monetary policy will be set based on a judgement of the balance between demand and the supply capacity of the economy. Under a no-deal scenario, this may once again require the Bank to manage the trade-off between the speed with which inflation returns to target and the support that policy can offer to economic activity (Carney, 2018). Much hinges on the evolution of inflation expectations in the economy. The Monetary Policy Committee will have the space to accommodate any demand shock only if inflation expectations remain anchored at a level that is consistent with the target inflation rate.

Our baseline Stay scenario assumes that the Bank of England raises Bank Rate every six months until the policy rate reaches 1.5 per cent by mid-2020. For the alternative scenarios, we allow the Bank Rate to evolve in line with a standard monetary policy rule that is embedded in NiGEM. Under that rule, the Bank Rate responds to the deviation of actual inflation from the 2 per cent target and the output gap.

## 5. Macroeconomic Effects

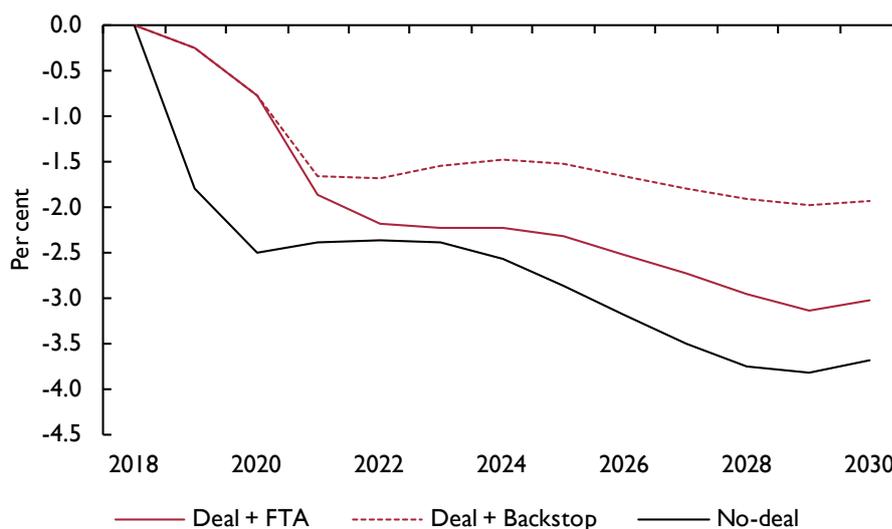
This section summarises the impact of the different Brexit scenarios on the economy as a whole, and on firms and consumers. It then discusses the scope for policy to respond. Next, the sensitivity of results to different assumptions about trade and the impact of political uncertainty, as well as the possibility to strike trade deals with non-EU countries is explained. Finally, we compare our results to other estimates.

### Long-run economic impact

We estimate that GDP would be 3 per cent lower per head under the proposed November 2018 Brexit deal and the successful negotiation of a free trade agreement with the EU, compared to continued EU membership (figure 10). This corresponds to a loss of £1,090 per head and year in the long run, i.e. by 2030. The impact on the size of the economy, i.e. taking into account potential reductions in net migration, is larger at 3.9 per cent. This is equivalent to the annual output of Wales.<sup>6</sup>

By contrast, membership of a single customs territory with the EU and closer regulatory alignment than under a free trade deal, as under the Irish backstop, results in a somewhat lower long-run impact of 2.8 per cent of GDP, or 1.9 per cent of GDP per head. This corresponds to an annual loss of £700 per person by 2030.

Figure 10. GDP per capita  
Per cent difference relative to Stay scenario



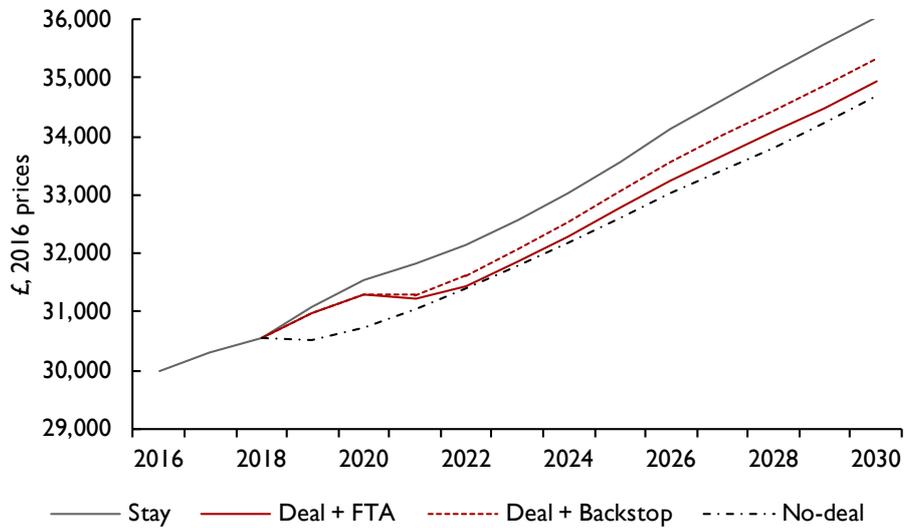
Source: NIESR.

If negotiations were to end without a deal and the UK reverted to trade with the EU under WTO terms in 2019, we would expect output to fall more sharply in the short run, relative to staying in the EU, and be 5.5 per cent lower in the long run. Per head this corresponds to a loss of 3.7 per cent, or £1,330 per person per year.

Figure 11 shows that the economy would continue to expand on all scenarios, though the whole path is higher in the stay case.

Figure 12 shows the impact of each of the transmission channels we have considered. We find that the single largest factor behind the reduction in economic output in the Deal + FTA case is productivity, lowering GDP by some 1.6 per cent in the long run. This is followed by the direct effect of trade barriers, reducing output by around 1 per cent relative to the Stay case. With the assumptions underlying our Deal + FTA scenario, lower migration scrapes 0.9 per cent off annual output and the reduction in FDI accounts for a loss of 0.3 per cent in the long run. By contrast, the impact on GDP of redirecting some of the contributions made to the EU budget to the domestic economy is negligible.

**Figure 11. GDP per capita**  
*Level in £, 2016 prices*

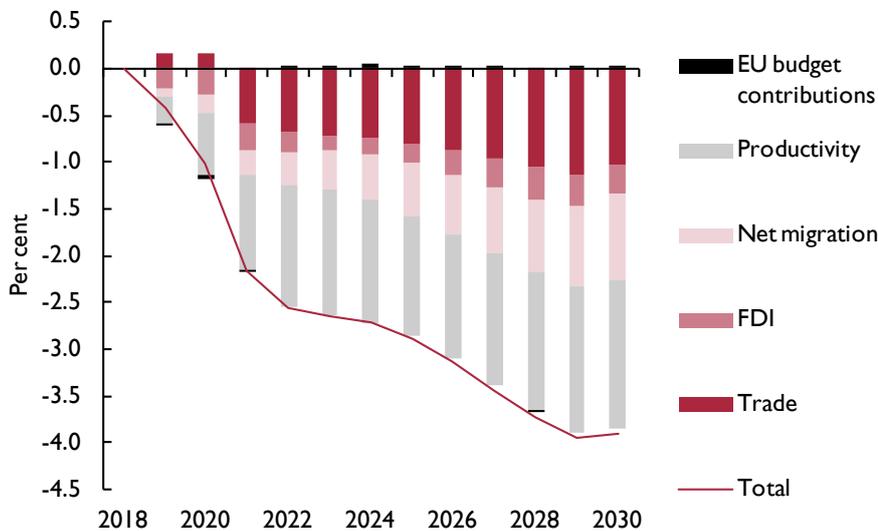


Source: NIESR.

Figure 13 illustrates that the likely introduction of trade barriers between the EU and the UK would reduce the total volume of exports by 11 to 17 per cent, depending on the regulatory alignment with the EU after the end of the transition period. Exports would be more than 20 per cent lower under a No-deal outcome.

The reduction in exports leads to an adjustment of the exchange rate. While in our Stay scenario we expect sterling to appreciate from current levels to around \$1.50 in the long run, i.e. to move back towards levels seen before the referendum was announced. Our analysis suggests that the current sterling-US dollar exchange rate of around \$1.30 is consistent with an outcome somewhere in the middle between the permanent backstop case and the UK-EU FTA case. Under a No-deal scenario, we would expect the pound to fall below \$1.30.

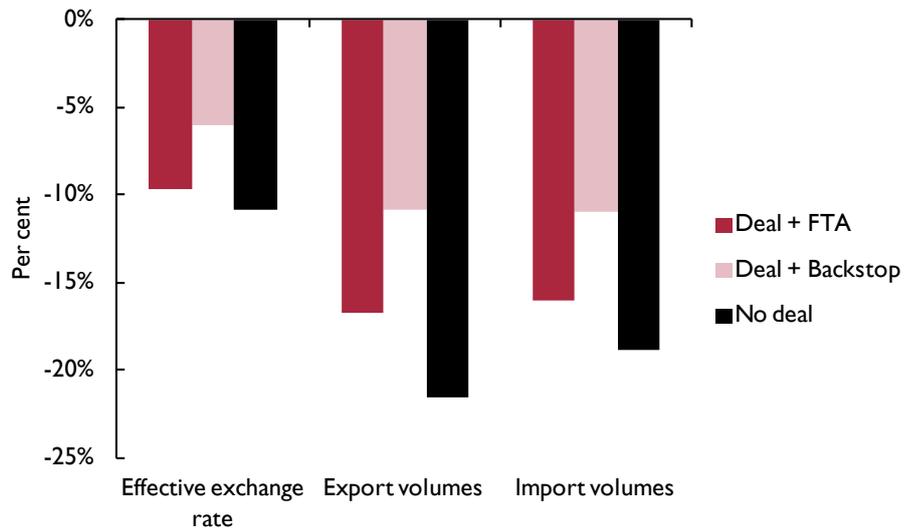
**Figure 12. Contributions to economic impact**  
*Deal + FTA scenario relative to Stay scenario, per cent difference in GDP*



Source: NIESR.

A lower exchange rate than in the Stay case means that, while providing some support to exporters, the price of imported goods and services stays elevated. This leads to a lower level of imports compared to the scenario of continued EU membership.

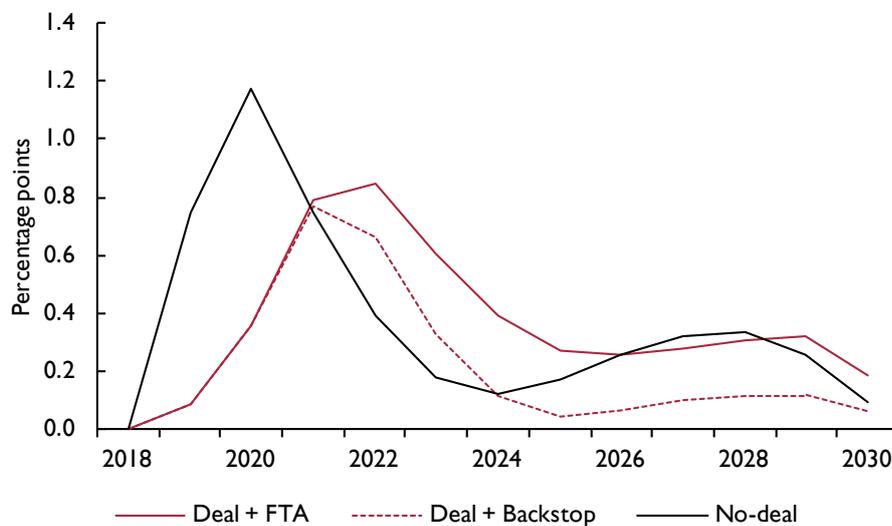
**Figure 13. Impact on total UK trade**  
Per cent difference relative to Stay scenario



Source: NIESR.

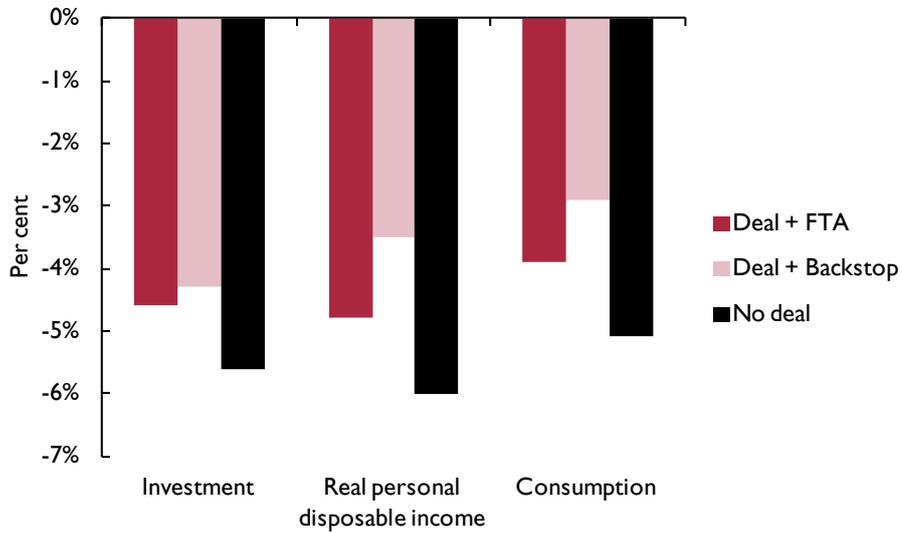
The worsening of trade conditions would lead to a rise in unemployment in the short run (figure 14). This, together with lower productivity, would put downward pressure on real wages and real disposable income (figure 15), leaving consumers with £600 to £1,000 less per year to spend compared to Stay.

**Figure 14. Impact on unemployment rate**  
Per cent difference relative to Stay scenario



Source: NIESR.

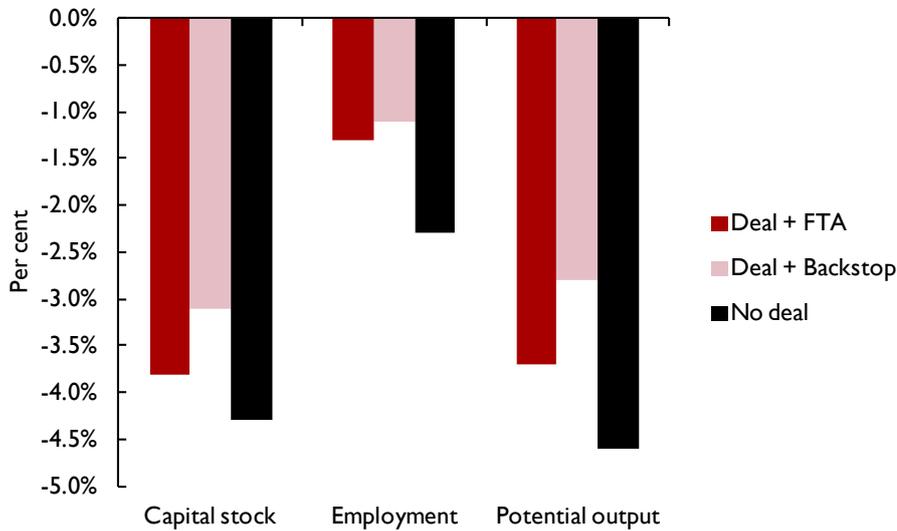
**Figure 15. Impact on investment and income**  
Per cent difference relative to Stay scenario



Source: NIESR.

Note: Investment includes business investment, housing investment and government investment.

**Figure 16 Supply side effects**  
Per cent difference relative to Stay scenario



We estimate that in the long run investment by companies, house owners and the government will be lower by 4 to 5 per cent under the government’s proposed deal, compared to the status quo. This corresponds to £19 to £21 billion less being spent per year on productive capacity, housing, and public infrastructure (figure 15).

A prolonged period of lower investment leads to a smaller size of the country’s capital stock than otherwise. Similarly, years of lower net migration in our Brexit scenarios reduces the size of the labour force relative to the Stay scenario. A reduction in capital and employment relative to Stay ultimately lead to a slowdown in the growth rate of the UK’s productive capacity. We estimate that by 2030, potential output is 2.8 to 3.7 per cent

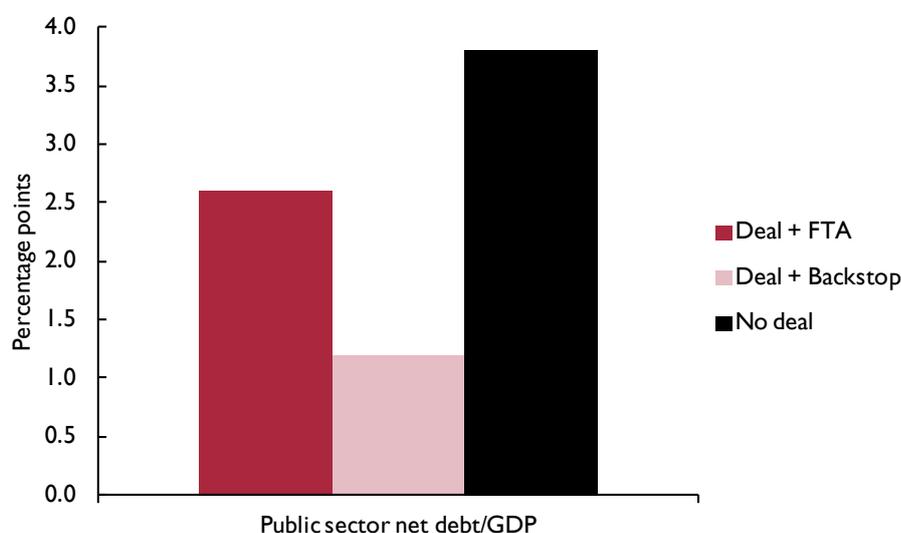
lower under the government's proposed deal compared to continued EU membership (figure 16). This explains nearly all of the long-run difference in GDP. In a No-deal scenario, the difference relative to Stay is larger at 4.6 per cent.

### *Is there scope for policy to offset some of the adverse effects on the economy?*

Because in the long run the proposed deal affects mainly the supply side of the economy through a slowdown in capital and employment growth, monetary policy will not be very effective in offsetting adverse effects. By assumption, monetary policy responds both to a reduction in capacity utilisation and higher inflation. On balance, Bank Rate is 0.2 to 0.4 percentage points higher on average over ten years compared to the Stay scenario to keep inflation close to the Bank of England's 2 per cent target. While this may leave some scope to alleviate economic shocks in the short term, monetary policy will not be able to improve the economic outlook in the long run.

Similarly, fiscal policy responds to weaker economic growth in the short run, compared to the Stay scenario. In our analysis, so-called automatic stabilisers in the form of welfare payments kick in to offset the adverse effects of somewhat higher unemployment. As a result of a weaker economy and a smaller population compared with the Stay scenario, government revenue is 1.5–2 per cent lower in the long run, corresponding to £18–23 billion foregone by the Treasury, and only partly offset by lower total long-run welfare spending. This leads to an increase in the share of government debt to GDP by 1.2 to 2.6 percentage points (figure 17), lowering the fiscal space available to the Chancellor. But in the long run, when differences in the economic outlook are shaped by differences in the trade relationship, migration and productivity, fiscal policy loses its power to stabilise the economy.

**Figure 17. Impact on public finances**  
*Percentage point difference relative to Stay scenario*



Source: NIESR.

### *Sensitivity of our results*

**Trade and productivity assumptions.** We have based our assumptions about the impact of the Brexit deal on bilateral trade between the UK and the EU on historical estimates of differences in trade patterns between members of EU and those outside. No country has to date left the EU's highly integrated economic area. One might therefore question whether our results hold under less restrictive assumptions. To check, we implement shocks to bilateral trade and productivity of half the size compared to our main analysis. Table 6 shows that this lowers the economic impact of the Deal scenarios by around 0.7 percentage points. Nevertheless, the size of the economy continues to be more than 3 per cent smaller under the Deal + FTA scenario, and more than 2 per cent smaller under the Deal + Backstop configuration. Our main estimates do not explicitly account for supply chain effects which are likely to be sizeable (Paczos, 2018) and could lead to larger differences in trade relative to the Stay scenario.

**Table 6. Sensitivity of the estimates**  
*GDP per cent difference relative to Stay scenario, long-run impact in 2030*

	Main result	Alternative trade and productivity assumptions	Main case with trade deals with non-EU countries
Deal + FTA	-3.9%	-3.1%	-3.7%
Deal + Backstop	-2.8%	-2.1%	n/a
No deal	-5.5%	n/a	-5.2%

Source: NIESR.

**Third-country free trade agreements.** If the UK were to negotiate a free trade agreement with the EU, or exit without a deal, it would have the ability to strike trade deals independently with third-party countries. Our main analysis includes the relatively optimistic assumption that the UK continues to enjoy the benefits of trade deals currently in place between the EU and non-EU countries. It might be that the UK fails to fully carry over some of these agreements but instead manages to negotiate free trade agreements with countries not currently covered by deals with the EU. This would leave our results largely unchanged. At the extreme, the UK retains full access to existing third-party arrangements and succeeds in negotiating new FTAs with major other non-EU countries. Ebell (2017) estimates that free trade agreements with the economies of the Anglosphere (US, Canada, New Zealand, Australia) could in the long run increase trade with these countries by 12 per cent. Similarly, free trade deals with all countries of the BRIICS group (Brazil, Russia, India, Indonesia, China, South Africa) could lead to an increase in bilateral trade by 19 per cent. Because current trade with both groups of countries is small relative to EU-UK trade, this would increase total UK trade by 4.8 per cent. Table 6 reports estimates for the total economic impact of a UK-EU FTA and the No-deal scenario under the assumption that all existing non-EU trade agreements stay in place and the UK enters into FTAs with Anglo-American and BRIICS countries. We find that such new FTAs would lower the overall impact on UK GDP by 0.2 percentage points in absolute terms. The difference from our main results is small because of the larger distance between non-EU countries compared to the EU and the fact that international goods trade is already considerably liberalised leaving less scope to further deepen relationships under conventional FTAs without deeper regulatory alignment and provisions for services trade. This estimate is within the range of 0.2 per cent to 0.7 per cent of GDP reported in government's own analysis (House of Commons Exiting the European Union Committee, 2018).

**Political uncertainty.** Our analysis assumes that once an agreement is found on the future trading relationships, the cloud of political uncertainty will be lifted and firms and households can adjust their expectations, at least in the long run. However, there is a possibility that the UK stays in a state of prolonged uncertainty as negotiations about future trade relationships drag on and temporary solutions effectively become near-permanent ones. In that case, we would expect the difference between the state of the economy under our deal scenarios and staying in the EU to be larger. Businesses will hold back decisions to invest and hire workers and financial market prices will incorporate risk premia that compensate investors for the uncertainty of holding UK assets. The quantification of such an uncertainty effect is difficult and the best guidance is probably provided by studies of the impact of the referendum result on the economy showing that investment growth was lower by 3 percentage points per year (Bloom and Mizen, 2018), household income was 4 per cent lower (Carney, 2018) and after two years UK GDP was 2 per cent lower (Born *et al.*, 2018) as a result of the referendum.

### *Comparison with related work*

There have been several earlier analyses of the economic impact of the UK leaving the EU, including by economists at NIESR (Pain and Young, 2004, Ebell and Warren, 2016, Chadha, 2016). Up-to-date summaries of recent studies have been published by Tetlow and Stojanovic (2018) and OBR (2018). Many of these studies have used the same 'top-down' approach as here to estimating the reduction in trade from leaving the EU based on gravity models. They have also used a similar approach to calibrating the effects from leaving the EU on migration, foreign direct investment and UK budgetary contributions.

Of course, estimates of Brexit's overall impact will depend crucially on Britain's final trading arrangement with Europe. As a result, most earlier analyses calibrate the effects of broad trading arrangements, such as moving to WTO rules, a typical free trade agreement (FTA) or to a Norway/European Economic Area (EEA) scenario. With some exceptions they broadly agree on the scale of effects. OBR (2018) summarises the effects of

additional trade barriers on GDP in each case by taking an average of previous studies and excluding the largest and smallest estimates. This suggests that, compared to the Stay case, GDP in the long run would be lower by 2.3 per cent in the EEA case, by 3 per cent in the FTA case and by 4.4 per cent in the WTO case. These estimates broadly correspond to our calculations.

In August 2018, we produced an economic assessment of the government's White Paper proposal published in July ('Chequers deal', see Hantzsche *et al.*, 2018). This analysis abstracts from direct effects of a decline in total factor productivity and finds that the economy would be some 2.3 per cent smaller in the long run under the government's July proposals. To produce a like-for-like estimate, we re-run our analysis of the two Deal scenarios 'switching off' the productivity channel. This produces a range of impact estimates of 1.9 to 2.3 per cent which encompasses our earlier estimate of the White Paper at its upper bound. Based on NIESR estimates, Tarrant and Tilford (2018) find that lower services trade in such a White Paper scenario accounts for a long-run loss of GDP of around 2 per cent alone (also accounting for service sector-related productivity effects).

Not all analyses are unfavourable to EU exit. Economists for Free Trade (2017) estimated that unilateral EU exit would boost UK GDP in the long run by 4 per cent, though this is an outlier and the methodology has been heavily criticised by Sampson *et al.* (2016) and Paczos (2018).

Gudgin *et al.* (2017) criticise the reliance of most analyses of Brexit on gravity models. In particular, they argue that the estimated average trade impacts typically used in Brexit studies apply to OECD countries on average. They find that the specific impact on goods trade for the UK is much smaller, though they do not challenge other estimates of the effects on services trade. We discuss the sensitivity of our results to different assumptions about trade and productivity in the previous section.

## NOTES

- 1 See 'We already know what the economic effects of a Brexit deal will be', by Chris Giles, *Financial Times*, 8 November 2018.
- 2 See 'Brexit deal: Government to publish analysis comparing impact of Theresa May's plan with staying in EU', *Independent*, 20 November 2018.
- 3 Letter from Mark Carney to Nicky Morgan, chair of Treasury select committee, 16 October 2018.
- 4 See Chancellor's letter to the Treasury select committee regarding the financial settlement in relation to UK withdrawal from the European Union, 24 January 2018.
- 5 UK Balance of Payments, The Pink Book: 2018, published on 31 October 2018. Available at: <https://www.ons.gov.uk/economy/nationalaccounts/balanceofpayments/bulletins/unitedkingdombalanceofpaymentsthepinkbook/2018>.
- 6 The output of Wales in 2016 was £59.6 billion, or 3.4 per cent of that of the UK (£1,748 billion).

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