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Cardiff Economics Working Papers



Working Paper No. E2015/17

Evaluating European trading arrangements

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EVALUATING EUROPEAN TRADING ARRANGEMENTS

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Abstract:

The EU protects agriculture and manufacturing through its commercial policies, namely its tariffs, its non-tariff barriers and the Common Agricultural Policy. By leaving the EU the UK would be able to abandon the EU's protectionist system in favour of free trade combined with transitional compensation for those hit by the changes. This would raise economic welfare by around 4% (i.e. UK households would be able to consume 4% more goods and services) and enhance the shift of the UK economy away from manufacturing into service industries where UK growth has been concentrated largely in the decades since 1979. As the UK is a small country with little if any monopoly power in world markets, bilateral trade agreements have trivial effects on it.

In this contribution I focus on the net costs to the UK of the EU's Common Agricultural Policy and its Customs Union in manufactures. It is well-known that the CAP is expensive for the UK; what is less well-known is the cost of the protectionist customs union in manufactures. Instead we are often told by defenders of the EU that the 'single market' is good for jobs and industrial output; however, the single market, supposedly created by a set of regulations, is actually a market where prices are inflated by a substantial protectionist apparatus. I use a 'Computable General Equilibrium' model to estimate the cost of this protectionism and the corresponding gains which might flow from leaving the EU.

What trade theory has to say about the EU customs union:

At the heart of trade theory lies the simplest of models, designed to analyse the long-term effects of trade restrictions. It assumes there is a homogeneous commodity whose price in the absence of protection would be set domestically at the world price. A tariff or equivalent trade barrier, t , would raise its domestic price above the world price (PW) to $PW(1+t)$. At this higher price domestic supply increases, and domestic demand decreases, so imports fall; tariff revenue is levied on the imports (t times imports) and foreign suppliers receive PW . In a customs union, where a group of countries levies the tariff and internal trade is free of protection, the country's supply and demand are the same as in the simple tariff case, the difference being that imports are supplied by customs union partners at the price $PW(1+t)$, so the government receives no tariff revenue. If the country has any exports they are diverted away from the world market where the price is only PW , to the customs union market where the price is $PW(1+t)$.

Overall, the result for the product is a rise in the price paid by consumers and received by home and rest-of-EU producers to $PW(1+t)$. In terms of whom a country trades with, the effect is 'trade diversion': that is imports from the rest of the world are replaced by imports from the EU wherever these can be produced at a cost less than $PW(1+t)$, and exports to the rest of the world at the price PW are replaced by exports to the rest of the EU at the price $PW(1+t)$.

The government may receive a share of the customs union revenue received on any remaining imports from the rest of the world, according to some formula. However, this revenue accrues to the EU and any sharing of it with national governments is counted as a component part of the country's net budget contribution - accounted for separately in that country's membership cost. So in our trade calculations no revenues are recorded.

Protection of EU output may also be achieved by levying 'anti-dumping' duties, or by physical quotas on imports, or just by the threat of these measures so that foreign producers raise their prices to avoid them- so-called 'self-restraint'¹. These measures act like straightforward tariffs to raise prices, again from PW to $PW(1+te)$ where te is the 'tariff-equivalent'. We can therefore treat these measures or the threat of them in just the same way as we treat tariffs in their effect on prices and trade.

The welfare costs to the UK arise because consumers pay higher prices to other EU producers in place of world prices, and they consume less, while extra resources are absorbed from suppliers into the protected industry.

For the price to rise to $PW(1+t)$ as a result of these tariff measures, it is necessary for the customs union as a whole to be a net importer; otherwise the exports diverted to the home EU market will undercut this higher price since they can only get PW on the world market. To achieve the same protectionist outcome when the EU is a net exporter, the customs union must also pay an export subsidy equal to the tariff, so that exporters do not undercut the home market as they are now getting $PW(1+t)$ on their exports. This problem is most prevalent for agriculture and so under the terms of the Common Agricultural Policy export subsidies are payable as well as import tariffs so prices are held above world prices for all commodities covered by the CAP.

In the case of traded services import protection is at the level of the nation-state and there is no customs union; the EU single market has in general not yet been applied to services so that they effectively lie outside our analysis here. The reason for the absence in general of a single market in services lies precisely in these national protective systems (other than in the UK where services are in most cases highly competitive and

¹ In this case the EU receives no revenue on any remaining imports; this in turn means that they will ask member governments for more of a fiscal contribution, a cost one must account for elsewhere as part of being in the EU.

lightly regulated); national governments have been unwilling to allow their service providers to be undercut by competition from other EU providers.

This model we have been discussing refers to one market alone, for a given commodity; the rest of the economy's prices are taken as given or else some other ad hoc decision is made about how they will vary as this industry expands. However the model can be extended to explain the general behaviour of all prices and quantities ('general equilibrium') by specifying the rest of the economy, calculating the market-clearing prices everywhere in it, and also in the rest of the world. The famous Heckscher-Ohlin-Samuelson model is attractive to use for this extension because it brings in the ultimate long-run determinants of comparative advantage with a minimum of complication, by assuming perfect competition in all markets, as well as production behaviour which has constant returns to scale. We discuss how this Computable General Equilibrium (CGE) model works in more detail below.

The Cost of EU Protection

In this section we use measures of EU protection to estimate its welfare implications for the UK and for the EU. For this, we use a CGE world model from Minford et al. (2015), along the lines just explained, to generate estimates of changes in trade that result from this protection.

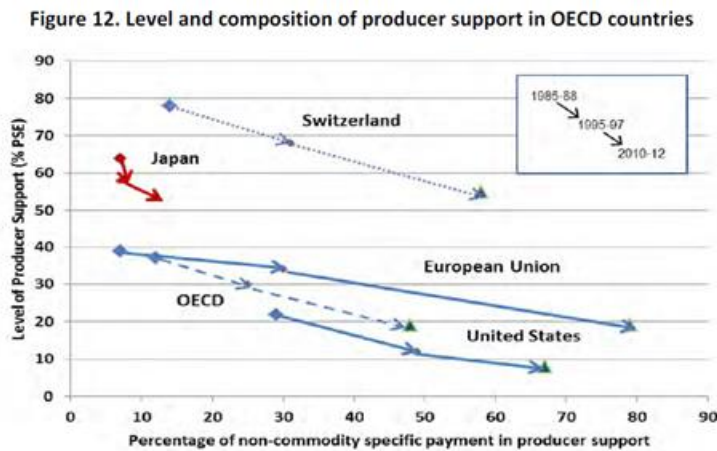
It is difficult to get reliable and up-to-date measures of EU protection because the world is constantly changing. In particular China's trade costs are moving rapidly in response to its own opening up and also its rapid internal growth of wages and living standards. Furthermore we cannot obtain direct measures of Chinese prices; our only price measures come from the OECD and cover only OECD members.

To deal with this complex situation we have decided to use two simplifying devices. First, we gauge the latest trends in protection in agriculture and manufacturing by using broad measures of protection that we have managed to calculate and updating them according to indicators built up by international bodies. The basis of these measures is price comparisons across countries, allowing for transport costs (Bradford 2003); a full account of the method is given in Minford et al. (2015). Comparing prices allows us to calculate the effect of non-tariff measures such as anti-dumping duties and threats to use them, both of which are widespread in today's world.

Thus for agriculture our estimate of protection is based on Bradford (2003) and his original tariff-equivalent for 1990 of 36%. OECD estimates of the producer-subsidy-equivalent within the EU (PSE, a measure of essentially the same protective margin) are approximately the same for this period, as can be seen from Figure 1 below. By 2010-12 their estimate has fallen to around half, at about 18%. We take this latest figure to be approximately the current measure. Plainly change continues as farming adapts; one of

the indicators of change is the percentage (shown in Figure 1) of non-commodity support in the total, which has by now reached 80%. What this implies is that farmers are in effect being compensated for not growing food on their land. Presumably it is this type of measure that is gradually reducing the PSE; to project where protection may be in 2020, our 'target year' for this calculation, we take it that it will be reduced further in line with this trend. In the spirit of avoiding spurious apparent accuracy we put the measure then at 10%.

Figure 1 Level and composition of producer support in OECD countries
 [Delete title on graph]



Source: OECD, PSE/CSE Database, 2013

If we turn to manufacturing, the situation is more complex still. It is usually assumed that since the various GATT and WTO rounds have brought manufactured trade tariffs down across the world (including the EU), EU protection is light in this sector. However, in the wake of retreating tariffs, governments have been given wide discretion to reach agreements on trade quotas, to impose anti-dumping duties or to threaten them and negotiate pre-emptive price rises by importers. Furthermore, these processes reinforce the power of cartels to be established and to survive. Thus what starts as temporary protection against 'dumping' ends as the equivalent of a permanent tariff. Tariffs are transparent; but these measures are hard to monitor. While we know how many duties have been imposed and what trade agreements have been made, we cannot easily find out what pre-emptive measures may have been taken, nor can we tell whether agreements which have notionally lapsed have done so effectively (especially if a cartel

of producers has been implicitly allowed to perpetuate it, as noted above). Calculating the tariff-equivalent has to be done by looking at the price-raising effect of all the various interventions.

Fortunately there are data on prices now on a wide scale because of the purchasing-power-parity calculations being done by international organisations. A pioneering study by Bradford of the price differentials between major OECD countries and their least cost OECD supplier suggested that the EU was substantially more protectionist in impact than the USA even though the latter has resorted to a similar number of anti-dumping duties (Bradford 2003). Averaging across the EU countries studied (Germany, Netherlands, Belgium and the UK), Bradford's figures, which are adjusted for distribution margins, tax and transport costs, are 40% tariff-equivalent for the EU against 16% for the US. These percentages are not much different if one looks at 1999 instead of his original 1993.

Le, Minford and Nowell (2009) updated these figures to 2002 and extended the comparison more widely now that OECD membership has risen, to include Korea in particular. They also cover all EU countries and have made an attempt to update the figures relative to China. The figures for the EU weighted average against lowest-cost non-EU trade partners are somewhat lower in 2002; the US and Korea are between them the lowest price alternatives. For the EU as a whole the 2002 figure comes out at 21%, against 30-40% on the narrower basis for the 1990s. For the US, which has also embraced policies of non-tariff protection, the 2002 figure is 6.5%, against middle double digit percentages in the 1990s.

If one attempts to include China, possible in a crude way for 2002, the implied protection estimates become much larger: 68% for the EU and 48% for the US. These numbers should be treated cautiously because we do not have prices in separate commodity categories for China and indeed China as yet does not produce for export a whole range of advanced products in competition with western countries. The estimates rely on the manufacturing wage cost comparisons made by the US Bureau of Labour Statistics (which estimates Chinese manufacturing wage costs per hour at 7% of Korea's); we also assume that unskilled labour represents 30% of total costs, a percentage deliberately put on the low, cautious side. Nevertheless even these crude estimates indicate just how China's products are being kept at bay by various means, at least in finished form. Even as protection may be coming down on the products of the more developed emerging market countries such as Korea, we can see that it is rising in response to the penetration of Chinese products.

Table 1: Estimates of tariff-equivalents on manufactured goods resulting from all trade barriers (%)

	1990	1996	1999
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Belgium	42	65	42
Germany	39	60	29
Italy	38	36	21
Netherlands	42	58	41
UK	41	41	50
US	16	14	15

Note: Data are expenditure-weighted average ratios of imputed producer prices to the landed prices of goods from the country with the lowest level of price in the sample.

Source: Bradford and Lawrence (2004)

Summarising these measures, we find that by 2002 EU protection may have come down on our preferred measure, based on OECD price comparisons, from a range of 30-40% in the 1990s to 21% by the early 2000s. On the other hand China did not enter these numbers and against China the protection may have been far greater. Nevertheless China is itself changing fast and for the sophisticated manufactured products with whose protection the EU is mainly concerned, it has allied itself with Japan and Korea through large supply networks; thus ‘made in Japan or Korea’ may in practice mean ‘assembled from largely Chinese components’ in these countries. As with agriculture we notice a downward trend in protection and again, to avoid an impression of spurious accuracy, we project a continuation of this trend going on to our target year of 2020, where we set the relevant percentage of manufacturing protection also at 10%.

The CGE Model

We now turn to our CGE model of trade to obtain measures of the cost to the UK and the EU of this protectionist policy. First we explain in more detail just what a CGE model is, before going on to explain how the model works in outline.

A CGE model of international trade, as used here, is intended to contain the relevant relationships that will hold in economic theory across economies and will determine the pattern of trade and the prices at which it takes place. These relationships are numerical so that we can extract meaningful estimates of the quantitative effects of changing trade policies in the long run. For this purpose we cannot aspire to any ‘exact realism’ but we do want to obtain estimates that a) are consistent with good uncontroversial economic theory b) give a reasonable idea of potential orders of magnitude for the long run. The way it is done is to construct a ‘base line’ set of estimates that correspond to the actual known facts; the model is set up so that it fits these facts. Then the alternative set of policies is injected into the model to find out what the alternative facts would look like. We are concerned about long run effects for the obvious reason that these policy changes stay in effect for very long periods, indeed can often be permanent; thus joining the EU occurred more than forty years ago and if we leave the move will undoubtedly not be reversed in a hurry. Experience shows that largescale changes in trade arrangements have quite radical effects on the shape of economies;

therefore we need a model that can work out what these effects might be. Table 2 below shows the CGE model estimates of leaving the EU, in terms of the percentage effects on a wide range of economic variables.

In this particular CGE model there is full competition in all products with free entry. There are world markets for the three traded goods, agriculture, manufactures and services; world supply and demand fix the relative prices of these goods, hence two relative prices- of agriculture/manufactures and services/manufactures. Tariffs (or equivalent measures) raise home prices in the country, raising them above their world price. For an individual country therefore prices of traded goods are set in world markets plus the effect of its own tariffs. In each country there is also a non-traded good, produced under full competition at its long-run average cost.

We now consider what happens in each country to its supplies and costs. Because of competition all prices equal long-run costs; hence prices of skilled and unskilled labour and land, the domestic production inputs entering each commodity, are driven to levels that satisfy this equality, that is they are priced so that they are competitive given the traded goods prices set in the world market. There are three traded goods and three prices of factors of production that are set in the country. The price of capital is set worldwide and capital circulates at this price to wherever it is needed. For simplicity we set this price as fixed at a constant world real interest rate times a fixed world price of production in manufacturing (of 1). Effectively we are assuming that in the long run (the focus of the model) savings are always made available as required at a fixed rate of interest. The wage and land costs, once fixed by traded goods prices, then determine non-traded goods prices.

With all prices set in this way by world prices, tariffs and production technology, we go on to determine how much is produced of each type of good. This is fixed by available supplies of factors of production - assumed to be unskilled and skilled labour. Land we assume is provided freely as needed by planners subject to a restriction placed on agricultural land, such that agricultural production is controlled to a fixed amount. Non-traded production has to be equal to non-traded demand, which depends on total GDP and relative non-traded prices. With these restrictions on agriculture and non-traded output we can work out the size of each sector that will exactly exhaust available supplies of the two sorts of labour. Then from that we can work out how much capital and land is needed by each sector.

So to summarise, world prices (determined by world demand and supply by all countries, as resulting from their country solutions) plus tariffs fix country prices and so costs of labour and land. Given these costs and each sector's resulting demands for these factors per unit of output, the sizes of each sector adjust so that the available supplies of the two types of labour are equal to sectoral demands.

So a tariff on manufactures for example acts to raise a country's price of manufactures.

Then because manufactures use a lot of unskilled labour its expansion drives up unskilled wages. In order to force other industries to economise on the unskilled labour manufacturing needs for its expansion, the other traded sectors contract. The non-traded sector's size moves close to proportionally with the whole economy as demand for non-traded goods is related proportionally to total income, apart from any effect of its changing relative costs brought about by the tariff. The rise in tariff raises consumer prices so that consumers are less well off than they would have been buying the manufactures more cheaply from abroad.

It might seem on the face of it that 10% protection in agriculture and manufacturing is not a very large or significant amount. It raises prices in these two sectors by 10% over the world price, while leaving service prices at world levels. For those used to macro models of short to medium run behaviour relative price movements of different sectors of this order occur regularly; for example world raw material prices can double or triple and greatly affect retail prices of sectors using those materials. Yet we do not observe huge sectoral output swings in the economy.

The difference here is that we are computing the long run effect of permanent relative price changes of these sectors. The sectors with higher prices pay higher wages, both skilled and unskilled, for the workers they need; they pay more for land and they use more capital whose price is fixed in world markets. What our CGE model shows in Table 2 is that resources are heavily attracted out of the service sector into agriculture and manufacturing. In fact we assume that output in agriculture is capped (effectively by control on the land that can be used in this sector) in our model by government policy; so that the attraction into this sector is frustrated by rising land prices. However for manufacturing no such limit is placed and the result is a substantial boost to manufacturing at the expense of services.

Table 2 goes on to show that the effect of raising prices for these two sectors by 10% is first a substantial, 7.5%, rise in the cost of living. Wages of unskilled workers go up more than this, 14%, because they are disproportionately used in manufacturing. But skilled workers' wages fall by 11%, being disproportionately used in service industries. Landowners do well, with land prices soaring 47%. We see in these figures how the politics of vested interests works; unions representing unskilled workers, farmers and other landowners, as well as manufacturing businesses, will clearly support being inside the EU.

Yet the effect of shifting output into sectors where their productivity is less than the price paid by consumers is an overall loss of welfare for UK citizens; these citizens would value more the output lost in services whose production contracts 32%. The loss of welfare, measured by the loss of potential consumption by UK households, is 3.3%. This potential consumption change is measured as the change in the value of all output deflated by its consumer price cost (i.e. the change in [nominal GDP/CPI]), minus the change in the value of resources used to generate it). In other words the welfare effect

is the percentage change in the resources available for consumption to UK households.

This cost is computed as if the protective measure is a tariff. However the customs union acts as a tariff in its effect on outputs and consumption; but the equivalent of the 'tariff revenue' (i.e. the extra cost of imports due to the protection) is disposed of differently. There is revenue on imports from outside the EU; this revenue (paid by UK consumers) accrues to the EU itself but it is already counted in the UK's net contribution (after rebate and EU spending on UK projects). There is also 'revenue' accruing to EU businesses that sell protected goods to the UK because they can charge higher prices: this revenue is not counted elsewhere and is a cost to UK consumers. Our businesses also gain more from other EU consumers on their exports; so the 'net revenue' paid by UK consumers to EU consumers is the tariff times the net imports by the UK. For manufacturing where we have large net imports (about 8% of GDP) this net revenue transfer amounts to 0.8% of GDP on the 10% tariff-equivalent we have assumed. This amount is not included in our Table 2 calculation and so has to be added to it. For agriculture the workings of the CAP on transfers between countries for agriculture are complex and are already counted in the net UK contribution. So in sum the total cost to the UK of the protection of agriculture and manufacturing is 4.1% of GDP.

Some politicians attach totemic significance to manufacturing; we have heard quite a few arguments since the 2010 election that the economy should be 'rebalanced' towards manufacturing. One can see why the vested interests listed above would want this; it is no doubt to appeal to these interests that politicians make these arguments. But there is no economic case for encouraging output in sectors which market forces would contract. For such a case there would have to be some disparity between social and market values; yet there is no such disparity. Similar arguments were made two centuries ago for preserving agriculture with a similar lack of basis.

Leaving the EU and eliminating this protection would, according to these figures, raise service output and effectively eliminate manufacturing in the long run. The reason for this is fairly simple: as the UK has developed in the decades since the economy began to be liberalised in 1979, there has been a big rise in the share of skilled labour in the workforce. By now approximately 50% of university-age people go to some form of higher education or equivalent. This has favoured the expansion of skill-intensive industries of which the service industries are the principal examples. We can also include in these industries the design element of manufacturing, which is a service industry; 'manufacturing' in the national accounts includes this, inside the manufacturing firms it comprises. So to the extent that service activity is currently included in manufacturing, this part would not be eliminated but just reclassified. These workers are engaged in jobs that require the use of their brainpower and associated skills. The actual making of things, manufacturing in the original sense, has contracted hugely in the UK. What the CGE model tells us is that in the absence of EU protection this actual making would largely disappear.

This result should not be regarded as very shocking. The strongly declining share of manufacturing in GDP has been an unremitting trend feature of the UK since the 1980s; it would be intensified by leaving the EU, and eventually we would be left only with those parts of manufacturing that involve design and hi-tech skills, as one would expect in a relatively small country heavily endowed with skilled and educated labour.

We can note that there is a good demand for unskilled workers in the non-traded service sector (distribution, construction, utilities and so on) which cannot be substituted for by bringing in cheaper substitutes from abroad. As this non-traded sector is around half of the economy, one can see that if roughly half the labour force is unskilled it will be fully employed in the non-traded sector and there will be little of it left over for the manufacturing sector. Plainly EU protection as we have seen raises the wages of unskilled workers; but if there was a case for redistribution to these workers because they were poor, then this would already be done by public redistribution policy. This policy area is extremely active in the UK, as evidenced by the high progressivity of the tax-benefit system. There is no case for using protection to help carry out this policy since it is clumsily directed at the issue and so as we have seen creates a big cost for the economy as a whole.

It turns out that the costs to EU citizens of the EU tariff on agriculture and manufacturing are roughly the same as those for the UK. Thus when the 10% tariff is levied EU-wide including in the UK, the Table of effects shown below more or less replicates in the rest of the EU what happens in the UK. The only difference for the rest of the EU is that there is a small net revenue gain due to the net revenue transfer from UK to Rest of EU consumers; but as a percent of the much larger RoEU GDP total it is only 0.15% of their GDP. Thus the total welfare cost to RoEU is just under 3% of GDP.

Table 2 Effects of UK and EU tariff of 10% on Agriculture and Manufacturing: percentage changes from Base

% changes	UK	EU	NAFTA	RoW
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y	-3.71	-3.39	0.22	0.16
y _A	0.00	0.00	0.00	0.00
y _M	93.33	49.07	-18.42	-12.22
y _S	-27.02	-30.91	6.97	8.20
y _D	-3.62	-3.47	0.21	0.16
E _A	-11.16	-4.29	0.47	0.76
E _M	-0.56	-0.57	0.03	0.19
E _S	-5.00	-4.76	0.30	0.06
w	13.25	13.25	-1.16	-1.16
h	-8.00	-8.00	4.11	4.11
l	48.37	48.37	0.92	0.92
N	1.25	1.25	-0.12	-0.12
H	-2.06	-2.06	0.52	0.52
L	-28.30	-28.00	-0.18	-0.28
K	7.08	7.75	0.50	0.37
CPI	8.18	8.15	0.79	0.76
P _A	10.48	10.48	0.43	0.43
P _M	10.00	10.00	0.00	0.00
P _S	1.89	1.89	1.89	1.89
Pw _A	0.43	0.43	0.43	0.43
Pw _S	1.89	1.89	1.89	1.89
Welfare	-3.39	-3.00	0.07	-0.03

Glossary: y= output; E=expenditure; w= wages of unskilled; h=wages of skilled; l= rent on land; N=unskilled labour; H= skilled labour; L= land; K= capital; CPI=consumer prices; P=price of commodity; suffixes: A=agriculture;M=manufacturing;S=services;W=world

Considerations of 'Brexit'

It might be thought that such estimates are all very well but that if we left the EU there would be a quite separate problem of being 'outside' the EU 'market' as well as 'excluded' from other markets with which the EU has signed free trade agreements (FTAs). The recent IEA-prize-winning paper on Brexit (Mansfield 2014) recommended that the first activity to be undertaken after Brexit should be a general negotiation of FTAs with Uncle Tom Cobleigh and All. What are we to make of such arguments? Is it true that there are gains in trade terms from leaving the EU and yet that we are vulnerable to problems of 'access' to all such markets?

What we need to understand is that if some other countries set up barriers against our trade, unlikely as that is, it would have no implications for the world prices of the types of products we produce. Those prices are set in all the markets of the world. If our producers faced some extra tariffs in some markets this would have no effect on the world price of the goods we produce. The UK produces a small fraction of world exports in virtually all product markets. These UK exports will be more expensive in the markets with extra tariffs but the impact on the overall demand for these products will be negligible. Then what will happen to our exports in the markets where they face these tariffs? They will be diverted to markets where they do not. In the markets where we face tariffs our competitors will sell the goods we did not sell; we will sell more in their other markets.

Given that world prices will be unaffected, our calculation holds exactly. This calculation estimates the gains of moving from protected EU prices on EU imports and exports to world prices on these. On non-EU exports and imports we get world prices already.

This is not an easy idea to grasp for those not used to international trade theory. Most people think in terms of 'market access' and the bilateral bargaining between producers and the country to which they are selling. But this is not how world trade works - except in the very short run which is soon over and so not relevant to a long-term shift like leaving the EU.

This illustrates what is known in international trade theory as the 'importance of being unimportant'; a small supplier in world markets such as the UK, faced with a tariff from country X, would simply divert supply to another market and so keep its price unchanged, passing the tariff on to the consumers in country X. The UK is too small to affect the world price of any product it sells- hence it is 'unimportant' at the world level.

This powerful argument implies that the calculation of the UK's net trade gains is immune to what third countries decide to do with their trade barriers on UK products, and is explicitly based on the assumption that the EU indeed raises its usual Most Favoured Nation (mfn) barriers on UK products so that UK export prices in the EU market revert to world prices.

What about a trade agreement with the EU?

It is sometimes said that we should try to obtain a Free Trade Agreement with the EU. The problem about this is that with free trade the UK would enjoy lower prices on goods that are protected in the EU. If they levy on us the usual EU tariff-equivalent then prices of UK exports to the EU would be brought up to EU levels and so the protection to EU producers would not be undermined. Hence it is natural to make the assumption that the EU levies its usual (mfn) tariff-equivalents on us when we leave. If we ask it not to,

then in effect it seems we are asking to remain inside the customs union and are not leaving at all! However, in free trade agreements such as NAFTA different countries can have zero tariffs against third countries even while enjoying zero tariffs from other FTA partners; it may well be possible for the UK to negotiate such arrangements for particular industries that are highly integrated across the EU.

For example there are some industries where competition is heavily restricted- such as aerospace and airlines. In these examples existing markets are heavily organised between the UK, EU and other producers. In effect leaving the EU would leave these arrangements intact.

An example of a highly integrated industry is the volume car industry in which multinational companies have invested heavily on the assumption of a protected EU market. For such cases the drop to world prices would lead to heavy losses. An arrangement whereby the UK and the EU maintained zero tariffs and tariff-equivalents against each other would make much sense for this industry; effectively the EU market would maintain its existing prices and UK producers would continue to sell into this EU market at these prices, even though UK prices for cars would fall to world levels so that EU producers would lose their EU price premium in the UK market.

Failing that, given that the UK encouraged these investments, it could reasonably make some compensation when policy changes, on the usual basis that reform requires losers be if possible compensated by gainers (in this case taxpaying households who enjoy lower consumer prices and other firms that enjoy lower input prices).

Alternatively, the existing arrangements for this industry could be left in place for a transitional period of a decade, allowing the industry time to adjust its capital stock and strategies to the new reality. This would mean that for a decade the current EU customs union protection was continued by the UK for this industry only. The gain to the economy of this part of the trade regime change would be deferred for this decade- but then would be reaped like all the rest.

In effect such agreements with the EU would amount to negotiating a 'Breset' rather than a 'Brexit'- a resetting of our relationship with the EU rather than a termination of all ties. The EU is after all a close neighbour and we would aim to have friendly and cooperative relationships with such a neighbour, in trade as in so much else.

Opposing views

There are some studies that argue there would be losses for the UK should it leave the EU customs union. One is by Ottaviano et al. (2014), who estimate that leaving the EU would imply costs of 1-3% of GDP due to the imposition of the EU's Common Tariff on the UK. This is to be compared with our calculated gain of around 4 per cent of GDP.

As we noted above we would in practice aim for a new Treaty which would preserve the helpful aspects of our trade relationships, notably good common regulation and bilateral free trade. 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%, 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.
- 2) They assume that the EU would react by raising trade and regulatory 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.

A final concern is how accurate their model can be in assessing a major change in commercial relationships like leaving a customs union. The 'multilateral gravity model' they use, due to Costinot and Rodrigues-Clare (2013), assesses all countries' bilateral trade according to calculated bilateral elasticities which effectively 'sum up' the total ('general equilibrium') effects of the change. Thus Costinot and Rodrigues-Clare argue that, if one is prepared to assume some set of 'micro-foundations' (ie underlying relationships between consumers and producers, such as the state of competition) one can regard the gravity model as an accurate method to evaluate any shock to trade. At a theoretical level one can accept that, given a constant elasticity of trade response, an estimate of the effects of a tariff shock would be accurate.

However, the question is whether one can regard such an elasticity as 'structural', that is invariant to the type of policy shock created. The basic point is a simple one: an elasticity sums up the effect of a tariff on trade via many different channels, some of which reinforce each other, some of which offset each other. These channels will be activated to different degrees by different shocks. Therefore an elasticity that works when only one thing is disturbed, namely the product tariff, will differ when that disturbance is accompanied by many changes to other tariffs. In the case of a large shock to the structure of trade such as leaving a customs union, the elasticity will no doubt be quite different again. As Costinot and Rodrigues-Clare point out, the difficulty

lies in assessing the elasticities to use and what we would add is that they are likely to vary with the nature of the joint shock imposed on the economy, and the effects of this on ambient features of the economy such as consumer prices, wages, and supplies of capital and of different types of labour.

Our model here, based on four sectors and four major ‘countries’ can reasonably be criticised as too aggregative to provide highly accurate estimates, yet it does have an explicit theoretical defence of the way it computes the equilibrium structure of industry and consumption; it at least is for sure a structural general equilibrium model, that can in principle evaluate any shock to the structure of trade or the economy. The gravity model may work well numerically, and be more accurate in detail, for quite general changes in conditions, like a general drop in transport costs, mirroring globalisation, which is what Costinot and Rodrigues-Clare use it for. The problem with using it for a for a shock to trade structure like the UK leaving a customs union is that the responses will certainly not be the same as for a general globalisation shock; indeed such a shock changes the UK’s internal structure substantially, in a way not assumed in a gravity model.

Other costs and benefits

A further argument of Ottaviano et al., for which they also cite related studies, 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 but 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.

Table 3: 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 et al (2015)

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 would 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 Table 3 as a factor that could lower UK growth by some 0.5% per annum, as a result of the dynamic effects on entrepreneurship of excessive regulation, especially in the labour market.

It is also said that we would no longer influence EU regulations, which is true. But we do not influence the regulations of any country to which we export and yet our exports are made to conform to them; this is part of our export costs and our influence in the EU has little if any impact on these costs. But by leaving we avoid the massive cost of these regulations to our own production in general, as also shown in Table 3. What will happen when we leave is that our exporters will have to continue to observe EU regulations on their products as they do now and as they do for all other countries to which they export; this is simply a normal cost of exporting anywhere. Also under the new suggested UK-EU treaty they could agree to continue to implement these regulations on all their production. As for everyone else (over 90% of GDP) EU regulations will cease to be relevant, lifting both a current burden and a future threat.

Table 3 also shows other costs of being in the EU identified by Minford et al (2015). These include euro entry (part of 'ever closer union'), bail-out costs, and the EU membership fee. It does not include the economic cost/benefit of immigration; however, because the economic effects of immigration on particular but large groups of UK citizens have been highly negative, control of the border is now an issue of great political importance.

Another 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% 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.

Conclusions

What we see here is that the EU protects agriculture and manufacturing through its commercial policies, namely its tariffs, its non-tariff barriers and the Common Agricultural Policy. By leaving the EU the UK would be able to abandon the EU's protectionist system in favour of free trade combined with transitional compensation for those hit by the changes. This would raise economic welfare by around 4% (i.e. UK households would be able to consume 4% more goods and services) and enhance the

shift of the UK economy away from manufacturing into service industries where UK growth has been concentrated largely in the decades since 1979.

This apparently surprising and shocking result- that leaving the EU customs union would be beneficial and would reorientate our economy towards the service activity at which the UK excels- should not really be such a surprise. There was nothing God-given about the UK joining the EU customs union; indeed many fine trade theorists, such as the late Harry Johnson, argued strenuously against it, on precisely the grounds of the damage that this paper has now quantified. He visualised the UK instead as part of the free world trading system and not cooped up in a regional protective union.

It turns out that if the UK decides to leave the EU, it will simply recapture this original role in world trade, much as is the case for some other small countries such as New Zealand and Singapore. It will sell its products at world prices to those who wish to buy them. It has no need of innumerable trade agreements, nor does it need to join EFTA, NAFTA or any other FTA. It simply needs to rejoin the world trading system, abolish its tariffs and trade restraints with all and sundry, and enjoy the resulting dividends of free trade.

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Appendix: Why trade agreements are irrelevant for small countries

Consider a market for a traded product in which many countries supply, and many demand the product. Inside each supplying country there may be many competitors or only a few or even just one but this fact is rendered unimportant by the existence of many countries' firms competing, so that no firm can influence the world price. Inside each demanding country we will assume there is competition in distribution so that distribution margins are competitively fixed; or again we could assume imperfect competition or monopoly where these margins are subject to a fixed mark-up. This fact again is not important.

In the demanding countries there are 'mfn' tariffs (i.e. tariffs that apply to all countries without a trade agreement giving exemption) and so the price in the shops is higher to consumers by the tariff, compared with the border price plus distribution margins. For the supplying countries the product firms get the price at the border (minus their transport and distribution margins). Let us call this border price the 'world price'.

Now suppose there is a trade agreement between supplying country, the UK, and demanding country Ruritania which abolishes its tariff on UK supply of this product. This will lower UK firms' price in Ruritania's market to the world price plus distribution margins. As a result other country suppliers cannot compete and withdraw from the Ruritanian market: the price there falls as the market is taken over by the UK at its lower price. But now the Ruritanian government loses its tariff revenue and has to replace it with other tax revenue on consumers; we assume that the two effects cancel out on total demand for the product there (even if this is not exactly true the overall demand for the product at the world level will be trivially affected as Ruritania, like the UK, is small in the world.)

But the border/world price will remain the same because at this price there was equality between world supply and demand.

Check this statement out. Assume the price remains the same. What adjustments will occur?

- a) at this (same) price UK suppliers' total supply will be the same. Hence as it supplies more to Ruritania it must withdraw product from other countries.
- b) In these countries other country suppliers will find an increase in demand for their product because the product from the UK has fallen in supply. They supply this extra demand with the product that they no longer supply to Ruritania. Consequently customers for the product have their demands satisfied by extra supply from other countries' producers.
- c) Hence supplies to all countries remain the same. So do supplies from all countries.
- d) Demands from all countries for the product also remain (approximately) the same.
- e) Hence there is no need for the world price to change.

What one can see from the explanation is that the trade agreement has not affected the UK in any way; it has merely redistributed the product it makes between demanding countries. Similarly for other supplying countries, they see a redistribution of their product.

As for customers, those in Ruritania see a lower price for the product due to abolition of the tariff but also have their after-tax incomes reduced; our simple assumption is that there is no close substitute for the product and so they buy the same amount of it but even if this is not exactly correct it will not make more than a trivial difference to world demand. Customers in other countries will see no change in price or income; they will simply buy a different country-mix of supplies.

Commentary

Of course this is pure theory. No doubt there will be numerous ways in which actual markets differ in detailed effects. However the point of the theory is to explain how 'zero effect' can occur. Even if there are some detailed differences in practice they are likely to be of second order. The force of the point lies in looking at 'general equilibrium' (i.e. all markets when all effects have worked out), rather than at one market on its own, 'partial equilibrium', where the effects may be strong but quite misleading for the overall effect. Unfortunately many policy commentators are ignorant of this general equilibrium analysis.

Some will argue that competition is not so intense as assumed in this theory. But there are two points about this. First, in the long run, which is relevant here for a long-term change in trade policy, competition does tend to be intense as pockets of inefficiency and imperfection are discovered over time by new or old competitors. Second, even under imperfect competition much the same sort of effect goes through in general equilibrium: a country's firms may benefit from the trade preference but they are limited in their capacity to supply and hence their higher supplies to the preferential market allow other suppliers to replace it in other markets. Overall, the main effects are of product displacement. Consumers in all markets are little affected since they have access to substitute product from other suppliers.

The essential 'take-away' point is that trade agreements are, from the national point of view, of limited relevance. At most they are of second order importance. Nevertheless particular firms

will not see matters like this; for a particular firm a market may be crucial to it as its main selling area and hence it will lobby intensely for a trade agreement in that market. But an implication of the take-away point is that we should not confuse corporate interests and lobbying with the national interest.

This point only fails if we are dealing with a national monopoly in the world market. In this case the firm and its country have the power to alter world prices. Two large countries with substantial monopoly power on each side will then be engaged in an effort to widen world trade in the interests of their domestic consumers and they will each try to gain overall in terms of the world prices they charge and pay for. But as noted at the start this is not the case for a small country without monopoly power such as the UK. The UK enjoys 'the importance of being unimportant'. It is from this that the essential irrelevance of trade agreements arises for its national interest.

