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**FULL ARTICLE**

UK trade and FDI: A post-Brexit perspective

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Abstract

Leaving the EU will reshape the UK's economic relations with the rest of the world. This paper summarizes the findings of recent research studying the UK's role in the global economy, and the consequences of Brexit for UK trade, investment, and living standards. We emphasize that international integration affects investment and labour flows as well as trade in goods and services. There are important interdependencies between different forms of integration that should be accounted for when evaluating policy changes. Brexit is likely to make the UK poorer by reducing trade and investment flows, but the magnitude of the economic decline will depend upon the nature of the UK's post-Brexit economic relations with the EU and the rest of the world. We conclude by considering options for UK-EU relations after Brexit and how the UK should approach future trade negotiations.

KEYWORDS

Brexit, trade negotiations, UK FDI, UK trade

1 | INTRODUCTION

The UK's participation in global markets has increasingly come to be based on its relatively abundant skilled labour, its business-friendly rule of law, and its geography. These characteristics dictate its pattern of comparative advantage in the trade of goods and services. Importantly, the same characteristics also dictate the direction and nature of the UK's foreign direct investment (FDI) flows.

Since the UK is a relatively small economy, it requires access to both export and import markets to realize an efficient scale of production and to access many of the inputs used by UK producers. One important reason why trade and FDI are interrelated is the prominent role of global value chains in the UK's economy. The UK is a net exporter of services (financial, IT and media) and sophisticated goods (pharmaceuticals and cars), but these exports are made possible, in large part, by using imported capital, inputs and technical know-how. Indeed, financial services, and IT

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and communications attracted the largest net FDI flows into the UK in 2015, and, together, accounted for 39% of the UK's stock of FDI, while manufacturing made up a further 17% (ONS, 2016).

Europe's geographical location and economic size make it the UK's natural trading partner. Because of this, FDI in the UK is often motivated by the ease of selling to the high-income and nearby consumers in the rest of the EU. The importance of geographic factors, such as the distance between countries, for international flows is one of the most well established empirical facts about the global economy (Anderson, 2011). Consequently, new trade agreements with countries outside the EU offer fewer opportunities for the UK to benefit from trade in goods, services, investment and people than the UK's current trade arrangements.

In this paper, we discuss the impact Brexit will have on the UK economy. Starting from the premise that Brexit will reduce economic integration between the UK and the EU, we describe how reduced integration will lead to higher trade barriers and lower trade volumes. We present evidence from recent research showing that lower trade volumes will reduce living standards in the UK, and that this reduction will be evenly distributed across households at all income levels.

The paper starts by reviewing the canonical conceptual framework used in the economics literature to analyse welfare gains and losses from international trade (Section 2). Next, we discuss evidence on how Brexit is likely to affect the UK's trade (Section 3) and FDI flows (Section 4), together with estimates of the implications of these changes for the level and distribution of income. We then turn to policy recommendations aimed at dampening the negative consequences of Brexit, discussing first the policy options (Section 5) and then concluding by suggesting how the UK government should approach its trade negotiations with the EU (Section 6).

2 | GAINS AND LOSSES FROM TRADE

International openness affects both aggregate income ("efficiency") and its distribution across different types of individuals ("equity"). Theories of international integration usually conclude that the effects of increasing and decreasing economic openness are equal, but opposite. However, the vast majority of empirical work that quantifies efficiency and equity effects draws from episodes of opening up to greater international integration, mostly in the form of reductions in tariffs. This section reviews the literature on the consequences of trade openness. Later in the paper, we will apply this literature to analyse the effects of a reduction in openness—the relevant case for understanding Brexit.

2.1 | Efficiency

There is a broad consensus among academic economists that trade creates opportunities that raise overall output, making the world as a whole better off. These gains materialize through many different channels. Some of the most important are the following. More trade allows countries to specialize in industries where they have a comparative advantage increasing the efficiency of production (Ohlin, 1933; Ricardo, 1817). Trade enables countries to import and consume goods that are not produced domestically (Krugman, 1979). Lower trade barriers increase competition between firms in different countries leading to lower prices for consumers (Krugman, 1979). Increased trade raises productivity by causing more productive firms to expand while less productive firms contract (Melitz, 2003). Larger markets allow firms to produce more and take advantage of economies of scale to lower production costs and prices. Greater integration also reduces the cost of knowledge transfer across countries helping to raise productivity.

Quantifying the size of the aggregate economic benefits of trade is a difficult challenge. Nonetheless, recent work by Arkolakis, Costinot, and Rodríguez-Clare (2012) has shown that in many of the canonical models of trade there is a simple way to express the relationship between trade flows and income: The percentage change in income *per capita* from a change in the volume of trade can be summarized in the following expression:

$$\text{Percentage change in 'Income per capita'} = -\frac{1}{Z} \times \text{Percentage change in '1 - Import Penetration Ratio'}$$



In this formula the import penetration ratio is the ratio of a country's total imports to its total demand. When a country trades more its import penetration ratio is higher. The parameter Z is known as the trade elasticity and is defined as the percentage increase in trade when trade costs fall by 1%, that is, Z is large when small changes in trade costs cause big changes in trade.

The formula shows that a rise in the import penetration ratio, due to lower trade costs, increases income *per capita*. But the size of this effect depends on the trade elasticity Z . The smaller is Z , the greater the increase in income *per capita* for any given rise in the import penetration ratio. The gains-from-trade formula captures the idea that there are aggregate gains from trade. But this formula is too simple to incorporate all the channels through which trade affects income *per capita*, implying that it is likely to underestimate the gains from trade. Accounting for differences across industries in the trade elasticity and allowing for trade in intermediate inputs magnifies the gains from trade (Costinot & Rodriguez-Clare, 2014; Ossa, 2015). State-of-the-art quantitative trade models, such as that used by Dhingra, Ottaviano, Sampson, and Van Reenen (2016) to estimate the consequences of Brexit for the UK economy, include these additional channels and find bigger gains from trade than a naïve application of the gains from trade formula would predict.¹

An important limitation of quantitative trade models is the assumption that trade does not change the set of technologies available for production. There is, however, empirical evidence that trade can stimulate technology investment by increasing competition between firms and facilitating international knowledge diffusion leading to dynamic productivity gains (Bustos, 2011; Grossman & Helpman, 1991). There is considerable uncertainty over the size of these dynamic gains, but recent theoretical work suggests that dynamic effects may double or treble the gains from trade compared to those estimated by static quantitative trade models (Bloom, Romer, Terry, & Van Reenen, 2014; Sampson, 2016).

An alternative way to estimate the gains from trade is to analyse the impact of specific changes in trade costs on income levels. Such studies estimate the sum of the static and dynamic gains from trade. The challenge here is in identifying the causal effect of trade on income *per capita*. Trade policy is correlated with many other potential determinants of income, and richer countries mostly choose more open trade regimes. Thus, the estimates need to isolate the effect of trade from these confounding forces.

Building upon the observation that trade flows are decreasing in the distance between countries, Frankel and Romer (1999) use variation in countries' proximity to their trading partners to isolate plausibly exogenous variation in openness to trade. Feyrer (2009a, 2009b) uses changes in transport costs caused by the introduction of air freight and the closure of the Suez Canal as exogenous shocks to trade. These papers find larger gains from trade than those estimated by quantitative trade models, confirming that the dynamic gains from trade are indeed quantitatively important (Harrison & Rodriguez-Clare, 2010, review the empirical findings from this approach). Feyrer's results imply a 1% increase in trade raises income *per capita* by between 0.25% and 0.75%.

2.2 | Equity

The fact that trade generates aggregate economic gains does not mean it necessarily makes everyone better off. Some relatively unproductive firms and industries may suffer from competition with foreign producers, potentially making their workers and owners worse off. Since the late 1970s inequality has increased in many countries, while over the same period international trade has grown rapidly. This has stimulated a large body of research looking at whether trade has contributed to rising inequality.

Traditionally, economists mainly analysed the effects of trade on inequality using the Stolper-Samuelson theorem (Stolper & Samuelson, 1941). This theorem predicts that trade integration will increase the wage gap

¹See Dhingra, Huang, Ottaviano, Pessoa, Sampson, and Van Reenen (2017) for an updated analysis.



between skilled and unskilled workers in skill abundant developed economies, while reducing wage inequality in developing countries where skilled labour is relatively scarce. This is because, in an open economy, the relative wages of skilled to unskilled workers in each country adjust to reflect their global, rather than domestic, relative supply.

However, empirical work studying the causes of rising wage inequality in the US and many other countries has found little evidence of Stolper-Samuelson effects. While trade has been found to have a small positive effect on the wage premium to a college education in the US during the 1970s, it is unable to explain the increased college wage premium in the 1980s (Leamer, 1998). Moreover, trade liberalisation has been accompanied by increases in inequality in both developed and developing countries (Goldberg & Pavcnik, 2007). And the increased demand for skilled labour that has led to increased inequality within countries has occurred primarily within industries, whereas Stolper-Samuelson effects are driven by between industry changes (Bekman, Bound, & Machin, 1998).

The empirical failings of the Stolper-Samuelson theorem have led to a burgeoning literature that considers alternative channels through which trade may affect wage inequality. Many of these studies incorporate firm heterogeneity, motivated by the empirical fact that only a select few highly productive firms participate in international trade and, on average, these firms are more skill intensive and pay higher wages than domestically oriented firms (Bernard, Jensen, & Lawrence, 1995). Trade allows high-wage paying, exporting firms to expand and become more profitable, while causing lower-wage paying non-exporters to contract or shut down because of increased import competition (Melitz, 2003; Pavcnik, 2002; Trefler, 2004). These reallocation effects within an industry can increase the wage gap between firms in environments with labour market frictions or heterogeneous workers, leading to higher wage inequality (Egger & Kreickemeier, 2009; Helpman, Itskhoki, & Redding, 2010; Sampson, 2014; Yeaple, 2005). Firm-level evidence also supports the hypothesis that trade increases wage inequality between firms (Amiti & Davis, 2012; Helpman, Itskhoki, Muendler, & Redding, 2017; Verhoogen, 2008).

Other channels through which trade may increase wage inequality are the offshoring of tasks that employ less skilled workers to developing countries (Feenstra & Hanson, 1996, 1999) and trade in capital goods that are complementary to skilled labour (Burstein, Cravino, & Vogel, 2013; Parro, 2013). There is also growing evidence that trade has a negative impact on workers who live in regions that face rapid increases in import competition, such as areas of the US that are highly exposed to imports from China (Autor, Dorn, & Hansen, 2013).

In sum, recent research that looks beyond the Stolper-Samuelson theorem has identified new channels through which trade may affect inequality. Helpman (2017) reviews these studies and summarizes their findings, concluding that it is likely increased trade has contributed to recent increases in inequality within developed countries. However, the quantitative importance of this effect in the overall increase in inequality is still a matter of debate. Using a quantitative model of the global economy, Burstein and Vogel (2017) estimate that, because of trade, the average skill premium across countries is 5.1% higher than it would have been in the absence of trade. This effect is important, but does not explain a large share of the observed increase in inequality since the 1970s.

3 | UK INTERNATIONAL TRADE

The Centre for Economic Performance (CEP) has produced a series of Brexit Analysis briefings studying how Brexit may affect trade, FDI and immigration between the UK and the EU and quantifying the possible welfare effects of these changes.² In this section we summarize the conclusions of these briefings regarding the impact of Brexit on UK trade and living standards.

²See: <http://cep.lse.ac.uk/BREXIT>



3.1 | Brexit, trade and aggregate welfare

The EU's Single Market is not only characterized by tariff-free trade but also by the continuing reduction of non-tariff barriers. 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 UK imports. 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 specialize in industries in which it has a comparative advantage. Through these channels, increased trade raises output, incomes, and living standards in the UK.

The economic consequences of leaving the EU will depend on the policies the UK adopts following Brexit. But the CEP's analysis finds that 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, regardless of what form Brexit takes.

Using a quantitative trade model that builds upon Caliendo and Parro (2015) and Costinot and Rodriguez-Clare (2014), Dhingra et al. (2016) estimate the effects of Brexit on trade and the UK's contribution to the EU budget would be equivalent to a permanent fall in income *per capita* of between 1.3% and 2.6% (£850 to £1,700 per household per year). The lower estimate of 1.3% corresponds to an optimistic 'soft Brexit' case where the UK remains part of the Single Market following Brexit. The larger estimate of 2.6% is for a pessimistic 'hard Brexit' case where the UK and the EU do not agree a new trade deal and revert to trading under World Trade Organization (WTO) terms.³ This range is a lower bound on the effect of Brexit that does not account for changes in FDI, migration, and the dynamic consequences of reduced trade on productivity growth.

Once the long-run effects of Brexit on productivity and investment are included, the decline in income *per capita* increases to between 6.3% and 9.5% (about £4,200 to £6,400 per household per year). Other possible economic benefits of Brexit, such as better regulation, would have to be very large to outweigh such losses.⁴

3.2 | Distributional effects of leaving the EU

The economic pain of Brexit is likely to be widely shared through its impact on consumer prices. Breinlich, Dhingra, Sampson, and Van Reenen (2016) study these distributional consequences using data on the heterogeneous expenditure patterns of households in different deciles of the income distribution. They take, as the basis of analysis, the industry price changes predicted by Dhingra et al.'s (2016) estimates of the aggregate effects of Brexit. Breinlich et al. (2016) weight these price changes by the industry's relative importance in household expenditure, thereby showing how real incomes fall due to price increases.

³In particular, in the optimistic case Dhingra et al. (2016) assume that: (i) there are no tariffs between the UK and EU; (ii) non-tariff barriers increase by one-quarter of the reducible non-tariff barriers on US-EU trade; (iii) intra-EU trade costs fall by 20% faster than in the rest of the world for ten years after Brexit; and (iv) the UK's *per capita* contribution to the EU budget is equal to Norway's contribution. In the pessimistic case they assume instead that: (i) the EU's MFN tariffs are imposed on UK-EU trade; (ii) non-tariff barriers increase by three-quarters of the reducible non-tariff barriers on US-EU trade; (iii) intra-EU trade costs continue to fall by 40% faster than in the rest of the world for ten years after Brexit; and (iv) the UK makes no budget payments to the EU. Their analysis does not consider the possible effects of Brexit on trade relations with non-EU countries. In a recent paper, Brakman et al. (2018) conclude that only a trade agreement with the EU can compensate for the negative trade consequences of Brexit.

⁴We note that the depreciation of the pound following the Brexit referendum reflects expansionary monetary policy by the Bank of England in the aftermath of the EU referendum as well as the expected negative effect of Brexit on the UK economy. In this respect, it is a signal of the decreased overall future value of UK economic activity and, while it may increase foreign-demand for those UK exports that do not rely on imported inputs (by lowering prices in foreign currencies), the depreciation is also a sign that Brexit has caused currency markets to downgrade their expectations of the UK's future economic performance.



The reduction in real income is fairly evenly shared across the income distribution, with the middle classes being slightly harder hit than the richest and poorest. Based on their specific expenditure patterns, households on average incomes would face losses of at least 4% of their real income (£1,637 per year) if the UK leaves the EU and trades as a regular member of the WTO, compared with remaining in the EU.

Prices would go up most in transport (a price hike of between 4% and 7.5%), alcoholic drinks (4% to 7%), food (3% to 5%) and clothing (2% to 4%). These product groups rely heavily on imported intermediate inputs. By contrast, prices for services will rise the least.

For the poorest tenth of households (the bottom decile), real income losses would be 1.7% to 3.6% in the short run and 5.7% to 12.5% in the long run. For the richest households, the short-run losses would be 1.8% to 3.9% and the long-run losses 6% to 13.4%. So the middle class loses out slightly more than the rich and poor.

Looking at specific households such as pensioners, families with children, and single people, the pain would also be widely shared. For example, even in the short run, pensioners will lose between 2% and 4% of their real income.

Brexit could also affect inequality by changing the distribution of nominal income across households, a channel not studied by Breinlich et al. (2016). To date there has been little work analysing this possibility, but the distributional effects would have to be substantial to offset the aggregate losses estimated by Dhingra et al. (2016).

4 | UK FOREIGN DIRECT INVESTMENT

The UK has long been one of the world's largest recipients of foreign direct investment. FDI is also an important determinant of the UK's economic performance.

4.1 | The importance of the UK as an FDI destination

FDI inflows reached all-time highs during the years prior to the financial crisis of 2007-08. Although the values of inflows fell in the aftermath of the crisis, the UK remains one of Europe's most popular destinations for FDI flows (Figure 1). As of 2014, the UK was the host to 6% of world FDI stocks, surpassed only by the USA and China

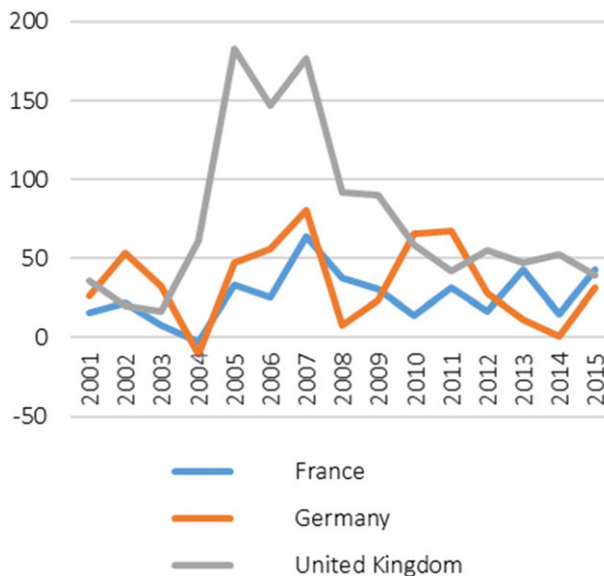


FIGURE 1 FDI Inflows (US\$ billions)

Source: UNCTAD.



(Figure 2). According to the CEPII, the UK accounted for 7.4% of announced world greenfield investment projects for 2015. Germany, in comparison, accounted for only 1.6%.

The motives for investing and locating production in a given country are multiple and complex, but we can broadly divide them into two categories that need not be mutually exclusive for any one investment. These categories are: (i) demand side: to gain access to foreign markets, either in the host market or in neighbouring countries; or (ii) supply side: to exploit local comparative advantages in certain processes or inputs of production—the basis for the existence of global value chains. With these motives in mind, we can ask why the UK is currently an attractive location for FDI.

On the demand side, the UK has a market of 60 million consumers with a mean GDP *per capita* of around US \$41,000. While some FDI in the UK serves the local market only, the UK often serves as an export platform for firms to access countries across the European Single Market. Through its EU membership, a UK location currently offers non-EU firms access to a further 443 million consumers with a mean GDP *per capita* of around US\$33,000. This is true both for manufacturing and services sectors. In particular, 'passporting rights' allow financial services firms to operate seamlessly to serve customers across country borders within the Single Market.

Market access alone cannot explain why the UK is the number one FDI destination in the EU since all member countries provide this access. Supply side considerations also explain the UK's appeal as a location to firms participating in global value chains. The UK offers three advantages for this business model: (i) low shipment cost of physical goods, from raw materials to final products, along the value chain; (ii) a legal environment that protects, and is conducive to, the creation of intellectual property; and (iii) access to skilled labour.

These supply-side factors that attract FDI to the UK, and retain it in the country, are intimately linked to the UK's EU membership. Shipping of goods along the value chain is facilitated by the Single Market, with firms purchasing inputs mostly from other EU countries. Member countries do not need to comply with 'rules of origin' concerning the inputs used in production, trade is tariff-free within the EU, and it is subject to minimal non-tariff bureaucratic costs. Moreover, the UK attracts highly skilled workers from the entire EU market, which adds to its advantage as a location. Free movement of people within the EU thereby increases the UK's appeal to foreign firms making direct investments in the UK in order to benefit from free movement of goods and services in the Single Market.

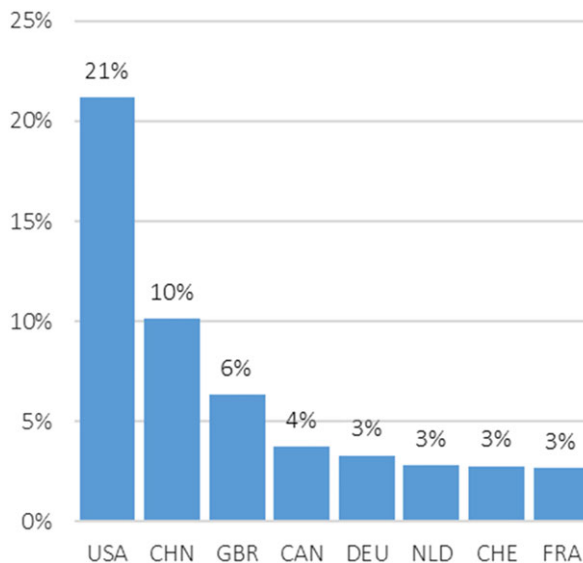


FIGURE 2 Share of world FDI stock

Source: OECD.

Note: World FDI Stock as of 2014: \$25.7 tr.



4.2 | The importance of FDI for the UK's economy

Table 1 shows that foreign-owned affiliates accounted for 14% of private sector employment, the FDI stock totalled 58% of UK GDP and FDI flows made up 10% of investment in 2014. The bulk of this investment has come from EU countries and the US. While the US is the single biggest investor country, Allen and Dar (2013) show that almost half of all of the UK's outward FDI is to the EU while half of its inward FDI is from there. Affiliates owned by EU and US corporations account for 7% and 4% of the UK's total employment, respectively. This is consistent with FDI flows following a gravity model, just as trade flows do (Anderson, 2011). The greatest FDI capital flows occur between geographically close and large economies. 'Closeness' is increased by shared institutions, and Bruno, Campos, Estrin, and Meng (2016) estimate that the UK would have received about 22% less FDI between 1986 and 2014 had it not been in the EU.

FDI inflows are concentrated in industries in which the UK has clear comparative advantage: the financial sector, mining and transport equipment, as well as sectors with high local demand (food and beverages). Much of this FDI is a consequence of mergers or acquisitions between pre-existing UK firms and foreign firms. Many studies document that the affiliates of foreign firms are larger, more productive, more innovative, and employ more people than

TABLE 1 Share of UK employment in foreign-owned affiliates, by sector

	Total employment (2014)	Share of total employment in					
		Foreign owned affiliates	EU-owned affiliates	Non-EU owned affiliates	Germany-owned affiliates	US-owned affiliates	China and India owned affiliates
Agriculture, fishing, and logging	491,458	2%	1%	0%	0%	0%	0%
Mining	61,187	52%	22%	30%	3%	12%	18%
Man. Food, beverage	430,319	34%	18%	16%	1%	8%	0%
Man. Textile	171,000	10%	5%	5%	0%	2%	0%
Man. Paper and printing	183,397	19%	10%	8%	1%	5%	0%
Man. Rubber, plastic, petroleum derivatives	176,204	29%	15%	14%	2%	8%	7%
Man. Chemicals and pharma	152,653	44%	13%	31%	3%	21%	1%
Man. Minerals	484,439	23%	10%	13%	2%	5%	4%
Man. Computer, machines, and electricals	535,766	41%	16%	25%	5%	16%	0%
Man. Auto and transport equip	290,749	46%	15%	31%	5%	9%	9%
Man. Furniture	171,767	12%	6%	7%	1%	4%	3%
Utilities	329,850	34%	27%	7%	7%	3%	4%
Construction	1,551,054	8%	6%	2%	0%	1%	2%
Wholesale and retail	5,078,376	19%	9%	10%	2%	7%	0%
Transportation	1,248,629	27%	19%	8%	7%	2%	0%
Accommodation, food and tourism	3,068,907	13%	6%	7%	1%	4%	3%
Media and publishing	407,403	26%	9%	17%	2%	13%	1%
IT	833,555	25%	8%	18%	1%	10%	2%
Finance and insurance	1,115,694	30%	11%	18%	2%	11%	0%
Real estate	1,425,237	10%	5%	5%	0%	2%	0%
Professional activities	3,873,933	11%	5%	6%	0%	4%	0%
Education and research	3,576,685	1%	0%	1%	0%	1%	0%
Health	3,740,822	4%	2%	2%	0%	1%	1%
Other	785,724	3%	1%	2%	0%	1%	0%
Total (excluding public sector)	30,184,808	14%	7%	7%	1%	4%	1%

Source: ONS.



domestically owned firms in the same industry (for example, Griffith, Redding, & Simpson, 2004, for the UK). Foreign-owned affiliates also provide positive spillovers to their suppliers and customers (Javorcik, 2004). Part of these benefits come about because foreign firms invest in the firms that would otherwise have been very productive (Crisuolo & Martin, 2009), but some of the benefits are a causal effect of being part of a multinational firm. Foreign ownership creates new incentives to invest in R&D, create employment, and seek out new sales channels (Arnold & Javorcik, 2009; Guadalupe, Kuzmina, & Thomas, 2012).

The effect of Brexit on the inflows and stock of FDI depends on the motives behind the multinational activity in the UK, from both the EU and parent firms located in the rest of the world. An increase in trade costs between the UK and the EU would make the option of serving the UK market from an affiliate located in the UK more attractive compared to importing from elsewhere in the EU. Utilities and industries like food, beverage and tobacco may experience an increase in inward FDI for this local market access reason. However, at the same time, an increase in the cost of importing inputs and of exporting outputs within the EU's Single Market may reduce the UK's participation in international value chains. Given the current composition of the UK's FDI stock across industries, this negative effect is likely to dominate.

If we concentrate on manufacturing, the participation of affiliates of multinational firms in local production is particularly important in sectors characterized by complex value chains and high export content, such as electronics and machinery, transport and automobiles, and chemicals and pharmaceuticals. In the case of US affiliates, which represent the bulk of non-EU FDI, the UK as an export platform for the EU Single Market is particularly important. According to the US Bureau of Economic Analysis, US affiliates in Europe sell, on average, only 50% of their output in the host country, they export 25% to customers in other countries in the Single Market, and the remaining 25% is internationally traded within the boundaries of the multinational corporation (Ramondo, Rodríguez-Clare, & Tintelnot, 2015).

To obtain a more granular view of the way that multinational activity in the UK in key sectors may be affected by a reduction in economic integration due to Brexit, we analyse the UK car industry—a recent manufacturing success story—in more detail.

The UK is now the EU's fourth largest car producer and KPMG (2014) argues that “much of the recent investment by car manufacturers is in new vehicles that will be predominantly for sale to the EU market.” In 2014, the car industry employed nearly 300,000 workers in the UK and contributed around 5.1% to total UK exports; 40% of its car exports were to the EU. In a survey of its members in 2014, the Society for Motor Manufacturers and Traders found that 70% of its members expect Brexit to have a negative medium to long-term impact on their business.

There are very rich data on the car industry, which enable one to extend the structural gravity model of exports in Dhingra et al. (2016) to the decisions of multinationals over where to base their production. Head and Mayer (2016) use information on assembly and sales locations (IHS Automotive data) on 1,775 models across 184 brands. These data include annual flows of each model shipped from 49 assembly countries to 75 destination countries between 2000 and 2013. They also contain information on the headquarters and assembly location of the car. The model accounts for how the headquarter decides where to locate production—for example, why BMW chooses to produce Minis in the UK that are sold in France.

Head and Mayer (2016) estimate the impact of Brexit on plant location as well as the levels of car production and price. In their work, they add to the direct effect of higher trade costs on prices, two additional implications for firms with production locations in the UK:

1. First, as the trade costs rise—because of non-tariff and possibly tariff barriers—locating production in the UK is less attractive because it becomes more costly to ship to the rest of Europe.
2. Second, there is an increase in the coordination costs between headquarters and the local production plants. Transfers of key staff within the firm may be harder if migration controls are put in place. Different regulatory standards can make engineering, R&D and consultancy services trickier.

**TABLE 2** The predicted impact of Brexit on UK car production and prices

	Change in total number of cars produced	Percentage change in cars produced	Percentage increase in car prices
1 Increase in trade costs and headquarters coordination costs	-180,746	-12.00%	2.55%
2 Increase in headquarters coordination costs only	-35,728	-2.40%	0.00%

Source: Derived from Head and Mayer (2016).

Both these factors may lead firms to reorganize their production locations and affect the amount of production activity conducted in the UK.

Table 2 examines two scenarios for the impact of Brexit on the automotive industry. Row 1 considers both of the costs together—the increased trade costs of exporting and the higher costs of headquarters coordination. Total UK car production is predicted to fall by 12% or almost 180,000 cars per year. This is mainly because European car manufacturers such as Volkswagen move production of some models out of the UK. Prices faced by UK consumers also rise by 2.55% as the cost of imported cars and their components increase. Row 2 analyses the case where the UK faces no trade barriers on cars and car components with the rest of the EU (for example, if it signs an ambitious free trade agreement with the EU following Brexit). Hence, the only increase in costs is due to increased headquarters coordination costs. Although prices are stable in this scenario, car production in the UK still falls by almost 36,000 (2.4%).

In short, the detailed model in Head and Mayer (2016) confirms the macroeconomic and survey evidence that the costs of Brexit for car production in the UK could be severe, particularly if the UK gives up access to the single market for goods.

5 | THE UK'S POLICY OPTIONS

All the research discussed in this paper, together with most other studies of Brexit, concludes that Brexit will reduce income levels and living standards in the UK.⁵ Our view, echoing others such as Armstrong (2016), is that maintaining economic integration with the rest of the EU to the greatest extent possible is in the best interests of the UK's economy, and should be the primary trade policy objective during Brexit negotiations.

The UK government has announced it intends to leave both the Single Market and the EU's Customs Union following Brexit, but exactly what form the UK's future economic relationship with the EU will take remains uncertain. In this section we discuss the policy options facing the UK as it leaves the EU.

As discussed in the introduction, the UK's position in the global economy is intimately linked to its location. The UK has gained much from concurrent integration with EU goods, services, investment and labour markets. If the UK does not preserve its market access, it is likely to see its locational advantages diminished and its participation in international value chains reduced. Firms with substantial presence in the UK may not immediately re-locate their operations, as reflected in Ernst and Young's survey in January 2017 that found that 86% of foreign firms with a presence in the UK have no intention to relocate European operations in the next three years. But we would expect a slowdown in reinvestment and new FDI flows in the medium and long term.⁶ It is very unlikely that non-EU markets will adequately replace the Single Market as a source of either demand for UK output or supply of production inputs (Brakman, Garretsen, & Kohl, 2018). That is, there are no alternative trading options that will compensate for the economic losses arising from leaving the EU's Single Market for goods, services, investment and people.

⁵This paper is silent on the non-economic costs and benefits of Brexit that might arise from increased political sovereignty or reduced influence over EU decision making.

⁶See <http://www.ey.com/gl/en/issues/business-environment/ey-attractiveness-surveys>.



To reduce the costs of Brexit, the UK needs to focus on maintaining tariff-free trade with the EU and, even more importantly, on preventing non-tariff barriers from increasing, especially for services. Important points to consider are:

- For firms participating in global value chains, with a high share of imported inputs, the bureaucratic costs of complying with 'rules of origin' are high and act as a non-tariff barrier to trade that may reduce the UK's attractiveness as a production location.
- Customs procedures should be simple and fast. The financial costs associated with border delays are especially important for small exporters, for whom these fixed costs are a larger share of export revenues. Small and medium-sized enterprises do not typically export and, when they do, they currently focus on the EU market, in large part because of the low cost of exporting to EU countries.
- The effect of Brexit on the administrative costs of trade will vary across sectors. Music, media and IT services, for example, are mostly regulated by national authorities not the EU. Some financial services are governed by global standards (foreign exchange trading, some derivatives clearing). Brexit is not expected to have a substantial impact on trade costs and investment decisions in these industries. However, if the EU further deepens integration in these areas, without the participation of the UK, this conclusion may reverse.

Current arrangements between the EU and non-EU countries offer options for UK-EU relations post-Brexit. European Economic Area (EEA) membership as, for example, Norway has now, would give the highest level of market access and minimize disruption to workers and businesses in the UK. Under EEA membership, the UK would remain part of the Single Market, meaning it would continue to accept EU economic regulation and free movement of labour with the EU.

Pulling out of the EU and reverting to WTO membership, which describes the current US trading relationship with the EU, would restore sovereignty over economic regulation to the UK and would allow the UK to impose restrictions on immigration from the EU. But the UK would not have the same level of market access to the EU that it currently has. Trade in goods would be subject to the EU's most-favoured nation (MFN) tariffs and there would be new non-tariff barriers and restrictions on services trade. For example, financial services firms based in the UK would no longer have 'passporting rights' to sell services throughout the Single Market. Policy options like the Swiss model and the Liechtenstein model would provide more intermediate levels of market access and sovereignty. The different policy options for future UK-EU relations, and their various pros and cons are summarized in Table 3.

Leaving the EU will give the UK greater freedom in designing domestic policies and regulation. It has been argued that this could compensate for the costs of reduced trade and FDI. After Brexit, the UK will have the freedom to redesign all areas of economic policy currently under the authority of the EU (e.g. competition policy, international trade policy, and funding for regional development, research and agriculture). However, any new domestic subsidies or regulations that do not comply with EU or WTO standards may provoke the imposition of further market restrictions from global trading partners. Regulatory divergence between the UK and the EU will also increase the export costs faced by UK firms that will need to satisfy different product standards for domestic production and for exports to the EU. More generally, while a lack of policy coordination with the EU will provide more freedom for domestic policy design, it will make it harder for UK firms to do business with the Single Market.

What about trading relations with non-EU countries? After Brexit, the UK plans to leave the EU's Customs Union, allowing the UK to have its own trade policy and to negotiate new trade agreements with countries outside the EU. With an independent trade policy, the UK could seek trade agreements tailored to UK interests and it would not need to compromise with the 27 other EU member states during negotiations. However, the UK acting alone would have less bargaining power in trade negotiations than the EU since it offers a much smaller market to foreign firms. This may mean the UK ends up obtaining worse trade deals with non-EU countries than those brokered by the EU. It is also uncertain what will happen to the trade agreements in which the UK currently participates as a member of the EU, such as the EU-South Korea free trade agreement. The UK may need to replace or re-negotiate these past trade

**TABLE 3** Options for the UK outside the EU

	Pros	Cons
EEA - the Norway model	<ul style="list-style-type: none"> ◦ Belong to the Single Market. ◦ No longer subject to certain EU policies (agriculture, fisheries, justice and foreign policy). ◦ Can negotiate trade deals independently of the EU. 	<ul style="list-style-type: none"> ◦ Implement Single Market policies, without representation in EU decision making. ◦ Must comply with rules of origin for exports to the EU and subject to EU anti-dumping measures. ◦ Must contribute to the EU budget, Norway's per capita contribution is currently 17% lower than the UK's.
Bilateral agreements - the Swiss model	<ul style="list-style-type: none"> ◦ Free trade in goods and free movement of people with the EU. ◦ Can negotiate trade deals independently of the EU. ◦ A la carte approach permits opting out of EU programmes on a case-by-case basis. 	<ul style="list-style-type: none"> ◦ Need EU consent for bilateral agreements. ◦ Adopt EU rules without representation in EU decision making. ◦ No agreement with the EU on trade in services. ◦ Pay a fee to participate in EU programmes, Swiss contribution is 60% lower than the UK's.
Continental Partnership	<ul style="list-style-type: none"> ◦ EEA membership with free trade in goods and services with the EU. ◦ Limited autonomy in setting immigration quotas for EU migrants. ◦ Consultative voice in EU decisions. 	<ul style="list-style-type: none"> ◦ Need EU consent for immigration quotas. ◦ Adopt EU rules without voting rights in EU decisions. ◦ Must contribute to EU budget.
Liechtenstein/ Brussels model	<ul style="list-style-type: none"> ◦ EEA membership with free trade in goods and services with the EU. ◦ Safeguard measure to control EU immigration or denial of access to public services for EU immigrants without a job. 	<ul style="list-style-type: none"> ◦ Need EU consent for safeguard measures. ◦ Adopt EU rules without voting rights in EU decisions. ◦ Must contribute to EU budget.
EFTA	<ul style="list-style-type: none"> ◦ Free trade in goods with the EU. ◦ Can negotiate trade deals independently of the EU. ◦ Not required to adopt EU policies and regulations. ◦ No obligation to contribute to the EU budget. 	<ul style="list-style-type: none"> ◦ No freedom of movement of people with the EU. ◦ No right of access to EU markets for services. ◦ Goods exported to the EU must meet EU product standards.
WTO	<ul style="list-style-type: none"> ◦ Can negotiate trade deals independently of the EU. ◦ Not required to adopt EU policies and regulations. ◦ No obligation to contribute to the EU budget. 	<ul style="list-style-type: none"> ◦ Trade with EU subject to MFN tariffs and any non-tariff barriers that comply with WTO agreements. ◦ No freedom of movement of people with the EU. ◦ No right of access to EU markets for services. ◦ Goods exported to the EU must meet EU product standards.

agreements, which will require costly and long-lasting diplomatic efforts and a fair amount of uncertainty in the interim. At a time of limited negotiating capacity, the UK must prioritize larger and closer trade partners like the EU and, to a lesser extent, the US.

Furthermore, export expansion into new markets is in itself a slow and costly process. Currently, China's consumption and investment demand for UK exports accounts for only 1% of UK GDP; Canada and Australia less than 0.5% each; and India only about 0.25% of UK GDP (Los, McCann, Springford, & Thissen, 2017). Given the importance of geographic factors in explaining the size of bilateral trade flows, policy efforts to increase trade with countries such as China and India are likely to have limited effects in the short-term.

It is important to note that deepening international integration with non-EU countries implies different challenges than those that are faced in current partnership with the EU. European economies are relatively similar to the UK in terms of education, labour costs, and environmental regulations. As a result, much of the gains from trade within the EU are based on economies of scale and access to broader varieties of goods and inputs. The gains from trade with labour-abundant economies such as China or India are based on comparative advantage driven by technological



differences and patterns of factor abundance. Deepening integration with these countries may lead to aggregate gains from trade but is also likely to reduce the real wages of some UK workers, particularly those employed in sectors that are intensive employers of unskilled workers. Recent evidence from the US and Europe shows that import competition from low-wage countries does increase wage inequality within a country (Autor et al., 2013; Pessoa, 2016). Further integration with low income countries will therefore create an increased need, relative to integration with the EU, for fiscal policy to compensate the losers from trade.

Summarizing, the UK's decision to leave the EU reflects a willingness to incur significant economic costs in exchange for an increase in political sovereignty. The UK should do everything possible to avoid new trade costs with the EU and to promote integration with countries outside the EU. These efforts will help mitigate the economic costs of Brexit, but will not be sufficient to overturn its negative effects.

6 | CONCLUSION: STRATEGIES FOR TRADE NEGOTIATIONS

What strategies should the UK government adopt to secure the best possible outcome from its future trade negotiations?

Trade negotiations are a bargaining game between countries with conflicting objectives. While both parties can gain from a successful trade agreement, the source of conflict is that each country's share of the gains is zero sum. That is, each country wants to achieve its goals while giving up as little as possible of the total gains to its negotiating partners. Dhingra, Ottaviano, and Sampson (2017) review the rationale for trade agreements and how this shapes the nature of trade negotiations (see also Evenett, 2016). They suggest four principles the UK should adopt in its negotiations with the EU.

6.1 | You get what you give, so be willing to make concessions

In order to achieve its objectives, the UK must be willing to make concessions. In general, the more countries concede and the more policy control they give up, the bigger are the potential gains from reaching an agreement. For example, bigger tariff cuts generally increase the benefits of a trade agreement, but also require countries to give up more control over future tariff levels. An important question the UK faces is what it is willing to give up in return for the EU allowing UK services firms to participate in the Single Market. Unless the UK makes a sufficiently attractive offer, UK services exporters will face new trade restrictions once the UK leaves the Single Market.

6.2 | Where negotiations start from matters, so define the options

The outcome of any bargaining game depends upon the fall-back option that participants obtain if negotiations fail. The fall-back option determines the potential surplus from an agreement, which is what parties bargain over during the negotiation process. Hence, the fall-back option affects the outcome of negotiations. Trade agreements are no exception to this general insight. Before any negotiations between the UK and the EU can make constructive progress, there needs to be a common understanding of what happens if negotiations fail. The UK needs a well-defined fall-back option in order to achieve its post-Brexit objectives.

6.3 | Bargain from a position of power

In principle, trade negotiations are supposed to involve countries making reciprocal concessions of equivalent value. In practice, this is not always the case. It is often difficult to determine the value of a concession and countries that bargain poorly will get a worse deal. Consequently, bargaining power affects the outcome of trade negotiations. Countries that are desperate to obtain a deal at any cost have little bargaining power and are less likely to achieve their objectives. The relative importance of EU demand to UK GDP is 6.1 times greater than the importance of UK demand



to EU GDP (Los et al., 2017), and because UK-EU trade accounts for a much larger share of the UK's economy than the EU's economy, the UK needs a deal more than the EU does. This puts the UK at a disadvantage. The weakness of the UK's position is further exacerbated by the two year time limit on exit negotiations imposed by Article 50, which provides insufficient time for a new trade deal to be negotiated.

One step the UK should take to improve its bargaining position is to prioritize agreeing a transition arrangement to govern UK-EU trade relations for as long as necessary between when the UK leaves the EU and when a longer term agreement is concluded. Remaining part of the Single Market offers the greatest chance of maintaining economic stability during the transition period. Returning to the principle that you only get what you give, the UK needs to decide what it is willing to offer the EU in return for a transition agreement.

6.4 | Invest in negotiating capacity

Trade agreements are complex. Smart negotiators use this to their advantage by ensuring they are better informed than their counterparts. Having not participated in trade negotiations for the past forty years, the UK currently has very little negotiating capacity. To become a smart negotiator, the UK needs to invest heavily in four areas of expertise: trade lawyers to undertake negotiations; diplomats to analyse the objectives and strategies of its negotiating partners; links with UK businesses to understand how they will be affected by proposed agreements, and economic expertise to study the consequences of trade policy changes.

Brexit will not be easy. And even under optimistic assumptions it is likely to make the UK poorer than it otherwise would have been. But how much poorer will depend on the choices the UK makes over the next decade as it renegotiates its relationships with the EU and the rest of the world. Whatever future the UK decides it wants, applying these four principles will help the UK government to achieve its objectives and, hopefully, to make the best of a bad situation.

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Resumen. La salida de la UE reformará las relaciones económicas del Reino Unido con el resto del mundo. Este artículo resume los hallazgos de investigaciones recientes que estudian el papel del Reino Unido en la economía global y las consecuencias de *Brexit* para el comercio, la inversión y los niveles de vida en el Reino Unido. El artículo pone de relieve que la integración internacional afecta los flujos de inversión y de mano de obra, así como el comercio de bienes y servicios. Existen interdependencias importantes entre las diferentes formas de integración que se deben tener en cuenta al evaluar los cambios en las políticas. Es probable que *Brexit* haga más pobre al Reino Unido a causa de la reducción de los flujos de comercio e inversión, pero la magnitud de la disminución económica dependerá de la naturaleza de las relaciones económicas post-*Brexit* del Reino Unido con la UE y el resto del mundo. Las conclusiones sopesan las opciones para las relaciones post-*Brexit* entre el Reino Unido y la UE y cómo debería el Reino Unido abordar las futuras negociaciones sobre comercio.

抄録: EU 離脱は、イギリスが諸外国との経済関係を再構築するということを意味する。本稿では、イギリスの世界経済における役割に関する最近の研究の知見、ブレグジット (Brexit: イギリスの EU 離脱) がイギリスの貿易、投資、生活水準にもたらした影響を要約する。我々は、国際統合が、投資、労働力フロー、そして物品およびサービス取引に影響することを強調する。政策転換の評価を行う際に考慮に入れるべき、異なる統合形式間の大きな相互依存性が存在する。ブレグジットは取引と投資フローを減少させイギリスをより貧しくする可能性が高いが、経済の衰退の規模は、ブレグジット後のEUとその他の諸外国との経済関係の性質に依存すると考えられる。最後にブレグジット後のイギリスとEUの関係として考えられる選択肢と、イギリスが今後の貿易交渉にどのようなアプローチをとるべきか考察する。