Thomas Sampson

Brexit: The economics of international disintegration

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Brexit: The Economics of International Disintegration*

Thomas Sampson†

London School of Economics

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Abstract

This paper reviews the literature on the likely economic consequences of Brexit and considers the lessons of the Brexit vote for the future of European and global integration. Brexit will make the United Kingdom poorer because it will lead to new barriers to trade and migration between the United Kingdom and the European Union. Plausible estimates put the costs to the United Kingdom at between 1 and 10 percent of income per capita. Other European Union countries will also suffer economically, but their estimated losses are much smaller. Support for Brexit came from a coalition of less-educated, older, less economically successful and more socially conservative voters. Why these voters rejected the European Union is poorly understood, but will play an important role in determining whether Brexit proves to be merely a diversion on the path to greater international integration or a sign that globalization has reached its limits.

Keywords: Brexit, European Union, trade agreements, quantitative trade models, globalization

JEL codes: F1, F5, F6

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†Department of Economics and Centre for Economic Performance, London School of Economics. E-mail: t.a.sampson@lse.ac.uk.

1 Introduction

On June 23, 2016, the United Kingdom held a referendum on its membership of the European Union. Although most of Britain's establishment backed remaining in the EU, 52 percent of voters disagreed and handed a surprise victory to the leave campaign. Brexit, as the act of Britain exiting the EU has become known, is likely to occur in early 2019.

The period since World War II has been marked by growing economic and cultural globalization and, in Europe, increasing political integration under the auspices of the European Union. Brexit marks a departure from this trend. For the United Kingdom, leaving the EU will mean withdrawing from the EU's supranational political institutions and will lead to the erection of new barriers to the exchange of goods, services, and people with the remaining 27 member states. More broadly, Brexit raises questions about the future stability of the EU and the extent to which further globalization is inevitable.

This article discusses the economic consequences of Brexit and the lessons of Brexit for the future of European and global integration. I start by describing the options for post-Brexit relations between the United Kingdom and the European Union and then review studies of the likely economic effects of Brexit. The main conclusion of this literature is that Brexit will make the United Kingdom poorer than it would otherwise have been, because it will lead to new barriers to trade and migration between the UK and the European Union. There is considerable uncertainty over how large the costs of Brexit will be, with plausible estimates ranging between 1 and 10 percent of UK per capita income. The costs will be lower if Britain stays in the European Single Market following Brexit. Empirical estimates which incorporate the effects of trade barriers on foreign direct investment and productivity find costs two-to-three times larger than estimates obtained from quantitative trade models which hold technologies fixed. Other EU countries are also likely to suffer economically from Brexit, but their estimated losses are much smaller than those faced by the United Kingdom.

Assessing the broader implications of Brexit for the European Union and for globalization requires understanding why the United Kingdom voted to leave. Thus, I next discuss why the referendum was held and who voted for Brexit. Support for Brexit came from a coalition of less educated, older, less economically successful and more socially conservative voters who oppose immigration and feel left-behind by modern life. Leaving the EU is not in the economic interest of most of these left-behind voters. However, there is currently insufficient evidence to determine whether the leave vote was primarily driven by national identity

and the desire to take back control from the EU, or by voters scapegoating the EU for their economic and social struggles. The former implies a fundamental opposition to deep economic and political integration, even if such opposition brings economic costs, while the later suggests Brexit and other protectionist movements could be addressed by tackling the underlying reasons for voters' discontent.

2 Options for United Kingdom-European Union Relations After Brexit

On March 29, 2017, the United Kingdom formally notified the European Union of its intention to leave, triggering the start of negotiations on a withdrawal agreement. Article 50 of the Lisbon Treaty allows withdrawal negotiations to last for at most two years. After this period Britain[1] will automatically cease to be a member of the EU even if there is no agreement, unless member states unanimously decide to extend the negotiations. The withdrawal agreement will cover the UK's outstanding financial liabilities to the EU, the future status of EU citizens living in the UK and British people living in Europe, and the framework for future UK-EU relations, but will not finalise the details of any new relationship (European Council 2017).

While the British government has committed to implementing the referendum outcome, the leave vote provided no guidance as to what form Brexit should take. In broad terms, there are three options. First, the United Kingdom could remain part of the EU's Single Market by joining Norway, Iceland and Liechtenstein in what is called the European Economic Area (EEA). Second, the UK and EU could sign a free trade agreement to govern their trade and economic relations. Third, if no alternative agreement is reached, the UK and EU would trade under the most-favored nation terms available to all World Trade Organization members (for further details on these alternatives, see HM Government 2016, and; Dhingra and Sampson 2016). Each of these options embodies a different resolution to the trade-off Britain faces between maintaining economic integration with the EU and reasserting national control over powers that are shared between EU members.

Joining the European Economic Area, like Norway, is the option closest to remaining a member of the European Union. EEA members are part of the European Single Market, which means they commit to its four freedoms: free movement of goods, services, capital and labor. EEA members must adopt all EU legislation regarding the Single Market, which covers areas such as employment law, consumer protection, product standards and competition policy. EEA members also pay to be part of the Single Market through contributing to the EU budget. In 2011, Norway's contribution of 106 pounds per capita was 83 percent as

[1] With apologies to the people of Northern Ireland, I will use Britain and United Kingdom interchangeably throughout this article to refer to the United Kingdom of Great Britain and Northern Ireland.

large as the UK's net per capita payment to the EU (House of Commons 2013).

The Single Market lowers trade costs by reducing both border barriers to trade, which are imposed when goods and services cross borders, and behind-the-border barriers, which arise from international differences in regulation and economic policy. For example, Single Market passporting rights give financial firms based in one member state the right to provide services throughout the Single Market, thereby reducing border barriers to trade in financial services. And regulatory harmonization lowers behind-the border barriers by ensuring producers do not have to adapt their goods to satisfy different product standards in different countries.

However, trade barriers between European Economic Area countries and the European Union are higher than within the EU because Norway, Iceland and Liechtenstein do not belong to the EU's Customs Union, which means they can set their own external tariffs and conduct their own trade negotiations with countries outside the EU. It also means trade between EEA members and the EU is subject to border barriers such as customs procedures, enforcement of rules of origin, and anti-dumping duties.

The impact of leaving the Single Market on trade barriers would depend upon what, if any, new deal the United Kingdom and the European Union negotiated. Absent a new deal, Britain would trade with the EU under World Trade Organization terms, as the United States and China currently do. Goods trade would be subject to most-favored nation tariffs and both border and behind-the-border non-tariff barriers would increase. Multilateral trade liberalization under the World Trade Organization has made substantial progress in reducing import tariffs on non-agricultural goods. The EU's average most-favored nation tariff on goods imports was just 4.4 percent in 2015 (World Bank 2017). However, multilateral negotiations have been less successful in lowering non-tariff barriers, particularly for services. Borchert (2016) documents how openness to services trade is higher within the EU than between EU and non-EU countries. For example, non-EU firms do not have passporting rights in financial services and only airlines that are majority owned by EU nationals can operate flights within the EU. Overall, the World Trade Organization option would result in the largest increase in trade barriers between the United Kingdom and the EU.

Free trade agreements differ greatly in their depth, scope and effects on trade (Hofmann, Osnago, and Ruta 2017), offering a menu of options for the United Kingdom and the European Union to negotiate over. Most recent free trade agreements have focused on lowering non-tariff barriers and increasing market access in services. However, the EU's existing trade deals, such as the EU-Canada agreement, do much less than the Single Market to harmonize economic regulation and do not guarantee market access for service providers.

Consequently, any free trade agreement would lead to higher trade costs with the EU than if Britain remains in the Single Market.

Instead of negotiating a tailor-made free trade agreement, the United Kingdom could also seek to form a customs union with the European Union, as Turkey has done. This would ensure UK-EU goods trade did not face tariffs or other border barriers, such as rules of origin, but customs union membership alone would do nothing to lower behind-the-border barriers or reduce restrictions on services trade. It would also prevent the UK from negotiating its own trade agreements with non-EU countries.

Outside the Single Market, the United Kingdom would not be bound by European Union economic regulation nor subject to the jurisdiction of European courts and would be free to restrict immigration from the EU. However, any free trade agreement with the EU would require relinquishing domestic control over some economic policies. Consider the case of Switzerland. Of all countries outside the European Economic Area, Switzerland is the most economically integrated with the EU and effectively belongs to the Single Market in goods. But to achieve this level of integration, Switzerland has been obliged to adopt many pieces of EU economic legislation, contribute to the EU budget, and accept free movement of laboreven though the Swiss electorate voted in 2014 to restrict immigration from the EU. Despite these concessions, Switzerland and the EU have not reached a comprehensive agreement on trade in services meaning, for example, Swiss banks do not have passporting rights.

A new trade deal between Britain and the European Union is unlikely to be concluded before March 2019. For example, the EU-Canada trade agreement started to come into force in 2017, eight years after negotiations began. Consequently, an interim agreement will probably be needed to avoid disruption to UK-EU trade in the period between Britain leaving the EU and any new trade agreement being reached.

At the time of writing, the likely shape of future relations between the United Kingdom and the European Union remains unclear. EU leaders have signalled that, although they hope to maintain close economic relations with the UK, they are not willing to compromise on the indivisibility of the four freedoms of the Single Market (Financial Times 2017). Contrary to the continental partnership proposed by Pisani-Ferry et al. (2016), this means that in order to remain part of the Single Market in goods and services, the UK would have to continue allowing free movement of labor with the EU.

Facing this choice, Prime Minister Theresa May announced in January 2017 that the UK would leave the Single Market and seek a new free trade agreement with the European Union that would allow for the freest possible trade in goods and services between Britain and the EU's member states (May 2017). She also

announced Britain would leave the EU's Customs Union to enable it to negotiate trade deals with non-EU countries. On June 8, 2017 Prime Minister May held a general election to seek a mandate for this position. Her Conservative party won the most seats, but unexpectedly lost its majority in parliament, denying May her mandate. The election result has prompted fierce debate over whether the UK should prioritize remaining economically integrated with the EU or taking control of immigration and economic regulation. However, as yet, it has not led the government to change its position.

3 The Economic Consequences of Brexit

The United Kingdom is a small open economy with a comparative advantage in services that relies heavily on trade with the European Union. In 2015 the UK's trade openness, measured by the sum of its exports and imports relative to GDP, was 0.57, compared to 0.28 for the United States and 0.86 for Germany (World Bank 2017). The EU accounted for 44 percent of UK exports and 53 percent of its imports. Total UK-EU trade was 3.2 times larger than the UK's trade with the United States, its second-largest trade partner. UK-EU trade is substantially more important to the United Kingdom than the EU. Exports to the EU account for 12 percent of UK GDP, whereas imports from the EU account for only 3 percent of EU GDP. Services make up 40 percent of the UK's exports to the EU with Financial services and Other business services, which includes management consulting and legal services, together comprising half the total.[2]

Brexit will lead to a reduction in economic integration between the United Kingdom and its main trading partner. How will this change affect the British and European economies? And how will the consequences of Brexit depend upon which option is chosen for future UK-EU relations?

Forecasting the economic consequences of Brexit is made difficult by the lack of a close historical precedent. Algeria left the European Communities (EC), as the European Union was previously known, upon becoming independent from France in 1962, as did Greenland in 1985 after achieving autonomy within Denmark, but neither of these cases is likely to shed much light on the impact of Brexit. Facing this challenge, researchers have used three approaches to estimate the effects of Brexit: i) historical case studies of the economic consequences of joining the EU; ii) simulations of Brexit using computational general equilibrium trade models, and iii) reduced form evidence based on estimates of how EU membership affects

[2]Trade data is for 2015 and is from the Office for National Statistics Pink Book (Office for National Statistics 2016a). United Kingdom GDP data is from the Office for National Statistics Blue Book (Office for National Statistics 2016b) and European Union GDP data is from World Bank (2017).

trade. Each of these methodologies is subject to a number of limitations, but, collectively they offer the best available evidence on how Brexit is likely to affect economic outcomes in the United Kingdom and the European Union.

The results I summarize in this section focus on long run effects and have a forecast horizon of 10 or more years after Brexit occurs. Less is known about the likely dynamics of the transition process or the extent to which economic uncertainty and anticipation effects will impact the economies of the United Kingdom or the European Union in advance of Brexit. Following the June 2016 referendum, sterling depreciated sharply and by the end of June 2017 was 12 percent lower against the dollar than immediately before the vote. As shown in Figure 1, this has contributed to a rise in inflation from 0.5 percent in June 2016 to 2.6 percent a year later and a decline in real wage growth from 1.5 percent to -0.5 percent over the same period. Output growth in the UK has also slowed, with GDP increasing at an annualized rate of 1.0 percent in the first half of 2017, compared to 1.7 percent in the year leading up to the referendum (Office for National Statistics 2017). These statistics suggest the referendum outcome is already harming the UK economy, though, of course, Britain is yet to leave the EU.

Case Studies of Joining the European Union

Crafts (2016) reviews the historical evidence on how joining the European Communities in 1973 affected the United Kingdom's economy. He concludes that membership raised GDP per capita in the UK, particularly through productivity growth resulting from increased product market competition. Falling barriers to trade reduced domestic firms' market power and firms responded by investing more in productivity improvements. A quantitative analysis of the historical data is undertaken by Campos, Coricelli and Moretti (2014) who use the synthetic control methodology. Their estimates imply that ten years after joining the EC, UK GDP per capita was 8.6 percent higher than it otherwise would have been. Fully disentangling the treatment effect of accession from other contemporaneous shocks is probably an impossible challenge and it would be nave to expect that Brexit will simply have the opposite effect to joining the EC in 1973. But, subject to these caveats, historical analysis concludes the UK obtains substantial economic benefits from being an EU member.

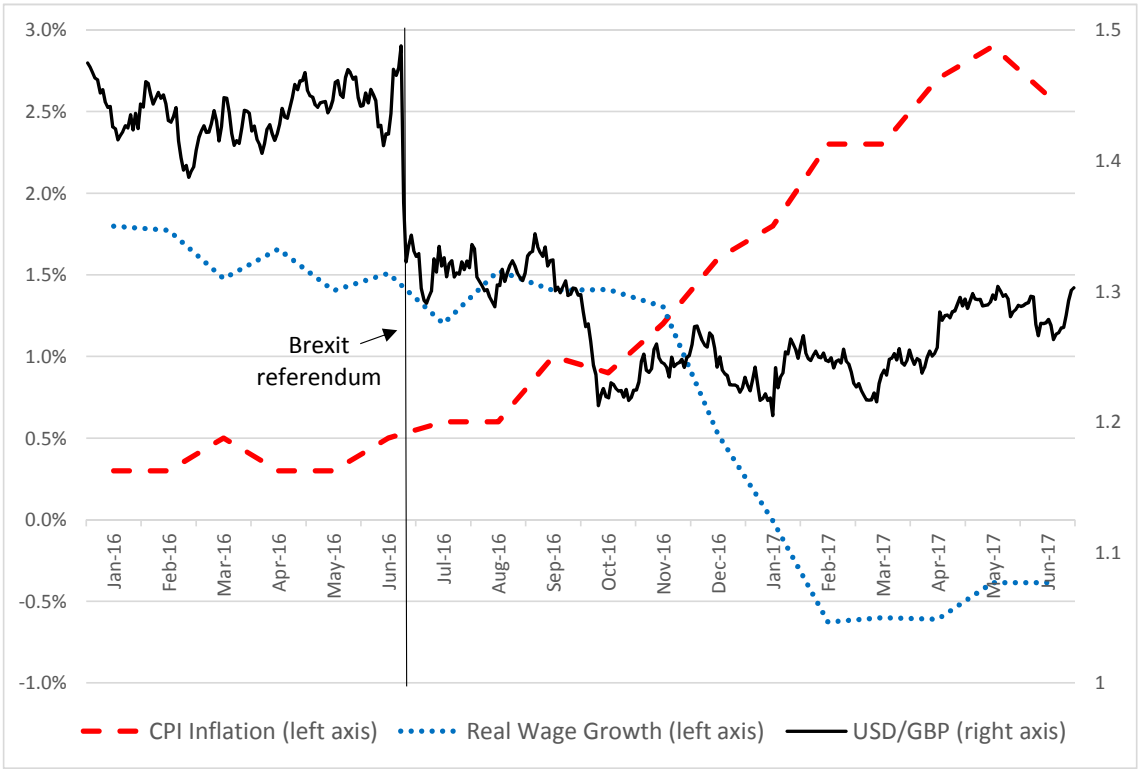

Figure 1: UK Exchange Rate, Inflation and Real Wage Growth

Source: Exchange rate from Bloomberg; CPI and real wage growth from Office for National Statistics.
Notes: USD/GBP is end of day rate. Inflation is annual change in CPI (series D7G7). Real wage growth is annual change in seasonally adjusted Regular Pay (series A2F9).

Simulations with General Equilibrium Trade Models

The most widely adopted approach for studying Brexit has been to run simulations using computational general equilibrium trade models. These models use assumptions regarding how Brexit will affect trade costs between the United Kingdom and its trading partners to generate predicted changes in trade, consumption, production, and welfare. Important advantages of this approach are that it accounts for general equilibrium effects, such as trade diversion between the UK and non-EU countries, and that it enables researchers to tailor their assumptions regarding how Brexit will affect trade costs to study alternative post-Brexit scenarios.

Modelling changes in non-tariff barriers, such as customs procedures, market access restrictions and regulation, is a necessarily imperfect art. To implement simulations, the assumed impact of Brexit on non-tariff barriers must be expressed numerically, typically in terms of ad-valorem equivalent trade costs. However, there is no generally accepted methodology for quantifying counterfactual non-tariff barriers, meaning it is important to examine the robustness of simulation results to plausible alternative specifications

of changes in trade costs. In addition, no single model will capture all the channels through which trade affects the global economy, making it useful to compare results across studies.[3]

An example of the simulation approach is Dhingra et al. (2017) who estimate the effects of Brexit using a quantitative trade model with 31 industries, 35 countries, and trade in intermediate inputs that is based on the multi-sector version of Eaton and Kortum (2002) developed by Caliendo and Parro (2014). They consider three channels through which Brexit may affect trade costs: tariffs, non-tariff barriers and future declines in intra-EU trade costs in which the United Kingdom participates only if it remains an EU member. Future trade cost changes are included because Mejean and Schwellnus (2009) estimate that intra-EU trade costs have been falling approximately 40 percent faster than trade costs between other OECD countries. Dhingra et al. model an optimistic scenario in which the UK remains in the Single Market and a pessimistic scenario in which UK-EU trade is conducted under WTO terms. They also allow for a decline in the UK's net fiscal contribution to the EU budget following Brexit.[4]

In both scenarios Dhingra et al. find the efficiency losses the United Kingdom suffers from higher trade barriers exceed the fiscal savings. Increased trade costs are welfare reducing because the United Kingdom faces higher import prices and is less able to specialize according to comparative advantage, which reduces production efficiency and output. Higher trade costs can also affect welfare through channels not analysed by Dhingra et al., such as by reducing product variety and raising mark-ups (Krugman 1979), or by allowing less efficient firms to survive which decreases aggregate productivity (Melitz 2003). However, all these mechanisms imply higher trade barriers lead to lower welfare.

In the optimistic case, Dhingra et al. estimate Brexit is equivalent to a permanent 1.3 percent decline in UK consumption per capita, while in the pessimistic case the loss doubles to 2.7 percent. Quantitatively, these estimates are dominated by the consequences of higher non-tariff barriers and exclusion from future declines in intra-EU trade costs, reflecting the fact that the EU's most-favored nation tariffs are low relative to estimates of non-tariff barriers.

Figure 2 shows that European Union countries also suffer from the fall in UK-EU trade. However,

[3] Kehoe, Pujolas and Rossbach (2016) review some of the past failings of computational trade models and advocate the need to better account for heterogeneity within countries and industries in future quantitative models.

[4] In the optimistic case, there are no tariffs between the United Kingdom and European Union, non-tariff barriers increase by one-quarter of the estimated reducible non-tariff barriers on US-EU trade, intra-EU trade costs fall by 20 percent faster than in the rest of the world for ten years after Brexit and the UK's per capita contribution to the EU budget is equal to Norway's contribution. In the pessimistic case, the EU's most-favored-nation tariffs are imposed on UK-EU trade, non-tariff barriers increase by three-quarters of the reducible non-tariff barriers on US-EU trade, intra-EU trade costs continue to fall by 40 percent faster than in the rest of the world for ten years after Brexit, and the UK makes no budget payments to the EU.

with the notable exception of Ireland, the losses are an order of magnitude smaller since UK-EU trade is relatively less important to the EU than the UK. Brexit is equivalent to a 0.14 percent fall in EU consumption per capita in the optimistic case and a 0.35 percent fall in the pessimistic case. Non-EU countries benefit from Brexit due to trade diversion, but the effects are quantitatively negligible compared to the losses faced by the UK and the EU. Other studies have found qualitatively and quantitatively similar results. See, for example, Aichele and Felbermayr (2015) who using a modelling framework based on Eaton and Kortum (2002) and Ciuriak et al. (2015) who use a version of the Global Trade Analysis Project model.

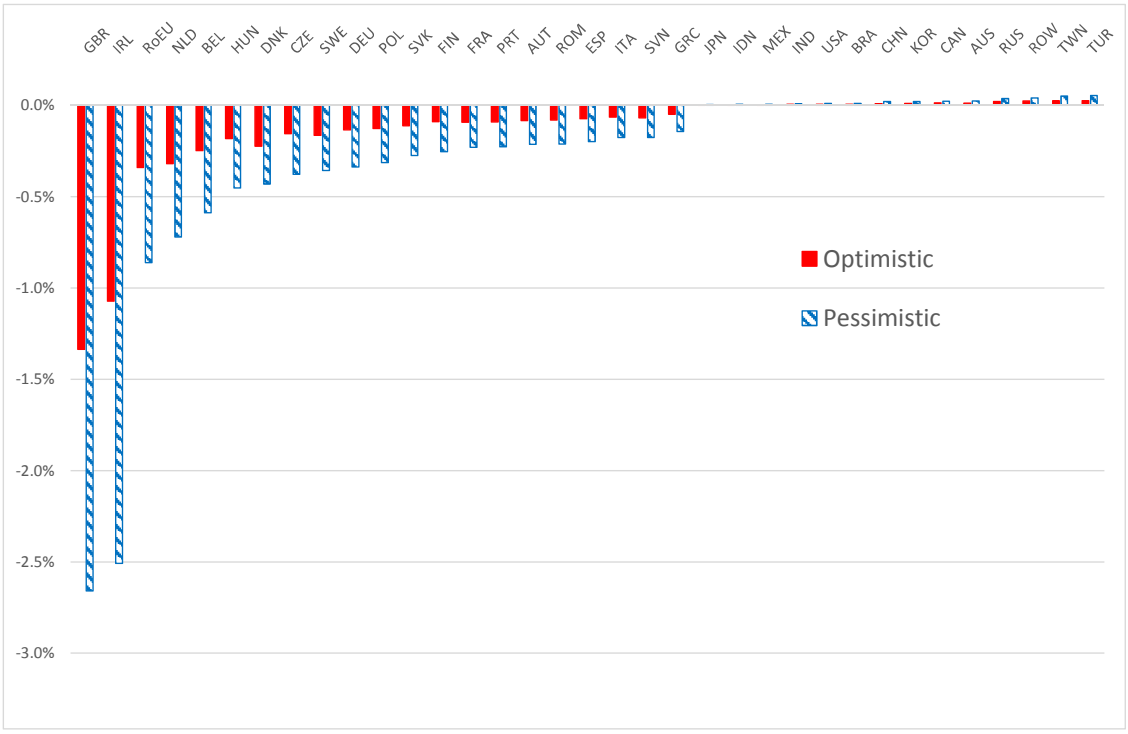

Figure 2: Estimated Welfare Effects of Brexit

Source: Dhingra et al. (2017).
Notes: Estimates give the permanent percentage change in income per capita that has the same welfare effect as Brexit. In the optimistic scenario the UK remains in the Single Market following Brexit. In the pessimistic scenario UK-EU trade is conducted under WTO terms. See Dhingra et al. (2017) for details.

One limitation of the existing literature lies in how it models financial services. London is Europe's leading financial center and financial and insurance services accounted for 7.5 percent of UK value-added and 13 percent of exports in 2014 (ONS 2016a,b). Oliver Wyman (2016) estimates around one-quarter of the finance industry's revenue comes from business related to the European Union. But if Britain leaves the Single Market, UK-based finance companies will lose their passporting rights and face higher barriers

to accessing European markets. However, the trade models used to study Brexit do not account for the agglomeration forces that shape location decisions in the finance industry. This may lead them to overestimate the Brexit effect if agglomeration externalities insulate the UK's finance industry against higher trade costs, or underestimate the effect if Brexit threatens London's position as Europe's financial hub.

An alternative way to estimate the impact of Brexit on the finance industry is through case studies that analyze how much business the United Kingdom may lose in different sub-sectors. Using this approach Djankov (2017) estimates that, if the United Kingdom and European Union trade under World Trade Organization rules, finance industry revenue would fall by between 12 and 18 percent and employment would fall by between 7 and 8 percent. By comparison, in their pessimistic scenario Dhingra et al. estimate finance industry output would fall by 6.4 percent. This suggests both approaches lead to similar results, but further research on the finance industry would certainly be valuable.

Reduced Form Evidence

The reduced form approach to studying Brexit involves two steps: 1) use the gravity equation for bilateral trade, in which trade levels depend upon economic size, geographic distance and other factors that affect trade costs, to estimate the effect of EU membership on trade, and; 2) combine the outcome of step one with an estimate of the elasticity of income per capita to trade to obtain the effect of EU membership on income per capita. The attraction of this approach is that it does not rely on assuming the validity of a specific trade model and allows researchers to exploit richer empirical variation than simply studying changes in output following EU accession. Its main limitation is the difficulty of obtaining causal estimates of the parameters of interest.

Dhingra et al. (2017) implement the reduced form approach using gravity estimates from Baier at al. (2008) that are identified from variation in trade when countries join the European Union. Baier et al.'s estimates imply leaving the EU and joining the European Free Trade Association would reduce the UK's trade with EU members by 25 percent.[5] Assuming no trade diversion with non-EU countries and using Feyrer's (2009) estimate that the elasticity of income per capita to trade lies between 0.5 and 0.75, it follows

[5]The Baier et al. (2008) estimates are based on goods trade data for 1960-2000 and assume the trade effect of EU membership is homogeneous across countries. Mulabdic, Osnago and Ruta (2017) perform a similar exercise using a continuous measure of the coverage of different trade agreements with 1995-2011 data for both goods and services trade and allowing for UK-specific treatment effects. Their estimates suggest Brexit will reduce services trade between the United Kingdom and European by slightly more than goods trade and imply larger reductions in total UK-EU trade following Brexit than Baier et al.'s results (see their Table 6).

Brexit would reduce UK income per capita by between 6.3 and 9.4 percent.

It is notable the reduced form approach leads to losses that are several times larger than the estimates from model-based simulations, even though both methods give similar predictions regarding changes in trade.[6] This may be because the reduced form estimates capture channels that are absent from quantitative trade models. The computational models used to study Brexit treat technology as exogenous, implying they will underestimate the costs of Brexit if trade integration raises productivity growth or leads to technology upgrading (as found by Bustos 2011). Sampson (2016) shows that allowing for trade to affect productivity through knowledge spillovers across firms approximately triples the gains from trade in a version of Melitz (2003). In addition, since trade and other forms of economic integration are highly correlated, Feyrer's (2009) estimate of the elasticity of income per capita to trade likely captures not only trade, but also other consequences of closer integration. This implies the reduced form estimates probably incorporate some of the broader effects of Brexit resulting from changes in foreign direct investment, immigration, and international technology diffusion.

Foreign Direct Investment and Immigration

Although most studies of the economics of Brexit focus on trade, there is also evidence the British economy will suffer from reductions in foreign direct investment and immigration after leaving the European Union. The Single Market has allowed foreign investors to use the United Kingdom as an export platform for serving EU markets. Looking at the automobile industry, Head and Mayer (2015) use a quantitative model of trade and foreign direct investment to estimate that increases in trade costs and intra-firm coordination costs following Brexit will reduce car production in the UK by 12 percent. At the aggregate level, Bruno et al.'s (2016) estimates using a gravity equation imply that leaving the Single Market will reduce the flow of foreign direct investment into the UK by around 22 percent. Since foreign direct investment has positive effects on domestic investment and productivity, this decline is likely to reduce UK output and living standards (Dhingra et al. 2016).

Leaving the Single Market would also allow the United Kingdom to adopt policies to restrict immigration from the European Union. The effects of changes in immigration policy are difficult to forecast, but an application of the reduced form methodology to immigration by Portes and Forte (2017) concludes lower

[6]For example, Dhingra et al.'s (2017) quantitative model implies total British trade declines by 9 percent in the optimistic case and 16 percent in the pessimistic case, while their reduced form estimates are based on a 12.5 percent decline in UK trade.

immigration from the EU could reduce the UK's GDP per capita by between 0.9 and 3.4 percent by 2030. I am unaware of any aggregate level analysis of how changes in trade, foreign direct investment, and immigration may interact following Brexit. But these interactions could be important, particularly for sectors such as finance that rely on access to highly skilled workers from across the EU.

Economic Arguments in Favor of Brexit

Economic arguments for Brexit have focused on the ideas that leaving the EU's Customs Union would allow the United Kingdom to strike new trade agreements with non-EU countries and that leaving the Single Market would allow the United Kingdom to deregulate its economy (Booth et al. 2015). It is unclear whether Brexit will result in the United Kingdom facing lower or higher barriers to trade with non-EU countries in the long run. The advantage of not needing to compromise with 27 other countries to reach new agreements must be weighed against the costs of being a smaller market than the European Union with less bargaining power in negotiations and the risk of losing access to existing free trade agreements between the EU and other countries. Whichever effect dominates, it is highly unlikely new trade deals could fully compensate for lower UK-EU trade. Ebell (2016) estimates membership of the Single Market has approximately twice as large an effect on bilateral goods trade as an average free trade agreement and finds that, unlike the Single Market, the average services free trade agreement in her data set has no statistically significant trade effects. Since around 60 percent of the UK's trade is with either the EU or countries that have already signed a free trade agreement with the EU, these results imply leaving the Single Market would reduce total UK trade even under optimistic assumptions about the UK's success in negotiating new trade agreements following Brexit.

Claims the United Kingdom will reap substantial benefits from post-Brexit deregulation are even less convincing. Open Europe (2015) lists 57 regulations based on EU legislation for which economic impact assessments by the UK government find higher costs than benefits. The net annual cost of these regulations is 0.9 percent of UK GDP, but half this cost comes from just two regulations aimed at reducing carbon dioxide emissions and limiting working hours. Support for these policies within the United Kingdom exists independently of EU legislation. More generally, there is no evidence UK voters see Brexit as a reason for further deregulation. According to the OECD's Indicators of Product Market Regulation and its Employment Protection Database, the UK's product and labor markets are already among the least regulated in the OECD with similar levels of regulation to the US economy and much lower regulation than most EU countries. This

suggests EU membership has not prevented the United Kingdom from tailoring regulation to suit its national preferences.

Drawing Conclusions

Overall, the research literature displays a broad consensus that in the long run Brexit will make the United Kingdom poorer because it will create new barriers to trade, foreign direct investment, and immigration. However, there is substantial uncertainty over how large the effect will be, with plausible estimates of the cost ranging between 1 and 10 percent of the UK's income per capita. European Union countries are also likely to suffer from reduced trade, but in percentage terms their losses are expected to be much smaller. The uncertainty over the size of the Brexit effect has two sources. First, alternative research strategies produce quantitatively different results. Second, the losses will depend upon the terms under which the United Kingdom and EU trade following Brexit. Continued membership of the Single Market is the best option for the British and European economies. But if Britain leaves the Single Market, the research shows that to minimize the costs of Brexit UK-EU negotiations should prioritize keeping non-tariff barriers low and ensuring market access in services rather than purely focusing on tariffs.

In years to come Brexit is likely to offer many research possibilities. It provides a novel natural experiment that will allow researchers to study the economic effects of raising barriers to trade and to evaluate the results of the estimation methods described above. There should also be opportunities to study the dynamics of adjustment to trade de-liberalisation, the relative importance of different non-tariff barriers and whether trade, foreign direct investment, and immigration are complements or substitutes, among other questions.

4 Implications of Brexit for the Future of the European Union and Globalization

Sixty years after the Treaty of Rome first established the European Economic Community, the European Union is struggling with the aftermath of the global financial crisis, geopolitical instability on its eastern and southern borders, and the success of anti-European political parties in many member states. Brexit adds to these challenges. This final section of the paper discusses what Brexit means for the future of the EU and, more broadly, global economic integration. To address these questions, we first need to consider why Britain voted to leave the EU.

The Brexit Referendum

The 2016 referendum was the culmination of a 20-year campaign against Britain's membership of the European Union that started after the Maastricht Treaty transformed the European Communities into the EU and launched the European Single Market in 1993. In Britain, the energy behind this campaign came primarily not from the Conservative or Labour parties, but from single issue parties set-up to advocate for Brexit first the Referendum Party and then the United Kingdom Independence Party (UKIP). These parties argued that sharing political power with the European Union was an unwanted constraint on Britain's sovereignty. Particular bones of contention were the UK's commitments to allow free movement of labor within the EU and to accept the jurisdiction of the European Court of Justice.

The movement to leave the European Union became increasingly influential after Nigel Farage took over as leader of the United Kingdom Independence Party in 2006 and broadened the party's appeal among working class voters. In 2014, UKIP won a plurality of votes in Britain's elections to the European Parliament and captured 24 of the UK's 73 seats. Under pressure both from supporters of UKIP and from within his increasingly euro-sceptic Conservative Party, then-Prime Minister David Cameron pledged to hold a referendum on EU membership if the Conservatives won the 2015 general election. Although Cameron supported remaining in the EU, he hoped his pledge would shore up right-wing support for the Conservatives and gambled that the British public would not vote to leave the EU. After the Conservatives won a surprise majority, Cameron's gamble was put to the test. On June 23, 2016, 17.4 million voted to leave the EU and only 16.1 million to remain. Cameron resigned as Prime Minister the following day and the Conservative Party chose Theresa May as his replacement.

Who Voted for Brexit?

The referendum split the British electorate on the basis of geography, age, education and ethnicity. Figure 3 shows data on voting patterns. England and Wales voted to leave, while Scotland and Northern Ireland voted to remain. Within England, support for Brexit was noticeably lower in London, where only 40 percent voted to leave.

Older and less educated voters were more likely to vote leave. Of those aged 18-24, 27 percent voted to leave compared to 60 percent of voters aged over 65. Only 41 percent of voters with a university degree chose leave, whereas 65 percent of those without a degree voted to leave. A majority of white voters wanted

to leave (53 percent), but only 33 percent of Asian voters and 27 percent of black voters chose leave. There was no gender split in the vote, with 52 percent of both men and women voting to leave. Interestingly, although Brexit has never received much backing from liberal or left-wing political leaders, leaving the European Union received support from across the political spectrum. A strong majority of 58 percent of Conservative voters supported leave, but so did 37 percent of Labour voters and 36 percent of Scottish National Party supporters.

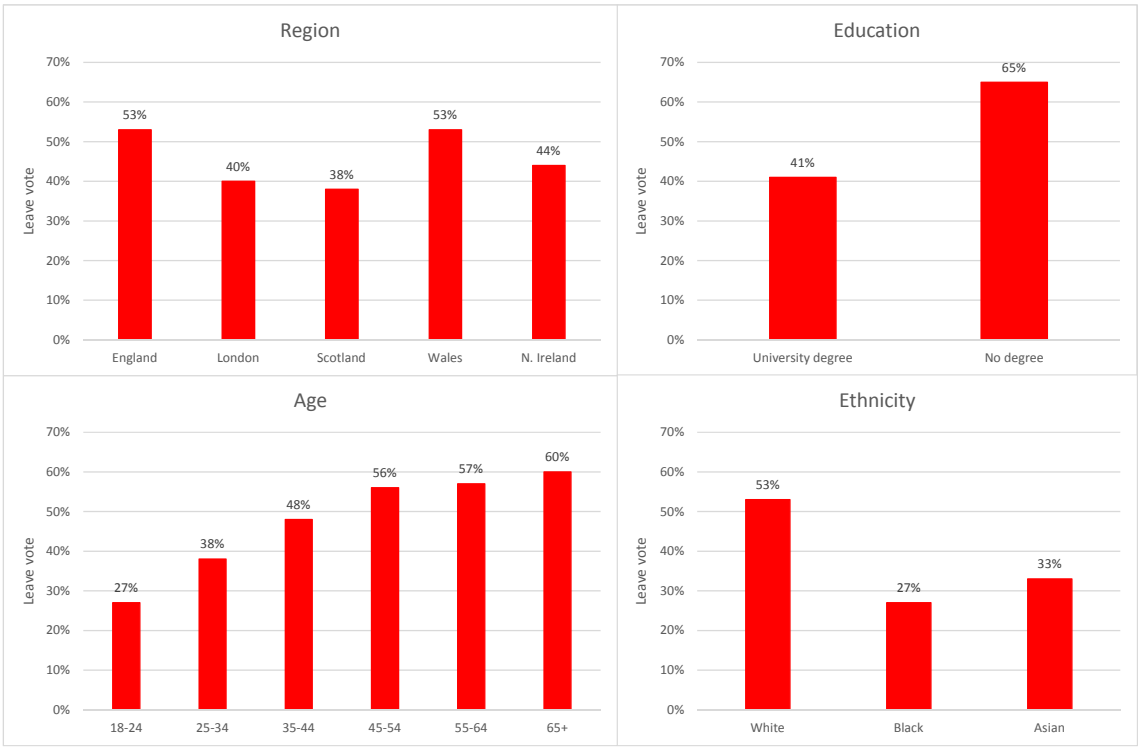

Figure 3: Leave Vote Shares in Brexit Referendum

Source: Regional data from the Electoral Commission. Demographic data from Lord Ashcroft Polls.
Notes: The geographic breakdown uses actual votes cast in the referendum. All other data on voting patterns is from polling conducted by Lord Ashcroft Polls on the day of the referendum.

Voting to leave the European Union was strongly associated with holding socially conservative political beliefs, opposing cosmopolitanism, and thinking life in Britain is getting worse rather than better. Among people who said feminism is a force for ill, 74 percent voted to leave, compared to 38 percent of those who thought feminism a force for good. Similarly, 69 percent of people who thought globalization a force for ill voted to leave, as did 81 percent of people who viewed multiculturalism as a force for ill. Among voters who backed staying in the EU, 73 percent thought life in Britain today is better than it was 30 years ago, while 58 percent of leave voters thought life was worse.

Econometric studies of voting outcomes by area (Goodwin and Heath 2016a; Becker, Fetzer, and Novy 2017; Colantone and Stanig 2016) and voting intentions at the individual level (Goodwin and Heath 2016b; Colantone and Stanig 2016) provide a richer picture of the demographic and economic variables associated wit individual level (Goodwin and Heath 2016b; Colantone and Stanig 2016) provide a richer picture of the demographic and economic variables associated with voting to leave.

First, education and, to a lesser extent, age are the strongest demographic predictors of voting behavior. For example, Becker, Fetzer and Novy (2017, see their Table 3) show that the share of the population with a university degree or equivalent qualification can, on its own, account for 62 percent of the variation in the share of the vote received by leave across 380 areas and that both the level and growth of the proportion of the population aged 60 and over are associated with a higher leave vote share.

Second, poor economic outcomes at the individual or area level are associated with voting to leave, but economic variables account for less of the variation in the leave vote share than educational differences. Controlling for age, gender and ethnicity, Goodwin and Heath (2016b) find support for leave is 10 percentage points higher among households with income below 20,000 pounds than among households with income above 60,000 pounds, but is 30 percentage points higher from individuals whose highest educational qualification is at the General Certificate of Secondary Education level (a qualification usually obtained at age 16) than from those with a university degree. While most studies of the referendum vote have focused on documenting correlations, Colantone and Stanig (2016) use an estimation strategy based on Autor, Dorn and Hanson (2013) to show that exposure to Chinese import competition led to increased support for Brexit. At the regional level, their estimates imply a one standard deviation increase in Chinese import competition raised the leave vote share by almost two percentage points. By contrast, they estimate a one standard deviation increase in the proportion of the population with a university degree is associated with a five percentage point fall in the leave vote. They also find higher unemployment is associated with greater support for leave, as do Becker, Fetzer and Novy (2017).

Third, support for leaving the European Union is strongly associated with self-reported opposition to immigration, but not with exposure to immigration. Immigration played a central role in the Brexit campaign and Goodwin and Heath (2016b) report 88 percent of people who thought the United Kingdom should admit fewer immigrants supported Brexit. However, studies find that a higher share of EU immigrants in the population is actually associated with a reduction in the leave vote share across local areas. There is some evidence growth in immigration, particularly from the 12 predominantly eastern European countries that

joined the EU in 2004 and 2007, is associated with a higher leave vote share, but the effect is small and not always present (Colantone and Stanig 2016; Goodwin and Heath 2016a; Becker, Fetzer and Novy 2017).[7]

Overall, the picture painted by the voting data is that the Brexit campaign succeeded because it received the support of a coalition of voters who felt left-behind by modern Britain. People may have felt left-behind because of their education, age, economic situation or because of tensions between their values and the direction of social change, but, broadly speaking, a feeling of social and economic exclusion appears to have translated into support for Brexit.

Why did Britain Vote for Brexit?

Knowing that the left-behind voted for Brexit does not tell us why they voted for Brexit. Hobolt and De Vries (2016) detail three factors that affect support for European integration: economic cost-benefit calculations, values and identity, and the information available to voters. One possible explanation for the referendum outcome can be ruled out immediately. Britain's vote to leave the European Union was not the result of a rational assessment of the economic costs and benefits of Brexit. As highlighted in the previous section, there is a broad consensus in the literature that being part of the EU has benefited the UK economy on aggregate.

Moreover, there is no evidence changes in either trade or immigration due to EU membership have had large enough distributional consequences to offset the aggregate benefits and leave left-behind voters worse off. There is little direct evidence on the distributional impact of UK-EU trade. Using a quantitative model in which trade affects wage inequality through both interindustry and intra-industry changes in the demand for skill, Burstein and Vogel (2017) estimate moving to autarky would reduce wage inequality in the United Kingdom, but would also make both skilled and unskilled workers worse-off. Extrapolating from this result suggests neither high nor low skill British workers stand to gain from a reduction in trade with the EU.

In practice, most discussion of the impact of EU membership on inequality in the United Kingdom centers not on trade, but on the wage effects of immigration. Immigration to the United Kingdom from EU countries increased rapidly from the late 1990s onwards and between 1995 and 2015 the share of EU nationals in the UK's population rose from 1.5 to 5.3 percent (Wadsworth et al. 2016). Studies do not find significant negative effects of immigration on average employment or wages for UK natives, but there

[7] Relatedly, Becker and Fetzer (2016) find evidence of a small post-2004 increase in support for UKIP in European Parliamentary elections in areas where the increase in immigration from the ten 2004 accession countries was higher relative to the initial stock of European Union immigrants.

is some evidence immigration has reduced wages for lower paid workers (Dustmann, Frattini and Preston 2013; Nickell and Saleheen 2015). Wadsworth et al. (2016) report that, based on the level of immigration from the European Union between 2004 and 2015, Dustmann, Frattini and Preston's estimates imply a 1.0 percent wage decline for native workers in the bottom decile of the wage distribution. Likewise, Nickell and Saleheen's estimates imply a 0.7 percent decline in wages in semi-skilled and unskilled service sectors. These losses are lower than the estimated gains from trade due to EU membership.

The observation that Brexit will impose economic costs even on many of its supporters establishes an important difference between Brexit and protectionist trade policies, such as anti-dumping duties or restrictions on agricultural imports, which receive support because they shield particular groups of voters from loses caused by economic integration. In this sense, support for Brexit is a distinct phenomenon from opposition to trade with China among manufacturing workers in the United States. The insignificance of economic considerations in explaining the Brexit vote also suggests the negative correlation between education and voting to leave the European Union is not driven by economic interests, but instead by how education is related to voters' values, identities and information sets. However, it is consistent with evidence that economic self-interest is less important in explaining attitudes towards immigration than cultural attachments and concerns about how immigration affects the nation as a whole (Hainmueller and Hopkins 2014).

So why did left-behind voters back Brexit? Ruling out the economics of European Union membership as a cause, leaves two plausible hypotheses for why Britain voted to leave.

Hypothesis 1: Primacy of the Nation State. Successful democratic government requires the consent and participation of the governed. British people identify as citizens of the United Kingdom, not citizens of the EU. Consequently, they feel that the United Kingdom should be governed as a sovereign nation state. EU membership erodes Britain's sovereignty. In particular, it prevents the UK from controlling immigration and forces the UK to implement laws made by the EU. According to this hypothesis, British people voted to leave the EU because they want to take back control of their borders and their country.

Hypothesis 2: Scapegoating of the EU. Many people feel left-behind by modern Britain. The left-behind are older, less educated, more socially conservative, less economically successful and think life in Britain is getting worse not better. Since the global financial crisis the UK's median wage has declined (Costa and Machin 2017). Influenced by the anti-EU sentiments expressed by Britain's newspapers and eurosceptic politicians, these individuals have come to blame immigration and the EU for many of their woes.

According to this hypothesis, voters supported Brexit because they believe EU membership has contributed to their discontent with the status quo.

The nation-state hypothesis explains Brexit as an assertion of national identity, while the scapegoating hypothesis views Brexit as resulting from voters being misinformed about the effects of EU membership. It is likely that both hypotheses played some role in the referendum outcome, but the existing evidence is insufficient to assess their relative contributions. When leave voters are asked to explain their vote, national sovereignty and immigration are the most frequently cited reasons (see, for example, the survey data from Lord Ashcroft Polls discussed above), but these responses are consistent with either hypothesis. They could reflect voters' attachment to the UK as a nation state, or they may mirror the language used by pro-Brexit newspapers and politicians. However, there are important differences between the hypotheses. If voters supported Brexit to reclaim sovereignty from the EU then, provided they are willing to pay the economic price for leaving the Single Market, they will view Brexit as a success. But if misinformation drove support for Brexit, then leaving the EU will do nothing to mitigate voters' discontent. More broadly, the two hypotheses have quite different implications for how policy makers should respond to Brexit and for the future of European and global integration.

Brexit and the Future of International Integration

The nation-state hypothesis is closely related to Rodrik's (2011) idea that the global economy faces a political trilemma. Rodrik argues nation states, democratic politics and deep international economic integration are mutually incompatible, and that countries can choose at most two of the three options. Viewed through this framework, the nation-state hypothesis sees the Brexit vote as a democratic response to the erosion of British sovereignty caused by EU membership. If this perspective is correct, it means the deep integration promoted by the EU is incompatible with national democracy. For Europe to remain democratic, either the people of Europe must develop a collective identity in place of their separate national identities or the supranational powers of the EU must be reduced. Otherwise, the tensions evident in the Brexit vote will recur in other countries and the EU may lose more members.

Two components of the EU's deep integration are obvious candidates for inclusion in any retrenchment: free movement of labor and the supremacy of EU law in regulating the Single Market. The indivisibility of the four freedoms of movement of goods, capital, services and labor within the Single Market is a core principle of the EU, but, in practice, restrictions on immigration could coexist with free movement of goods,

services and capital, even if this would reduce economic efficiency. Similarly, harmonization of economic regulation throughout the EU may be economically desirable, but if the nation state hypothesis holds, allowing greater diversity across countries may be a price that has to be paid to ensure the viability of the EU.

The nation state hypothesis does not directly threaten the sustainability of shallow integration agreements that aim to lower tariffs and border non-tariff barriers. This is evident in the British government's response to the Brexit vote. The government has chosen to assume the nation state hypothesis explains the referendum outcome, leading it to interpret the vote as a mandate for controlling immigration and withdrawing from the deep regulatory integration of the Single Market. At the same time, the UK has branded itself as a champion of free trade working towards the reduction and ultimate elimination of trade barriers wherever they are found (Fox 2016). Setting aside that leaving the Single Market contradicts this aim, it is noteworthy the UK government does not view Brexit as part of a broader shift towards protectionism. Consistent with the government's position, Ballard-Rosa, Rickard and Scheve (2017) present survey evidence showing there is widespread support for free trade and investment in the UK, but that supporters and opponents of Brexit have different preferences over immigration and regulation.

The scapegoating hypothesis, on the other hand, assumes that support for Brexit results not from any particular consequence of EU membership, but from voters channelling their discontent with modern life against the European Union. Colantone and Stanig's (2016) finding that exposure to Chinese import competition had a positive effect on support for Brexit is consistent with scapegoating of the EU. The scapegoating hypothesis does not threaten the ideal of the EU as a supranational political project or provide an immediate reason to reconsider the desirability of deep integration. But it does pose a different challenge to the future of international integration. As long as geography continues to be an important determinant of group identity, international institutions will always be more vulnerable to losing popular support than domestic institutions. The scapegoating of outsiders is a recurring phenomenon in world history. Brexit illustrates how this can lead to outcomes that limit integration.

If the scapegoating hypothesis proves correct, policy makers seeking to promote European and global integration have two main options available. One option would be to channel popular protests against another target. Both euro-sceptic and pro-EU politicians have proved willing to blame the European Union for problems with domestic origins, but this could change. For example, left-wing politicians could embrace a progressive populism that blames the financial industry, large corporations and rich individuals for the

economic malaise that has followed the global financial crisis.

Alternatively, policy makers in the United Kingdom and elsewhere could focus on tackling the underlying reasons creating discontent among left-behind voters. Addressing economic and social exclusion is a daunting challenge, but enacting policies to support disadvantaged households and regions and broaden access to higher education would be an obvious starting point. O'Rourke (2017) argues the EU should position itself as a port in the storm for anxious electorates and should respond to Brexit by renewing its commitment to protecting Europeans from economic shocks, partly by allowing greater flexibility for governments to implement shock-absorbing policies.

It is too soon to know whether Britain leaving the European Union will prove to be merely a diversion on the path to greater integration, a sign globalization has reached its limits, or the start of a new era of protectionism. In the year since the Brexit vote, EU leaders have worked to ensure Brexit does not lead to other countries leaving the union and, in the short-run at least, they have succeeded. A dialogue on the longer-term implications of Brexit has also started to develop, demonstrating how the referendum has made new futures imaginable. For example, the European Commission has issued a white paper laying out scenarios for Europe's future that include not only muddling through or committing to closer integration, but also scaling back the EU to just the Single Market or building a multi-speed Europe (European Commission 2017). Understanding and responding to the motivations of voters who oppose the European Union will play an important role in determining which of these futures comes to pass and whether the many benefits of economic and political integration can be preserved.

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