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**The Growth Effects of EU Membership for the
UK: a Review of the Evidence**

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The Growth Effects of EU Membership for the UK: a Review of the Evidence

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Abstract

This paper reviews the literature on the implications of EU membership for the UK. It concludes that membership has raised UK income levels appreciably and by much more than 1970s' proponents of EU entry predicted. These positive effects stem from the EU's success in increasing trade and the impact of stronger competition on UK productivity. The economic benefits of EU membership for the UK have far exceeded the costs of budgetary transfers and regulation. Brexit is risky and its impact would depend heavily on the terms negotiated and the use made of the policy space that it freed up.

1. Introduction

The economics of EU membership for the UK can be viewed as the payment of a 'membership fee' in return for improved macroeconomic performance. The fee comprises the costs of acceptance of the rules of the club notably through the UK's net contribution to the EU budget, other costs from the Common Agricultural Policy, and net costs of EU regulations. Given that the UK has not joined the Euro and that the NAIRU is determined by labour market institutions and policies which are under UK control, it is possible to see medium-term inflation and unemployment outcomes as unaffected by EU membership. There are, however, a number of ways in which EU membership can affect UK productivity performance and thus the level or even the rate of growth of real GDP per person.

The accession of the UK into the EU reduced trade costs. In terms of short-run static effects, trade liberalization can improve allocative efficiency and/or productive efficiency, i.e., given existing costs, factors of production are deployed more efficiently or production costs are lowered. The former might result from greater specialization along lines of comparative advantage and the latter from a new found ability to realize economies of scale. Insofar as freer trade increases competition in product markets (through actual or potential entry), it may have both effects as market power is reduced and price-cost margins fall while managers of firms are pressured to reduce costs to the minimum feasible (principal-agent problems are reduced).

Balassa (1961) distinguished between different degrees of increasingly deep economic integration working up from free trade area to customs union, in which there is also pooling of sovereignty in a common external trade policy, to common market, within which factors of production can move freely, to economic union, in which some economic policies are harmonized, to complete economic integration, where there is political union with a supra-national authority. The EEC customs union was achieved in 1968 but Single Market took much longer and awaited the Single European Act which addressed non-tariff barriers to trade, liberalized trade in services and ended capital controls and was (less than fully) implemented from 1992. The Maastricht Treaty of 1992 was a significant step towards economic union and paved the way to a single currency which further reduced trade costs as well as eliminating exchange rate instability. This process of ongoing integration can be expected to have reduced trade costs, notably by reducing non-tariff barriers to trade, by much more would have happened in a free trade area like the European Free Trade Area (EFTA) of which the UK was a member from 1960 to 1973.

With a medium-term perspective, the capital stock adjusts to a higher level of productivity or perhaps a reduction in the price of capital goods and a further increase in the level of output can be expected. Furthermore, as barriers to capital mobility are reduced, relocation of economic activity may be a consequence, possibly based on matching industrial and regional characteristics on a factor endowments basis (Heckscher-Ohlin) or possibly based on market access considerations (New Economic Geography).

In terms of long-run dynamic effects, according to endogenous growth models, it is possible that the growth rate will rise as a result of economic integration. In a basic AK model if investment (or more generally the rate of growth of the capital stock) responds positively there is no tendency for diminishing returns to erode this initial effect so there is a 'permanent' impact on growth. Perhaps more plausibly, if a larger market and/or more competition in product markets ensues from economic integration this may raise the rate of innovation and total factor productivity (TFP) growth.

Since the UK joined the European Economic Community in 1973 up to the eve of the recent crisis, its relative growth performance vis-à-vis major European economies that were signatories of the Treaty of Rome in 1957 has improved, as is reported in Table 1. While growth slowed down everywhere from the 1970s after the 'golden age of post-war growth' the extent of the slowdown was more marked in France and Germany than in the UK. From the mid-1990s to the crisis, UK growth was the strongest of these three countries. Table 2 shows that after the 1970s relative economic decline vis-à-vis France and Germany ceased at least through 2007.

This suggests that EU membership could have had favourable effects. Support for such an interpretation was recently voiced in Bank of England (2015) which stressed the favourable impact of the greater openness associated with EU membership for the dynamism of the British economy without, however, providing any explicit quantification of its magnitude. This paper reviews the available evidence with the principal aim of addressing two questions:

- How much has EU membership contributed to UK economic growth?
- How do the income gains compare with the 'membership fee'?

This also permits reflections on two related issues, namely:

- How does the ex-post outcome compare with ex-ante predictions made prior to UK entry?
- How large might the growth penalty of Brexit be?

The purpose is to extract estimates from the existing literature and compile this information in a useful format rather than to conduct new research. Even so, this is quite a difficult exercise since it is not easy to specify counterfactual UK growth performance outside the EU.

2. The Impact of EU Membership on UK GDP

Although some endogenous growth models imply that trade liberalization can raise the rate of economic growth, the evidence for European economic integration does not support this prediction. Badinger (2005) approached the issue through growth regressions. He made an index of the level of European integration for each EU15 country from 1950 to 2000 and in a panel-regression setting with suitable controls examined its relationship with growth and with investment. The integration index, which took account both of GATT liberalization and European trade agreements, shows that 55 per cent of the protectionism of 1950 was eliminated between 1958 and 1975, a figure which then rose steadily to 87 per cent by 2000. The results of the regressions were that changes in integration were positive for growth but that the level of integration had no effect while changes in integration had somewhere between half and three quarters of their impact through investment with the remainder coming from changes in TFP. For the EU15 as a whole, real GDP in 2000 was estimated to be 26.1 per cent higher than if there had been no economic integration after 1950 with the impact for the UK very similar at 25.5 per cent.

The implication of the results in Badinger (2005) is that European economic integration has had a sizeable impact on the level of income but has not had a permanent effect on the rate of growth. This amounts to rejecting the endogenous growth hypothesis. This is line with recent investigations

of the impact of trade liberalizations using difference-in-difference approaches (Estevadeordal and Taylor, 2013) but goes against the hopeful predictions of some economists in the 1980s.[1]

A recent method to infer the implications of accession to the EU in the style of 'with-without' comparisons is available in the synthetic counterfactuals method of Campos et al. (2014). This compares growth in each post-EU accession country with growth in a weighted combination of other countries which did not accede and which are chosen to match the accession country before its entry to the EU as closely as possible. A difference-in-differences analysis is then performed to compare the actual and synthetic-control series for each country. The results are that EU accession typically has had a substantial and statistically significant impact on growth relative to the counterfactual of staying out. Estimates for countries which joined the EU between 1973 and 1995 are reported in Table 3. For these countries, the average impact of EU membership after 10 years is estimated to have been a 6.4 per cent income gain with the UK showing an 8.6 per cent gain. It seems quite probable that the 10-year impact understates the total since the Single Market surely added to the initial effect during later years and the total cumulative effect is reported at 23.7 per cent in Table 3.[2]

An alternative and better-known approach is to use a gravity model to find the implication of EU membership for the volume of trade and then to quantify the effect of expanded trade on the level of income using the estimated relationship in Feyrer (2009) which itself is an improved version of the well-known Frankel and Romer (1999) model.[3] This uses an econometric approach to capture impacts working through improved productivity and a larger capital stock which far exceed traditional welfare triangle gains from improved resource allocation. Feyrer concludes that the elasticity of income to trade is probably between 0.5 and 0.75. Baier et al. (2008) use a bilateral-trade gravity model approach, augmented by dummy variables for the economic integration agreement to which the exporter and importer belong, to investigate whether EU membership causes a country to trade more than EFTA/EEA membership which was the status quo had the UK remained outside the EU. They use panel data and estimation with country-pair fixed effects. Quantitatively, their estimates imply that EU membership raised trade relative to the counterfactual by 41.2 per cent after 15 years.[4] In 1988, EU trade was 51.4 per cent of total so the implication is that joining the EU had raised UK trade by 21.1 per cent. Taking the lower bound of Feyrer's estimated elasticity this would have raised income by 10.6 per cent.

A major implication of the analysis in Baier et al. (2008) is that the EU has been much more effective in increasing trade than EFTA and that in this respect membership of the EEA is a poor substitute. This suggests that the EU has achieved a deeper level of economic integration. Much the same story

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[1] For example, Baldwin (1989) argued that the Cecchini Report could be massively underestimating the impact of the European Single Market because the static efficiency gain that it expected would raise the output to capital ratio, and hence for any given savings rate the growth of the capital stock. In a constant-returns setting, this could permanently raise the growth rate of GDP perhaps by as much as 0.9 percentage points per year. Sadly, this does not seem to have been the outcome.

[2] It seems fair to suppose that the reliability of these estimates decreases as the length of the post-accession period increases.

[3] An estimated relationship of the effect of greater trade exposure on income reported by Frankel and Romer (1999) was used by HM Treasury in its analysis of the impact of the UK adopting the Euro, see below.

[4] Calculated based on the estimated coefficients in Baier et al. (2008, Table 6, column 2). Both countries in the EU increases trade by $e^{0.70} - 1$ but one country in EU and the other in EFTA by $e^{0.17} - 1$. If a country stays outside the EU, its trade with EU members is reduced by $(e^{0.17} - e^{0.70})/e^{0.70} = 41.2\%$.

comes from a long view with an explicit time-varying econometric specification provided by Straathof et al. (2008). They find that EFTA had much smaller (and possibly insignificant) effects on trade, and that trade creation rose appreciably after enlargements and with the Single Market. However, this does not seem to be the case with the final step in the reduction of EU trade costs that came with European Monetary Union. The currency union effect on trade volumes was initially thought to be very large but better econometrics and the opportunity to examine the actual impact of EMU led to estimates that trade volumes increased by only about 2 per cent (Baldwin et al., 2008) or possibly no effect at all (Berger and Nitsch, 2008; Straathof et al., 2008). This suggests that the UK's decision to remain outside the Euro did not carry a significant trade penalty.[5]

If accession to the EU raised UK real income by 8 or 10 percent, then a major component of this must have come from increased competition in product markets. The average effective rate of protection fell from 9.3% in 1968 to 4.7% in 1979, and 1.2% in 1986 (Ennew et al., 1990). Trade liberalization in its various guises reduced price-cost margins (Hitiris, 1978; Griffith, 2001). A computable general equilibrium (CGE) exercise using a model incorporating imperfect competition and scale economies found that the static effects of reductions in market power would have contributed a welfare gain equivalent to 2.1 per cent of GDP (Gasiorek et al, 2002).

However, in addition there were favourable impacts on productivity performance consequent on stronger competition and entry threats in product markets. A difference-in-differences analysis found that there was a substantial boost to productivity in sectors which experienced a large reduction in protection (Broadberry and Crafts, 2011).[6] Reductions in market power effectively addressed long-standing obstacles to productivity performance from weak management and industrial relations problems in British firms. Nickell et al. (1997) estimated that, for firms without a dominant external shareholder (the norm for big British firms at this time), a reduction in supernormal profits from 15 to 5 per cent of value added would raise total factor productivity growth by 1 percentage point. The 1980s saw a surge in productivity growth in unionized firms as organizational change took place under pressure of competition (Machin and Wadhwani, 1989) and de-recognition of unions in the context of increases in foreign competition had a strong effect on productivity growth by the late 1980s (Gregg et al., 1993). This goes a long way to explain the boost to growth found by Campos et al. (2014) or the higher income level predicted by the Feyrer (2009) method.

A second important contribution to the growth effects of EU accession came through foreign direct investment (FDI). It is a standard result in the literature that EU membership has a strong positive effect on FDI for market-access reasons (Barrell and Pain, 1998; Slaughter, 2003). There is also evidence in a number of papers that the presence of FDI raises productivity levels in domestic firms through both intra- and inter-industry spillovers (Harris and Robinson, 2004; Haskel et al., 2007).

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[5] This contrasts with the estimate made by HM Treasury (2003) that adopting the Euro would raise the volume of trade with the Euro Area by up to 50 per cent and GDP by between 5 and 9 per cent based on Frankel and Romer (1999). As was noted by Cottarelli and Escolano (2004), the trade gains would have far exceeded reasonable estimates of the costs of greater output volatility resulting from losing control of monetary policy. Eight years into the Eurozone crisis and with better information on the trade effects, the opposite conclusion now seems appropriate.

[6] Sectors which experienced a reduction of 10 percentage points or more in the effective rate of protection saw an additional increase of 1.4 percentage points in the rate of labour productivity growth in 1979-86 over 1968-79.

Taking account of both these effects, Pain and Young (2004) estimated that EU membership increased the level of GDP through the FDI channel by about 2.25 per cent.[7]

Overall, the evidence summarized in this section suggests that the timing of accession to the EU for the UK compared with France and West Germany may have played a significant part in the improvement in the UK's relative growth performance after 1973.[8] If the UK had stayed outside the EU, it seems very likely that growth of real GDP per person would have continued to lag behind French and German rates.

3. The 'Membership Fee'

EU membership comes with conditions which are often thought of as costs that are incurred in order to obtain the income gains described above. These include having no control over immigration from the EU, unwanted regulations, the Common Agricultural Policy (CAP), and the UK's net budgetary contribution (a substantial part of which derives from the CAP).

Migration has only been significant since the mid-1990s and has only become controversial since the accession of (relatively poor) eastern European countries in 2004 and 2007. The stock of EEA immigrants in the UK rose from 0.9 to 2.8 million between 1995 and 2011 of whom 0.4 million were employed in 1995 and 1.5 million in 2011. A key issue is the impact of migration on the productivity of the domestic labour force and thus on the income of the resident population. Obtaining reliable estimates is challenging but the international evidence points, if anything, to positive effects (MAC, 2010) and a recent study suggests that the increase in the migrant share of the UK labour force between 1997 and 2007 might have raised labour productivity by between 0.27 and 0.40 percentage points (Rolfe et al., 2013). A further important aspect is the net fiscal contribution of migrants. Contrary to much political discourse, EEA immigrants made a net fiscal contribution estimated at £28.7 billion (at 2011 prices) between 2001 and 2011 (Dustmann and Fratinni, 2014). In sum, it appears that migration from the EU has not entailed an economic cost and does not add to the EU membership fee.

Eurosceptic voices in the UK frequently raise the issue of excessive EU regulation and the costs that it imposes on the British economy. Gaskell and Persson (2010) reviewed the regulatory impact assessments of this legislation from 1998 onwards and found that overall it averaged a benefit-cost ratio of 1.02. Nevertheless, there are a significant number of regulations for which either there are no benefits or recurring benefits are less than recurring costs. Open Europe (2015) lists 56 such regulations for which the total annual net cost is £16.5 billion (0.9 per cent of GDP).[9] Regulations which affect decisions to invest or innovate can impair productivity performance and thus impose welfare losses far in excess of compliance costs (Crafts, 2006). In this regard, however, it should be recognized that the UK has persistently been able to maintain very light levels of regulation in terms

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[7] The regression results in this paper suggest that EU membership is a much greater attraction for FDI than EEA membership.

[8] Accession to the EU raised the level of real GDP in the UK and in so doing had a transitory effect on the growth rate of perhaps 0.7per cent per year for about 15 years after 1973. The original members obtained a similar transitory boost to the growth rate during the 15 years before 1973 (Boltho and Eichengreen, 2008). On this account, relative growth performance swung by 1.4 percentage points per year pre-and post-1973.

[9] This estimate is for 2014. Costs in the early years of UK membership were probably much lower since regulation was less onerous.

of key OECD indicators such as PMR (Product Market Regulation) and EPL (Employment Protection Legislation) for which high scores have been shown to have significant detrimental effects (Barnes et al., 2011). In 2013, the UK had a PMR score of 1.09 and an EPL score of 1.12, the second and third lowest in the OECD, respectively.

The CAP has imposed costs on the UK both in terms of the taxpayer contributions to fund EU expenditure and higher prices for agricultural goods paid by UK consumers to EU producers. The policy has been notably disadvantageous to the UK because it has a relatively small agricultural sector. Empirical research has found that the annual cost to the UK from the early 1980s through to the present is typically about 0.5 per cent of GDP (Buckwell et al., 1982; Ackrill et al., 1994; Philippidis and Hubbard, 2001; Boulanger and Philippidis, 2015).[10]

The UK's net budgetary contribution is the most visible component of its EU membership fee. At least since the UK's rebate was agreed in 1984, which has traditionally reduced the UK contribution by 2/3rds, this has been around 0.3 per cent of GDP but in the last few years has increased to about 0.6 per cent of GDP (Webb and Keep, 2016). Generally speaking, while the net budgetary contribution was at the 0.3 per cent level there was no additional amount above that already accounted within the cost attributed to the CAP.

In sum, on average, the 'membership fee' has probably been no more than about 1.4 per cent of GDP comprising the costs of the CAP and of badly-designed EU regulation. Compared with the positive annual effect on GDP of 8.6 or 10.6 per cent estimated by the synthetic counterfactual or trade and growth methods reviewed earlier the clear implication is that a cost-benefit analysis of the economics of accession to the EU suggests that it was highly beneficial.

4. Ex-Ante Predictions versus Ex-Post Outcomes

It is interesting to compare the analyses made by economists before and after entry. The latter were made with superior information, obviously, but also with more sophisticated economics. Over time, the outcome has tended to look better. In particular, the standard approach in recent years to evaluating the impact on trade and growth of the UK withdrawing from the EU or of the UK staying out of the Euro is rather different from earlier approaches to measuring benefits and costs of membership.

Ex-ante analyses of the economic effects of UK entry into the EEC paid a lot of attention to the expected negative impact on the balance of payments, the downsides of the Common Agricultural Policy and net UK budget payments which were regarded as definite costs (albeit of somewhat debatable magnitude) to be borne in return for the potential (but unknowable) benefits in the industrial sector of economies of scale and greater competition.[11] The latter were seen as conducive to reductions both in market power and in X-inefficiency. The CAP (and the associated budgetary contributions) was relatively onerous for the UK as a food importer with a small agricultural sector. It was agreed that the welfare-triangle gains from trade creation would be quite small. The welfare

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[10] The costs in all these studies is 0.5 per cent of GDP except Ackrill et al. (1994) which estimated 0.4 per cent of GDP during 1987-92.

[11] The 'estimates' in column (2) of Table 4 were admitted by Williamson (1971) to be largely guesswork while the authors of column (1) did not even attempt any such estimates, merely noting how large these effects would have to be to offset the net welfare losses from the other elements of their estimates.

implications of predicted balance of payments effects were calculated via the terms of trade effects of the exchange rate adjustment required to correct a deficit using the Marshall-Lerner conditions. The findings of some well-known papers of the time, which suggest at most a small welfare gain, are summarized in Table 4.

Ex-post analyses found similar results in terms of the direction of the effects but in some respects quite different magnitudes, notably, with regard to the balance of payments deficit in manufacturing (Winters, 1987) and the welfare gains from competition, even though analysis of these gains was restricted to the static effects of reductions in market power (Gasiorek et al., 2002). Both these papers used considerably more advanced methods to compute their estimates than had the ex-ante studies.[12] Adding up all the numbers in the ex-post (1) column seems to give a more optimistic assessment of the net welfare impact of the UK's entry into the EEC – the gamble seems to have paid off with a larger payments deficit in manufactures being more than offset by greater benefits from competition.

However, in the 1970s a vocal group of economists argued that balance of payments deficits were much more costly to correct than orthodox economics assumed. In a world of relatively immobile international capital which seemed to exclude financing such deficits through the capital account this loomed large. The Cambridge Economic Policy Group model embodied an assumption of real wage rigidity which precluded the use of devaluation and required (permanent) reductions in aggregate demand to hold down imports. On this analysis, the welfare cost was about 3 times the balance of payments deficit (Bacon et al., 1978).[13] Thus, the overall impact of entry was seen by these economists as decidedly adverse, especially once the manufactured trade deficit had become clear (cf. Table 4).

Indeed, the CEPG argument went further than this since it embraced the need for permanent import controls to allow expansion of aggregate demand and avoid a balance of payments constraint on growth. This was plainly incompatible with the membership of the EEC and implied the need for exit. Analyses of this kind became popular with advocates of an 'alternative economic strategy' on the left of the Labour Party which held considerable sway. In 1981, the Labour Party adopted an official policy of withdrawal from the EEC and this was in its manifesto for the 1983 election. The rationale was to permit greater government intervention in the economy.

In fact, the estimates of medium-term growth in the UK compared with a synthetic counterfactual (an 8.6 per cent rise in GDP) or the likely implications of trade for income levels through TFP and investment (10.6 per cent of GDP) suggest that 'dynamic gains' not included in the top part of Table 4 rewarded the gamble of EEC entry handsomely. The benefit-cost analysis of EU membership which looked finely balanced even to orthodox economists in the 1970s seems in the event to have been very favourable primarily because of positive impacts on sources of growth which economists like Williamson (1971) suspected would matter but could only 'quantify' using cautiously optimistic guesswork. The pessimism of the Cambridge Economic Policy Group seems completely mistaken.

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[12] Winters (1987) used a fully-articulated AIDS approach to modelling the demand for imports and Gasiorek et al. (2002) employed a computable general equilibrium model with imperfect competition and scale economies in some manufacturing sectors.
[13] Rather than about 1/3rd, as in Table 8; the assumption of real wage rigidity has no empirical validity and was soon rejected by mainstream economists, see, for example, OECD (1989).

5. Would There Be a Growth Penalty from Brexit?

EU membership has raised trade and income levels in the UK in the past through increasing economic integration.   It seems quite clear that these gains have outweighed the 'membership fee' which has primarily consisted of budget transfers and costly regulation. When the UK entered the EU in 1973 it was after a period of serious underperformance in economic growth which had seen income and productivity levels fall behind those of France and West Germany.   The trade liberalization and concomitant increase in competitive pressures associated with EU entry was an appropriate policy response to relative economic decline especially given the importance of competition for the effective functioning of the 'liberal market economy' variety of capitalism. There is no reason, however, to suppose that Brexit would restore the status quo ante. The UK has addressed some of its problems of corporate governance and industrial relations, and it has a much more effective competition policy regime. On the eve of the UK's entry into the EU, UK (EU) tariffs on manufactures averaged 10 per cent (8 per cent) compared with an average for the common external tariff at 4 per cent today.

Obviously, exit from the EU would reduce or even eliminate the membership fee and could also remove the risk of more onerous regulation or transfers in future. Much less clear is whether Brexit would, on the one hand, imply a (partial) reversal of gains from trade with the EU or perhaps being excluded from the benefits of further reductions of trade costs within the EU or, on the other hand, allow the UK to realize benefits from freer trade outside the constraints of the common external tariff and the CAP. The net outcome would depend on the terms of exit negotiated by the UK and the subsequent evolution of both EU and UK policy. In this context, it is interesting to note that economists who favour Brexit nowadays, for example, Minford (2015), tend to do so at least partly on the grounds that it could lead to a higher degree of trade liberalization whereas opponents of EU membership in the 1970s and 1980s were protectionists.

Two points of clarification are useful at this point. First, it should be recognized that the most important trade costs these days are imposed not by tariffs but by non-tariff measures such as regulations and border costs (Anderson and van Wincoop, 2004). Outside the EU Single Market, the UK would potentially be exposed to such costs as well as the common external tariff on trade with the EU. If the UK is outside the customs union but in a free-trade agreement, it will also face significant compliance costs from implementing rules-of-origin legislation (CEPR, 2013). Second, the UK could seek to negotiate a trade agreement to continue to participate in the Single Market perhaps on a similar basis to Norway but this would almost certainly entail continuing to pay some of the membership fee in terms of a budgetary contribution together with acceptance of some regulations and, crucially, free movement of people (Booth et al., 2015). If establishing control over migration is the reason for Brexit, then that means accepting trade costs which accrue from being outside the Single Market.

This discussion implies that there are many permutations of Brexit possibly with rather different implications for the UK economy. Some of these variants have been explored in recent empirical research. Estimates of various aspects of Brexit are reported in Table 5. Neither of these studies covers every component of the possible costs and benefits and, of course, different assumptions and modelling techniques have been employed. Nevertheless, some points emerge quite strongly.

This discussion implies that there are many permutations of Brexit possibly with rather different implications for the UK economy. Some of these variants have been explored in recent empirical research. Table 5 sets out some of the details.

First, it is potentially quite costly to leave the EU without negotiating a new trade agreement and taking positive action to reduce barriers to non-EU trade and to de-regulate. Here, reducing the membership fee by about 0.5 per cent of GDP through ending fiscal transfers runs the risk of reducing the level of GDP by as much as 2.75 per cent as the economy faces increased tariff and non-tariff barriers to trade. The costs might be more serious if, over time, regulatory divergence between the UK and the EU increases and/or the UK misses out on future deepening of economic integration inside the EU. Conceivably, this might cost a further 2.0 per cent of GDP each year.

Second, proactive use of the freedom to change policy outside the EU could deliver significant benefits that might at least largely offset the initial costs of Brexit. These might arise firstly from abolishing regulations relating to social issues, employment, health and safety, environment and climate change. One estimate of the maximum feasible annual gain is 1.3 per cent of GDP. In addition, aggressive liberalization of non-EU trade whether by unilateral measures or trade agreements could increase GDP by another 0.75 per cent so that the initial annual GDP loss might be reduced to about 0.7 per cent of GDP.

Third, a better version of Brexit from a purely economic perspective would be to negotiate a trade agreement with the EU that would retain access to the Single Market on EEA terms. This would significantly reduce the losses from trade costs on EU trade but would, on the other hand, probably mean accepting a significant budgetary contribution and constraints on de-regulation. Booth et al. (2015) estimate that, if supplemented by freer non-EU trade and feasible de-regulation, a permutation along these lines could even produce an overall positive outcome of as much as 1 per cent to GDP annually. However, if this package is only available with free movement of people, it might not be in the politically feasible set on exit.

Fourth, a precautionary reason for Brexit might be to preclude the possibility of large future increases in the membership fee. These could possibly result from larger fiscal transfers perhaps associated with problems in the Eurozone or from onerous future regulations. Minford (2015) stresses the risks of new EU regulations that would undermine the flexibility of the UK labour market or the profitability of business investment, i.e., that would have big effects on the real economy rather than merely compliance costs. In the most apocalyptic version, the costs are claimed to be as large as 25 per cent of GDP. However, this analysis seems to ignore the value of keeping options open until the regulatory threat actually arises.

The estimates in Table 5 do not take account of the transition costs of switching from current to future trading arrangements and thus imply an unduly favourable view of the net present value of Brexit. On leaving the EU, the UK would need to renegotiate well over 100 trade agreements that the EU has or is pursuing with other countries. The detail is typically complex especially where services are concerned and the intention is to minimize non-tariff barriers to trade. The recent deal between Canada and the EU took seven years to conclude. The implication is not only that the benefits from new trade agreements will typically accrue after some delay but also that in the meantime there will be considerable uncertainty about trade policy. Modern economic analysis stresses that uncertainty is bad for investment and productivity growth (Bloom, 2014). Trade policy

uncertainty holds back the entry of firms into exporting and the inhibiting effect can be considerable, as the example of Portugal prior to EU accession shows (Handley and Limao, 2015).

In sum, it is unlikely that Brexit would mean that the UK would give up all the economic gains that were achieved by EU membership but it is possible that the 'wrong sort of exit' could be quite costly, especially since the estimates in Table 5 are probably lower bounds since they do not take account of longer-term 'dynamic gains'.[14] If one is relaxed about not having control over European migration, then paying the membership fee to stay in the Single Market seems advantageous and this would limit the losses from increased trade costs with the EU.

6. Conclusions

Joining the EU membership raised the level of real GDP per person in the UK compared with the alternative of staying in EFTA. The deeper economic integration that EU membership entailed increased trade substantially and this had positive effects on income. Using a variant of the standard methodology pioneered by Frankel and Romer (1999) suggests that the impact was an annual gain equivalent to about 10 per cent of GDP. This far exceeded the 'membership fee' required in terms of the net budgetary contribution and net costs of regulation which have totalled about 1.5 per cent of GDP.

In the context of the 1970s at which point the UK had endured a long period of protectionism, the 'shock' of joining the EU had favourable effects on productivity and was part of an effective antidote to relative economic decline which worked through strengthening competition (Crafts, 2012) as contemporaries suspected might be the case (e.g., Williamson, 1971). Nevertheless, the ex-post magnitude of the income gains was much greater than even the optimists imagined ex-ante.

Brexit could mean that the UK gives up some of the benefits that it has obtained from EU membership. It is unlikely that all the gains would be lost but a scenario where the UK does not negotiate continued membership of the Single Market and also fails to liberalize non-EU trade and to de-regulate could easily entail net welfare costs of the order of 2.2 per cent of GDP. Leaving the EU in this way would also discard the 'commitment technology' provided by membership that limits the room for manoeuvre of a future would-be protectionist government. It is possible that Brexit could deliver net benefits to the UK but this would depend heavily on the use made of increased policy space.   If Brexit is driven by a desire to control migration from Europe, other things equal, it will be relatively costly because it will mean withdrawal from the Single Market.

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[14] Using a methodology very similar to that which I used in section 2 above to calculate a gain of 10.6 per cent of GDP from EU entry, Dingra et al. (2016) suggest that Brexit could cost over 6 percent of GDP when 'dynamic losses' are taken into account. This should be treated with caution since it is based on the (untested) assumption that there is no difference in trade volume with the EU between a former member of the EU and an EFTA member that has never been in the EU.

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Table 1. Rates of Growth of Real GDP/Person and Real GDP/Hour Worked (% per year)

	Y/P	*Y/HW*
1950-1973		
France	4.02	5.29
Germany	5.00	5.91
UK	2.42	2.81
USA	2.45	2.57
1973-1995		
France	1.65	2.67
Germany	1.76	2.86
UK	1.76	2.40
USA	1.81	1.27
1995-2007		
France	1.75	1.75
Germany	1.56	1.70
UK	2.55	2.17
USA	2.16	2.21
2007-2014		
France	-0.21	0.40
Germany	0.93	0.44
UK	0.00	-0.29
USA	0.31	1.17

Note: Germany is West Germany prior to 1995.

Source: The Conference Board (2015)

Table 2. Real GDP/Head (UK = 100 in each year)

	USA	*West Germany*	*France*
1950	137.8	61.7	74.7
1973	138.8	109.4	106.6
2007	133.1	107.2	98.8
2014	132.2	114.8	97.5

Notes: estimates refer to Germany from 1870 to 1937. Purchasing power parity estimates in $1990GK for 1870 through 1979 and in $2005EKS from Penn World Table for 2007 and 2013.

Sources: The Conference Board (2015); West Germany in 2007 and 2014 calculated from Statistiches Bundesamt Deutschland 2015.

Table 3. Post-Accession Differences between Level of Actual and Synthetic GDP per Person (%)

	After 5 Years	*After 10 Years*	*Total*
Denmark	10.3	14.3	23.9
Ireland	5.2	9.4	48.9
United Kingdom	4.8	8.6	23.7
Greece	-11.6	-17.3	-19.8
Portugal	11.7	16.5	18.4
Spain	9.3	13.7	19.8
Austria	4.5	6.4	7.2
Finland	2.2	4.0	4.4
Sweden	0.8	2.4	3.2

Source: Campos et al. (2014)

Table 4. Welfare Effects of UK Entry into EEC: 1970s' and 1980s' Estimates (% GDP)

	Ex Ante (1)	Ex-Ante (2)	Ex-Post (1)	Ex-Post (2)
Trade Creation	+0.1	+0.1	+0.4	
Scale		+0.4		
Competition		+0.5	+1.7	
Investment		+0.5		
Manufactures Deficit	-0.1	-0.1	-0.9	
Import Saving on Food	+0.4	+0.2	+0.1	
Excess Food Cost	-0.4	-0.2	-0.1	
Official Transfers	-1.2	-0.8	-0.7	
Total	-1.2	+0.6	+1.3	
Aide-Memoire				
Synthetic Counterfactual				+8.6
Trade and Income				+10.6

Notes: welfare effects based on orthodox correction of balance of payments deficits/surpluses, see text. Excess food cost refers to payments to EEC farmers for agricultural commodities purchased at EEC prices, i.e. at greater than world prices. Ex-post trade creation includes scale effects.

Sources:

Ex-Ante (1) general equilibrium based on Miller (1971); a later version of these estimates was published as Miller and Spencer (1977).

Ex-Ante (2): partial equilibrium based on Josling (1971) for agriculture and on Williamson (1971) for manufactures.

Ex-Post: compiled using Buckwell et al. (1982) for agriculture, Gasiorek et al. (2002) for trade creation, scale and competition effects in manufacturing, and Winters (1987) for balance of payments effects in manufacturing.

Synthetic Counterfactual: Campos et al. (2014)

Trade and Income: as described in the text based on Baier et al. (2008) and Feyrer (2009).

Table 5. Welfare Effects of Brexit (%GDP)

	Dingra et al. (1)	*Booth et al. (1)*	*Dingra et al. (2)*	*Booth et al. (2)*
Fiscal Transfers	+0.31	+0.53	+0.09	+0.22
Regulation				+0.7 to +1.3
Tariff Barriers to EU Trade	-0.14	-0.95	+0.00	
Non-Tariff Barriers to EU Trade: Initial	-0.73	-1.81	-0.34	-1.03
Non-Tariff Barriers to EU Trade: Future	-2.05		-1.03	
Reduced Barriers to Non-EU Trade			+0.30	+0.75
Total	-2.61	-2.23	-0.98	+0.64 to + 1.24

Notes:

Dingra et al. (1) and Booth et al. (1) assume UK exits single market; Dingra et al. (2) and Booth et al. (2) assume that UK has a Norway-type relationship with the single market and pays fiscal transfers to ensure market access.

Future costs of non-tariff barriers to EU trade in Dingra et al. accrue from missing out on benefits of further development of EU single market. I have divided the NTB costs into 'initial' and 'future' based on the relative proportions reported in an earlier version of this paper.

Sources: Booth et al. (2015), Dingra et al. (2016)