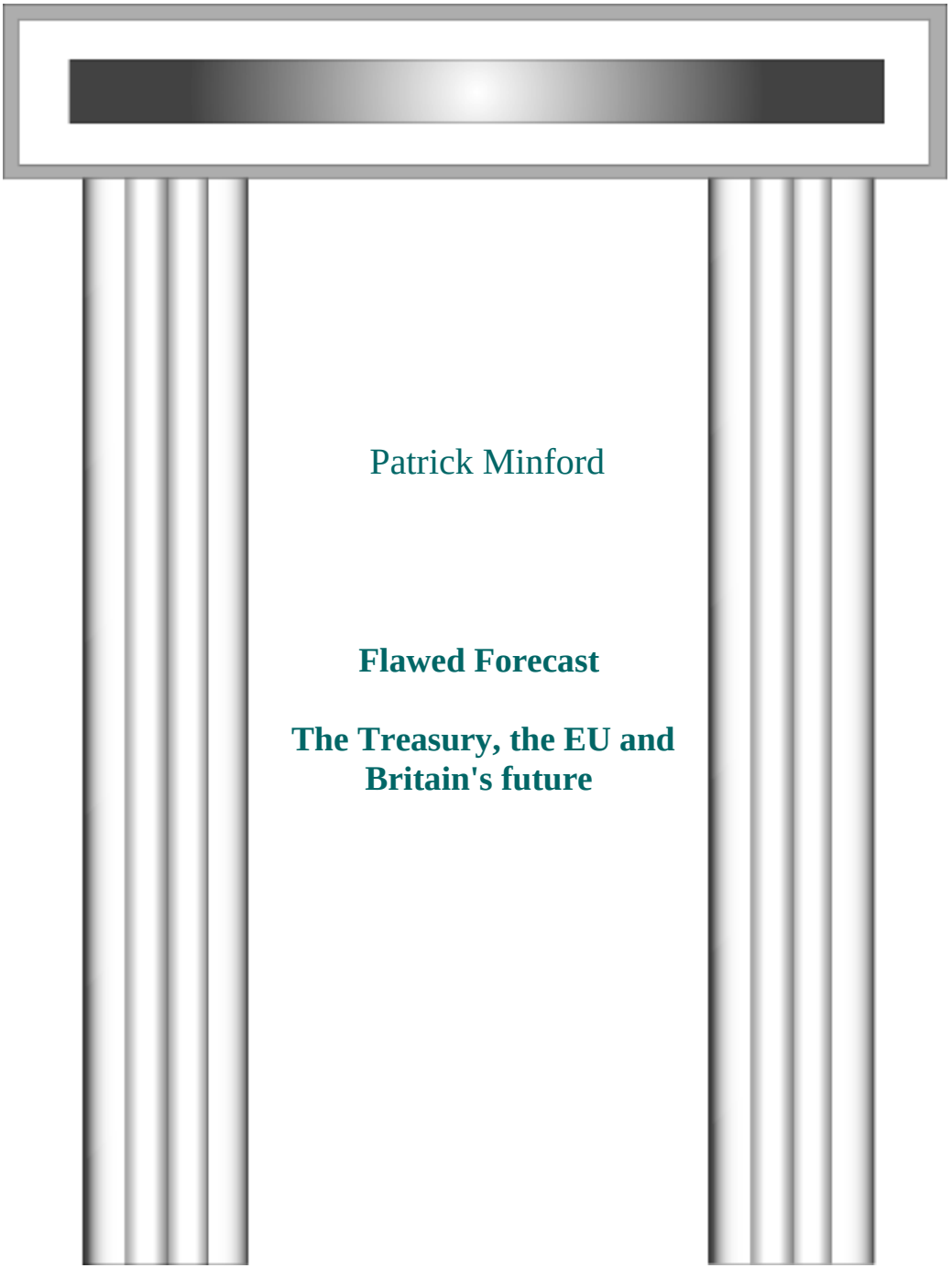
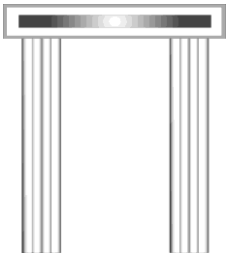


Patrick Minford

Flawed Forecast

The Treasury, the EU and Britain's future

A FORUM FOR SOCIAL AND ECONOMIC THINKING



POLITEIA

A Forum for Social and Economic Thinking

Politeia commissions and publishes discussions by specialists about social and economic ideas and policies. It aims to encourage public discussion on the relationship between the state and the people. Its aim is not to influence people to support any given political party, candidates for election, or position in a referendum, but to inform public discussion of policy.

The forum is independently funded, and the publications do not express a corporate opinion, but the views of their individual authors.

www.politeia.co.uk

Flawed Forecast
The Treasury, the EU and Britain's future

Patrick Minford

POLITEIA

2016

First published in 2016
by
Politeia
14a Eccleston Street
London SW1W 9LT
Tel. 0207 799 5034

E-mail: info@politeia.co.uk
Website: www.politeia.co.uk

ISBN: 978-0-9926340-6-3

Cover design by John Marenbon

Politeia gratefully acknowledges support for this publication from

Foundation for Social and Economic Thinking (FSET)

Printed in Great Britain by:
Plan – IT Reprographics
Atlas House
Cambridge Place
Hills Road
Cambridge CB2 1NS

THE AUTHOR

Patrick Minford is Professor of Applied Economics at Cardiff University. He has been an economic adviser to Her Majesty's Treasury's External Division and editor at the National Institute of Economic and Social Research. His recent publications include: *Breaking Up is Hard to Do: Britain and Europe's Dysfunctional Relationship* (2016), *Should Britain leave the EU? An economic analysis of a troubled relationship***,** (with S.Gupta, V.Mahambare, V. Le and Y. Xu) Edward Elgar, second edition, (2015), **'**Evaluating European trading arrangements', *Cardiff Economics Working Paper*, (2015), and as co-author 'The role of Fiscal policy in Britain's Great Inflation**'**, (with Jingwen Fan and Zhirong Ou), *Cardiff Economics Working Paper* (2014).

CONTENTS

Introduction

The Treasury recently issued its report on the long term effects of Brexit which, it claims will be dire. It then followed this with a report on the short term effects, which naturally reflected the alleged long term effects and aimed to chill our marrows. These reports are backed by a consensus of international bodies and UK economists, led by the LSE - that is to say the UK and world's establishment in politics and economics. How could anyone deny such a consensus?

Well, think of a parallel. When has an establishment ever wanted the disruption of free trade?

Think back to Cobden and Bright and their proposal to abolish the Corn Laws. The establishment of that day, led by the landed aristocracy who dominated the Tory party, fought for the Corn Laws tooth and nail. Cobden and Bright explained to the masses that abolition would lower the price of corn and the cost of living, improve the prospects of manufacturing and cut back high cost of domestic corn production; the 'dynamic' of lower prices would feed through the economy, increasing its efficiency and growth and raising the living standards of ordinary people. 'Comparative advantage' would prevail; prices would fall, and resources would be reallocated to the most productive industries of our economy.

Imagine how that establishment would have argued their case had they used the arguments of today's economic consensus. They would have said: look, large farms exploit economies of scale, they employ lots of agricultural workers. If the Corn Tariffs are repealed, those people will be laid off and those farm businesses will become smaller and less efficient. There will be less investment in farming, including foreign investment by French- born aristocrats. Yes, they would say, there will be more imported corn; and perhaps our manufacturers will produce more but this will lead to foreign tariffs being placed on their threatening extra output, which will actually damage this growing manufacturing industry. So actually our trade would fall, because the extra imports of corn would be offset by the greater damage to our exports of manufacturing. The damage to the economy would be compounded by falling jobs and incomes as those workers in farming are laid off. As for that fall in the cost of living, forget it! Corn is a small component of the cost of living and the general contraction of the economy will raise prices as efficiency falls.

We know that such arguments would have been false and we would now regard them as totally ridiculous. We know now from centuries of experience that free trade has raised living standards, potentially by massive amounts, because it has reallocated resources and lowered living costs, so increasing the welfare of the average household both directly through lowering import prices and indirectly by more efficient production.

Now turn to the current Brexit debate. As many economists, including the Economists for Brexit group have explained, Brexit will lower the prices of imports by abolishing the EU tariffs currently erected due to the EU Customs Union. This has a massive effect in raising our cost of living, through higher food and manufacturing prices. It is just like the Corn tariff which, because in those days corn and its food by-products were the main constituents of people's shopping baskets, also had a huge impact on the cost of living.

As for the threat that the rest of the world with whom the EU has trade agreements will no longer allow these agreements with a UK outside the EU, such agreements have a negligible effect on our economy and even if they were to stop (which there is no reason to expect), the same would be true. Exactly the same was true in the time of the Corn Laws. British manufacturing products were sold all around the world at good prices because they were worth buying; yes, some countries put up barriers but this had no effect on the world prices of those British products, sold to buyers from all over the world.

Yet as we see today any proposal of free trade is met with great hostility by the establishment. Why is that? In the immortal words of Mandy Rice-Davies, 'they would, wouldn't they?' Probably unconsciously, to be kind, those who would lose from the disruption of free trade, the falling prices, the greater competition, create arguments as to why changing the status quo will damage the economy. Of course, these arguments are quite easy to sell to casual standers-by who can see that some existing business and jobs would be disrupted and lose out, and find it hard to see the new businesses and jobs that would be created out of the disruption. The workings of the economy to create those new jobs and businesses are indirect: what happens is that as consumer prices fall and workers are better off as a result, they are willing to work for less–and this raises the economy's overall competitiveness and expands new business, more than offsetting the contraction in the old protected sectors. Because the economy becomes

more efficient, production overall increases; to sell this higher production the exchange rate falls and this reinforces the rise in competitiveness.

This is not the first time that the UK establishment has opposed reforms that now we know greatly advanced the UK economy or defended EU monetary institutions that have later proved disastrous. At my advanced age, I can remember 40 years of such behaviour. There was monetarism which finally conquered our inflation (remember the 364 economists writing to *The Time*s...); trade union reform which brought order and efficiency to our industrial relations; privatisation which ended the dreadful mismanagement of publicly owned industry; and then most recent and most well-known, the issues of the European Exchange Rate Mechanism and the issue of us joining the euro. On all these major issues the establishment was on the wrong side of history. Their insults flew and their condescension inside the consensus as great then as now.

Soon after its long term report the Treasury set out its short term shock and horror forecast for the UK economy. But beware! Long term garbage in, short term garbage out!

The rest of this paper considers the technical tricks used by the Treasury and its establishment supporters to create this latter day Corn Tariff apologia – and this, a basic analogy, should be borne in mind. What I and my fellow Economists for Brexit use as a model of international trade and the economy is much like the one used by Cobden and Bright. It is however, more sophisticated than theirs in keeping with modern working models, but in essence it works the same way. Of course that approach was proved right; and if one stands back, who would now argue with it? Can anyone seriously believe, away from the heat of battle in defence of the status quo, that more free trade is bad for an economy? And yet such is the power of modern technical 'voodoo' in economics, that economists and civil servants who would never believe that, can fool themselves into thinking the opposite through clever sophisticated tricks. Effectively they willingly fool themselves because they would, wouldn't they.

I
Economic Models:
Trade and the Economy

The Treasury, The Gravity Model and Standard Theory: What stands out?

In order to create their case against Brexit the Treasury has used a 'gravity model' approach. To understand how this relates to standard theory one needs to know how applied trade theory has changed since the standard theory was accepted. In the standard theory, there is full competition between products entering trade and world prices are set in world markets by the total of supplies and demands from many countries' traders. A 'product' is an item with certain defined characteristics like a computer chip or a bale of cotton or a TV component or a type of tourist location or a financial service such as general insurance. The idea is that knowledgeable traders can compare products and grade them accurately so that a product item of a particular grade commands the same price everywhere. So when UK producers sell a product they obtain a known world price for it from the world's traders; think of this as the border price. Now the local or retail price of such a product in a country will depend on transport and marketing costs and also on trade and other taxes, including trade 'barriers' such as administrative hurdles, special duties like anti-dumping, quantitative quotas and so on. Retail prices affect consumer demand which in turn determines the demand from the world market.

If one applies this model, two key things stand out. The first is that all the small countries participating in the world market can have only a negligible effect on the world price by their fluctuations in demand whether from growth/decline or from putting tariffs on or taking them off in general or for particular trade partners (in a 'trade agreement'). This is known as the 'importance of being unimportant'. It means that as a small country it is bad for yourself to put on tariffs because it raises consumer prices and moves production away from your best industries towards the protected ones. It further means that you are indifferent whether other small countries put tariffs on your goods because this will have no effect on the world price and hence on your total production. It follows that trade agreements are pointless though also harmless.

The second thing that stands out is that if you join a customs union with a large group of other countries, such as the EU, in which the union sets tariffs and other barriers on behalf of all members, domestic prices inside

the union will rise by the percentage protection. Your producers will benefit from the higher prices but so will the foreign EU producers who now sell to you at higher than world prices. Your consumers will pay more to both. The effect is to move away from free trade: instead of having free trade with the world, you have limited free trade inside the protected regional area. The only way you could do well out of this is if you sold much more to the rest of the EU than they sell to you. Unfortunately so great is the loss due to the protection that this gain has to be very large to make it worthwhile for you: if it did, it would be at the expense of your EU trade partners. as it happens, the UK buys much more from the rest of the EU than it sells to them, and so inside the EU it is doubly worse off; both by the effect of the protection and because it pays more to foreign producers than it gets back. So when you use the standard model of trade it is clear that you will find a customs union like the EU will inflict damage on you; the question is only how much. You can then put this into the balance against possible gains from the union.

The Treasury Findings and Applied Trade Theory: Missing factors?

To understand the Treasury methods used to generate large-scale losses from leaving the EU customs union, we need to consider two later developments in applied trade theory. First came the 'new trade theory' due to Paul Krugman (1979) in which he assumed that there was imperfect competition in world markets and increasing returns to scale. Imperfect competition implies that prices are set above costs by a mark-up reflecting the degree of imperfect substitution between a product and its nearest rival. The effects of these modifications to the standard theory, though in principle important, were not in practice that major. Free trade is still best, even though 'second best', since under free trade prices are not equal to costs. There are unusual situations of strong 'bilateral monopoly' when countries should act aggressively in setting tariffs on their rival country's product as that will force the other to reduce prices; this might for example apply to Boeing and Airbus. However even here there are dangers because of retaliation; the best course is to reach a cooperative agreement to keep tariffs down as that maximises the size of the overall market for both. Most of trade however, is not bilateral monopoly but rather large competing numbers of firms; assuming they compete imperfectly does not change the policy conclusion that free trade is the best available option.

This brings us to the latest applied trade theory development: the 'new, new trade theory'. This originated with Mark Melitz (2003, not to be confused with Jacques Melitz, his also famous father, who is a monetary

and macro economist). This theory emphasises path dependence in trade dominance and the role of geography and building markets. The gravity equation can be thought of as approximating the practical trade relationships prevailing in all markets. The idea is that how much people buy from further away (trade) depends on the costs of 'transport': here transport means all the costs associated with distance, whether geographical or political ('the border') or tariffs and other explicit barriers. Transport/distance is thus like gravity: the 'closer' you are to foreigners the more the gravity you exert pulls in their exports or the gravity they exert pulls out your exports. (For some more discussions of gravity models, see Deardorff, 1998, and Feenstra et al, 2001).

Gravity models predict the levels of trade well in a statistical sense. So when one combines the attractiveness of the applied theory with the ability to predict trade flows well, one seems to have found a good way to analyse trade. One way of thinking about this is that they are like 'demand equations' that relate consumer demand to income and relative product price. These also are simply derived from basic theory and do well empirically. When one uses demand equations one implicitly assumes that incomes and relative prices are being fixed by other forces. So it is the case in gravity models: income, tariffs, geography, developments in transport technology (like containers) are fixed elsewhere. This embraces the imperfect competition of the new trade theory: now those mark-ups are also fixed elsewhere, making relative prices rather inert or 'sticky'.

These equations are used widely in applied trade to estimate the effects of tariff changes. It can easily be seen that this will be accurate as long as the basic assumption that everything else that is held constant is true. If it is just a tariff change on one or a few goods, this would be the case. However, if one is estimating the effects of a large change in the structure of tariffs and other trade barriers, accompanied by changes in regulations, then these equations cease to be reliable because these other factors do not remain constant. In the jargon of macro-modelling these equations are 'reduced forms', i.e. they are the observed final effects of the interaction of many influences bearing down on prices, incomes and trade. It is not a criticism of gravity models in themselves to say this: it is instead a criticism of the use to which they may be put.

There is a name for this problem: Lucas' Critique of Macro Models (Lucas, 1976). Reduced form equations are not a reliable guide to the effect of changes in policy (and in other factors in the general economic

environment) because these policy and other factors themselves have determined these estimated relationships.

Overall Well-being and Economic Gain v Trade Effects

To ram this point home take an example from Brexit. Will exports to the EU rise or fall on Brexit if we leave and make no trade deal with the EU? Suppose that if no deal were made and our manufacturing exporters to the EU face the external tariff (but not any other barriers because these would be forbidden by WTO rules). Now according to the gravity equation this will reduce exports to the EU. But think: existing EU trade barriers against the rest of the world are larger than just the external tariff and raise prices by much more. In fact we estimate them at about 20 per cent for manufacturing, whereas the external tariff is around 4-5 per cent on average. What will then happen on Brexit is that prices on the home UK market will fall 20 per cent while if our exporters sell to the EU they will get the EU price (20 per cent higher) minus the external tariff at say 5 per cent; this is 15 per cent more than they will get at home. Plainly they will export as much as possible now to the EU, to escape dire prices at home. Exports to the EU would surge. This is the opposite of what the gravity equation says.

Matters do not end there. To link the economy to trade as predicted by the gravity model, equations are estimated for the average relationships with trade, whether for GDP, for productivity, for investment and much else. The problem is that these relationships too will vary according to the shock the economy faces. Consider the simple example we have just looked at. The usual relationship between manufacturing exports and manufacturing output is positive. Yet in the above Brexit scenario, output in manufacturing will fall while exports balloon.

This matters because the gains to welfare of UK citizens come from the effects on consumption and on the structure of output. Consumers are able to buy more with their existing incomes and production shifts towards more productive industries, which raises average productivity. Hence measuring these shifts in the economy itself is vital to a proper assessment. Taking a shortcut through the trade effect, even if it was accurately predicted, does not give the welfare answer.

The gravity model could not pick these things up because it does not consider a full model of the underlying relationships (the ‘structural model’) with all the interactions.

Our standard theory is such a full model. Of course it does away with the all the 'stickiness' and imperfection of the gravity model. One might think this would be a fatal problem. But our aim is to project the effects of a major change in trade policy over the very long term- around 10-20 years ahead. This is because the effects will be with us for ever. If we leave the EU we will never rejoin: once bitten etc. In the very long term competition must prevail; this is because markets see excess profits in the end and firms enter industries where they exist to exploit them. Also products that are 'branded' to appear different can only do this for a limited time: consumers and traders will discover their properties in the end and value them exactly the same way as rival brands. When we look at a set of economic relationships in the short term, we are looking at a shifting situation where the products we are observing have temporary monopoly power via branding. But ten years ahead these same products will have lost this monopoly power; we can think them as on a transition path to full competition. This is true across the whole economy; the industries there are either already competitive or on that transition path. Yes, new products will come into being and early on they will enjoy some monopoly power; but again this will gradually be eroded. Hence for a very long term time frame of analysis the competition assumption makes sense as a broad approximation.

Of course as we have already seen from the 'new trade theory' above, just assuming imperfect competition makes little practical difference to the behaviour of these trade models. The most widely used imperfect competition model has fixed mark-ups which only vary with the business cycle, irrelevant in the long term; hence movements in the equilibrium due to trade policy will be the same as in perfect competition model. No, what marks out that gravity model is that it is a set of reduced equations masquerading as a 'structural' model of trade (i.e. a model is which all the underlying relationships are allowed to interact with each other and the policy change); the problem of the Lucas Critique we discussed above. Its defenders say that the reduced form equations are unchanged as one changes trade policy: but as the example above shows, that unchangedness depends crucially on what the policy experiment is. It is not a general property; and in the case of a complicated change in trade policy like leaving a customs union it is vanishingly unlikely to apply.

II
The Gravity Model - Before the Treasury Work[1]

Loss and Gain: the EU and The Rest of the World

Before the Treasury work was published the nearest available exposition of the gravity model approach was the work of Ottaviano et al (2014), which concluded that leaving the EU would bring, contrary to our estimate of a 4 per cent gain, a loss of some 1 per cent of GDP. This remains, to say the least, a surprising finding. In fact, it turns out that they treat leaving the EU as merely resulting in a rise of manufacturing tariffs from the EU on the UK, as well as a rise in other barriers to trade with the UK; inside the EU the UK does not face these barriers. However while this assumption is correct, it ignores the point that after exit it would no longer be in the UK's interests to levy tariffs on the rest of the world (ROW); its best policy is, as we have explained, to leave the EU customs union for free trade. Implicitly, they in effect assume that the UK would maintain the same tariff-equivalent barriers against the ROW if it left the EU; but this would be clearly welfare-reducing compared with going to free trade, as we assume. It is indeed a 'straw man'. In our approach the main gain for the UK in leaving the EU is that it can abandon the mass of complex trade barriers the EU levies on the rest of the world, both in agriculture and in manufacturing.

Thus the calculations of Ottaviano et al, which come up with a net loss of UK welfare from leaving the EU leave out two important elements:

1) They do not factor in the effect of moving to free trade with the rest of the world from existing EU protective measures. Since on our calculation the EU levies tariff-equivalents on the rest of the world of about 10 per cent, this omission would generate large negative effects if included in their calculation. They appear to assume that the UK would levy the same tariff-equivalents on the rest of the world (accounting for around half UK trade) - whereas on our view the UK would move to free trade vis-à-vis all countries. Certainly that is the policy we propose on 'Brexit'/'Breset' and so it should be costed accurately.

[1] This section closely follows the discussion in Minford et al (2015).

2) They assume that the EU would react by raising trade and regulative barriers against UK exporters even though we impose none such on EU exporters to us; as discussed above, this is highly unlikely because EU industries are closely integrated in many cases with UK industry and the UK market. They would be damaged by difficulties in accessing UK input products and would fear retaliation by the UK to EU aggression. At the same time it is possible for UK exporters to have free access to the EU market without undermining the existing prices created by the customs union. While EU businesses would regret the loss of high preferential prices in the UK market, they would be against a vindictive response which would make matters worse for them.

If Ottaviano et al had allowed for the total policy discussed here: namely leaving a regional customs union for free trade with the whole world, then their calculations should have come, at least to some extent, into line with ours. The EU currently levies a substantial tariff-equivalent on the ROW, raising UK prices above world prices. The UK pays more for its imports, including more to its EU partners, and receives no tariff revenue. Its exporters also receive higher prices on EU exports and also as we have seen on exports to the ROW because they are interchangeable with imports and EU exports. If the UK leaves the EU these prices fall to world levels. If, as it well might, the EU after UK exit levied on our exports the same tariff-equivalent as on any other ROW supplier, this would not affect the price we get, which is the world price; it would simply mean that EU consumers would pay this plus the tariff-equivalent (i.e. the same price as they paid before). As we have seen, this results in a fall in profitability of EU-protected output relative to output unprotected by the EU. Similar arguments apply to EU exporters to the UK, who would find it no longer so profitable to export to the UK relative to selling at home or to the rest of the EU. In the language of customs union UK exit ends 'trade diversion' towards EU-protected output and trade. It would certainly be interesting to see the total changes including those on ROW tariffs calculated within a multiple-sector gravity model, since this contains much richer detail of reactions at a highly disaggregated level. In the absence of an attempt to include the ROW, we unfortunately do not have this calculation from Ottaviano et al.

There is a parallel here with the debate a decade ago about the UK joining the euro. Many in favour asserted that joining the euro would eliminate exchange rate uncertainty and so also get rid of a tax on trade and foreign

investment. However they forgot that it would only eliminate regional exchange rate uncertainty. Our work then (it is explained in Minford et al chapter 3) showed that because of the euro's substantial fluctuations against the dollar (and hence against most Rest of World currencies) exchange rate uncertainty of the pound against the dollar and the ROW currencies would rise sharply, implying as we found out from simulations of the relevant variations that overall exchange rate uncertainty would not necessarily go down and could go up. So here it is true that joining the EU has lowered our trade barriers with the EU but raised them against the ROW. The analogy is not exact because here we are talking about relative price effects (effects on average prices) whereas in the euro case we were discussing uncertainty (the variability of prices). However the basic point remains, that we must allow for global and not merely regional aspects of the issue.

A further question that arises with the calculations of Ottaviano et al is that they are not based on a structural general equilibrium model, as discussed above. Even though they claim that the gravity trade model they use, from Costinot and Rodriguez-Clare (2013, CR), represents well the reduced form effects of shocks to the world economy like globalisation and so can be treated as if it is a general equilibrium model, there is no guarantee it will have the right reduced form effects for a shock to economic trade structure such as leaving a customs union; we know from macro general equilibrium models (and trade models are simply a static sub-class) that the reduced form effects of different shocks (the impulse response functions) differ, as widely popularised in Lucas' Critique of reduced form econometric macro models. CR discuss the potential advantages of using multiple-sector gravity models as well as the disadvantages. The latter include the difficulties of pinning down the elasticities that are the workhorse of the gravity model. CR suggest that in principle, if one is willing to make particular assumptions on utility and production functions and the competitive micro-foundations of the model, a gravity model with the correct elasticities can capture the effect of tariff shocks. However, this begs the question of whether these elasticities can be calculated reliably and are structural in the sense that they do not vary with different policy shocks and regimes. CR admit that there is difficulty in achieving agreement on what the elasticities should be; and it seems plain that they will depend on what constellation of shocks is considered, as well as precisely what micro-foundations the gravity model is given. After all the elasticity represents the total solved effect of the tariff on the trade; this will be reached through a complex web of reinforcing and offsetting

effects via many channels. A tariff effect when no other tariffs change and when there are no effects on the general level of wages and prices will differ from one when other tariffs change in a complex way and there are large effects on the wage/price structure.

To make the matter concrete, globalisation (the main shock CR consider) is like a tide lifting all boats from which one would expect trade to expand and with its GDP in all countries; yet leaving a customs union will cause a reversal of trade diversion so that some UK trade will contract and other trade expand, while GDP will change structure, with some (small) overall expansion in efficiency. While trade will indeed change direction away from the EU, this will improve the structure of the UK economy and the gains of this need to be evaluated.

A further argument of Ottaviano et al is that there would be 'dynamic' effects of leaving the EU, from reduced investment, technological diffusion, export learning effects, and investment in R&D. However, all these effects assume that there is no expansion in similar opposite effects as trade expands with the Rest of the World. We see here again the omission of the general ROW effects of leaving a customs union. It must also be stressed that estimating these effects is difficult and uncertain; the empirical literature on growth is marked by much elaborate theory but considerable problems in 'identifying' the effects of growth mechanisms in practice.

Attracting Entrepreneurship – Encouraging Competition Probably the most important element for the UK is the extent to which the UK state can establish favourable tax and regulation conditions for competition and entrepreneurship. In this leaving much of the damaging features of EU intervention will be beneficial, regardless of the structure of trade. Here recent work (Minford, 2015) has shown strong evidence that barriers to business affect UK growth.

This is identified in our Table of Costs, next, as a factor that could lower UK growth by some 0.5 per cent per annum, as a result of the dynamic effects on entrepreneurship of excessive regulation, especially in the labour market.

Leaving the EU and 'Border' costs: Likely or Unlikely Scenarios?
What of the danger of invisible barriers following a decision by Britain to leave? Ottaviano et al emphasise a further element that is the way that invisible barriers to trade, through regulative differences for example, may

be raised on UK-EU trade if the UK leaves. This is nowadays called 'the border', as it seems that when borders exist between countries trade is reduced materially- something discussed in Minford et al (2015) in the context of work by McCallum (1995) on the Canadian-US border.

Table 1.1 A Survey of costs from EU membership

	(% of GDP)
Net UK contribution	0.5
Costs of Common Agricultural Policy and of EU protection of manufacturing	4.0
Regulations	6-25
Bail-out transfers	2-9
Effects of EU regulations on growth to 2035	0.5 p.a.
Effect of joining the euro on economic volatility	Doubling of volatility

Source: Minford, Gupta, Le, Mahambare, Xu, 'Should Britain leave the EU?' 2015, Edward Eglar (1st edition 2005)

However this assumes a total breakdown of relations between the UK and the EU on UK departure, which is most unlikely. On the contrary we envisage the signing of a bilateral treaty in which barriers would be kept to the minimum. If UK firms feel that keeping EU regulations in place for their industries would enhance their situation they are quite free to retain them and not merely on their exports to the EU.

Can one square the circle of leaving the EU and yet maintaining no barriers between the UK and the EU on trade? Plainly from the UK perspective free trade with all includes the EU and so no barriers to EU imports would be erected by the UK after departure. UK regulative systems would, where UK industry required it, remain the same as the EU system, except in labour markets where we would preserve our own market approach as now, minus some recent EU intrusions. The question is whether the EU would wish to levy barriers against UK imports.

From the EU's viewpoint (misguided as we may find it) the aim is to keep prices within the EU at their protected (target) level, while disrupting as little as possible existing commercial relationships within the industry that

cross the UK-EU border. In this aim they will be reinforced by industry lobbying, since this is greatly in the industry's interest also. One possibility is that they could persuade the UK in some cases to abandon free trade and simply preserve the status quo; plainly the UK will come under intense lobbying in some industries to do precisely this. Realism suggests that in a few industries, possibly including the volume car market, lobbyists might succeed in this aim, at least for a transitional period. Notice that this arrangement would be a called a 'free trade agreement' between the UK and the EU in respect of this industry. Really it is the exact opposite of what the name implies: it is in fact a decision to keep existing trade barrier preferences in place.

Another possibility is that the UK would stick to its free trade policy and that the EU would allow continued preferential access by UK-sourced products in the industry - so permitting UK producers to continue to enjoy high prices on EU exports. Presumably there would be an upper limit on the quantity of UK product allowed to enjoy this preference, as otherwise UK capacity would be switched in potentially unlimited quantities into this relatively profitable outlet, given that general costs have fallen.

Yet a further possibility is that the pressure of UK competition would eventually lead to the EU's abandoning of its preferential barriers.

Or finally the EU might decide on none of the above and simply treat the UK like the ROW, raising trade barriers against it. In effect our calculations assume this last decision, so that UK industries all face world prices in all their markets. Notice however, that there is no assumption here of any regulative barrier; the barriers would simply mean that the UK would pay a trade tax that would raise its EU prices above world prices by the same margin as currently occurring within the EU. Subject to paying this tax there would be no 'invisible border' barrier between the UK and the EU.

It is difficult to predict which of these outcomes will be chosen in every industrial case. However, we should make it quite clear that from the viewpoint of general economic welfare the best outcome is full free trade, with the EU treating us like the ROW and raising its existing preferential tariff-equivalent. This outcome would ensure that the UK moved to world prices, under which it would enjoy its comparative advantage and therefore its economy would be the least distorted. It is this calculation that we have made in assessing the cost of EU trade membership. As noted we see no

reason to deduct from this any cost of some 'invisible' barrier since we can see none such as involved.

Should other outcomes be chosen, in effect these would lead to less political obstruction of the UK's decision to leave the EU but also less gain from doing so. We think such outcomes may well be transitional elements in any agreement. So our assumption is that they may well occur in some case temporarily but do not affect the long-term gains.

Another full trade study is that of Open Europe (2015). This at least considers the case we set out here of moving away from the EU to full free trade. It uses the GTAP, a large CGE model with very many sectors, linked by input-output relationships, and generally under imperfect competition, hence rather similar to the models used by Ottaviano et al. Such a model suffers from the same criticisms that it cannot deal properly with a largescale change in trading regime such as leaving a customs union for free trade. However, we can get from the Open Europe study what the effect on welfare would be of such a change; and it appears to be of the order of an improvement by 1 per cent of GDP. This order would be understated in my view by the failure to embody all the long-run effects examined in our model here. But at least one can see that it points in the same direction of gains from free trade- as indeed one would expect and hope such a model would find.

The Treasury Study – Devilling behind the Detail

So far we have considered the nature of the gravity model and its use by previous authors, contrasting it with the assumptions in our standard trade theory approach. It is time now to go through the Treasury workings themselves in some detail.

The way the Treasury models Brexit is to focus on 'openness', that is the sum of imports and exports relative to GDP, and FDI (Foreign Direct Investment). These two factors are each assumed to follow a gravity model, estimated from multi-country data. They are then assumed to determine productivity, in a manner estimated from UK industrial data. Finally, this productivity effect is added into a multi-country macro model (managed by the National Institute, called NIGEM) to find the general effects on investment, GDP etc.

The Treasury discussion of all this goes into all sorts of theoretical and econometric problems, without of course touching on the logic of the basic approach as we have just discussed. Not surprisingly no journalists or other commentators have really had the stomach to go over this mass of technical material and explain or criticise it more widely. If they are on the Remain side they nod approvingly and wisely; if on the Brexit side they have dismissed it as pure propaganda from a beleaguered Chancellor. Here however I propose to go through it quite carefully.

Let me say at the start that even though full of detail, the report lacks transparency about the actual data on tariffs and barriers used to operate the gravity equations; about the actual equations estimated and used throughout; about exactly what numbers for openness effects come out; exactly how they produce the productivity effects; and how exactly these input to NIGEM (National Institute Global Econometric Model) compare with the GDP outputs. In my applied work I try to make it possible to the knowledgeable reader to reconstruct the numerical results I get. Indeed it is standard these days for journals to insist that code, data and models all be posted on the internet. A casual reader might think that in all the 200-odd pages this information would be available. It is not. Instead the text is full of waffly claims about rigour and world-class methods- all of which we would be spared in a professional exposition.

However, if we lay aside such concerns and assume the Treasury has added things up right and used the right data - which I doubt because of some remarks about the scale of different sorts of protection made here and there in the text, we can move to discussing their methods in principle.

Let us begin with the gravity equations for openness and FDI. These are estimated for many countries over many different time periods. To obtain the effects of trade barriers, the statistical effect on countries from the date of EU entry (as well as of entry into other trade agreements like EFTA, EEA) is used. They tried using tariffs and indicators of non-tariff barriers but the data and results were poor.

The correlation between trade and the effects of tariffs varying over time, as tariff rates are altered, might have given a reasonable estimate of the effect. However, with regard to the effects of EU entry date, there is a well-known and acute problem of 'post hoc ergo propter hoc' that is familiar to most people: meaning 'the fact that something happened after something else does not mean it was because of it'. Take a country that

trades heavily with the rest of the EU; it joins the EU perhaps for this reason, perhaps because it was already closely involved with it, perhaps because it is carrying out reforms and EU membership will buttress them. Is its high share of trade due to joining the EU? No, not at all. Something else that we cannot directly observe (ie, its political 'closeness' to its neighbours or its allied policy programme) is causing both the high trade share and the EU membership.

The Treasury gravity models of trade and FDI are riddled with this problem, which is known as 'selection bias'. Two nice examples of this will drive home the point.

One good example of this problem came up in the debate about the UK joining the euro. Andrew Rose (1999) of UC, Berkeley, estimated a model of trade and its determinants, including monetary union, on a huge panel data set. Using a dummy for monetary union Rose initially found that the effects of union on trade expansion with the EU were very large- no less than 300 per cent. He included a lot of other factors that could have caused countries both to have a lot of EU trade and join the union- such as being ex-colonies. Still the effect came through. Unfortunately there is no way in these studies for controlling away selection bias precisely because we cannot know the unobservable characteristic that makes union and trade hang together anyway. One way however, to test for such an effect is to take a country that has been in and out of a monetary union for reasons beyond its control. Thom and Walsh (2002) did such a study for Ireland and the UK. Ireland had from time immemorial been in a monetary union with the rest of the UK; after the collapse of Bretton Woods it adopted the Irish punt; then when the euro was launched it adopted the euro. Hence its monetary union with the rest of the UK was broken. However, this led to negligible changes in its trade with the rest of UK. Later Rose reduced his estimate to a 'near-doubling'- still most unlikely.

Yet another example comes from the Treasury's own equations for the 'border effect' (HM Government, 2013) when the Treasury published its estimate of what would happen to UK-Scotland trade if Scotland became independent, using a similar gravity model to the one here. Its estimate was an 80 per cent drop! This astonishing number seems to imply that after independence the two countries would have virtually gone to war. Like many such 'border effects' they are produced by the data as an amalgam of many factors that have nothing to do with the erection of a new border, such as war, cessation of diplomatic relations, or even longstanding

animosity. If anyone seriously believed Scotland and the rest of the UK would have such a breakdown of relations, they were dreaming. However, it suited the Treasury's war of terror against Scottish independence.

I am not suggesting these economists in any way cooked their figures. Unfortunately, the truth is worse: such estimates can be extremely unreliable because of selection bias.

The Treasury gravity models of trade and FDI are therefore beset by potential selection bias. Suppose we ignore this and trust the estimates. We then trip over the next problem; these relationships have nothing to do with the UK. They are for lots of different countries, many of them developing countries, whose behaviour is unlikely to be similar to that of the UK, an old developed country.

Or take another example from the experience of the UK itself. When it joined the EU in 1973 it did so having in place a large set of protective tariffs; adopting EU tariffs tended to reduce overall UK protection against the rest of the world. The effect of the UK joining would therefore be expected to increase UK trade with the EU and possibly also with the rest of the world, even after the effect of trade diversion to the EU. However under the Brexit WTO option the UK would eliminate its trade barriers against the rest of the world while also abandoning its zero barriers against the EU: not at all the reverse of what it did on entering the EU.

Before we leave these equations, remember what we said earlier about these relationships: they are what some underlying model of the economy with full interactive relationships would imply you would find between the variables being correlated here. For example successful economies (e.g. because they have good pro-business policies and free markets) tend to generate more GDP, more trade and more FDI as a by-product. The relationships found are a product of the shocks interacting through the underlying model; so what we are observing is relationships spawned by a million different shocks applying to many different countries in many different periods. Even if the econometrics was unflawed, how can we know that these relationships will apply to the UK under the Brexit shock?

Now turn to the next set of the Treasury's models: the UK industrial relationships between openness, FDI and productivity. Here at least a lot of detailed UK data is used, across many industries and many time periods- again a panel data sample but for the UK. The problems with these statistical relationships again arise from the absence of a structural model

(i.e. an underlying set of relationships): some sets of shocks caused different industries to do well or badly in the sample period and so affected their trade patterns, their FDI and their productivity according to these underlying relationships. What we observe is some average correlations that come through in the data. Yet there is no direct causality between FDI, trade and productivity: instead they are all reacting to various industrial shocks. If anything one would be tempted to say that these shocks first impact on productivity and then drive FDI, production and so trade; thus any causality would be the other way around from what is assumed by the Treasury. We do not know of course. The only way we could tell is by writing down an underlying model of these industries, with causality defined by the model, and testing on the data against other potential causal models. But that is a tall order and has not been done here for obvious reasons of time and money. The trouble is that what we are left with is equations that are not causal relationships but mere associations. It is clear that if you use them to generate causal results you could be very wide of the mark.

To put it plainly the many claims made by Remain about how FDI would fall and so would trade and that these in turn would reduce productivity are baseless and not in any way supported by these statistical relationships. What our standard trade model shows is that under the WTO option what would happen on Brexit is that EU-protected sectors would contract, while non-protected sectors would expand, that FDI (foreign capital) would gravitate towards the latter away from the former, that EU trade would fall and that non-EU trade would expand, that overall productivity would rise, and so would consumer welfare.

Last we come to the NIGEM model. This a perfectly standard macro model; the fact that it has a lot of countries in it is really irrelevant to its function in the Treasury calculation which is confined to seeing what would happen to UK GDP when the assumed productivity change due to Brexit is added in. While there are some time lags in NIGEM, these are irrelevant when projecting forward 15 years. The basic story in any such macro model is straightforward: a rise in productivity raises the return on capital and so raises the capital stock until the marginal return is equal to the cost of capital again through the operation of diminishing returns to capital, holding the supply of land and labour pretty much fixed by the constraints of UK availability. Or in the Treasury anti-Brexit case, vice versa. In this calculation a bit part can be played by land planning and migration; the more flexibility in each the more capital responds. However,

whether there is net gain or loss from Brexit, and whether it is large or small, should be quite insensitive to the potential range of assumptions about each.

III
The Three Treasury Scenarios:
The Implications

The Treasury looks at three scenarios/options for Brexit through the prism of the models described above.

The EEA/Norway Option. Here the UK effectively re-enters from the outside into the EU-protected Single Market. To ensure that no non-UK-origin output is allowed into the EU, duty-free rules of origin are applied and custom checks are necessary, which increases expense. The UK must continue to contribute financially to some degree and also must submit to all Single Market regulations, as now. The cost here that the Treasury finds is due to this extra administrative hassle; otherwise, it is similar to the status quo. In particular, free movement between the EU and the EEA is a condition of this arrangement.

If we ask whether there would be much of a different outcome under our standard trade model approach, the answer is our result would be somewhat better: a nil effect, as we cannot find much evidence that the administrative hassle (dealt with by repetitive, often computerised routines) affects trade much. This is because the gains from leaving the EU are principally due to effects on trade and from regulation of the Single Market, the two main EU delegated powers. Neither of these would be diluted much, if at all, by the EEA model; there would just be this extra administrative hassle.

Of course, if the main aim is political separation, then the EEA delivers it without much disturbing the existing trade/Single Market set-up. But, notice it delivers no political control on immigration.

The Canada Agreement Option. Under this proposed agreement with the EU, Canada is negotiating the mutual abandonment of tariffs on goods on both sides and national barriers on services trade are to be reduced. On regulation there is mutual recognition and there are rules of origin and custom checks. Freedom of movement does not apply. The Treasury costs this as worse than the EEA/Norway option because it believes the financial services Single Market contributes to trade and productivity.

Under our standard model, a gain would be generated from the UK adopting its own regulations under mutual recognition (we again do not assign any cost to administrative hassle). However, the lack of a financial

Single Market is not a negative under our model because there currently is no real Single Market in services and we project little change (or, most likely, change for the worse). Politically, the Canada model allows the UK to control migration. Thus our calculation of the Canada agreement is for a positive gain due to the elimination of the EU Single Market regulations (see The Economy after Brexit at www.economistsforBrexit.co.uk for details), an issue we cost separately from the trade effects. On trade there is no change on our assessment.

In our approach therefore this agreement amounts to the status quo on trade but an improvement on regulation. In particular, it takes the City out of EU regulation under future Single Market changes. It could also correspond to what some politicians have said they wanted: no change in trade but no EU regulation and the return of political control**.**

The WTO Option. It is here that the Treasury's costings become extremely negative and their model outcomes depart massively from our standard model evaluation**.** The Treasury applies the full 'EU effect' on both trade and FDI; to this it adds the 'EU trade agreement' effects on our exports to non-EU trading partners who have EU trade agreements. Finally, it assumes no effects from our reductions in import tariffs on non-EU goods (as it has no 'effect' for this in its gravity models); implicitly it is assuming here that the UK maintains the EU external tariff. These various assumptions are not shown explicitly anywhere in the Treasury report and so it is impossible to be sure what they have done. Via these assumptions, they generate large negative effects on openness and on FDI. Once these are taken through the other models, they generate large net costs, nearly 8 per cent of GDP.

As we have already explained, in our standard model of trade, matters are entirely different**.** EU protection raises consumer prices across the food and manufacturing sectors and so Brexit has a major direct beneficial effect on consumer prices. This, in turn, impacts on wages and competitiveness throughout the economy. The structure of production shifts towards non-protected sectors, raising productivity overall. In addition, our consumers no longer transfer resources to foreign EU producers. Trade agreements with non-EU countries have no effects in our model.

- All this gives a net gain to consumer welfare and GDP of 4 per cent, the opposite of the Treasury calculation.

- Furthermore the WTO option allows the UK to abandon all EU regulation within the Single Market. This in turn brings further gains to GDP.
- Politically it gives us full freedom from the EU in every respect.

Last but not least, we are in no way reliant in negotiating this option on good will from the EU, which may indeed not just be absent but replaced by a great deal of ill will. It relies not at all on cooperation from the EU. If we do a deal with the EU it would be from a position of bargaining strength. We can always 'walk away' if there is inadequate progress and unilaterally abolish the 1972 European Communities Act, which is what gives the EU its powers over us.

There is a key 'game theory' point here. By becoming invulnerable to the rest of the EU this also enables us to bargain successfully with them should we wish to strike a political deal, for example allowing some transitional agreement to maintain existing arrangements for some industry such as the car industry. Interestingly it seems likely that EU industries such as cars will not be keen to see UK prices for their products drop as world free trade washes into the UK market: thus unilateral free trade acts as a 'threat point' for the UK in bargaining with the EU. To avoid this they are likely to want some sort of deal. Politically, even if it deviates from the pure gain of unilateral free trade in the short run, such a deal could be worth having. But without the threat point the rest of the EU are likely to use bully boy tactics on the UK post-Brexit.

IV
Conclusion

The Treasury study of the Brexit options uses methods that have no foundation in economic theory. The gravity model for trade and FDI is an implication of some underlying maximising behaviour for average shocks; it is highly unlikely that it will correspond to the responses of trade and FDI that occur with the particular shock of Brexit. Furthermore, even if it did, trade and FDI do not cause productivity change; productivity, sectoral output, and consumption emerge from the maximising reactions of consumers and firms to economic shocks. To find out what will happen with Brexit one needs to use a proper underlying, structural, model of these maximising reactions. The standard trade model we use for our analysis is such a model; the results that come from it are totally at variance with the Treasury's results which are consequently unsound.

It is widely pointed out that there is a consensus among a wide variety of established institutions that Brexit is a mistake. Such a consensus has been seen frequently before since the reforming UK governments of Mrs. Thatcher began their work in 1979; the consensus has regularly opposed reform of the British economy and supported damaging exchange rate proposals coming from the EU.

But the most important point to notice about the consensus is that none of them has costed Brexit in its optimal form: leaving the EU for unilateral free trade under the WTO - the true 'WTO option'. All of them cost a WTO option in which the UK moves to impose after Brexit on the whole world the same full protective regime that the EU currently imposes on the outside world. In effect all the consensus forecasters (as recently noted by the IFS, 2016, in their Brexit survey) assume that Brexit extinguishes the limited free trade in goods we have within the EU while maintaining all the current trade barriers the EU has in place; hence it would be a reduction of free trade. It is hardly surprising that, regardless of modelling methods, they all reach a negative long term result on GDP. All the models imply that more free trade is better; so less free trade is unsurprisingly found to be worse! The only group that costed Brexit as unilateral free trade - where UK free trade policy expands to the whole world even though it faces trade barriers from the EU - found a large gain, namely our Economists for Brexit group.

Whether this consensus and Treasury decision on assumptions is a deliberate deceit about Brexit or mere misrepresentation is not for me to

judge. Various of the forecasters like the IFS regard unilateral free trade as politically unlikely. However, this is not necessarily so: New Zealand adopted this policy at the end of the 1980s and the UK now has a long tradition of following free market policies. Also, 92 per cent of the workforce now work in unprotected sectors and have a fairly robust view of the role of market forces, to which they have had to adjust. They also understand that some farmers should be directly supported by the Treasury on social grounds, as should some manufacturers (such as Port Talbot steel). Policy can be improved on energy, the exchange rate will fall on our forecasts, and competition can push firms to move towards the hi-tech end of the industry where a third is already and where the future lies.

Most importantly, the role of economists and the government is to inform and advise voters about their options, not to suppress those they disapprove of. In the case of Brexit it looks very much as if the government 'and friends' have decided to use worst-case assumptions to frighten voters out of a Brexit the establishment opposes. It is a deceit and may rebound on them.

Brexit is a major reform that is disruptive of existing market relationships; it is no surprise that once again the British and international establishment and their serving economists oppose it. It is entirely to be expected. As so often before, it is wrong. What is disappointing is the dishonesty with which the establishment has pursued its aims.

References:

Costinot, A., and Rodriguez-Clare, A. 'Trade theory with numbers: quantifying the consequences of globalization', *CEPR discussion paper no. 9398*, March 2013, Centre for Economic and Policy Research, London (2013).

Deardorff, Alan V. 'Determinants of Bilateral Trade: Does Gravity Work in a Neoclassical World?', *The Regionalization of the World Economy*, edited by J.A. Frankel. Chicago: University of Chicago Press, (1998), pp.21.

Feenstra, Robert C., James R. Markusen, and Andrew K. Rose, 'Using the Gravity Equation to Differentiate among Alternative Theories of Trade.' *The Canadian Journal of Economics*, Vol. 34, No. 2. (May, 2001), pp. 431.

HM Government (2013). '*Scotland analysis'*, HMSO.

Institute of Fiscal Studies 'Brexit and the UK's public finances', *IFS Report 116*, Institute for Fiscal Studies, (2016).

Krugman, Paul , 'Increasing returns, monopolistic competition, and international trade', *Journal of International Economics*, vol. 9, (1979), pp. 469–79.

Lucas, Robert, 'Econometric Policy Evaluation: A Critique'. In Brunner, K.; Meltzer, A. *The Phillips Curve and Labor Markets*. Carnegie-Rochester Conference Series on Public Policy **1**. New York: American Elsevier, (1976), pp. 19–46. ISBN 0-444-11007-0.

McCallum, J. 'National borders matter: Canada - US regional trade patterns', *American Economic Review*, June 1995, vol. 85, (1995), pp. 615-623.

Minford, Lucy *'The Impact of Policy on UK output and productivity growth, 1970-2009: Testing an Open Economy DSGE Model'*, PhD thesis, Cardiff University, (2015).

Minford, Patrick with Sakshi Gupta, Vo Phuong Mai Le, Vidya Mahambare and Yongdeng Xu, *Should Britain leave the EU? An economic analysis of a troubled relationshi*p, Edward Elgar in association with the IEA, second edition, (2015), pp. 197.

Minford, Patrick, 'Understanding trade agreements with the EU and other countries', *Cardiff working papers in economics*, Cardiff Business School, (2016), available at www.patrickminford.net/wp/E2016_1.pdf

Ottaviano, G., J.P. Pessoa, T. Sampson, and J. van Reenen (2014) 'The costs and benefits of leaving the EU', Centre for Economic Performance, LSE, (May 2013).

Open Europe (2015) *What if..?: the consequences, challenges and opportunities facing Britain outside the EU*, http://openeurope.org.uk/intelligence/britain-and-the-eu/whatif-there-were-a-brexit/ (accessed 2 September 2015).

Rose, A.K. 'One money, one market: estimating the effect of common currencies', *Economic Policy*, (April 2000), pp.30: 7–45.

Thom, R., and B. Walsh, 'The effect of a currency union on trade: lessons from the Irish experience', *European Economic Review*, vol. 46, (2002), pp. 1111-1123.

Subscribe to Politeia's Publications!

For £35 a year (£30 standing order) you will receive an electronic copy of each of our publications, plus hard copies of two new publications on request, and, if you wish, free hard copies of your choice from our back catalogue. You will also receive advance notice and invitations to Politeia's conferences and flagship events, with guest speakers from the UK and overseas.

More information can be found on our website: www.politeia.co.uk. Or, write to the Secretary, Politeia,14a Eccleston Street, London, SW1W 9LT or at

info@politeia.co.uk

A Selection of Recent and Related Publications

The EU: an Idea Whose Time Has Passed
Roger Bootle

Joining the World: Britain Outside the EU
Nigel Lawson

Banking on Recovery: Towards an accountable, stable banking sector
J. McFall, S. Kamall, G. Lyons, F. Capie and others

Dumbing Down the Law – The SRA's Proposals for Legal Education
Anthony Bradney

The British Bill of Rights: Protecting Freedom Under the Law
Jonathan Fisher QC

Paying for the Future: Working Systems for Healthcare and Pensions
Ludger Schuknecht, Matthias Dauns, Werner Ebert

Working Welfare: Contributory Benefits, the Moral Economy and the New Politics
Frank Field

History in the Making: The New Curriculum, Right or Wrong?
David Abulafia, Jonathan Clark, Robert Tombs

Nuclear Options: Powering the Future
Roger Cashmore, David Mowat, Simon Taylor

The Treasury has joined the fray on the 'remain' side in the UK's referendum debate with a report forecasting the future if Britain leaves the EU.

But the Treasury's study is flawed, says Patrick Minford, one of Britain's leading economists, in *Flawed Forecast: The Treasury, the EU and Britain's future*. The Treasury uses methods that have no foundation in economic theory. Moreover, says Professor Minford, it attempts to assess the post-Brexit options without considering the true WTO option, which is free trade under the World Trade Organisation. Instead it portrays a worst case scenario of remaining after Brexit under the EU regime of costly protections and obstacles.

The true position is rather different. Using standard economic models, the figures show that after Brexit there would be a net gain to consumer welfare and GDP of 4 per cent, the very opposite of the Treasury calculation. Moreover, further gains would follow the WTO free trade option.

POLITEIA

£8