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B for Brexit: A Survey of the Economics Academic Literature

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IZA DP No. 12134

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FEBRUARY 2019

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ABSTRACT

B for Brexit: A Survey of the Economics Academic Literature*

This paper surveys the economics academic literature on Brexit. It is organised in: pillars, channels, and consequences. The two building blocks to understand Brexit are the economic history of the UK-EU relationship and the literature on the political economy of globalisation and populism. The paper then reviews the evidence on the standard mechanisms through which the UK benefited from EU integration (trade, migration and FDI). Next it surveys the short-run effects of the vote and discuss expected long-term consequences of "Brexit proper." It concludes by identifying some main gaps in the economics literature on Brexit.

JEL Classification: F22, F10

Keywords: Brexit, migration

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B for Brexit

Before Brexit, there was light.

1. Introduction

Brexit means the exit of the United Kingdom (UK) from the European Union (EU). It is a process, not an event. Brexit entails the unilateral cancellation of the UK's membership in the EU. Its advent generated enormous uncertainty, shattered the status quo and challenged conventional wisdom. The outcome of the Brexit referendum was unexpected. Cameron's 2013 pledge was that a referendum would take place before 2018, hoping that a coalition government would abandon this pledge once kept in power (Copsey and Naughton, 2014).

The aim of this paper is to take stock of the economics literature on Brexit. From a purely economic perspective, the verdict is that its costs will significantly exceed its benefits (Begg 2017). While in the short-term, uncertainty is the major issue (Graziano et al 2018), in the long-term Brexit is expected to have deep consequences in terms of growth and productivity making the UK "permanently poorer" (Baldwin 2016). One of the few undisputed benefits from Brexit is that it motivated a huge amount of new research on the political economy of deep integration.

This paper surveys the economics academic literature on Brexit. As this is a fast-growing multidisciplinary literature, it is admittedly selective and non-exhaustive (it excludes important work from other social sciences.) It is organised in three main blocks: pillars, mechanisms, and consequences. The first two sections examine economic history and political economy, which are the two principal building blocks to understand Brexit. Section 2 examines the UK-EU relationship since WWII and the net benefits to the UK from its EU membership. Section 3 discusses globalisation, populism and the vote to Leave. It underscores that Brexit means populism, an association that has not been made explicitly enough. Next it examines integration channels: the freedoms of movement of goods (section 4 on trade), of people (migration in section 5) and of capital (section 6 on financial services and foreign direct

investment, FDI). Section 7 discusses the assessments of the immediate impact of the Brexit vote, chiefly in terms of the exchange rate depreciation and its real wage consequences. Section 8 focuses on the long-term consequences contrasting, on the one hand, the need for new anti-trust and regional policies embedded in a strategy to address the productivity paradox to, on the other hand, the over-stretching of state capabilities seen since the referendum. Section 9 concludes with issues that still need further research. Key among these are: (a) the role of the media, (b) the role of the Single Market in developing key UK sectors (e.g. financial services), and (c) the relative roles of political and economic factors in understanding the determinants of the vote to Leave.

2. Economic history

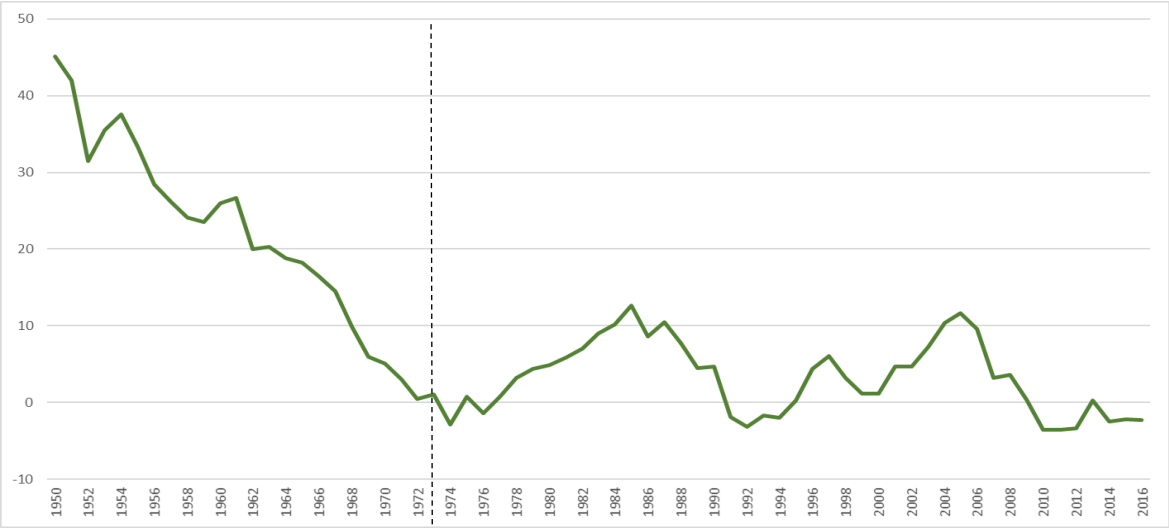
Despite the destruction the Second World War caused, recovery was swift: by 1950 the pre-war levels of per capita GDP and productivity had already been reached in Europe. The UK was exceptional as it experienced positive growth during the war. Data from the Maddison project shows that after the war GDP per capita in the UK was about twice as large as the average GDP per capita of the six founding members of the EU.

The Marshall Plan required European countries to coordinate policies. To do so, the French favoured a customs union, the British a free trade area. Customs unions entail deeper integration because the common external tariff requires a supra-national institution to adjudicate conflicts in case members choose to deviate (Sapir 2011.) The United States sided with the French. In 1950, the British Labour government declined to join the Schuman Plan's European Coal and Steel Community (Eichengreen 2008). GDP per capita in the UK relative to the EU6 average went down to 45% (Figure 1). Seven years later, at the signing of the Treaty of Rome, UK per capita GDP was just 26% higher than the EU6 average.

By 1960, the British government unveils a competing organisation, the European Free Trade Area (EFTA.) Its founding members were the UK, Austria, Norway, Sweden, Denmark,

Switzerland, and Portugal. These were referred to as the Outer Seven to contrast with the Communities' Inner Six. One year later, the UK makes its first formal membership application prompted by the inferior trade performance of EFTA in comparison to the EC (Aitken 1973). De Gaulle vetoed the British application in 1963. In 1967 Britain applied for membership for a second time and it was again vetoed by De Gaulle. The difference in per capita GDP between the UK and the EU6 average reached 14%.

Figure 1. Percentage difference between the UK's GDP per capita and EU founding members' average (EU6) between 1950 and 2016



Data source: Author's calculations using Maddison data (2018).

Pompidou succeeded De Gaulle in 1969 and encouraged the UK to re-apply (O'Rourke 2019). At the time of the third application, UK per capita GDP was a mere 6% greater than the EU6 average. When the UK joined in 1973, the per capita GDP gap with the EU6 vanished.

The ratio of UK's per capita GDP to the EU founding members' declined steadily from 1945 until 1972 but became relatively stable between 1973 and 2016 (Figure 1). Campos and Coricelli (2017) uncover a structural break around year 1969 (using a range of tests such as Chow, Bai-Perron, and Zivot-Andrews) and conventional levels of statistical significance. Such a structural break suggests substantial benefits from EU membership especially considering that Britain joined late, at the time of the collapse of the Bretton Woods system and first oil shock.

Why did Britain join? For multiple reasons but chiefly among them it did because joining the European project was as a way to stop its relative economic decline (Crafts 2012). In 1950, UK's per capita GDP was a multiple of the EU6 average. By 1973, they were the same and the gap has remained comparatively stable since. On this basis, joining the EU worked – it helped to halt Britain's relative economic decline vis-à-vis the EU6. This questions the conventional wisdom that the revival of the UK economy owns more to Mrs Thatcher's reforms than to EU membership.

Why EU membership made such a difference? There is a disappointingly small econometric literature on the benefits from EU membership. There is little research answering questions such "what the level of per capita income in a country would be had it not joined the EU?" Many believe, incorrectly, that this literature is vast because of the volume of work on the benefits from trade liberalization, the Single Market, and the common currency. Sapir (2011) notes that the literature on the static benefits of integration is vast but not that on the dynamic benefits. Moreover, most of the few papers on the benefits from EU membership are open about the fragility of their estimates with cross-country heterogeneity to blame.

Campos et al. (2019) use the synthetic control method to estimate the benefits from joining the EU in terms of economic growth and productivity on a country-by-country basis. Figure 2 shows their results for the UK. The dark line is for actual per capita GDP and labour productivity, and the dotted line for the estimated counterfactual. These estimates focus on the effect of a given intervention (in this case, EU membership) by comparing the evolution of an outcome variable for a country affected by the intervention vis-à-vis that for a control group which is constructed as a weighted combination of other countries chosen to better match the treated country, before intervention, for a set of predictors of the outcome variable. The estimates in Figure 2 show what would have been per capita GDP and productivity if Britain had not had become a member of the EU.

Figure 2. UK net benefits from EU membership

Fig 2a. Real per capita GDP

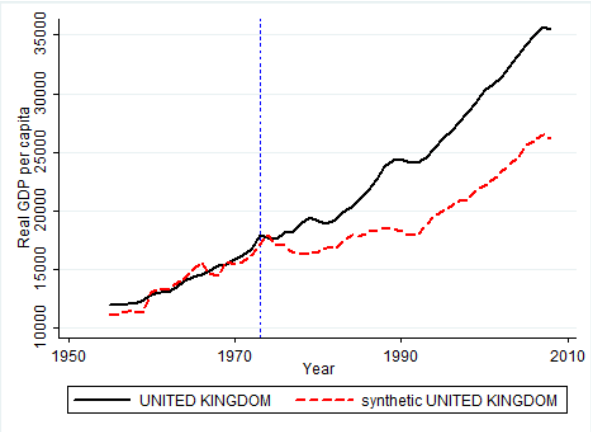
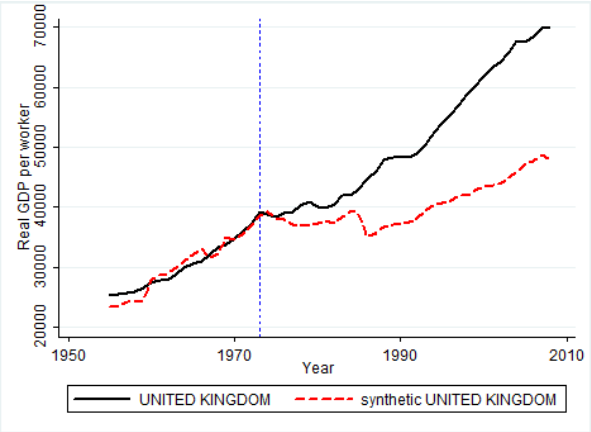


Fig 2b. Labour productivity (real GDP per worker)



Source: Campos, Coricelli and Moretti (2019.)

They estimate the net benefits from EU membership for the UK to be 8.6% of GDP over ten years. This suggests that per capita GDP would be considerably lower if the UK had not joined the EU in 1973. Actual and estimated series are reasonably close before 1973, more so for labour productivity than per capita GDP. The difference between actual and counterfactual does not diminish over time, suggesting that the benefits from membership seem more likely to be permanent than temporary. Campos et al. (2019) also identify trade openness and financial integration as the main channels for these net benefits.

3. Political economy

Perhaps the sentence that will be more closely associated with Prime Minister May's tenure is "Brexit means Brexit." We may never know what Brexit means because it will likely entail a process of continuous renegotiations, but we may know what it is. If Brexit is populism than the political economy literature on populism and globalisation is fundamental.

Guiso et al (2018) argues that whether populist parties arise from left or right of the political spectrum is determined by the availability of political space and that the typical non-populist party policy response is to reduce the distance of their platform from that of new populist entrants, amplifying the aggregate supply of populist policies. While Rodrik (2018)

argues the advanced stages of economic globalisation ("hyper-globalisation") produces political backlash because then "policy makers go after the remaining, low barriers, trade agreements become more about redistribution and less about expanding the overall economic pie" (2018, p. 15). Losers from globalisation may lose relatively more the smaller are the trade barriers between removed. He argues that right-wing populism stresses identity cleavages and target foreigners and minorities, while left-wing populism stress income cleavages and target the wealthy and large corporations.

These cleavages in Europe may have shifted away from left and right and towards pro- and anti-globalisation. Hix et al (2018) provide evidence showing how these cleavages shift voting patterns in the European Parliament. Not only they find that voting over time become increasingly (decreasingly) explained along a pro- and anti-globalisation (left and right) axis, but that these changes are more prominent in certain issues than others (e.g., voting on the EU budget vis-à-vis on gender discrimination laws.) These shifts are complex and driven by the global financial crisis and the various policy mistakes in handling it (elite failure) which have increased economic insecurity and decreased in trust in traditional political parties, in the national government, and in European institutions.

There has been a generalised decrease in trust. Dustmann et al (2017) use data from the European Social Survey on trust in national and European parliaments and in the European Union, disaggregated at the individual level, to identify the causes of populist support and the decline of trust across Europe. They show that unemployment shocks are strongly correlated with voting for populist parties in the European Parliament elections, with the decline in trust being the main mechanism. They also find that while macroeconomic shocks explain a large fraction of the observed decline in trust in national parliaments, they explain a much smaller fraction of the recent changes in the electoral success of anti-EU parties.

Trust in the political parties in Europe has declined after the global financial crisis. Guiso et al. (forthcoming) explain the different levels of support for populist parties (defined as

those championing short-term protection policies while downplaying or lying about their long-term costs) across different European countries. They show that the success of populist parties led mainstream parties to defend instead of attack populist platforms. They also document that populist parties had greater success in the Euro area due to the inability of those governments to react to globalization shocks and crises.

These findings are key to understand Brexit, considering the rapid growth of the main UK populist party (UKIP) and how traditional parties (especially the Conservatives) responded by defending and co-opting (instead of attacking) populist policies. The EU referendum and the "hostile environment" migration policy are cases in point.

The vote for Brexit was won with populist promises and in response to the rise of a populist party. Perhaps more importantly, the vote for Brexit legitimised the populist backlash against globalisation (Sampson 2017). The world's reactions may have been if those rational, sensible, and well-mannered Brits voted for it, it cannot be that bad. Yet, the vote came as a surprise, generating a huge literature trying to grasp how and why it happened.

Becker et al. (2017) is the most detailed and comprehensive attempt to understand the Brexit vote to date. They combine various data sets to assess the four main factors that may increase the likelihood of "voting Leave": (a) exposure to the EU (migration, trade and structural funds), (b) fiscal consolidation and local public goods provision, (c) demographic and educational characteristics, and (d) unemployment and importance of the manufacturing sector. Their main finding is that exposure to the EU in terms of either migration or trade explains relatively little of the cross-regional variation of the likelihood of voting Leave. Instead, they find that education, income, unemployment and a historical dependence on manufacturing are the key characteristics explaining the vote. It is important to mention that theirs is one of the few papers that discuss the possible role of media exposure.

Crafts (2018) further explores their regression results by calculating the values that would, ceteris paribus, give Remain 50%+ of the vote. Crafts argues that "a fairly modest

reduction in the imposition of fiscal cuts might have been enough for Remain to have won" (2018, p. 33). He calculates that to reverse the vote it would require a share of population above 60 of 12.3% (compared to the actual share of 24%), an unemployment rate of 0.6% (actual rate was 5.3%), a growth rate of EU migration of -0.5% (actual was 1.7%) but fiscal cuts per person of £407 (compared to an actual figure of £448). The only other factor that comes close is the share of the population with no qualifications (33.6% to reverse the vote compared to the actual share of 35.4%).

Is austerity the main cause of the vote to Leave? Fetzer (2018) puts forward convincing evidence about the role of austerity-induced withdrawal of the welfare state after the 2010 election (change from Labour to a Conservatives-Liberal Democrats coalition in government). Using data from all electoral contests in the UK since 2000, he shows that shares of Leave vote are causally associated with the extent of exposure to these austerity policies, both at the individual and at the district-area levels post-2010. Analysis of three specific welfare reforms (abolishment of council tax benefits, changes on disability benefits, and introduction of the "bedroom tax") confirms that the Welfare Reform Act of 2012, the UK's welfare state was able to equalise growing income differences across the skill divide through transfer payments.

What are the deep causes of the Brexit? One camp stresses the role of economic factors and grievances, while the other highlights the role of identity and cultural resentment (for instance, Norris and Inglehart 2019 argue that there is no evidence that economic losers from globalization voted for Brexit.) One possible explanation for these differences, brought up by Guiso et al (2018), is voting turnout. They show that, for individual-level data on voting in European countries, once turnout effects are taken into account, "economic insecurity drives consensus to populist policies directly as well as through indirect negative effects on trust and attitudes towards immigrants." This effect is reinforced by simultaneous developments on what they call the "supply side of populism." Populist parties take advantage of their platforms capacity to polarise. Such parties are more likely to emerge and grow when countries are faced

with a systemic crisis that traditional left-wing and right-wing parties find hard to address. This disappoints voters and leads to abstinence of moderates.

In addition to the global financial crisis and the European sovereign debt crisis, there is one additional key globalisation issue, the "China shock." Colantone and Stanig (2018) show that economic factors dominate over cultural or social explanations. They show that support for the Leave option in the Brexit referendum was systematically higher in regions hit harder by economic globalization. They document the deep consequences of the emergence of China as a globalisation shock, specifically China's membership in the World Trade Organisation in December 2001. Using data since 1990, they show the effects of surging imports from China as a structural determinant of divergence in economic performance across UK regions. They also provide evidence that migration as a potential factor has little explanatory power for the vote for Brexit, either as stocks or inflows. They show that this is driven by displacement because of the austerity-driven disappearance effective compensation to the losers.

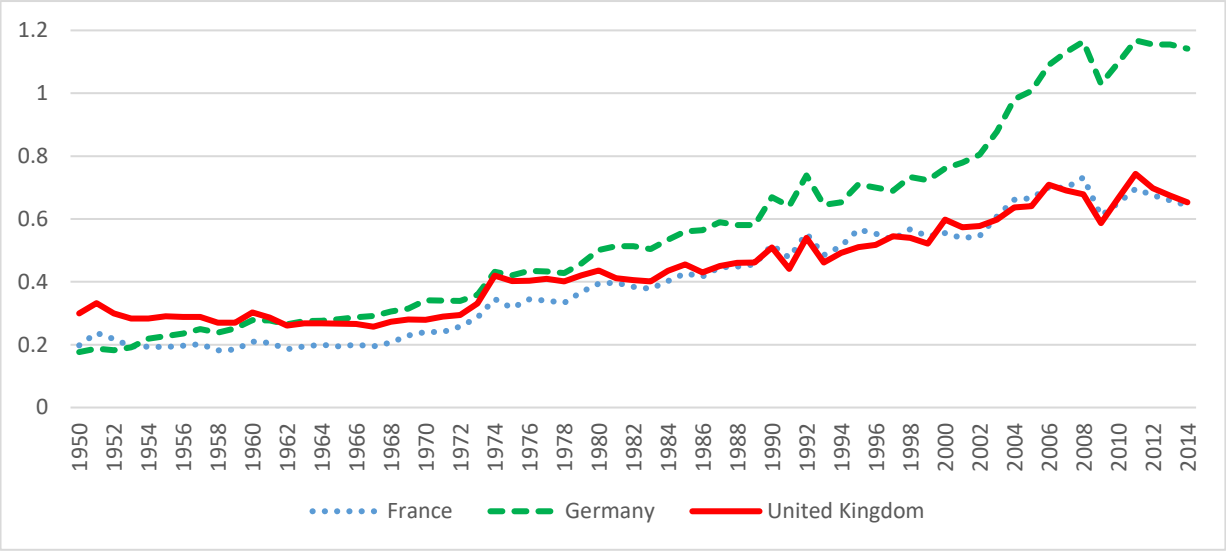
4. Trade

One of the key channels through which the UK benefited from EU integration is trade. Article 2 of the Treaty of Rome sets the establishment of a common market as a main goal of the European Integration project. Did joining the EU affect trade openness in the UK? Yes but in subtle ways. Figure 3 shows the dynamics of trade openness in the UK compared to that of France and Germany. Both were already EU members when the UK joined in 1973. While Germany has become a much more open economy since, the UK trajectory mirrors the French.

Overman and Winters (2011) argue that the UK accession led to a significant re-orientation of trade towards EEC members. They combine plant- with port-level trade data to examine the impact of EU accession on the spatial distribution of employment in UK manufacturing. They show that joining the EU was an exogenous shock to different regions, as this affected ports and airports through which trade is carried out, and did change the

composition of trade. It shifted manufacturing employment towards the South East, basically from the West Midlands and the North. Such adjustment was costly and lengthy: plants with better access to export markets and intermediate goods increased, while those that faced greater import competition decreased employment.

Figure 3. Trade Openness (as % of GDP) in the UK, France and Germany since 1950



Data source: Author's calculations using PWT9.

Joining the EU meant not just joining a different integration model (customs union from free trade area) but also joining a process of continuous, deepening or "ever closer" integration. Two recent papers estimate the effects from deeper integration on UK trade: Saia (2017) investigates how much UK trade flows would have increased had the UK joined the euro, while Mulabdic, Osnago and Ruta (2017) study the effects from the deepening of the integration process.

Saia (2017) uses the synthetic control method to estimate the trade flows in a counterfactual where the UK joined the euro. He finds that the aggregate trade flows between the UK and euro area countries would have been 16.8% higher if the UK had adopted the euro in 1999. Interestingly, these effects appear mostly from 2002 onwards (when euro coins and notes where introduced). Moreover, Saia shows that the adoption of the euro would also have led to a significant increase in British trade flows with non-euro area members (specifically

with the US, Japan, Switzerland, Sweden, Norway and Hong Kong). For instance, he estimates UK trade with the US would have been about 12% higher had the UK joined the euro. These are important results as they indicate that trade diversion may have played a much smaller part in driving these effects than often feared.

Mulabdic, Osnago and Ruta (2017) use a gravity model to study the effect of European Union membership on UK's trade. One main contribution is the use of a new measure of the depth of trade agreements based on the number of provisions they cover. They report that among 279 trade agreements, the EU is the deepest according to this measure. They estimate that deep trade agreements increased UK goods and services trade by about 42 percent between 1995 and 2012, and value-added by about 14 percent. Because of EU membership, UK's services trade more than doubled. They also find that the increase in domestic value added in gross exports from the UK is driven by stronger global value chains links: the UK's "forward linkages" increased by about 30% due to deepening integration, while its "backward linkages" increased by almost 40% thanks to EU membership. Mulabdic et al (2017) also show that EU membership has been more important to increase UK exports of services to new EU members than to the EU founding members.

Trade is beneficial and intra-industry trade seems even more so. Trade with the Commonwealth has a positive effect on UK GDP, but trade with the EU is more important as it affects productivity. Commonwealth trade is mainly driven by comparative advantage (hence gains from trade are mostly from specialization and scale), while EU trade by being mostly intra-industry generates gains that are basically driven by increased competition and technological innovation. An important related issue that needs considerably more research is trade in services. One should expect the impact of the latter on UK productivity growth to be more substantial and longer-lasting.

Dhingra et al (2017) provides a full assessment of the costs and benefits (welfare effects) of Brexit in the medium to long run anchored on a general equilibrium trade model.

The model covers 40 countries and 30 sectors and includes trade in intermediate goods. They simulate a range of counterfactuals reflecting alternative options for the EU-UK relation after Brexit. Distinguishing between a soft and a hard Brexit, they estimate welfare losses for the average UK household between 1.3% and 2.7%. Moreover, using a reduced-form approach that captures the dynamic effects of Brexit on productivity they show that this more than triples the estimated losses. It implies a decline in average income per capita of between 6% and 9%, in large part thanks to falls in foreign direct investment. The paper also shows that the negative effect of Brexit is unlikely to be offset by “new trade deals”.

Vandenbussche et al (2017) construct a gravity model that includes domestic and global value chain linkages between goods and services sectors and bilateral tariffs that have direct and indirect (i.e., via third countries) effects on production. They use it to predict the impact of Brexit in terms of value added, production and employment for the whole set of EU countries. In line with most of the literature, they find that Brexit hurts the UK relatively harder than the EU27. They estimate Brexit would reduce economic activity in the UK approximately three times more than in the rest of the EU. Yet, they find EU27 losses from Brexit are substantially higher than those estimated in other studies and that they vary across countries because of differences in sectoral composition of output. They estimate that absolute job losses from Brexit for the EU27 will be larger than for the UK, but value-added losses as a percentage of GDP are smaller, from 0.4% for “soft” to 1.5% for a “hard" Brexit. They also find that these losses are larger for countries that are more closely connected to the UK (e.g. Ireland) and for small open economies in the EU (e.g. Belgium and the Netherlands).

5. Migration

It was a watershed moment in 2004 when ten new members joined the EU. Eight of these countries were former communist economies. For these, a seven-year transitional period with respect to labour mobility was agreed. Of the 15 EU members, only Ireland, the UK and Sweden waived these transitional arrangements. This led to an unexpectedly large inflow of

Eastern European immigrants to the UK and Ireland and, to a lesser extent, Sweden. In the UK, the share of migrant workers in employment increased from less than 0.5% in 2004 to 4.5% in 2016 mostly driven by EU flows (only in Ireland and Austria show larger shares).

This prompted a surge of economic research. Most studies show that the net benefits from these inflows are small but significant and positive; acknowledging that many of the benefits are intangible or very difficult to capture empirically. There is little robust econometric evidence supporting views such as that migration leads to increases in unemployment, or that lower unemployment rates attract more migrants, or that a higher share of migrants in a region lowers wages, and/or that higher wages attract migrants (Lewis 2013 and Dustmann and Preston 2018 survey the international literature and Wadsworth 2018 the UK evidence).

Blanchflower and Shadforth (2009) provide one of the first studies of the immigration effects of the 2004 EU accession. They report evidence of significantly weaker wage growth for those groups of workers that compete directly with new arrivals. They document that the increasing numbers of foreign workers led also to "fear of unemployment" and help control wage pressure. Dustmann, Frattini and Preston (2013) qualify this finding by estimating wage effects of immigration along the distribution of native wages. They find that such downward pressure is restricted to the bottom percentiles but, thanks to increases in the upper parts of the distribution, the overall effect on native wages is positive.

There remain areas that need further research. We need time-series and counterfactual analysis to further shore up causality claims. The lack of a political economy literature on the role of the media in the UK migration debate is nothing short of puzzling. Finally, we should heed to non-economic research and explore specific features of Central and Eastern European migration to the UK that are difficult to quantify (Parutis 2014.)

The specificities of eastern European migration should also be more fully recognised. Firstly, these migrants arrive in the UK with significantly higher levels of schooling than that of native workers (Altorjai 2013; Alesina et al 2018). Secondly, migrants may take on

unskilled jobs because they know it is temporary. The “EU’s temporary restrictions between 2004 and 2011” furthered creaming: the UK would receive top migrants anyway because say of labour market flexibility and language, yet it received more skilled migrants thanks to restrictions elsewhere (especially Germany and Austria).

These migrants are highly educated: they come to the UK and invest a year or two in learning the language. They are promoted fast because they know how to learn (they've been in school longer than their UK co-workers) but they are not fluent in English. As soon as they become fluent, they start climbing the ladder (Parutis 2014.) They get promoted or they open their own business (growing up under communism gives them an enviable comparative advantage in dealing with paperwork and bureaucracy). This high visibility may have important implications for understanding the vote for Brexit as it can potentially reconcile “perceptions of mass migration” with the reality of few migrants in certain areas.

6. Capital flows

Above we reviewed the literature on the movement of goods and people, we now turn to capital. The benefits of FDI are well-established: not only it contributes to the diffusion of frontier management practices, increases competition and shores up innovation, it does all this in relatively more resilient and sustainable fashion, than for example portfolio flows (Blanchard and Alpin 2016.) Lane and Milesi-Ferretti (2018) show that these flows as a share of world GDP collapsed after the crisis. This was mainly driven by weaker capital flows among advanced economies (e.g. cross-border activity by banks in the euro area) and the rise of emerging markets. They show that FDI continued to expand after the crisis, unlike portfolio, but argue that this was mostly fuelled by financial centres like the UK.

Despite the obvious importance of the subject, evidence remains scarce. Bekaert et al (2017) investigate the joint effects of EU membership and euro adoption on financial and economic integration in Europe. They find that EU membership significantly lowered discount

rate differentials (their proxy for financial integration) and expected earnings growth rate differentials (their measure of economic integration) across countries. Yet they do not find that euro adoption boosted financial nor economic integration. In contrast, De Sousa and Lochard (2011) study whether the introduction of the euro, in 1999 explains the increase in intra-European investment flows. They tackle this question using a gravity model for bilateral FDI. Their main finding is that the euro increased FDI stocks by around 30%. More importantly, they find evidence that this effect varies over time and across the euro area: it is significantly larger for outward investments of less-developed members.

The UK is one of the main FDI recipients in Europe. Net FDI inflows to the UK were small until the mid-1990s but saw two periods of rapid expansion, one in the second half of the 1990s and the other before the financial crisis. Figure 4a presents estimates of the effects of the launch of the Single Market in 1986 on UK FDI net inflows while Figure 4b has similar estimates for portfolio investment. The FDI model estimates larger weights for USA, Canada and New Zealand. The results for portfolio flows cover less years due to data availability and larger weights are given to Canada and USA. The dotted lines are our estimates for what these flows would have been after 1986 if the UK had decided not to join the Single Market.

Figure 4. What would capital inflows be if UK had not joined the Single Market in 1986?

Fig 4a. FDI net flows

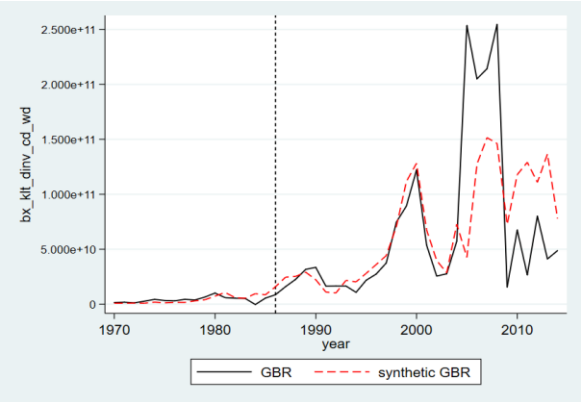
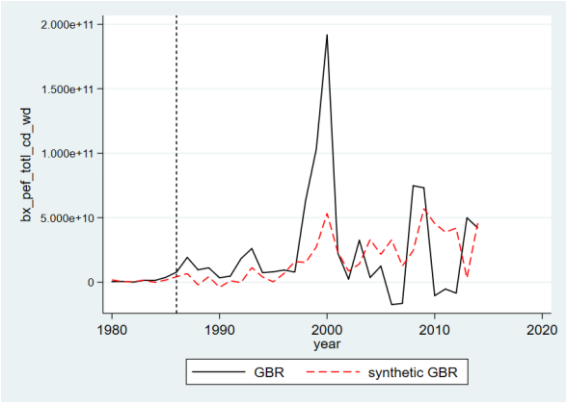


Fig 4b. Portfolio net flows



Source: Author's estimation based on World Bank (WDI) data.

These preliminary results show that the Single Market played an important role in mobilizing capital flows to and from the UK. Most of these benefits in terms of additional FDI and portfolio investment happened after the introduction of the euro in 1999, between the dot-com bubble and the financial crisis. The results show that both FDI and portfolio have been very volatile and that, while the gap for FDI is greater just before the crisis, for portfolio it peaks around the introduction of the euro.

McGrattan and Waddle (2019) study the economic effects of Brexit on FDI introducing trade frictions and bilateral costs on FDI in a multi-country dynamic general equilibrium growth model. Their central idea is "technology capital": accumulated know-how from investments in R&D, brands, and organizations which can be used simultaneously in domestic and foreign production. They simulate the UK and the EU raising or lowering barriers on FDI and on trade with either one or both doing so at a time. They "assume that trade costs and FDI costs both rise by 5 percentage points (…) In the case of FDI costs, this cost increase is equivalent to a lowering of TFP of 5 percent" (2019, p. 2). The main result from their simulations is that the direction of the change is determined by whether costs to FDI and trade are raised or lowered, but the magnitude of the overall effect is mostly driven by FDI.

Bruno et al (2017) investigate how deepening economic integration fosters FDI and international trade. They estimate the effects of integration on FDI and trade jointly and deal originally with selection and implementation lags. Within a structural gravity framework and using annual bilateral data from 34 OECD countries over 1985–2013, they find that deep integration (EU membership) increases trade by about 100% and FDI inflows by about 25%. Importantly, they find that the FDI effect survives the Glick-Rose critique, i.e., it does not vanish due to estimator choice (unlike trade.) Moreover, while the FDI estimates are unaffected by the inclusion of trade, the trade estimates shrink when FDI is included. They calculate that leaving the Single Market would result in a decline of FDI inflows to the UK of about 22%, close to other estimates above which use different data and methods.

Of course, financial integration goes well beyond FDI. London has historically been a major financial centre but since the early 1990s it regained this status. As a share of GDP, the UK financial system is now larger than that of the US. Despite outside the euro but thanks to passporting rights, the UK has gained market share in foreign exchange at the expense of Germany, France, and even Switzerland. Eichengreen (2019) notes that "more than 90% of the euro-denominated interest rate swaps of euro area banks, three quarters of all foreign exchange transactions, half of all bank lending, and half of all securities transactions in the EU occur in London." (p.5).

Access to the EU Single Market has been a relatively important yet under-studied factor. The comparative advantages of the UK financial sector (tradition, flexible regulation, product diversification, human capital, language, etc.) help the UK to exploit the benefits of EU integration. The UK benefited from EU membership through the positive impact of EU integration on the development of the UK financial sector. Although we still lack a comprehensive time-series analysis, access to the EU Single Market contributed to strengthening the position of the UK as a leading international financial centre.

7. Short-run effects

The objective of this section and of the next is to review the economics literature on the short- and long-run impacts of the Brexit vote, respectively. In the run-up to the June 2016 referendum, a number of studies tried to construct scenarios for the UK economy (and to a lesser extent for various selected EU countries and for the EU as a whole). These numerous studies cover both the immediate and long-range implications of the vote and have been prepared by governmental and international organisations, academic economists, think tanks and private sector companies. Due to the lack of clarity by the UK government before and after the vote about the future UK-EU relationship, scenarios were often built for the whole range of options (namely, remaining in the EU, remaining in the EEA, a free trade area agreement, and

an exit on WTO rules.) This paper does not review these various exercises and how well they performed. It focuses instead on the available economic analyses of what happened so far (this section) and what are the key long-term issues that need resolution. Yet it should be clear that the two blocks above (on pillars and channels) inform the majority of these forecasts.

In the two years and a half following the vote, several important consequences from it can be identified. Most of them have been harmful with one important exception. The exception is the behaviour of the UK labour market. Even considering that unemployment is a lagging business cycle indicator, the UK labour market held up extremely well since the vote, registering unemployment rates unseen since the 1970s. The collapse in real wage growth (more below) is part of the explanation but not all of it.

Excluding the unemployment rate, the Brexit vote was followed by several negative developments: a depreciation of the pound, an increase in inflation, and a hit to real wages and per capita output. The depreciation is perhaps the most lingering financial effect of the vote, despite the role played by central bank support in the immediate aftermath. Plakandaras et al (2017) use time-series methods and conclude that it was unexpected or, in other words, this unanticipated negative shock to the UK economy was driven mostly by uncertainty generated by the vote for Brexit. Such uncertainty focuses on future economic policy and how can it be designed to counteract the expected decreases in the openness of the UK economy to migration, trade and foreign investment.

What are the impacts of the Brexit vote on UK inflation and living standards? Breinlich et al (2018) provide a useful theoretical framework. The key dichotomy in the model is that households are exposed to imported goods directly (through consumption of foreign final goods) and indirectly (through foreign intermediates in domestic production.) From this distinction, they construct empirical measures of direct and indirect exposure based on the UK 2013 input-output tables. Using these measures, they show that the depreciation of the sterling

following the Brexit vote led to those product groups with larger import shares experiencing significantly higher inflation after the vote (than those groups with low import shares.)

They calculate that the Brexit referendum increased (reduced) UK inflation (real wage growth) by about 1.7 percentage points. This is important because CPI inflation (real wage growth) has accelerated (fell) after the third quarter of 2016 with real GDP growth moving since to the bottom of the G7. Inflation in the UK after the Brexit vote has risen faster than in the euro area or in the US. CPI inflation increased from about 0.5% at the time of the vote to 2.6% in late 2017. This paper shows that 1.7 out of the 2.1 percentage points overall increase is due to Brexit so far (similar figures for real wage growth) as driven by goods with higher import exposure.

Finally, Breinlich et al (2018) find that the increase in inflation has been shared evenly across the income distribution. Yet the effects across regions are far from homogenous. While they find that London has been the least affected region, Scotland, Wales and Northern Ireland have been the most affected ones. This is because of the varying share of expenditures on non-tradables (such as rent) compared with that in tradable goods (especially food and fuel).

Born et al (2018) combine synthetic control method estimates to identify the output loss caused by the Brexit vote with an expectations-augmented vector autoregression used to identify its main drivers. It must be noted that their estimates of the output loss (1.8 percent from June 2016 to December 2017) are very much in line to those from Breinlich et al (2018) although they use radically different data and methods. They show that forward looking agents have lowered spending since the vote causing the output loss. Decomposition of the VAR estimates shows that shocks to economic policy uncertainty account for the initial output loss following the vote but they find that these effects fade relatively quickly. Importantly, the output costs of Brexit they estimate continue to rise over time, “increasingly driven by anticipation effects reflecting downward revisions of output growth expectations” (2018, p 4.)

Overall, they estimate that uncertainty and growth expectations jointly account for about half of the total economic costs of the Brexit vote.

8. Long-run effects

It is obviously too early to judge the long-run effects of "Brexit proper." These effects will be determined by how the exit shock affects (the loss of) the net benefits from being a full-fledged member of the EU. The exit shock entails (a) the time profile of the exit and (b) how the exit takes place for each one of the different channels (trade, migration and FDI). Contrast, for instance, the impact on international trade of goods and of services, migration and investment if the UK leaves the EU on WTO rules in March 2019 compared to a situation in which it negotiates a gradual de-coupling over a decade or so. If the exit shock turns out to be similar to the entry shock, it will be a significant structural break (Campos and Coricelli 2017).

As soon as Cameron announced the manifesto pledge of an EU referendum, scenarios about its effects started to appear. The first ones were mostly from Eurosceptic non-academic think-tanks and often reported a zero effect. These were followed by a stream of medium- and long-term forecasts conducted by academic and public organisations. These prompted a third type of projection constructed from assumptions that lack support from international evidence such as that the cost of regulation amounts to 6% of GDP (Minford 2019, p. 14.)

The central estimates of the academic forecasts indicate a loss to the UK economy from Brexit of about 2 to 3% of GDP compared to remaining in the EU (Begg 2017). These are losses calculated from a canonical, static model that does not capture dynamic productivity effects (e.g., does FDI increase the productivity of domestic firms?) Given the difficulties of the UK government in addressing the uncertainty about the future UK-EU relationship, these studies also put forward scenarios for different types of the exit shock, specifically they for a free trade agreement with the EU and for an exit on WTO rules. For the former the existing estimates show a loss for the UK of about 5% and for the latter about 8% of GDP in the long-

run, compared to remaining in the EU.

These larger estimates have been widely criticised for not being based on sound economics (especially those recently produced by say the Bank of England). Such criticism should be weighed against at least three arguments. Firstly, there has been explicit recognition that the lower estimates are based on static models while the larger estimates are not: "unfortunately, there is no canonical trade model that incorporates these dynamic effects, as the theory is complex and still evolving" (Van Reenen 2016, p 374).

Secondly, as Crafts (2018) observes, it is remarkable how estimates that use rather different methodologies and data concur: those for the net benefits of EU membership (about8.5% for the UK) compare very neatly to the larger dynamic costs of EU exit above. Moreover, these long-run scenarios assume the EU growth rate would not be affected by the referendum and would remain the same in the future. If the EU reforms and starts to perform better than it has of late, those estimates of GDP losses calculated against "remaining in the EU" may need revising upwards.

A third response is that the static estimates ignore not only dynamic (productivity) but also "institutional drift" effects. Philippon and Gutierrez (2018) document that while US markets were more competitive than European markets in the 1990s, this has changed. Today, European markets show lower concentration rates, lower excess profits, and lower regulatory barriers to entry than those in the US. They document that concentration rates, for example, have risen in the US since 1990 but remained constant or stable in the EU. They explain this reversal arguing that when politicians in different countries set up a common supra-national regulatory (anti-trust) agency they tend to design it to be more pro-competition and with more independence than the national agencies it replaces.

These considerations become more severe considering productivity persists as the UK's key problem. Ketels and Porter call it the productivity paradox (not puzzle): "overall performance has been mediocre despite the competitive advantages the UK has traditionally

enjoyed: an open economy, competitive local markets (…), relatively low regulatory costs (…), and a strong financial system (…). The UK also has a strong science base (…) and with London a truly global city (…) that attracted talent and activity from around the globe. So why is the UK underperforming? The answer lies in largely-known weaknesses in competitiveness fundamentals: infrastructure quality (…), major skills shortages, (…) low spending on innovation, (…) and strong clusters (…) mostly located in the London region" (2018, p. 4-5).

Brexit means the UK will have to craft anti-trust and regional policies (Becker et al 2017) as part of a comprehensive strategy to deal with its productivity paradox. If UK's state capacity continues to be fully stretched in the near future, the higher estimates of the costs of leaving the EU may turn out to be accurate even under softer forms of Brexit.

9. Conclusions

The objective of this paper was to take stock of the academic economics literature on Brexit. We argued, firstly, that economic history and political economy are key building blocks to understand Brexit. Secondly, we reviewed three standard channels through which the UK economy benefited from EU membership (trade, migration and FDI.) All short- and long-run assessments of the economic impacts of Brexit draw upon these channels. Increasing barriers to trade in goods and services, further impediments to movement of people, and restrictions on capital flows will likely harm the UK economy. Brexit may have particularly severe effects on the UK financial sector, and through these, further effects on trade and FDI. These costs may also increase once we account for interactions among these factors as well as for foregone benefits from deep integration (chiefly "institutional" ones regarding competition and regional policies.)

In light of the literature discussed above, we highlight three areas that would benefit from further attention. First is the role of the media. The economics of the media has received huge attention internationally (Anderson et al 2015) but almost nothing has been produced for

the UK. This is an important issue to understand the gap between perception and reality (e.g., migrants or austerity) driving support for Leave. A second area for future research regards the role of the Single Market in developing various industries in which the UK is competitive today but was not in the mid-1980s. Services, automobile and pharmaceutical industries are good examples. A third and final area that we believe deserves further research is to disentangle political and economic factors in understanding the determinants of the vote to Leave. The discussion of the economic aspects of Brexit will certainly continue for years to come but we hope that this paper is helpful in informing new efforts towards the important aspects highlighted above that have not yet received due attention from researchers.

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