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# The consequences of Brexit for UK trade and living standards

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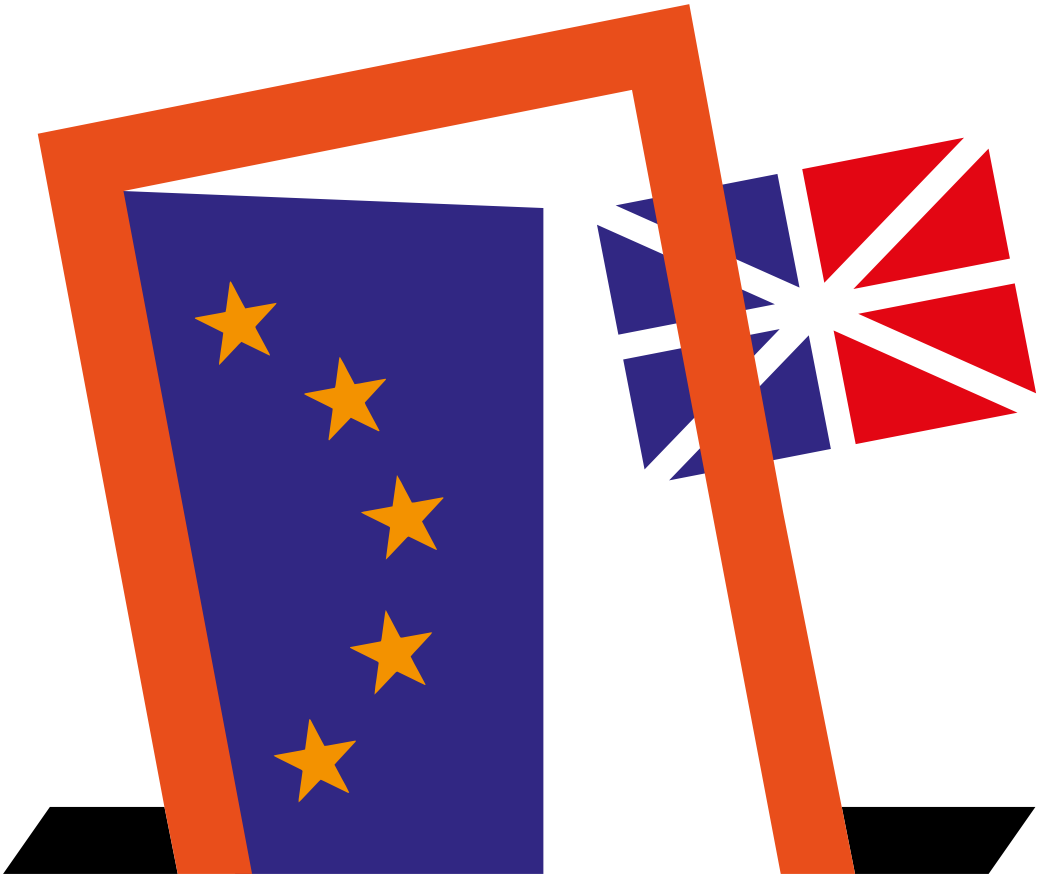

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# CEP BREXIT ANALYSIS NO. 2

## The consequences of Brexit for UK trade and living standards

- The European Union (EU) is the UK's largest trade partner. Around a half of the UK's trade is with the EU. EU membership reduces trade costs between the UK and the EU. This makes goods and services cheaper for UK consumers and allows UK businesses to export more.

- Leaving the EU ('Brexit') would lower trade between the UK and the EU because of higher tariff and non-tariff barriers to trade. In addition, the UK would benefit less from future market integration within the EU. The main economic benefit of leaving the EU would be a lower net contribution to the EU budget.

- Our analysis first quantifies the 'static' effects of Brexit on trade and income. In an 'optimistic' scenario, the UK (like Norway) obtains full access to the EU single market. We calculate this results in a 1.3% fall in average UK incomes (or £850 per household). In a 'pessimistic' scenario with larger increases in trade costs, Brexit lowers income by 2.6% (£1,700 per household).

- All EU countries lose income after Brexit. The overall GDP fall in the UK is £26 billion to £55 billion, about twice as big as the £12 billion to £28 billion income loss in the rest of the EU combined. Non-EU countries experience some smaller income gains.

- If the UK unilaterally removed *all* its tariffs on imports from the rest of the world after Brexit, UK incomes fall by 1% in the optimistic case and 2.3% in the pessimistic case.

- In the long run, reduced trade lowers productivity. Factoring in these effects substantially increases the costs of Brexit to a loss of 6.3% to 9.5% of GDP (about £4,200 to £6,400 per household).

- Being outside the EU means that the UK would not automatically benefit from future EU trade deals with other countries. This would mean missing out on the current US and Japanese deals, which are forecast to improve real incomes by 0.6%.

- After Brexit, would the UK obtain better trade deals with non-EU countries? It would not have to compromise so much with other EU states, but the UK would lose bargaining power as its economy makes up only 18% of the EU's 'single market'.

- It is unclear whether there are substantial regulatory benefits from Brexit. The UK already has one of the OECD's least regulated product and labour markets. 'Big ticket' savings are supposedly from abolition of the Renewable Energy Strategy and the Working Time Directive – both of which receive considerable domestic political support in the UK.

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## Introduction

The outcome of the UK's referendum on membership of the European Union (EU) will shape the future of the country's relationship with its largest trade partner – the EU. Membership of the EU has reduced trade costs between the UK and the rest of Europe. Most obviously, there is a customs union between EU members, which means that all tariff barriers have been removed within the EU, allowing for free trade in goods and services.

But equally important in reducing trade costs has been the reduction of non-tariff barriers resulting from the EU's continuing efforts to create a 'single market' within Europe.[1] Non-tariff barriers include a wide range of measures that raise the costs of trade such as border controls, rules of origin checks, cross-country differences in regulations over things like product standards and safety, and threats of anti-dumping.

Reductions in trade barriers have increased trade between the UK and the EU. Prior to the UK joining the European Economic Community (EEC) in 1973, around one third of UK trade was with the EEC. In 2014, the 27 other EU members accounted for 45% of the UK's exports and 53% of our imports (ONS, 2015). EU exports comprise 13% of UK national income.

Higher trade benefits UK consumers through lower prices and access to better goods and services. At the same time, the UK's workers and businesses benefit from new export opportunities that lead to higher sales and profits and allow the UK to specialise in industries in which it has a comparative advantage. Through these channels, increased trade raises output, incomes and living standards in the UK.

These standard 'static' effects of trade have been understood for many centuries since at least the work of David Ricardo. But in recent decades, studies of trade have revealed very large effects on wellbeing through other routes such as higher productivity and innovation.

How would Brexit affect the UK's trade, and what impact would this have on incomes in the UK? This briefing reports new estimates of how Brexit would affect UK living standards through trade (updating our earlier analysis in Ottaviano et al, 2014). We report a range of forecasts based on alternative estimation methods and different assumptions about how the UK's relationship with the EU would change following Brexit. We primarily focus on the narrow, static trade consequences of Brexit rather than other channels through which Brexit could affect the UK's economy, such as investment or migration.

Although it is always hard to assess what the economic future may bring and there are many uncertainties, *we consistently find that by reducing trade, Brexit would lower UK living standards*. Importantly, the fall in income per capita resulting from lower trade more than offsets any savings that the UK obtains from reduced fiscal contributions to the EU budget. Our baseline estimates imply that, after accounting for fiscal savings, the effect of Brexit is equivalent to a fall in UK income of between 1.3% and 2.6% – that is, a decline in average annual household income of between £850 and £1,700 per year.

[1] The single market is the name given to the integrated European economy created by removing economic barriers between EU members.

Our baseline estimates come from a state-of-the-art static model of the global economy. We also present estimates using empirical evidence on the links between EU membership, trade and income. This 'reduced-form' approach captures the long-run effects of leaving the EU on productivity growth and leads to much higher estimates. In this case, we calculate that Brexit may reduce national income by between 6.3% and 9.5% – that is, about £4,200 to £6,400 per household per year.

We abstract away from the cost of the policy uncertainty that will result from the negotiations over Brexit. The impact of such uncertainty has been found to be important in much recent research (Handley and Limão, 2015).

## Estimating the effects of Brexit

To estimate the effect of Brexit on the UK's trade and living standards, we use a modern quantitative trade model of the global economy. Quantitative trade models incorporate the channels through which trade affects consumers, firms and workers, and provide a mapping from trade data to welfare. The model provides numbers for how much real incomes change under different trade policies, using readily available data on trade volumes and potential trade barriers. Our model uses the most recent data (WIOD) which divides the world into 35 sectors and 31 regions. It allows for trade in both intermediate inputs and final output in both goods and services. The model takes into account the effects of Brexit on the UK's trade with the EU and the UK's trade with the rest of the world.

To forecast the consequences of the UK leaving the EU, we must make assumptions about how trade costs change following Brexit. It is not known exactly how the UK's relations with the EU would change following Brexit, which means that there is a lack of clarity over the consequences of Brexit for trade costs between the UK and the EU.

To overcome this difficulty, we analyse two scenarios: an optimistic scenario in which the increase in trade costs between the UK and the EU is small, and; a pessimistic scenario with a larger rise in trade costs.

The *optimistic* scenario assumes that in a post-Brexit world, the UK's trade relations with the EU are similar to those currently enjoyed by Norway. As a member of the European Economic Area (EEA), Norway has a free trade agreement with the EU, which means that there are no tariffs on trade between Norway and the EU. Norway is also a member of the European single market and adopts policies and regulations designed to reduce non-tariff barriers within the single market.

But Norway is not a member of the EU's customs union, so it faces some non-tariff barriers that do not apply to EU members such as rules of origin requirements and anti-dumping duties. Campos et al (2015) find that Norway's productivity growth has been harmed by not fully participating in the EU's market integration programmes.

In the *pessimistic* scenario, we assume that the UK is not successful in negotiating a new trade agreement with the EU and, therefore, that trade between the UK and the EU following Brexit is governed by World Trade Organisation (WTO) rules. This implies larger increases

in trade costs than the optimistic scenario because most favoured nation (MFN) tariffs[2] are imposed on UK-EU trade and because the WTO has made less progress on reducing non-tariff barriers than the EU.

Increases in trade costs between the UK and the EU following Brexit can be divided into three parts: (i) higher tariffs on imports; (ii) higher non-tariff barriers to trade (arising from different regulations, border controls, etc.); and (iii) the UK may not participate in future steps that the EU takes towards deeper integration and the reduction of non-tariff barriers within the EU.

In the optimistic scenario, we assume that the UK and the EU continue to enjoy a free trade agreement and Brexit does not lead to any change in tariff barriers. In the pessimistic scenario where trade is governed by WTO rules, we assume MFN tariffs are imposed on UK-EU goods trade.

Regarding non-tariff barriers, in the optimistic scenario, we assume that UK-EU trade is subject to one quarter of the reducible non-tariff barriers that are observed in trade between the United States and the EU. In the pessimistic scenario, we assume a larger increase of three quarters of reducible non-tariff barriers.[3]

Finally, trade costs between countries within the EU have been declining approximately 40% faster than trade costs between other OECD countries (Méjean and Schwellnus, 2009). In the event of Brexit, the UK would not benefit from any future reductions in intra-EU trade costs.

In the optimistic scenario, we assume that in the ten years following Brexit, intra-EU trade costs fall 20% faster than in the rest of the world, while in the pessimistic scenario, we assume intra-EU trade costs continue to fall 40% faster than in the rest of the world. This implies that in the optimistic case, non-tariff barriers within the EU fall 5.7% over the next decade, while in the pessimistic case they fall by 12.8%.[4]

Our estimates also account for fiscal transfers between the UK and the EU. Like all EU members, the UK makes a contribution to the EU budget. The net fiscal contribution of the UK to the EU budget has been estimated to be around 0.53% of national income (HM Treasury, 2013). One benefit of Brexit for the UK would be a reduced contribution to the EU budget.

But Brexit would not necessarily mean that the UK would make zero contribution to the EU budget. In return for access to the single market, EEA members such as Norway make substantial payments to the EU. On a per capita basis, Norway's financial contribution to the EU is 83% as large as the UK's payment (House of Commons, 2013). Therefore, in the optimistic case we assume that the UK's contribution to the EU budget falls by 17% (that is, 0.09% of national income).

[2] Under WTO rules, each member must grant the same 'most favoured nation' (MFN) market access, including charging the same tariffs, to all other WTO members. The only exceptions to this principle are that countries can choose to enter into free trade agreements such as the EU or the European Free Trade Association and can give preferential market access to developing countries.

[3] These assumptions imply a non-tariff barrier increase of 2.0% in the optimistic scenario and 6.0% in the pessimistic scenario. Our data on non-tariff barriers between the United States and the EU are taken from Berden et al (2009, 2013).

[4] See Dhingra et al (2016) for a complete explanation of how these changes are calculated.

In the pessimistic case where the UK is outside the EEA, we assume that the UK saves more of its current contribution. The 0.53% saving includes only the public finance components so excludes all the transfers the EU makes directly to universities, firms and other non-governmental bodies. Under the reasonable assumption that post-Brexit the UK government does not cut this funding, the saving is 0.31% according to Eurostat (http://ec.europa.eu/budget/figures/2007-2013/index_en.cfm).[5] This cost essentially comes from the agricultural subsidies in the Common Agricultural Policy.

Table 1 summarises the results of our analysis. For each case, we calculate the percentage change in the level of income per capita that has the same effect on living standards in the UK as Brexit.[6] The numbers we report should be interpreted as permanent changes in average income per capita in the UK that occur immediately following Brexit.

In the optimistic scenario, there is an overall fall in income of 1.28% that is largely driven by current and future changes in non-tariff barriers. Non-tariff barriers play a particularly important role in restricting trade in services, an area where the UK is a major exporter. In the pessimistic scenario, the overall loss increases to 2.61%.

The costs of reduced trade far outweigh the fiscal savings in both scenarios. In cash terms, the cost of Brexit to the average UK household is £850 per year in the optimistic scenario and £1,700 per year in the pessimistic scenario.

**Table 1: The effects of Brexit on UK living standards**

| | **Optimistic** | **Pessimistic** |
|---|---|---|
| Trade effects | -1.37% | -2.92% |
| Fiscal benefit | 0.09% | 0.31% |
| **Total change in income per capita** | **-1.28%** | **-2.61%** |
| Income change per household | -£850 | -£1,700 |

**Source:** CEP calculations (see Dhingra et al, 2016, for technical details).
**Notes:** *Optimistic scenario:* Increase in EU/UK Non-Tariff Barriers (+2%) + exclusion from future fall in NTB within EU (-5.7%), saving of 17% of 0.53% lower fiscal transfer. *Pessimistic scenario:* MFN Tariff + increase in EU/UK Non-Tariff Barriers (+6%) + exclusion from future fall in NTB within EU (-12.8%), saving of 0.31% net fiscal transfer.

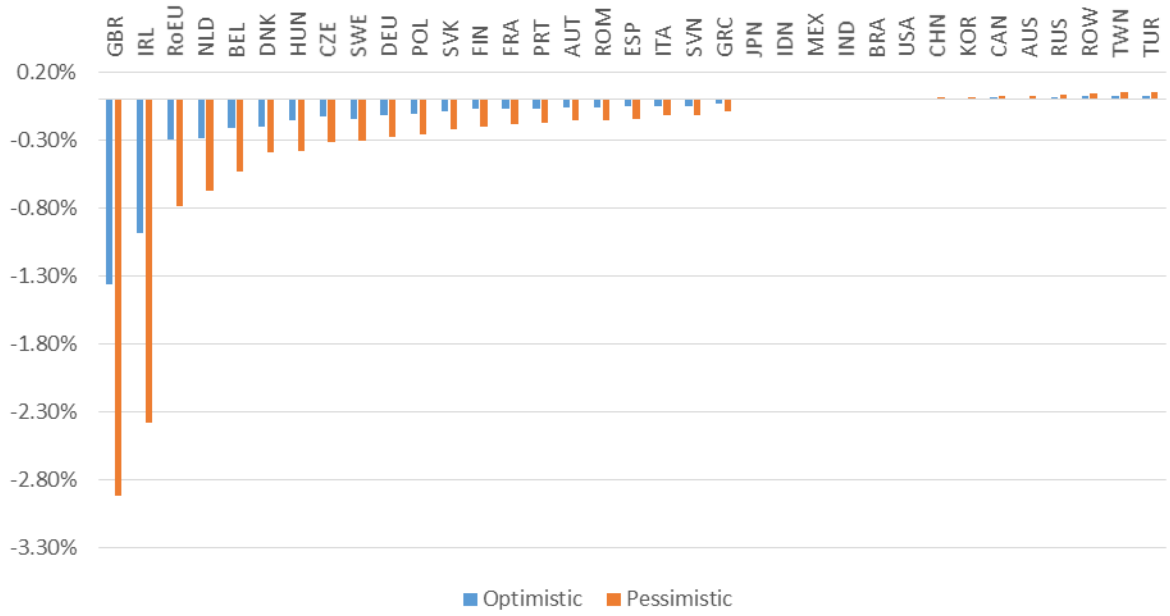
## The effect of Brexit on other countries

Although we have focused on the UK, the fall in trade also affects other countries. Figure 1 shows the distribution of changes in income per capita across countries in the optimistic and pessimistic scenarios. All EU members are worse off: Ireland suffers the largest proportional losses from Brexit, alongside the Netherlands and Belgium. Countries that lose the most are those currently trading the most with the UK. Some countries outside the EU, such as Russia and Turkey, gain as trade is diverted towards them and away from the EU.

[5] Note that we are overstating the benefits of Brexit in the optimistic scenario by using the higher 0.53% number. But we do not have accurate calculations on the comparable fraction of the 0.31% net fiscal contribution for Norway.
[6] Formally, we calculate the permanent percentage change in income per capita that has the same present discounted value effect on welfare in the UK as Brexit. We assume an annual discount rate of 4% and an intertemporal elasticity of substitution equal to one.

Altogether the EU loses between -0.12% and -0.29% of its GDP which is offset by a 0.01% to 0.02% gain for non-EU countries. These seem small percentages, but the rest of the world's GDP is, of course, much bigger than that of the UK. So whereas the UK loses between £26 billion to £55 billion from Brexit the rest of the EU is collectively £12 billion to £28 billion worse off.[7] The 'Brexit shock' is almost half as big in the rest of the EU as it is in the UK.

**Figure 1: The effect of Brexit on living standards across countries**




**Source**: CEP calculations (see Dhingra et al, 2016, for technical details).
**Notes:** Same assumptions as in notes to Table 1 except net fiscal savings not included (since we do not know how Brexit would affect the budget contributions of other EU members).

## A Swiss alternative?

Switzerland is not in the EEA but has many bilateral agreements with the EU, which gives it some access to the single market. Like Norway, it has to adopt all the regulations covering those parts of the single market in which it participates and it allows free movement of labour. It does, however, benefit from a lower fiscal transfer to the EU (about 40% of the UK's contribution on a per capita basis). On the other hand, it does not have free trade in services with the EU, which would be a disadvantage for an economy like the UK, which has a comparative advantage in services.

We simulate the effects of Brexit using Switzerland as an alternative optimistic scenario. The results are very similar: a loss of income of 1.30%. Although the fiscal transfers are lower than for Norway, these are more than offset by higher costs of trade in services.

[7] These calculation use IMF GDP estimates for 2014: world GDP $77.3tr; EU $18.5tr and UK $3tr. https://en.wikipedia.org/wiki/List_of_countries_by_GDP_%28nominal%29.

## Unilateral liberalisation after Brexit?

Following Brexit, the UK would no longer be bound by the EU's common external tariff on imports. Proponents of leaving the EU argue the UK could benefit from this change by unilaterally removing all tariffs on imports into the UK in order to lower the cost of imported goods. To analyse the consequences of this unilateral liberalisation policy, we re-run our optimistic and pessimistic scenarios after including the additional assumption that the UK removes all tariffs on imports from anywhere in the world.

Table 2 reports the results. We find that unilateral liberalisation reduces the costs of Brexit by 0.3 percentage points in both scenarios. But the overall effect of Brexit is still negative. The reason that the benefits of such a radical move are small is simple. WTO tariffs are already low, so further reductions do not make much difference. In today's world, integration is not a matter of lowering tariff rates. It requires policies, such as hammering out regulatory differences in services provision that rely on international agreement and cannot be achieved unilaterally.

**Table 2: The effects of Brexit and unilateral trade liberalisation on UK living standards**

| | ***Optimistic*** | ***Pessimistic*** |
|---|---|---|
| Brexit trade effects (from Table 1) | -1.37% | -2.92% |
| Fiscal benefit (from Table 1) | 0.09% | 0.31% |
| Unilateral liberalisation | 0.30% | 0.32% |
| **Total change in income per capita** | **-0.98%** | **-2.29%** |

**Source:** CEP calculations (see Dhingra et al, 2016, for technical details).
**Notes:** This includes simulating the unilateral removal of all tariffs on imports into the UK.

## Long-run effects of Brexit

The estimates in Table 1 are based on a static trade model that does not account for the dynamic effects of trade on productivity. Trade can have positive effects through increasing competition, which reduces excess profits and promotes efficiency. Competition, access to superior intermediate goods and a larger export market can also stimulate innovation. Recent research finds that dynamic effects may double or triple the size of the static effects reported in Table 1 (Bloom et al, 2014; Sampson, 2016).

An alternative way to evaluate the consequences of Brexit is to use the results of reduced-form empirical studies of the effects of EU membership. Baier et al (2008) find that after controlling for other determinants of bilateral trade, EU members trade substantially more with other EU countries than they do with members of the EEA or EFTA. Their estimates imply that, if the UK leaves the EU and joins EFTA, its trade with countries in the EU will fall by about a quarter.

Combining this with estimates that a 1% decline in trade reduces income per capita by between 0.5% and 0.75% (Feyrer, 2009) implies that leaving the EU and joining EEA would reduce UK income per capita by between 6.3% and 9.5% (£4,200 to £6,400 per household per year). These estimates are much higher than the costs obtained from the static trade model, suggesting that the dynamic gains from trade may be important.

Interestingly, these larger long-run effects are in the same ballpark as the benefits that the UK has gained since 1973 from being part of the EU. In a recent survey of the evidence of the impact of EU membership, Crafts (2016) concludes that EU membership raised UK GDP per capita by between 8.6% and 10.6%. Economists under-estimated the benefits from EU membership because they focused on static trade models of the kind we have employed in Table 1.

The bottom line is that the costs of Brexit could easily be about three times larger than those in the static analysis shown in Table 1.

## Future trade agreements

EU members have a common trade policy and are represented by the EU in all international trade negotiations. After Brexit, the UK would become an independent player, free to seek its own trade deals with the rest of the world. The UK could use this freedom to look for new trade deals with countries such as China, India and the United States.

Our model shows that trade with such non-EU countries does indeed rise after Brexit. But the magnitude of these increases is not enough to offset the decline in trade with the EU. Being part of the EU does not restrict UK companies' ability to trade with the rest of the world, but as our nearest neighbour and the world's largest market, the EU is the UK's natural trade partner.

When negotiating post-Brexit trade deals, the UK would not need to compromise with other EU countries. On the other hand, the UK would have to take on the cost of hiring civil servants to rebuild its capacity to undertake trade negotiations. More importantly, since the UK is a smaller market than the EU, it would have less bargaining power in trade negotiations than the EU does.

Has the UK benefited from past trade deals reached by the EU? CEP research by Breinlich et al (2016) estimates that trade agreements negotiated by the EU over the past two decades have reduced the quality-adjusted prices of imports into the UK by over one-third. Although it is often argued that the EU does not pursue trade agreements that are beneficial to the UK, these consumer benefits are twice as big as those enjoyed by the 12 other members that joined before 1995.

The EU is currently negotiating a major new free trade agreement with the United States (the Transatlantic Trade and Investment Partnership or TTIP) – as well as an 'economic partnership agreement' with Japan. If the UK leaves the EU, it will not benefit from these. Breinlich et al (2016) estimate that the US and Japanese agreements would lower prices by 0.4% and 0.2% respectively. The United States has stated that it would not do a trade deal with the UK alone (Holehouse, 2015).

## Other Brexit effects on migration, foreign investment and regulation

We have focused on the impact of Brexit on UK households through trade. Brexit could also affect the UK economy through changes in investment, migration and regulation. We will

examine these channels more closely in future reports, but one way of interpreting our findings is that for Brexit to have an economic benefit, these channels must have a sufficiently large positive effect on the UK economy to outweigh the negative effects we identify. This is extremely unlikely to be the case.

Brexit is likely to reduce foreign investment, which has been found to lead to higher productivity – for example, Haskel et al (2002). Pain and Young (2004) estimate that EU membership adds 2.25% to UK GDP via the channel of foreign direct investment. Similarly, migration is found to aid growth and help to reduce the budget deficit without serious adverse labour market effects (Wadsworth, 2015).

Eurosceptics often point to the promise of better and less regulation as a big benefit after Brexit (for example, Minford, 2015). It is important to realise that regulation will not much affect the optimistic scenario. This is because to access the single market, countries like Norway or Switzerland must adopt the same regulations as the rest of the EU (without having a vote on what these regulations are).

The UK could weaken social, employment and environmental regulation to some degree. But even if this were politically possible, the UK already has one of the most flexible employment and product market regulations in the world according to the OECD (second in product regulation to the United States and third to the United States and Canada in labour regulations). Even if the GDP impact of such regulations were large (a point on which there is controversy), further weakening protection to say US levels would make little economic difference.

If the UK were to accept higher trade costs by giving up high levels of access to EU markets (the 'pessimistic scenario' above), there would be more scope for regulatory loosening. Booth et al (2015) identify 56 regulations derived from EU legislation where the UK government's Impact Assessment finds that the costs outweigh the benefits. Crafts (2016) calculates the cost of these regulations is 0.9% of the UK's GDP.

But many of these regulations implement policies that the UK government is committed to following inside or outside the EU. For example, half of the total cost comes from just two policies: the Renewable Energy Strategy; and the Working Time Directive. Scrapping these regulations would mean abandoning the UK's renewable energy targets and removing rights such as the entitlement to 20 days paid annual leave.

Even if the regulatory costs of EU membership were 0.9% of GDP, this figure is still less than half as large as our estimates of the net cost of Brexit even in the purely static case, and a lot less than the 6.3% to 9.5% costs under the dynamic case. There are many costs of regulation in the UK, such as our inefficient planning system (as explained, for example, by the LSE Growth Commission, 2013). But these problems are primarily home-grown, rather than imports from Brussels.

## Conclusions

The economic consequences of leaving the EU will depend on what policies the UK adopts following Brexit. But lower trade due to reduced integration with EU countries is likely to cost the UK economy far more than is gained from lower contributions to the EU budget.

Even setting aside foreign investment, migration and the dynamic consequences of reduced trade, we estimate the effects of Brexit on trade and the UK's contribution to the EU budget would be equivalent to a fall in income of between 1.3% and 2.6% (£850 to £1,700 per household per year). And once we include the long-run effects of Brexit on productivity, the decline in income increases to between 6.3% and 9.5% (about £4,200 to £6,400 per household per year).

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