

# **Evaluating the Economic Impact of Brexit: ‘Fearmongering’ or Just a Matter of Degree?**

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## **Abstract:**

The UK’s decision to leave the European Union (Brexit) is a potential watershed for the UK economy. Economists are almost unanimous that this will lead to welfare losses, the extent being contingent on the specific form of UK trade relations post-Brexit. The purpose of this paper is two-fold: first, to review the insights from recent research quantifying the impact of Brexit and, drawing on this, what these models imply about the likely challenges in determining the UK’s trade relations in a post-Brexit context. Second, to consider the specific issues that will apply to the UK food and agricultural sectors. These issues will be complex: the UK relies considerably on the EU for food imports and as a destination for exports; tariffs are higher in this sector compared with other sectors; and the use of non-tariff barriers is particularly prevalent. As a consequence, Brexit will have a potentially significant impact on the food and agricultural sectors with the consequence of reduced trade and higher food prices.

**Keywords:** Brexit; trade impacts; food and agriculture.

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# Evaluating the Economic Impact of Brexit: ‘Fearmongering’ or Just a Matter of Degree?

## 1. Introduction

Despite the recent backlash against the impact of globalization and the political manifestations of this on both sides of the Atlantic, the UK’s Referendum vote to leave the European Union (EU) does not appear to be primarily related reducing exposure to trade. Indeed, the position of supporters of the UK’s departure from the EU (Brexit) has not been premised on anti-globalization *per se* but, on the departure from the EU, to develop stronger trading partnerships with non-EU countries including the US. Thus, while the vote in the Referendum may have reflected a broad and disparate range of concerns (ranging from immigration, to discontent with the functioning and governance of EU institutions (‘taking back control’), the prolonged effects of economic austerity, to cultural factors associated with anti-establishment, among others), taking a more insular approach to the UK’s engagement with trade more generally did not appear to be one of them<sup>2</sup>. Yet, while the public did not appear to vote to make themselves poorer (Hammond 2016), the outcome of Brexit which will be to loosen the UK’s ties with (by far) its most significant trading partner will most likely result in this outcome.

Quantitative assessments of Brexit confirm this to be the case and, while economists have often been criticized on their inability to reach a consensus, on the assessment of the likely consequences of Brexit, economists are almost unanimous that this will be the case. Further, the anticipated losses will be significant. The extent of the losses will be contingent on the nature of the UK’s trade post-Brexit and, in particular, whether the UK retains access to the EU’s Single Market, or ends up with a ‘hard Brexit’; this is where WTO tariffs will apply on UK exports and imports with the UK government seeking trade deals with non-EU countries.

In this paper, we review the recent assessments of the economic impact of Brexit on the UK economy. This review is not only pertinent in highlighting the direction and magnitude of the impact against alternative benchmarks, but also in determining what issues will likely arise as the UK negotiates with the EU and the development of non-EU trade arrangements post-Brexit. For example, recent research suggests that the main issue in negotiating new trading arrangements will not specifically relate to tariff barriers but on the extent of ‘actionable’ non-tariff barriers. These will determine the depth of new trade arrangements and hence on the trade potential that may arise; even the ‘softest’ of Brexit’s will have implications for the UK’s access to the EU’s Single Market particularly with respect to non-tariff barriers.

We also discuss issues specific to the UK agricultural and food sectors. The issues associated with Brexit relating to agriculture and food are both disparate and complex. With regard to agriculture, there is a perspective that leaving the EU will provide an opportunity to replace a dysfunctional Common Agricultural Policy (CAP)<sup>3</sup>. But while agriculture contributes a

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<sup>2</sup> See the UK’s government’s apparently positive outlook for UK trade in “Preparing for Our Future UK Trade Policy” Department for International Trade, 2017.

<sup>3</sup> Despite reforms to the CAP in recent years including reducing the emphasis on trade-distorting support, around 40 per cent of the EU budget is accounted for by spending on agriculture.

relatively small amount to UK GDP, the food manufacturing sector is the largest sector in UK manufacturing. Further, the UK is a substantial net importer of food and agricultural products with its major trading partner for both exports and imports being the EU. Moreover, while tariffs are generally low across manufacturing in general, they are much higher with respect to agricultural and food trade and, given the importance of standards, labelling and other regulatory requirements that impact on the food sector, the incidence of non-tariff barriers is much higher with regard to trade in food and agricultural products compared with other sectors. Addressing the broader concerns with immigration which was a main feature in the UK Referendum will also have implications for the UK food and agricultural sectors due to their reliance on the availability of seasonal and low-cost labour.

Finally, we address whether the negative assessments of Brexit are ‘fear-mongering’ or just reflect a matter of degree. While the initial assessments by the UK Treasury were certainly portrayed as the former by both senior government ministers and the pro-Brexit section of the media, the economic assessments of Brexit not only predict a change in welfare in the same direction (they are (almost) all negative), but the losses are potentially substantial. Indeed, the initial UK Treasury assessments have since been regarded as too conservative. We therefore close with some observations relating to the apparent difficulty for the economists’ case to be made to the general public.

## **2. Economic Assessments of Brexit**

### *Context*

It is useful to provide some context to the quantitative assessments of Brexit. First, most UK trade in goods is with the EU: around 47 per cent of UK exports go to the EU and the EU is the source for over 50 per cent of UK imports (UK Treasury 2016). Some sectors are more tied to the EU than others, as Table 1 shows. More than half of UK total imports in chemical products, machinery and transport and manufacturing more generally are sourced from the EU. The UK is also reliant on the EU for (mainly processed) food imports. The EU is also the main destination for UK exports: for manufactured goods, chemical products and transport equipment, over 40 per cent of UK exports are destined for the EU. The food sector has a greater reliance on the EU, with around 70 per cent of food products destined for the EU<sup>4</sup>.

Econometric (gravity-based) studies have confirmed the trade-enhancing aspects of the EU. Carrere (2006), using data on 130 countries over the period 1962 to 1996, estimates that membership of the EU increased trade by 104 per cent. Baier *et al.* (2008) estimates that EU membership increased intra-EU trade by over 92 per cent and Eicher *et al.* (2012) estimate the trade enhancing effect to be in the region of 50 per cent. The UK Treasury report (2016), discussed in more detail below, estimates that intra-EU trade increased by between 68 and 85 per cent (relative to a WTO benchmark) due to membership of the EU<sup>5</sup>. The direct observation of the importance of the EU as a trading partner for the UK, complemented by

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<sup>4</sup> Trade in services with the EU is also important for the UK; as a net exporter in the services sector, the EU accounts for 50 per cent of UK services exports (UK Treasury 2016).

<sup>5</sup> The trade enhancing effects of membership of the EU estimated from these studies outstrip the gains for countries party of free trade agreements.

estimates about the trade-enhancing effect of EU membership, gives an indication of the economic significance of the UK’s decision to leave the EU.

**Table 1: UK Trade with the EU as a Percentage of Total Trade (2015)**

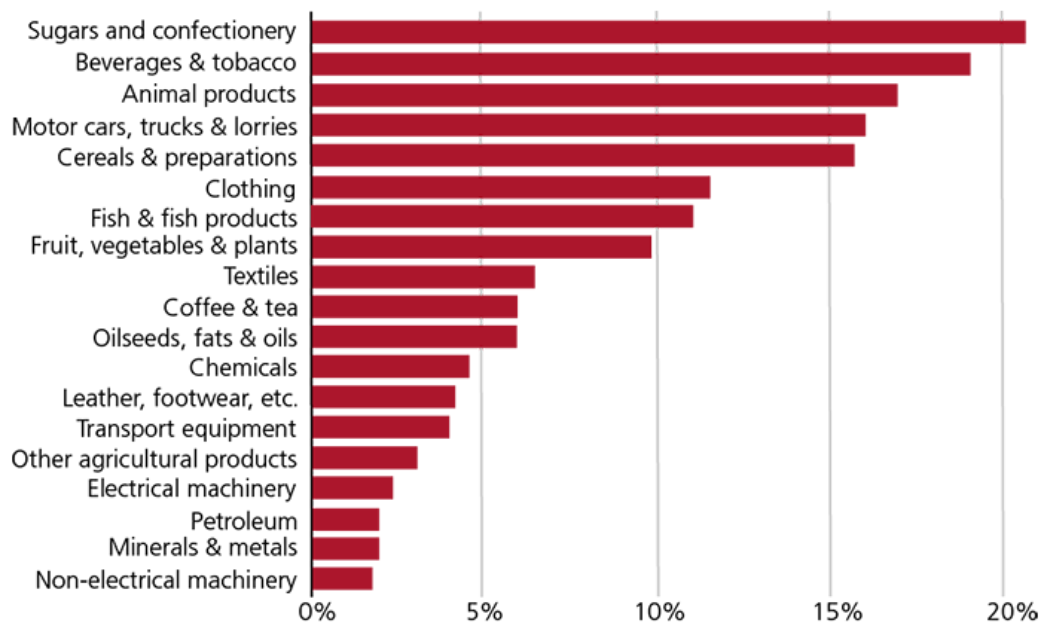
Industry	% of UK Total Exports to EU	% of UK Total Imports from EU
Food and Live Animals	69	65
Beverages	37	70
Mineral Fuels	62	5
Animal & Vegetable Oils	77	63
Chemical and Related Products	44	64
Manufactured Goods	47	51
Machinery and Transport	39	56
Misc Manufactured Goods	42	36

**Source:** UN COMTRADE. Data is at the SITC 1 Digit Level.

Second, given the deepening of EU integration over time, not only is trade with EU partners tariff free, but the development of the Single Market has involved the harmonisation of standards, the exercise of common policies and the removal or reduction in other barriers to trade that has facilitated the reduction of trade costs among the 28 (soon to be 27) EU partner countries. As we note below, the depth of the EU trading bloc (in terms of the range of barriers it seeks to reduce including so-called ‘behind the border’ measures) means that seeking new trade deals will be challenging (or at least involve prolonged negotiations) if they are to go beyond simple reduction of tariffs. However, the Single Market is not just tied to the reduction of trade costs between EU Member States but also require commitments regarding the free movement of capital and labour. This, in turn, has implications for the UK financial sector and the movement of labour across EU Member States and will feature in any post-Brexit trade arrangement the UK negotiates with the EU.

Third, these issues also extend to the UK’s trade relations outside the EU where the negotiations will focus on market access issues with other countries. In this context, tariffs will be the relatively easy part of the negotiations. Assuming an initial profile of tariffs as per the EU’s common trade policy, tariffs that apply on EU imports and exports (most-favoured nation (MFN) tariffs), on average, are already quite low. In Figure 1, we report a profile of applied tariffs that apply to EU imports. With the exception of tariffs on vehicles and clothing, applied tariffs on non-food and agricultural imports are low; the 5 per cent un-weighted average is similar to the MFN tariff that applies to EU exports. One standout from Figure 1 relates to tariffs on food and agricultural imports. These tariffs are considerably higher compared with other sectors and we return to this issue below.

**Figure1: EU Average Final Applied Tariffs by Industry**



**Source:** House of Lords (2017) *European Union Committee, Brexit: Agriculture*.

However, non-tariff measures are much more significant: recent attempts to gauge the magnitude of non-tariff barriers that apply across sectors are reported in Table 2. The data relates to *ad valorem* tariff equivalent effects. In the first column, we report the results from Egger *et al.* (2015) who estimate the tariff equivalent effect of reducing barriers to intra-EU trade to be, on average across the manufacturing sector, around 13 per cent which exceeds the average applied tariff of 5 per cent. In general, non-tariff barriers exceed tariff barriers in all sectors. But there is also substantial dispersion in these non-tariff effects: most notably, non-tariff measures are particularly high for processed foods, metals and agriculture. A similar profile arises from the Berden *et al.* (2013) study. Non-tariff measures faced by the US accessing the EU market are, on average across manufacturing, around 20 per cent and again there is substantial dispersion; most notably, non-tariff measures have a tariff equivalent of around 57 per cent for the food processing sector. Berden *et al.* (2013) also suggest that the proportion of ‘actionable’ non-tariff measures is just over 50 per cent i.e. outside the EU Single Market, even if the UK agrees trade deals that encompass non-tariff measures, trade costs that the UK will likely face outside the EU Single Market will still be significant.

Two observations arise from this. First, the impact of Brexit vis-à-vis trade will likely arise with regard to the impact of non-tariff barriers. The success of any post-Brexit trade arrangement with non-EU countries, will relate to the depth of agreements and how they address non-tariff-related issues. Second, given the profile of tariff and non-tariff measures, they will be particularly pertinent to the impact of Brexit on the UK food and agricultural sectors.

**Table 2: Comparison of the Tariff (*Ad Valorem*) Equivalent Effects of Non-Tariff Measures in EU**

Industry	Egger <i>et al.</i> (2015)	Industry	Berden <i>et al.</i> (2009)
Primary Agriculture	25	Food, beverages & Tobacco	57
Processed Food	48		
Beverages and Tobacco	42		
Chemicals, pharmaceuticals	21	Chemicals & Chemical Products	24
Fabricated Metals	38	Basic & Fabricated Metals	12
Motor Vehicles	20	Transport Equipment	22
Electrical Machinery	19	Electrical & Optical Equipment	7
Goods Average	13	Overall Weighted Average (All Sectors)	20

**Notes:** The estimates of the tariff equivalents of non-tariff barriers differ between the two studies. In Egger *et al.* (2015), the estimates are derived from a gravity-based framework where the tariff equivalents relate to the tariff equivalent measure of the reduction in trade costs due to membership of the EU. In Berden *et al.* (2009) is the tariff equivalent of (non-tariff) trade costs relating to trade flows between the US and EU. Estimates from both studies have been rounded.

### *Beyond Trade Issues*

The impact of Brexit will extend beyond trade flows: foreign direct investment (FDI) and immigration will also be affected by Brexit. The issue of FDI is less well-covered in the assessments reported below largely reflecting a comparative lack of research on this topic. Bruno *et al.* (2016) have recently focussed on the impact of EU membership on FDI. Based on a gravity framework, their estimates suggest that membership of the EU has increased FDI inflows by between 14-38 per cent. This is lower than the gravity-based estimates of the effect of EU membership on trade reported above though this may also reflect that with EU integration making trade easier, this has reduced the extent to which FDI would have been expected to increase between EU members.

Immigration has been one of the most politically toxic issues with regard to the UK's relations with the EU. Aspects of the UK's relations with the EU post-Brexit will likely be tied to compromises (or lack thereof) with regard to the movement of labour. There has been a marked increase in the numbers of working age migrants in the UK in recent years, the numbers more than doubling from 3 million in 1993 to 7 million in 2015; in 2015, foreign-born migrants accounted for almost 17 per cent of total employment (Rienzo 2016). A significant part of the increase in immigration has been sourced from the EU particularly since 2004 following the accession of East European countries to the EU<sup>6</sup>. These numbers are not evenly spread across sectors and, as we note below, the food and agricultural sectors are reliant on the supply of migrants.

<sup>6</sup> Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia.

While the issue of immigration loomed large in the EU Referendum, it has been difficult to discern that immigration into the UK has, overall, had a significant impact in depressing wages. In part, this reflects the profile of immigrants who tend to be better educated than UK nationals. Evidence presented in Wadsworth (2015) show that 43 per cent of EU immigrants had completed higher education compared with 23 per cent for UK nationals. Reflecting this profile, Manacorda *et al.* (2011) find no effect of immigration on wages of UK nationals largely reflecting that immigrants and domestic workers are imperfect substitutes. Their results show that recent immigrants are more likely to have a negative impact on the wages of previous immigrants than UK workers.

The educational attainment of immigrants also features in the assessment of Dustmann *et al.* (2013). They focus on the distributional profile of wages in the UK and report that immigration has led to an increase in average wages in the UK. But there are differences across the distribution: immigration has had a positive effect on median wages and wages in the higher deciles have increased but decreased wages in the lowest decile. One observation from Dustmann *et al.* (2013) is that immigrants tend to find employment in industries that are not commensurate with their educational achievements. But even this negative effect on wages at the low end of the distribution, while statistically significant is not economically large.

#### *Alternative Scenarios*

Since the triggering of Article 50 which formalises the UK's departure from the EU, there is less clarity on what Brexit would actually mean and, as such, quantitative assessments address scenarios relating to 'soft' or 'hard' Brexit. While these alternatives obviously relate to the potential implications for trade costs and the re-orientation of UK trade, they are also loaded with political issues (particularly in regard to the free movement of labour) that may be more or less palatable to the UK government and public as the post-Brexit trade deal will encompass trade-offs if access to the EU Single Market is to be retained.

'Hard' Brexit is what the most zealous Brexit-eers would demand and is alternatively referred to as the 'WTO' option. In this case, the UK would be -in a policy sense- completely extricated from the EU and would apply MFN tariffs vis-à-vis all trading partners. The UK would seek trade deals with any other country independently of the EU. At the same time, the UK would lose access to the EU Single Market. There would be no requirement to retain the principle of free movement of labour though the UK financial sector would have no right of access in other EU Member States. However, given that the EU is the UK's major trading partner, this would have a significant impact on trade. The UK's exports to and imports from the EU would now be subject to tariffs and non-tariff barriers, as detailed above. Even if the UK retained the same (EU) regulatory and other aspects of harmonisation that apply at present, the costs of trade could still rise due to, *inter alia*, customs checks, border controls and auditing of regulations to ensure compliance.

'Soft' Brexit comes in a variety of forms but are largely centred on retaining some degree of access to the EU Single Market. One version of this is the 'Norway option' involving

membership of the European Economic Area (EEA): Norway is not a member of the EU, can negotiate its own trading arrangements with non-EU countries but has access to the EU Single Market. But compromises would be necessary to comply with this option: as part of the Single Market, there would however still have to be free movement of labour and contributions to the EU budget would still be made. In addition, the UK would have no input into rule-making at the EU level but still be subject to EU decisions. But the costs of UK's trade with the EU would still rise even with tariff-free access and harmonisation with EU standards. Specifically, the 'Norway option' would require rules of origin for exports to the EU given that Norway still has the capacity to form its own trade arrangements with non-EU countries<sup>7</sup>.

An alternative 'soft' option is a bilateral deal similar to the agreement Switzerland has with the EU. This again involves free access to the EU market but with the *quid pro quo* of free movement of labour. While the UK would have the freedom to negotiate bilateral deals with non-EU countries and to opt in or out of EU programmes on a case-by-case basis, the downsides of this option (at least as it applies to Switzerland) is that trade in services is excluded which would have implications for the UK financial sector and that there are still financial contributions to the EU budget.

Bespoke free trade arrangements (such as the Canadian free trade agreement with the EU) offer alternative forms of post-Brexit arrangement with the EU. But there may be limitations on what would be covered here. For example, in the Canadian-EU free trade agreement, although market access for Canadian exports to the EU will increase, there are certain exclusions particularly in the agricultural and food sectors and services<sup>8</sup>. Finally, there is the option to become a member of the European Free Trade Area (EFTA) which would involve free trade in goods with the EU (but not in services), but avoid commitments regarding free movement of labour and contributions to the EU budget. The UK would be subject to product standards set by the EU and, as not being a member of the customs union, would incur border checks to ensure compliance with EU requirements.

The options between 'soft' and 'hard' Brexit therefore revolve around trade costs that will apply to the UK following exit from the EU and will relate to the extent to which the UK and EU will compromise on wider issues. At one end, the range of 'soft' Brexit options involve access to the EU Single Market; in this case, there would still be an increase in trade costs beyond what applies to UK-EU trade at present though with the added complications of retaining the principle of free movement of labour in particular and continued financial contributions to the EU budget, both of which could have significant political ramifications in the UK. At the other end, 'hard' Brexit gives the UK more sovereignty and avoids the

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<sup>7</sup> Various studies have highlighted the impact of rules of origin as representing an increase in trade costs. For example, a study by the Centre for Economic Policy Research found that applying rules of origin increased trade costs by between 4-15 per cent (CEPR 2013).

<sup>8</sup> The EU-Canadian trade deal –the Comprehensive Economic and Trade Agreement (CETA)- came into force in September, 2017. Tariffs across almost all tariff lines are fully eliminated. There are some exceptions that apply in the food and agricultural sectors however. Some sectors have been identified as being sensitive where either the opening of the partners' countries markets has been limited or where it has been excluded from the trade agreement (for example, poultry).



political compromises associated with the softer options. But ‘hard’ Brexit would involve the most significant increase in trade costs and a greater re-orientation of trade away from the EU.

### **3. Assessing the Impact of Brexit**

In interpreting the quantitative assessments of Brexit, it is important to differentiate between the static (e.g. the impact of alternative Brexit scenarios on trade flows and the resulting welfare effects) and the dynamic effects (i.e. the effects of openness on productivity, innovation, better management and so on). These dynamic effects, though more tenuous in terms of identifying their specific form and impact, are thought to be more important than the static effects on welfare that arise through trade; recent studies including Sampson (2016) report that the dynamic effects of openness can exceed the static trade effects by a factor of between 2-3. In broad terms, there are two approaches to measuring the potential impact of Brexit. One approach is to estimate the aggregate trade impact on trade relating to alternative options for the UK based on a gravity-model approach and, from the trade impact, derive the dynamic (long-term) effects. The most convenient way of measuring these dynamic effects is to use an external estimate of the elasticity of growth with respect to trade, the estimates provided by Feyrer (2009, 2011) being used as linking the static to dynamic effects of Brexit. This is the approach taken in the UK Treasury assessment of Brexit (UK Treasury 2016). The alternative is to use calibrated models that focus on the static trade effects. The advantage of the latter is that they can cover more detail on the trade impact as the model can be calibrated across more sectors and cover more countries. This is the key feature of the structural general equilibrium model covering 31 sectors and 35 countries/regions is employed by Dhingra *et al.* (forthcoming) to assess the trade impact of Brexit. We report on the insights from both of these approaches below.

#### *Long-Term Impact of Brexit*

The most widely-publicised assessment of the impact of Brexit has been the UK Treasury report published in the run-up to the Referendum (HM Treasury, 2016). The main results from this study are reported in Table 3. The Treasury assessment is based on three components: the effect of trade contingent on the form Brexit may take and the effects on FDI; linking the static effects of trade and FDI with the potential dynamic effects employing an estimate of the elasticity of productivity to openness from Feyrer (2009); inputting these estimates into a macroeconomic model to measure the long-term effects on UK GDP. To benchmark the Treasury estimates, we also report in Table 3, a comparable approach by Dhingra *et al.* (2016); also reported in the table, is the results on the long-term impact produced by the OECD (2016) though the latter use a macroeconomic model to gauge the potential effects.

The estimates from the UK Treasury indicate the substantial negative effect as a result of Brexit. With a ‘hard’ Brexit, welfare is predicted to fall by 7.5 per cent. The Treasury aimed to convey the significance of these effects by relating the impact to the cost at the household level; in 2015 terms, each household would be £5,200 worse off as a result of a ‘hard’ Brexit.

A ‘soft’ Brexit would still involve substantial losses of between 3.8 to 6.2 per cent of GDP (equivalent to between -£2,600 and -£4,300 at the household level), the range dependent on the specific form a ‘soft’ Brexit would take. To put these numbers in context, the data from the UK Office for National Statistics reports average household disposable income in 2015 at around £28,000. As the estimates from the Treasury analysis show, even the ‘softest’ version of all (i.e. continued access to the EU Single Market) would still involve losses to the UK as the level of trade with EU Member States would fall; this is due to the impact of some non-tariff barriers (such as customs procedures and rules of origin issues) even if there was tariff-free access and harmonisation of standards between the UK and the rest of the EU.

**Table 3: Long Term Estimates of the Effect of Brexit on the UK**

	<u>UK Treasury</u>		<b>Dinghra <i>et al.</i> (2016)</b>	<b>OECD</b>
	<b>‘Soft’ Brexit</b>	<b>‘Hard’ Brexit</b>		
Change in GDP	-3.8 to -6.2%	-7.5%	-6.3 to 9.5%	-5.1%
GDP cost per household	-£2,600 to -£4,300	-£5,200	-£4,200 to -£6,400	-£3,200

**Note:** ‘Hard’ Brexit relates to the case where the UK leaves the EU and WTO tariffs applies to UK trade and the UK applies current (EU) MFN tariffs. In the case of ‘Soft’ Brexit, the scenario relates to the UK having access to the EU Single Market. In the case of the UK Treasury analysis, the higher estimates of the losses the UK incurs relate to an agreement with the EU similar to the one currently in place with Switzerland. The lower estimates relate to an agreement with access to the EU Single market similar to the agreement Norway has with the EU.

While these estimates, as with all economic assessments are subject to error, they nevertheless point to a significant impact for the UK from Brexit. The publication of these estimated losses, attracted the wrath of supporters of Brexit, involving accusations of ‘fear-mongering’ even by serving (pro-Leave) government ministers, politicians and sections of the media<sup>9</sup>. But they are in the ball-park of other assessments. Applying a similar methodology (i.e. a gravity-based model and then accounting for the dynamic effects by linking the trade impact to a growth elasticity), Dinghra *et al.* (2016) suggest that the UK Treasury assessment is too conservative. They report the long-term impact to be between -6.3 to 9.5 per cent of UK GDP; these estimates relate to the ‘softest’ of the Brexit options and therefore comparable with the lower end of the UK Treasury estimates. In deriving this higher figure, Dinghra *et al.* (2016) estimated the trade effects to be greater and used a higher value of the elasticity linking the static trade effects to the dynamic effects. They are also within the range of those reported by the OECD (2016). Although the OECD pursues a different approach to gauging the potential direct effects of Brexit (though the macroeconomic model to gauge the

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<sup>9</sup> Conservative Minister Andrea Leadsom labelled the Treasury assessment as “unfair and biased” and John Redwood characterised the estimates as “absurd” (The Guardian, Treasury Brexit report is ‘unfair and biased’, says Tory minister” [www.theguardian.com](http://www.theguardian.com). Accessed 19<sup>th</sup> September, 2017).

GDP effects is also the one used by the UK Treasury), the reported impact is also significant at -5.1 per cent of GDP (though this estimate assumes the ‘hard’ Brexit scenario).

### *Trade-Specific Impact*

The most immediate and obvious impact relates to the change in trade flows and the volume of trade as barrier-free trade no longer applies to UK exports and imports even under the ‘soft’ Brexit option. The Treasury estimates that the UK’s departure from the EU but retained access to the Single Market would reduce trade by around 9 per cent. The WTO option, however, would reduce UK trade by between -17 and -24 per cent. A negotiated free trade deal would reduce trade by between -14 and -19 per cent. Relating to the work by Mulabdic *et al.* (2017) that emphasises the importance of the ‘depth’ of regional trading arrangements, Dhingra *et al.* (2016) suggest that the trade effects could be even higher: with access to the Single Market, UK trade could fall by around 14 per cent with the impact rising to over 50 per cent in the WTO case. These higher estimates underpin the importance of the ‘behind-the-border’ effects associated with bilateral agreements.

More detailed assessment of the (static) trade effects are reported by Dhingra *et al.* (forthcoming) using an alternative to the econometric gravity models with their estimates being based on a structural general equilibrium model that has ‘gravity-type’ features as detailed by Costinot and Rodriguez-Clare (2014). This model derives the change in trade costs that arise in alternative Brexit scenarios that is then related to a ‘trade elasticity’ that determines the static trade effect. The trade elasticities vary across sectors with estimates of these being sourced from Caliendo *et al.* (2015). The attraction of this structural rather than reduced-form approach is that the model can be calibrated in greater detail relating to a large number of sectors (31 in the case of the model calibrated here) and countries/regions (35), identify the effects the use of tariff and non-tariff barriers that apply to trade in these sectors as well as the foregone benefits of further integration in the EU.

The impact of trade arising from this structural approach is reported in Table 4. Not unsurprisingly, the trade effects of a ‘soft’ Brexit are lower than the ‘hard’ Brexit case. There is a decrease in total trade of between -8 per cent (for imports) and -9 per cent (for exports), though trade with the EU falls by a considerably greater amount (-25% for exports and -22% for imports). In the ‘hard’ Brexit case, trade falls by around -16 to -17 per cent with the reduction in trade with the EU being much more significant<sup>10</sup>.

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<sup>10</sup> Trade flows are not the only dimensions of globalisation that will be impacted by Brexit. Foreign direct investment and labour flows will also be affected. The UK Treasury assessment provides a direct assessment on the effects of FDI using a gravity model from which they also derive the dynamic effects. Specifically, over the long-run, a ‘hard’ Brexit outcome will lead to a decrease in UK FDI by between -18 and -26 per cent which compares with an estimate used by Dhingra *et al.* (2016) of -22 per cent. Relating this to UK income, the decline in FDI between the UK and the EU, the decline in income would be in the region of around 3 per cent

**Table 4: Comparison of the Trade Effects of Brexit  
(Percentage Change)**

	Total Exports	Exports to EU	Total Imports	Imports from EU
'Soft' Brexit	-9	-25	-8	-22
'Hard' Brexit	-16	-43	-16	-38

**Notes:** The 'soft' Brexit scenario relates to where the UK exits the EU but agrees access to the Single Market via the European Economic Area. The 'hard' Brexit option relates to the WTO case.

**Source:** Dhingra *et al.* (forthcoming).

These trade effects translate into substantive changes in welfare. These are reported in Table 5. In the 'soft' Brexit case, welfare falls by -1.34 per cent which translates (at 2015 levels) into a decrease in household income of -£893. These losses are almost doubled in the 'hard' Brexit case, with a decrease in welfare of -2.66 per cent, corresponding to a decrease in household level income of -£1773. The composition of the welfare changes are reported in the bottom half of Table 5<sup>11</sup>. The most significant impact relates to being outside the EU as further integration develops with further harmonisation across EU member countries and the removal of remaining non-tariff barriers. The 'price' of missing out translates into a decline in welfare of -0.9 per cent in the 'soft' Brexit case to -1.6 per cent in the 'hard' Brexit case. If we also allowed for these foregone effects in the UK Treasury assessment, the reported losses in the 'hard' Brexit case would increase from -7.5 per cent (see Table 3) to around 9.5 per cent (UK Treasury 2016).

**Table 5: Impact of Brexit: Welfare Change and Composition**

	'Soft' Brexit	'Hard' Brexit
Welfare Impact:		
Total Change in Welfare	-1.34%	-2.66%
Household Effect	-£893	-£1,773
Composition of Welfare Changes:		
Rise in UK-EU Tariffs		-0.13%
Rise in UK-EU Non-Tariff Barriers	-0.53%	-1.31%
Foregone Impact of Further EU Integration	-0.90%	-1.61%

**Source:** Dhingra *et al.* (forthcoming)

Even if pro-Leave interests would cast doubt on these additional integration effects actually materialising, they nevertheless point to the importance of non-tariff barriers as the main driver of the trade impact. Comparing tariff levels with current levels of non-tariff barriers confirm that it is the latter which is important, an observation which is arguably obvious from the evidence reported in Figure 1 and Table 2 above. Outside the EU, Dhingra *et al.* (forthcoming) estimate the effect of being exposed to EU tariff measures to reduce UK

<sup>1111</sup> These figures do not exactly add up to the welfare changes reported in the top-half of the table due to the different nature of the counterfactuals used to derive these numbers.

welfare by -0.13 per cent. Facing non-tariff measures (where the reference is to a proportion of the reducible dimensions to non-tariff measures, see above), UK welfare falls by -1.31 per cent, a decrease by a factor of around 10 compared to the tariff case. These estimates highlight the significance of focussing on non-tariff measures in any post-Brexit agreements. This point is also underpinned by a recent study by Mulabdic *et al.* (2017). They show that the most significant regional trade agreements involve ‘deep’ integration with the focus on integration between countries that go beyond standard trade measures.

### *Summary*

As is clear from the above discussion, none of the main studies report a positive outcome for the UK following Brexit, whatever form it takes. Indeed, all report substantive negative consequences with damaging effects on the UK economy which translates into significant reductions in the income of average households. The effects do not come only through the static effects associated with the reductions in (net) trade but also through the dynamic effects associated with increases in productivity and innovation that is associated with openness. As noted above, from a political perspective, Brexit is not *per se* associated with concerns about globalization (at least as far as trade is concerned) as the expectation is that the UK government will seek trade deals with other countries. But Brexit is certainly denying gravity: the UK will reduce its ties with its major trade partner and forego lower trade costs associated with the process of European integration. These effects may be ameliorated to some extent by a ‘soft’ Brexit option but this will likely involve compromises regarding free movement of labour, less control over decisions that will affect the UK economy and with little compensation in terms of reduced (net) contributions to the EU budget<sup>12</sup>. As such, the decision by the UK to limit its ties with the EU, its major trading partner for both exports and imports will result in significant the negative consequences; there is almost unanimous consensus among economists that this will be the case. The quantitative assessments emphasise the role of the different mechanisms but all are clear in their overall message: the reduction in welfare for UK households will be significant and long-lasting.

Finally, note that the consensus of economists on the impact of Brexit is nearly, but not quite, complete. The *Economists for Free Trade* (formerly known as the *Economists for Brexit*) have portrayed a different view of Brexit arguing that there are substantial gains to be reaped, referring to the above-mentioned UK Treasury report as ‘Project Fear’<sup>13</sup>. These gains arise not only from the UK leaving the EU but also followed by a unilateral liberalisation of tariffs on UK imports, arguing that the long-term gains will amount to around 6 per cent of GDP. Their approach, however, has been regarded as overly-simplistic as it ignores many of the aspects of world trade that are accommodated in the assessments reported above including

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<sup>12</sup> While much has been made of UK savings arising from not contributing to the EU budget, the potential net savings are dwarfed by impact of the static and dynamic effects. Indeed, the overall fiscal impact is greater than the budget contribution saving as reductions in trade and GDP that would arise from Brexit would reduce tax receipts. The UK Treasury assessment is that UK fiscal receipts would be £20 (£45) billion per annum lower with the ‘soft’ (‘hard’) Brexit options.

<sup>13</sup> Economists for Free Trade, ‘*From Project Fear to Project Prosperity*’ (2017). Available at [www.economistsforfreetrade.com](http://www.economistsforfreetrade.com)

the importance of gravity and no (or inadequate) reference to non-tariff barriers that are more important than the tariff effects they simulate<sup>14</sup>.

#### **4. Agriculture, Food and Brexit**

Formal assessment of the consequences of Brexit for the UK agricultural and food sectors (and the resulting impact on food prices) has been sparse; yet the issues associated with these sectors will be among the most complex to resolve. The political context for addressing issues that will arise in these sectors is also confusing: Cabinet members (both in the run-up and immediately following the UK Referendum) responsible for the Department of Environment, Food and Agricultural Affairs (DEFRA) have been leading proponents of Brexit; the main body representing farmers' interests (the National Farmers Union) advocated 'Remain', yet the majority of its membership voted to leave. While the public view of the EU's involvement with UK farmers likely relates to the high budgetary costs associated with payments arising the Common Agricultural Policy (CAP), it is important to separate agriculture-specific from food issues<sup>15</sup>.

In context, while the contribution of agriculture constitutes a relatively small proportion of UK GDP (at around 2 per cent), the UK food manufacturing industry contributes a much larger proportion to GDP and employment, food and agriculture's contribution as a whole amounting to around 7 per cent of UK GDP. As detailed below, with a high dependence on the EU for imports and as a destination for exports and with tariffs and non-tariff barriers applied to trade in these sectors being particularly high, UK food and agriculture will be one of the most exposed to Brexit-related issues. While there has been little assessment of what may arise for the agricultural producers at one end of the food chain and the impact on consumers at the other, the potential impact on UK food and agriculture is exacerbated by the observation that some of the 'soft' Brexit options outlined above have excluded access of Norway and Switzerland's agricultural sectors to the EU market and there are limitations on exports for food and agricultural products in the free trade agreement with Canada.

A number of observations place the potential concerns of the UK agricultural and food sectors in context. First, the UK is a substantive net importer of agriculture and food products, the UK being around 60 per cent self-sufficient in food and agricultural products. As the data in Table 1 indicated, the UK food and agriculture sectors are more reliant on the EU as a destination for exports and source of imports compared with other sectors. Table 6 highlights this reliance at a more disaggregated level. For example, over 90 per cent of dairy imports are sourced from the EU with over 70 per cent of meat and cereal imports coming from the EU. On the export side, the EU is also a main destination for food and agricultural exports, with between 70 and 80 per cent of exports across sub-sectors of the food industry going to the EU.

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<sup>14</sup> See Sampson *et al.* (2017) for a critique of their approach. Sampson *et al.* show that even if the UK pursued the WTO option and then unilaterally liberalised remaining tariffs, the unilateral free trade approach would have only a minimal effect on the long-term losses to the UK.

<sup>15</sup> 44 per cent of UK receipts from the EU budget relate to agriculture.

**Table 6: UK Trade with EU in Food and Agricultural Products as Proportion of Total Trade (2015)**

Industry	% of UK Total Exports to EU	% of UK Total Imports from EU
Meat & Meat Prep.	80	75
Dairy Products	69	92
Cereal & Cereal Prep.	64	73
Vegetables & Fruit	70	57
Sugar & Sugar Prep.	70	54

**Source:** UN COMTRADE. Data is at the SITC 1 Digit Level.

The challenges of the post-Brexit world will not only reflect geography but also the nature and extent of trade barriers. Consider the data presented in Figure 1 above. While applied tariffs are, on average, relatively low, they are considerably higher in agriculture and food processing compared with other sectors. While the average tariff on manufactured goods being in the region of 5 per cent, for some agricultural and food manufacturing sectors, the tariffs applied by the EU can be as high as 25 per cent (in sugar and confectionary) and 20 per cent for animal products. But non-tariff barriers are even more of a concern, as the data presented in Table 3 indicates. Recent estimates of the extent of non-tariff barriers show that the highest (by far) level of non-tariff barriers arise in the agricultural and food sectors. Although the Egger *et al.* (2015) and Berden *et al.* (2013) studies employ different approaches, they are both consistent in showing that the estimates of the tariff-equivalent effects of non-tariff barriers (of between 48 to 57 per cent) that apply to processed food outstrip by far non-tariff barrier tariff equivalents that apply to other sectors.

This has two immediate implications. First, given that the EU Single Market has levelled the playing field to promote intra-EU trade in agricultural and food products through harmonisation of standards, labelling and a common approach to regulation, aside from budgetary transfers under the CAP, the UK has reaped substantive benefits of EU integration in these sectors. As Egger *et al.* (2015) show, the sectors that have likely gained most from the EU have been agriculture and food processing mainly due to the impact of non-tariff barriers. Second, given that non-tariff barriers will be the most difficult to agree upon in a post-Brexit world, progress towards trade agreements with other countries as they relate to food and agriculture will likely be the most prolonged and intractable. Since what matters in promoting trade is the depth of the agreement, even if future trade agreements make progress on tariff levels (albeit relatively significant as they are in these sectors), it will still potentially leave considerable barriers to trade in place.

Progressing negotiations on non-tariff barriers will therefore prove to be challenging. For example, in the context of a possible UK-US trade agreement post-Brexit, issues relating to genetically-modified organisms, growth hormones in cattle and chlorinated chicken which characterise the US agriculture and food sector will be difficult to reconcile with UK food standards to the extent that specific EU food standards will continue to apply following Brexit. As Lang *et al.* (2017) and Egger *et al.* (2015) point out, concerns over food safety are not specifically about harmonisation at some agreed level but rather reflect a different philosophy regarding approaches to consumer safety.

These are not the only issues to be addressed. Post-Brexit, the UK government will have to decide the extent to which it supports the agricultural sector and the main purpose of agricultural policy. The Conservative administration has guaranteed current levels of support UK farmers receive will continue to 2022. More immediately, it will have to address the allocation of tariff-rate quotas and aggregate measures of agricultural support as it disentangles from the common EU commitments to the WTO. Beyond this, there will be tension relating to trade policy in these sectors: lower trade barriers and weaker regulatory standards which may help promote trade agreements with other countries (and potentially lower food prices for consumers) but limit access to the EU; maintaining EU standards will limit the options to promote market access for food and agricultural trade but provide more of a level-playing field with EU countries. But how it sets trade policy in the future will be integrated with the re-direction of agricultural policy in the UK and the overall purpose of this revised policy.

Specific assessment of the effects on the UK food and agricultural sector are (as yet) limited and, of those available, do not necessarily characterise the details of the food processing sector (and, in particular, the extent of non-tariff barriers that apply in this sector) nor detail the transmission of price changes from the agricultural sector through to consumers. One recent study by van Berkum *et al.* (2016) points to a number of issues that will be involved as the UK leaves the EU and, at the same time, re-orientates its policy towards the agricultural sector, specifically addressing the level of direct payments that will apply to support farmers. They report the results from a multi-market, multi-country partial equilibrium model that highlights the tensions involved. Specifically, with a WTO option but retaining present levels of direct payments, farm incomes across most activities will increase; but if direct payments do not apply then, with the exception of the horticulture and poultry sector, farm incomes will decline. The loss in incomes is exacerbated if departure from the EU coincides with trade liberalisation as advocated by the *Economists for Free Trade* group. Note that, even with the WTO option, prices would rise in their analysis since, coupled with the increase in trade facilitation costs, with the ending of the tariff-rate quota system, there would no longer be tariff-free access across much of the agricultural sector.

We can also glean from wider research some indication of the effect on food prices at the retail level: food prices will be expected to rise. In a pre-Referendum assessment of Brexit on UK consumers (based on a macro-level model of UK food inflation by Davidson *et al.*, 2016), food prices were estimated to rise by around 3 per cent if the UK reverted to a WTO scenario (DEFRA, 2016)<sup>16</sup>. The DEFRA assessment was based on UK trade in food products with the EU and the tariffs (and some estimate of trade costs to capture non-tariff barriers) on the import price of food post-Brexit. Food prices at the border were estimated to rise by

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<sup>16</sup> As shown in Davidson *et al.* (2016), the exchange rate is also a major driver of food inflation in the UK. With the depreciation in sterling post-Referendum, the Brexit decision will likely have a more immediate impact on food prices in the UK than any post-Brexit trade arrangement.



around 11 per cent which, when an estimate of the vertical price transmission elasticity is accounted for, would raise food prices at the consumer level by around 3 per cent<sup>17</sup>.

Dhingra *et al.* (forthcoming) also provided some indication of the impact on food prices. They show that the price effects for agriculture are separated from those that would arise in the food processing sector. For the upstream agricultural sector, in a ‘soft’ Brexit scenario, prices would rise by 1.6 per cent; in a ‘hard’ Brexit case, prices would rise by 2 per cent. But in food processing, the impact is much greater: in the ‘soft’ Brexit case, prices would rise by around 4 per cent and in the ‘hard’ Brexit case by close to 8 per cent. This differential impact across food and agriculture is perhaps not surprising given the UK trade profile in the food sector (see Table 5) and the structure of tariffs and non-tariff barriers (see Tables 1 and 2) that apply. Food price impacts will likely have a differential impact across income groups: while, in the UK, around 16 per cent of household income is spent on food products, for the lowest (highest) decile, expenditure on food is 23 (10) per cent of household income<sup>18</sup>.

Finally, movement of labour will also impact on UK food and agriculture since there is considerable reliance on low-cost and seasonal labour, particularly on labour from the EU. For agriculture, a recent House of Lords report suggests that 20 per cent of regular employees are from the EU (House of Lords, 2017). Rienza (2016) reports that the sector with the highest share of foreign-based labour is food processing, with foreign-born workers accounting for over 40 per cent of the workforce. Moreover, seasonal labour is a particular challenge for UK agriculture: around 90 per cent of seasonal labour is from the EU (House of Lords, 2017). While there may be a mis-match between public concerns about the impact of immigration and evidence on the impact on domestic workers, how Brexit outcomes address immigration as a whole will impact on the supply of labour to the UK agricultural and food sectors.

## 5. Economists and Brexit

Given the near-unanimity in the assessments by economists on the (potentially significantly negative) impact of Brexit on the UK economy, it is relevant to address their lack of impact on the Brexit debate. While those who voted ‘Leave’ did not (to paraphrase the Chancellor of the Exchequer’s statement) necessarily vote to make themselves poorer, given the importance of the EU in UK trade and the likelihood that it will be difficult to negotiate any alternative which could replace it, what can explain the lack of influence by economists on the Brexit debate?

Most obviously, the vote for Brexit reflected issues beyond the economy with the vote reflecting broader disenchantment, the desire for sovereignty and ‘taking back control’

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<sup>17</sup> The assessment by the *Economists for Free Trade* would largely impact on the food and agricultural given the relatively high tariffs that apply in these sectors, see Figure 1 above. Compensating this would be a reduction in food prices.

<sup>18</sup> Data on food expenditure by income decile is sourced from Levell *et al.* (2017). Note that Dhingra *et al.* (forthcoming) suggest that the distributional effects even out across income groups. Although poorer households spend a greater proportion of their income on food, other highly tradable sectors (e.g. transport) will also be affected by Brexit and which will impact on higher income households.

trumping any concerns about the potential economic effects that may arise as a consequence. Brexit may have reflected more long-standing disaffection not solely targeted at the EU but also more generally with rising inequality, austerity and globalization. O'Rourke (2016) argues in this direction while Dustmann *et al.* (2017) discuss the lack of trust in political institutions across the EU more broadly.

That said, given the potential consequences of Brexit, why was it the case that the economic assessments were effectively marginalised in the run-up to the Referendum? One of the most obvious, is that the role of 'experts' was publically dismissed in a campaign that was divisive and where-when many professional economists would regard themselves as impartial-were readily criticised as 'fear-mongering' when the outcomes did not support the motives of the pro-Brexit campaign. The UK Treasury assessment was labelled as 'Project Fear' by the *Economists for Free Trade* (previously *Economists for Brexit*) who advocate a 'hard' Brexit in combination with a unilateral reduction in UK tariffs. Lord Lawson, a former Chancellor and leading 'Leave' campaigner labelled the UK Treasury assessment as "political propaganda and scaremongering"<sup>19</sup>. Current Secretary of State for International Trade previously labelled the Treasury assessment as 'disreputable, shabby and misleading'<sup>20</sup>. Much of the mainstream media in the UK was also split on Brexit and, in an effort to avoid accusations of bias, the *Economists for Brexit/Economists for Free Trade* would have been given relatively higher profile despite their assessments being criticised (see discussion above) and representing a relatively marginal part of the UK economics profession.

Whatever outcome arises from the Brexit negotiations, arguably there is a need for some reflection on how economists contribute to major policy debates. As is clear from the discussion above, the assessments of Brexit reflect near-unanimity on the direction of the effect even if they differed in the assessment of the extent of the potential losses. More generally, economists agree on a wide range of issues though this is often not how the profession is portrayed. This may also reflect how economists communicate. Reporting changes in welfare of "x% of GDP" or reducing growth by "y%" arguably does not mean that much to the general public and neither would the details of gravity models and other relatively technical approaches professional economists take for granted. In that sense, despite the accusations of 'fear-mongering', the economics profession should take the opportunity to reflect how to better communicate with the general public particularly on significant issues that will impact, one way or another, on their well-being. This will also be pertinent in addressing the complex issues that relate to the food and agricultural sectors. These issues will be politically sensitive: consumers (particularly poor consumers) may face higher food prices in a context where economic growth may be hindered due to Brexit. The farm lobby is powerful, but how they will fare in a post-Brexit environment will also depend

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<sup>19</sup> The Guardian, 23<sup>rd</sup> May, 2016. "Lord Lawson accuses Treasury of 'prostituting' itself with Brexit report". [www.the-guardian.com](http://www.the-guardian.com). Accessed 22<sup>nd</sup> September, 2017.

<sup>20</sup> The Guardian, 23<sup>rd</sup> May, 2016. "Lord Lawson accuses Treasury of 'prostituting' itself with Brexit report". [www.the-guardian.com](http://www.the-guardian.com). Accessed 22<sup>nd</sup> September, 2017.

not only on the trade policy that applies to the agricultural sector but what direct support measures accompany these changes. The food manufacturing sector will also be impacted by potentially higher costs and limited market access to its main destination for exports. The challenge for economists is not only in providing the insights and evaluating the effects but also communicating the insights on potentially difficult political issues, particularly when the insights may be politically unpalatable depending on which side of the Brexit fence the interests lie.

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