EU Membership and Trade

Summary:-

This note considers the impact of EU membership on trade and consequent welfare effects.

Trade is a key driver of growth, and the reduction of barriers to trade between Member States would be expected to result in increased trade and growth. Straightforward high-level observations show an initial boost from accession to the UK's trade with the EU as a share of GDP. However, the impact later on is less obvious, particularly following the Single Market reforms, where one would expect to observe an increase in intra-EU trade. Given data constraints and other influencing factors, it is hard to develop an accurate counterfactual to see what would have happened to trade had the UK not become a member of the EU. Using Norway and Switzerland as comparators is also problematic. Instead, econometric examination of the observable impact of EU membership shows a significant and positive impact on the UK's trade – membership initially boosted UK trade with the EU by 7%, outweighing trade diversion. The Single Market was seen to boost intra-EU trade by a further 9% (although this may be an under-estimate).

Further benefits are also likely from reduced trade barriers that would not be observed looking at trade flows. The threat of greater competition in a more contestable market impacts firm behaviour, and there is evidence of reduced price-cost margins following the Single Market reforms. There is also evidence of some price convergence between Member States.

However, barriers to trade still remain, in particular in services sectors, and the EU's protection of agriculture is also damaging. This implies that there are still greater trade benefits to be reaped from EU membership if the UK remains a force for reform in the Union.

Introduction

The free movement of goods and factors of production between Member States established by the treaty of Rome is a key achievement of the EU, and an important benefit of membership. In particular, the removal of tariff barriers to trade, followed by the formation of the Customs Union with a Common External Tariff (CET) applied to imports from third countries, and later, the creation of the Single Market, were all designed to stimulate trade between member states, contributing to the end goal of greater European prosperity.

This note considers how increased trade impacts on growth and welfare, and looks at how UK trade has evolved since joining the EU. To establish the EU effect, the note considers the counterfactual situation if the UK had not joined the EU, and possible alternative scenarios. However, to get a more accurate impression, an econometric assessment of the 'EU effect' on UK trade is

outlined, and benefits that will not be demonstrated by increased trade flows are considered. There is then a brief sectoral analysis, looking at agriculture, services and manufacturing.

Benefits of Trade

Growth in trade is considered to be beneficial for a country's welfare. Trade in line with countries' comparative advantage allows resources to be allocated more efficiently, leading to a step-change improvement in efficiency, productivity and growth. Much of the trade seen between developed countries, e.g. the EU Member States, however, is intra-industry trade, which is not necessarily determined by countries' factor endowments, but boosts welfare by enhancing competition, allowing for specialisation in production, and increasing diversity and choice for the consumer.

In addition, openness to trade can result in important second-order dynamic effects, boosting productivity and long-term growth through greater competition, openness to inward investment, and greater incentives for innovation.

Literature examining the precise importance of trade for growth is, however, limited, and empirical estimates are complicated by the potential for endogeneity – while trade will boost GDP, growth in income should itself result in more trade. However, the academic literature that exists[1], and internal HMT research[2], <u>suggests that a 1% increase in the trade share of GDP will lead to an increase in the rate of growth of 0.2%</u>.

High-level trends

UK trade with the (then) EEC[3] grew significantly after accession in 1973 – the chart below shows the step change in trade flows one would predict.

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[1] Inter alia, Frankel & Romer: Does Trade Cause Growth? The American Economic Review, June 1999
[2] See paper by Stephen Farrington, 1 April 2004
[3] Founding members: Germany, France, Italy and Benelux 3; 1973 joiners: UK, Ireland and Denmark.

UK Trade as % GDP
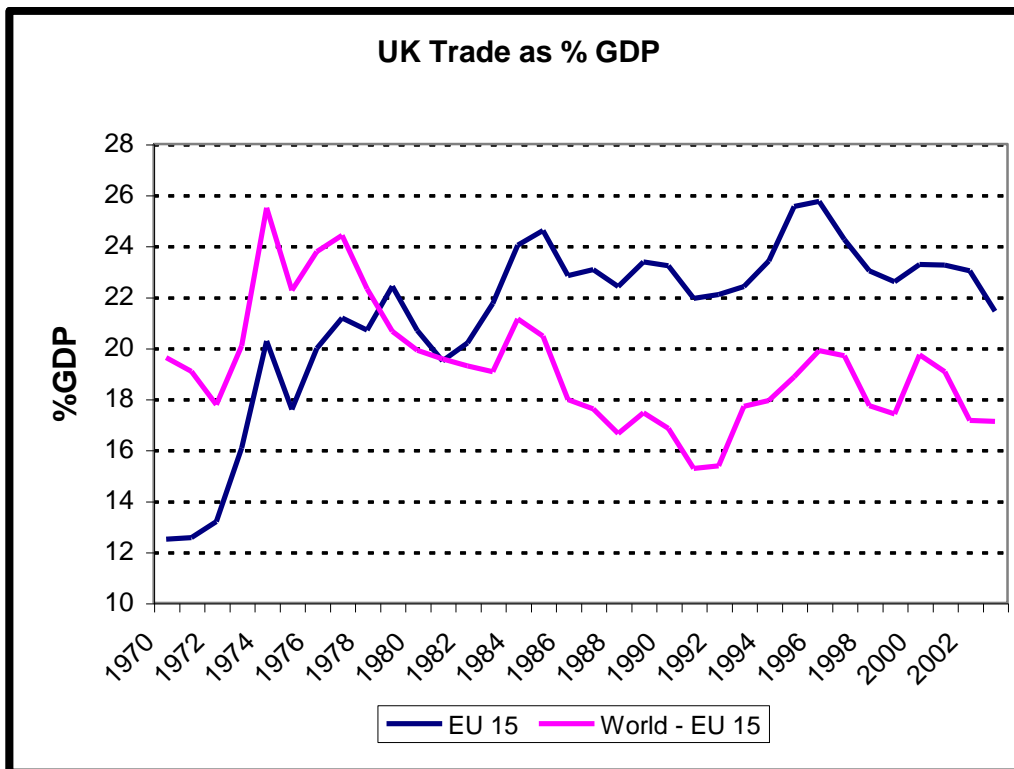
Source: ONS

However, after this initial boost from accession, straightforward comparisons of UK trade with the EU 15 and the rest of the world (ROW) from 1970 to date do not immediately highlight the significant boost in trade amongst the EEC members that one might have expected, particularly over the period of implementation of the Single Market. There are a number of possible explanations for this that we could consider, such as incomplete implementation of Single Market reforms, limited trade potential between the UK and the EU, or, more positively, that the benefits are not seen in direct trade flows, as the market rather becomes more *contestable*, which still produces welfare benefits as firms reduce their mark-ups when faced with the *threat* of competition from other Member States.

Establishing whether EU membership has boosted UK trade and welfare

Counterfactual Analysis

Whilst looking at high-level analysis of trade patterns over time can be useful for getting a broad idea of how trade flows have developed, a more accurate assessment of the specific impact EU membership has had on UK trade (and prosperity) would, in an ideal world, require some form of counterfactual analysis.

In these circumstances, we would want to define a counterfactual that demonstrates how UK trade flows would have evolved in the absence of EU membership, from 1973 to the present, and compare this analysis with the current situation.

When developing counterfactual scenarios, we would need to focus on the extent to which the 'different worlds' would have affected the UK economy's ability to develop its productive potential.

Such considerations include: -

- Competitive pressures that have arisen for reasons other than European integration: for example, as a result of strong domestic UK growth, and/or the emergence of competitive Asian markets driving businesses to raise their own productive potential in order to compete with lower cost producers in other parts of the world.

- The implications of an increasingly globalised world, reduction in Most Favoured Nation (MFN) tariffs increasing the ease of access to other countries' markets and the consequent effects of such market access on, for example, a firm's ability to exploit economies of scale.

- How the development of alternative institutional arrangements (e.g. bilateral trade agreements) would have affected patterns of trade and investment (and hence competition and productivity).

- The relationship between economic and political pressures (the UK was a key driver in the creation of the European Single Market? Would the same pressures have arisen regardless of leading individuals or Governments involved in the process?)

Counterfactual analysis: the constraints

Whilst the above scenarios would be interesting to explore, developing an accurate counterfactual is a complicated exercise for several reasons: -

- Hard evidence doesn't exist, as the alternative world is unobservable, especially over such a long time period.

- It can be difficult to separate out the 'EU effect' from other factors affecting UK trade since 1973.

- As the UK has been a significant driver for openness and reform within the EU, it is quite possible that if the UK had not been a member, the Single Market may have evolved differently – potentially less successfully.

<u>**Possible alternative scenarios**</u>

Given the constraints in developing an accurate counterfactual, it can be helpful to look at the situation of countries who chose alternative relationships with the EU to full membership, such as other members of the European Free Trade Area (EFTA) and the European Economic Area (EEA).

European Free Trade Area (EFTA) and the European Economic Area (EEA)

Had the UK not joined the EU, two possible scenarios would be to have remained a member of the EFTA and not subsequently to join the EEA (and therefore be of similar status with the EU as Switzerland) **or** for the UK to have joined the EEA but not the EU (therefore mirroring a similar relationship with the EU as Iceland, Norway or Liechtenstein)[4].

EFTA Membership:-

- UK exporters to the EU would face the Common External Tariff (CET) (weighted average 6.7%), plus administrative burdens (estimated as 2% of the transaction values[5], resulting in total additional costs of exporting to the EU of 8.7%[6]. Approximately 57% of all UK merchandise exports go to the EU, so this would translate into an ex-ante rise in the effective relative price of UK goods. This could not all be passed on to the consumer, so a deterioration in the terms of trade would result, reducing the potential for UK trade with the EU.

- However, it should be noted that in some cases this would be offset by cheaper imports of some goods and intermediate imports that are subsidised in the EU, e.g. agricultural produce, which would in fact benefit the UK food processing industry.

EEA Membership:-

- Were the UK in the EEA, and so had access to European markets, goods would still be susceptible to anti-dumping action by the EU. As this is targeted to specific goods, the effect is hard to model accurately, but could be targeted towards goods where the UK would have a competitive advantage – the EU has recently imposed anti-dumping duties of 16% on Norwegian salmon, a key Norwegian export. Globally, as tariff barriers to trade fall, antidumping actions are becoming more important.

- UK businesses would still have access to European markets, but UK goods would be subject to customs controls (and would have to conform to product specifications outside our control) – a burden on business in addition to current EU regulations estimated at 2% of transaction values;

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[4] The EEA essentially gives EFTA countries access to the Internal Market in return for their adopting relevant aspects of the European Acquis without the full responsibilities and entitlement of EU membership. So, whilst UK-EEA membership would allow the UK to have access to the Single Market, it would still face trade barriers in the form of anti-dumping duties and administrative burdens, which can still be significant, and in the case of anti-dumping may be targeted at competitive industries.

[5] Hine, 1994 and Keuschnigg & Kohler, 1996

[6] As an example, if the UK were to have a similar relationship with the EU as Switzerland, it would face a 15.4% tariff when exporting prepared meats to the EU, a 3.2% tariff on instant print cameras (high-tech manufacturing) and a 12.2% tariff on anoraks (low cost manufacturing).

- The UK would still have to transpose all internal market legislation (including broader social/consumer protection/environmental measures) into national law but we would no longer have a say in the negotiation of new legislation;

- We would continue to contribute to the funding of EU programmes and to economic and social cohesion within the EU, but would not be eligible to receive EU funds in return;

EFTA or EEA Membership:-

- The UK would not be included in EU external trade agreements, so would have to negotiate on its own in the WTO and in reaching bilateral trade agreements with other non-EU countries. The UK would no longer be able to push for a more outward-looking position by the EU in trade negotiations;

- The UK would not contribute to/be within the Common Agricultural Policy – but would still face many of the barriers erected by the CAP, competition with EU-subsidised produce, British agricultural exports to the EU would be subject to tariffs and EU health rules;

However, whilst comparison with Norway and Switzerland as examples of EEA and EFTA members are interesting and potentially useful, they have significant limitations, given the fundamental economic differences between the UK and each of these countries – e.g. Norway's economy benefits heavily from oil and Switzerland on pharmaceuticals and financial services, distorting any comparison.

Factual (econometric) analysis

Given the complications and uncertainties that exist with developing an accurate counterfactual, we have instead focussed on analysing the observable impact of EU membership on trade flows.

More specifically, we ran a diagnostic test (see annex) to simulate the trade effects of EU membership. By using a standard gravity model to estimate the trade flows between EU and non-EU members, controlling for the size of country, the population and the real exchange rate, we should be able to determine the isolated effect that EU membership, subsequent accessions, the creation of the single market, and trade effects from other trade agreements (e.g. NAFTA) have had on trade flows between EU Member States, and between the UK and the EU, thus disentangling the 'EU effect' from other influences such as the global growth of trade.

Results

The diagnostic test showed positive and significant effects of EU membership on trade flows, with any trade diversion caused by the Union outweighed by

trade creation. The test estimated that trade between Member States was boosted by 38% by membership of the Union, with only 5% of trade diverted from non-member countries. In addition to the 'EU effect' on trade, the model observes a positive 'Single Market effect' of 9%.

The 'Single Market effect' may be underestimated here, and there are a number of possible reasons for this. Firstly, there is a technical issue with the model – although implementation of the Single Market programme was over several years (and indeed is ongoing), the model assumes reforms come into force in one year – 1992. This may therefore miss some of the Single Market effect, as behaviour will have begun to change from the announcement of the Programme in 1986, and continue change as reforms continue to be implemented post-1992. There will also be Single Market effects that are not picked up in trade flow data, such as price convergence. Importantly however, the relatively small impact of the Single Market could be a result of an implementation deficit – for instance, there are still significant barriers to trade in services. This implies that there is further important trade growth that could be realised from further market integration.

The test was then rerun to determine the size of the impact for the UK. UK trade with EU members was seen to have increased by 7%, with only 4% of trade with non-EU countries suffering diversion.

The EU trade effect for the UK is significant, but smaller than the average effect for EU Member States. This may reflect the fact that the UK was more open to trade than some Member States before accession, and therefore the relative impact may have been less. Nevertheless, given the important contribution of trade to growth noted earlier, this 7% increase in trade will have had a positive impact on UK welfare.

	Intra-EU trade	UK-EU trade
EU Effect – creation	38%	7%
EU Effect – diversion	-5%	-4%
Single Market effect	9%	

It was also interesting to rerun the test to determine the relative impact on EU trade of each enlargement, which showed that, while all had significant and positive effects on trade between EU members, the 1986 enlargement – around the period of the announcement of the Single Market Programme – had the most significant effect. This may reflect either the relative importance of the trade barriers between Spain and Portugal and the rest of the EU prior to accession, or the effect of convergence – these two countries were significantly poorer than the EU average.

Enlargement	Trade creation (between new members and EU)
1973 (UK, Ireland, Denmark)	90%
1981 (Greece)	46%

1986 (Spain, Portugal)	107%
1995 (Austria, Finland, Sweden)	81%

Trade creations vs. Trade diversion

While EU membership has boosted trade between members, this can only be considered welfare-enhancing if trade growth is not at the expense of trade diverted from more efficient partner countries. The Common External Tariff that is a key element of the EU's Common Commercial Policy may have this effect.

Trade creation describes a situation whereby new imports from a more efficient partner country replace local production or trade with a less efficient partner country, and as such is deemed to be a positive thing (welfare enhancing) – trade takes place which previously did not exist. Trade diversion, however, occurs when changing relative trade costs between partners means that imports switch from a more efficient third country to a less efficient partner country (a hypothetical example, the UK diverts some of its trade with country x in favour of trade with the EU 15, even though production in country x is more efficient), and as such, is deemed to be a negative thing (welfare reducing). A potential concern regarding the development of 'new' EU trade is whether it is trade diversion from other, more efficient, parts of the world.

Econometric results presented in 'The Single Market Review' (a series of studies commissioned by the European Commission and undertaken by the Centre for Economic Policy Research, CEPR) concluded that the net impact of the SMP has been one of trade creation. There is apparently little evidence of any substantial trade diversion of non-EU trade.

The gravity model outlined above also observed trade creation significantly outweighing any diversion. While EU membership was estimated to have boosted trade between members by nearly 40%, only 5% of external trade was estimated to have been diverted.

A study by Allen et al[7] (1998) considered the effects of the Single Market on patterns of production and trade, and its effects on price-cost margins and industrial restructuring. They found that the single market has been trade creating overall, for both EU and non-EU countries, with EU countries gaining marginally more – while the share of demand for domestic production in EU Member States across fifteen sensitive sectors was an average 5.4% lower, intra-European trade had increased by 2.95%, and extra-European trade had increased by 2.45%.

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[7] Allen, C, Gasiorek, M & Smith, A: European Single Market: How the programme has fostered competition'. Economic Policy, 1998

Non-trade benefits of dismantling barriers

The benefits of falling trade barriers within the EU are not always translated into increased trade flows, they can occur in the form of more competitive behaviour, or price convergence. The perceived threat of new entrants into a market may be enough to incentivise firms to become more efficient, reducing economic rents. What is important is that the market is seen to be more <u>contestable</u>. This can boost welfare without necessarily observing an increase in trade flows.

Price convergence between member states firms' may therefore be another manifestation of falling tariff barriers, and as such is evidence of contestability. The chart below points to some – albeit limited - evidence of price convergence[8]. Price convergence can be seen early on, but the effect then weakens, and price divergence can be seen both in 1993-1995, and, to a lesser extent, from 2000 onwards – a period when manufacturing trade between the EU-15 stagnated, reducing competitive pressure on prices. Remaining legal, administrative and technical barriers that hamper integration of the single market probably explain the on-going price observable price differentials. Indeed, as the Commission has stated '*comparison with the US indicates that markets are not performing as well as they could in the EU because price divergence is much wider in Europe*'[9].

Price convergence between Member States
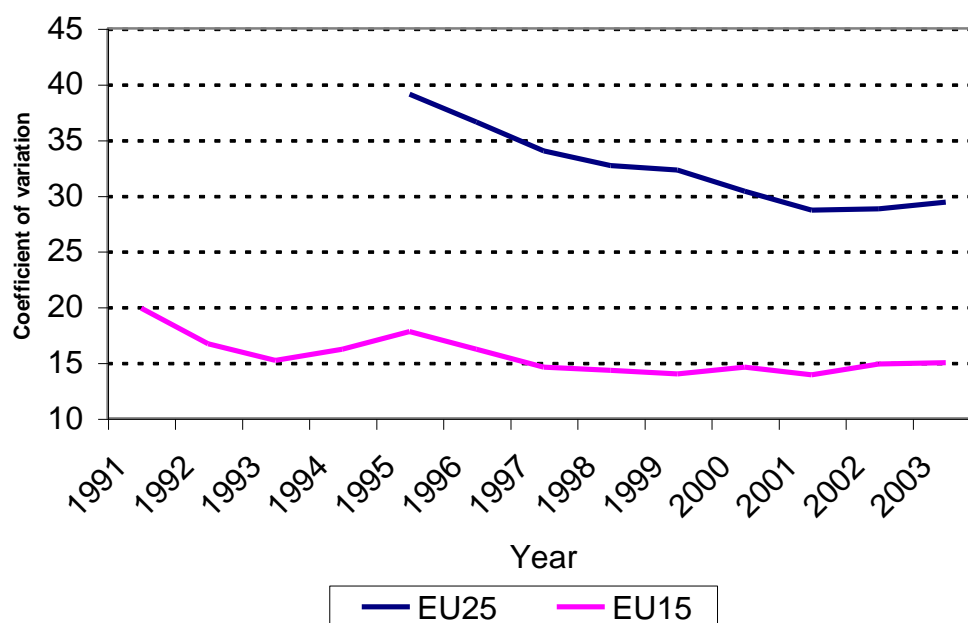
The chart also shows price convergence between the EU25 from 1995 onwards. While price dispersion is naturally still higher than between the

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[8] The chart plots the coefficient of the variation of comparative price levels of final consumption goods by private households, including individual taxes.
[9] Preliminary Analysis of Price Data; European Commission, DG Internal Market, July 2004

EU15, the steeper reduction in dispersion shows clearly the potential impact of membership of the Union[10]. It is reasonable to assume that, following accession, conversion will continue.

The Commission's Single Market Review in 1996 looked at price convergence across the Union and found a general trend of convergence up until 1993, which accelerated following the launch of the Single Market Programme. The study found that there was less price dispersion among goods that were more highly traded within the EU, and more open to competition from outside the EU – highlighting the importance of ensuring that the EU remains an outward-looking trade bloc. Looking at both products and services, a statistical test showed that among the 86 categories where price disparities changed over time across the EU, 78 showed statistically significant price convergence, while only 8 showed price divergence[11].

In their study of the competitive effects of the Single Market on competition, Allen et all (1998) looked at fifteen sensitive sectors, and found that price-cost margins fell an average 3.9% since 1991 – margins fell in all but one sector (motor vehicles).

Sectoral Analysis

The EU should therefore intensify efforts to complete the single market in order to further increase trade between EU member states, and remove remaining obstacles to trade. As the section below will detail, this is particularly true in agriculture and services, where significant barriers still remain, and where, arguably, there are even more significant potential gains to be unlocked (for example, services accounts for 70% of the European economy, compared with around 11% for manufacturing in 2004).

The barriers to trade within the EU and in relation to other countries vary between different sectors of the economy, and so the costs and benefits of membership vary accordingly.

1) Manufacturing

The Internal Market Programme has made most progress in liberalising trade in goods, so one would expect to see the greatest benefits in the manufacturing sector. However, progress in creating a *real* single market varies across manufacturing sectors and the price convergence data discussed above hides disparities across industries. Prices have converged most where the Single Market has most successfully facilitated intra-EU trade, e.g. in clothing, footwear and alcohol.

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[10] Europe Agreements, or Association Agreements, between the EU15 and the A10 were agreed during the 1990's, which aimed progressively to establish a free-trade area between the EU and the Accession countries over a given time period.
[11] Allen et al 1998

2) Agriculture

Although barriers to trade between Member States have been removed, agriculture is probably the most protected sector in the European Union in terms of external barriers, through the Common Agricultural Policy (CAP). The costs of protectionism in this sector are possibly the most damaging to economic welfare and provide a good illustration of why the UK should remain a force for more outward-looking reforms in the EU.

At the broadest level, it is estimated that the CAP costs EU citizens roughly €100 billion a year: €50 billion to consumers through higher food prices and €50 billion to the taxpayer. The UK, as a net food importer, suffers particularly from higher food prices, impacting both on the consumer and on the food processing industry, which accounts for around 7% of GDP [*Philippidis?*]. Minford et al (2005) estimated that the CAP costs the UK 0.5% of GDP, and in economic and budgetary terms is probably the most costly factor of EU membership.

These costs arise in a number of different ways, and have different effects. The most significant economic distortion occurs through market price support, in the form of border protection (tariffs and import quotas), keeping cheap imports out and permitting artificially high prices[12]. The results are manifold: welfare losses to consumers who pay a high cost through higher prices, resources diverted to agriculture from more productive sectors of the economy, and losses to third country producers through lack of access to markets and depressed (and volatile) prices.

The second element of protection arises through budgetary transfers (of the order of €30 billion) in the form of direct payments to farmers. Having said this, in June 2003 and April 2004, the EU agreed reforms to break the link between production and receipt of payments for many important products, albeit with some scope for a continuation of the status quo. Surplus produce is subsidised (the third element) and 'dumped' on third markets.

3) Services

Whilst the internal market did much to liberalise trade in goods between the EU member states, much less liberalisation has taken place with respect to the services sector, even though, according to a report by Copenhagen Economics[13] commissioned by DG Internal Market, the EU service sector accounts for almost 70% of EU GNP and employment. The potential contribution of trade in this sector to overall economic prosperity is therefore restrained by the existence of many barriers, defined by Copenhagen Economics as both 'rent creating' (intended to protect incumbent providers,

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[12] Given the EU has a common external tariff with third countries; the price of world competitive produce is increased upon its entrance into the EU, and the revenue is channelled to the EU budget (although member states are allowed to claim up to 25% of the revenue back to cover for administering the tariff.

[13] Copenhagen Economics (2005), 'Economic Assessment of the Barriers to the Internal Market for Services

reducing competition and allowing prices to be inflated over costs) and 'cost creating' (bureaucracy associated with the various barriers).

The report estimates that, on average, the directive will reduce current barriers to service provision by more than 50 percent, with the largest impact for regulated professions (e.g. accountancy) and smallest for business and IT related services. The directive will spur many different types of welfare gain: prices of services are expected to drop, as stronger competition will work to reduce artificially high prices, leading to a more efficient allocation of resources economy-wide. Higher productivity and employment (of 0.3 percent, roughly 600,000 new jobs) will result in an additional 0.6 percent of EU output (or 37 billion Euros equivalent) on conservative estimates.

However, and as the authors of the report note, regulatory reforms such as the services directive which aim to create a legal level playing field cannot remove all types of barrier, for example, language barriers and cultural barriers (e.g. local business practices) that will only affect foreign firms setting up in the new environment.

Enlargement of the EU

As the EU continues to expand the trade dynamics and benefits of membership will also change[14]. Enlargement brings increased trade opportunities with the new Member States, and while these countries are considerably less wealthy than the EU-15, they are growing much faster and so the trade relationship will grow in importance over time. The 2004 enlargement expanded they population of the EU by 20% to 455 million people – the largest multi-country single market in the world.

DTI research has shown that the effects of trade liberalisation between the EU-15 and the Accession countries over the 1990's has already benefited the UK – since 1993, UK trade with the ten new member states has increased by 208% compared with 73% for world trade. As economic reform in the new Member States and the EU-15 continues, the benefits from trade should increase. Reforms should also increase the productivity of EU Member States, through enabling reorganisation of production to efficient locations in the new Member States and increasing competitive pressures. This should result in a rise in trend growth. While quantifying these benefits precisely is complicated, the CEPR[15] suggests that the 2004 enlargement could add 0.2% to the GDP of the EU-15, of which the UK's share is estimated to be worth £1.75 billion per year in 1999 prices. Any further enlargement of the Union should also bring proportionate benefits.

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[14] See 'Trade and Investment Implications of EU Enlargement', DTI, April 2004
[15] 'Baldwin, R; Francois, J; Portes, R: 'The costs and benefits of eastern enlargement: the impact on the EU and central Europe'. CEPR, 1997

Conclusions

Membership of the EU has had a significant and positive effect on trade flows between Member States and between the UK and the EU, and welfare benefits from this growth in trade do not appear to have been offset by significant trade diversion. Trade makes an important contribution to efficiency, growth and welfare in the economy. There is potential for further trade benefits to be realised from continued integration and reform.

Although there are no tariff barriers to trade between the EU-15, and the Single Market has worked to facilitate trade still further, there is evidence of continuing barriers to cross-border trade within the EU. The limited price convergence reinforces the suggestion that non-tariff barriers are still significant.

This indicates that the EU should intensify efforts to complete the Single Market in order to further increase trade and the benefits of trade between EU Member States. This is particularly true in services, where significant carriers still remain, and where, arguable, there are even more significant potential gains.

However, while the impact on trade from EU membership has been and will continue to be an important advantage of membership, the literature, e.g. Barrell and Choy (2003), suggests that the most important gains from EU membership for the UK come less from direct trade flows in line with specialisation and comparative advantage, but more from indirect 'productivity' benefits, such as from increased competition and economies of scale. These benefits are considered elsewhere.

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ANNEX

Diagnostic of Effects of EU membership on UK Trade

Standard trade gravity model with fixed effects panel estimation.

Aggregate trade version:

$$T_{ijt} = \alpha_{ij} + \beta_1(GDP_{it} * GDP_{jt}) + \beta_3(POP_{it} * POP_{jt}) + \beta_4 RER_{ijt} + \beta_5 SM_{ijt}$$
$$+ \beta_6 EU2_{ijt} + \beta_7 EU1_{ijt} + \beta_8 EUT_{ijt} + \beta_9 FTA_{ijt} + \gamma_t + \varepsilon_t$$

where (all in logs):
for I;j = OECD members
α_{ij} = fixed effects
GDP = real GDP
POP = population
RER = real exchange rate
SM = dummy for the creation of the single market set equal to 1 from 1992 (what about 95 accessions?); 0 otherwise
EU2 = dummy for EU membership set equal to 1 when *both* members of a bilateral pair are members of the EU; 0 otherwise
EU1 = dummy for EU membership set equal to 1 when *one* member of a bilateral pair is a member of the EU; 0 otherwise
EUT = EU 'trend' variable – defined as the negative of the "transposition deficit" computed by the Internal Market Scorecard (% of internal market directives not in national law after deadline for implementation has passed).
FTA = free trade agreement dummy for NAFTA etc.
γ_t = year dummies
ε_t = stochastic error term

Data: annual data 1960-2004. Trade and GDP data in constant 2000(?) US$.

The UK's bilateral trade with each of the other countries in the sample is therefore a function of their relative size (i.e. GDP and population), the real exchange rate and the dummies for changes in (policy) trade barriers.

Results

The results for the first model are given below. All of the coefficients are estimated sensibly and significantly. That said, the coefficient on income is a little high (would like to see it closer to 1) and the real exchange rate term is difficult to interpret (with a slightly unusual definition). The time trends account for the general increase in trade levels through the period.

The numbers in red show the effect of each of the dummies variables. These suggest that the EU may have boosted trade between members by around 40% with only a marginal trade diversion effect. The introduction of the single market is included separately but is (perhaps surprisingly) not particularly large. NAFTA is

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estimated to have boosted trade between its members by over 75%, though this is consistent with the tripling of trade observed between Mexico and the US since its creation.

Dependent Variable: LOG(T)
Method: Panel Least Squares
Date: 07/25/05   Time: 17:45
Sample: 1960 2004
Cross-sections included: 210
Total panel (unbalanced) observations: 8232

Variable	Coefficient	Std. Error	t-Statistic	Prob.	
C	-34.3822	1.089822	-31.5484	0	
LOG(Y)	0.766032	0.021733	35.24789	0	
LOG(RER)	-0.00564	0.003128	-1.80277	0.0715	
EU2	**0.320113**	0.023851	13.42118	0	**0.38**
EU1	**-0.05379**	0.013755	-3.91091	0.0001	**-0.05**
SM	0.066746	0.020774	3.212947	0.0013	**0.07**
NAFTA	0.563295	0.076846	7.330204	0	**0.76**
E61	0.079772	0.041435	1.925209	0.0542	
E62	0.088566	0.041516	2.133276	0.0329	
E63	0.115018	0.040465	2.842369	0.0045	
E64	0.174753	0.040987	4.263613	0	
E65	0.199248	0.040836	4.879238	0	
E66	0.241542	0.041194	5.863575	0	
E67	0.229852	0.041895	5.486406	0	
E68	0.228412	0.042851	5.33037	0	
E69	0.314443	0.044039	7.140129	0	
E70	0.417412	0.045158	9.243285	0	
E71	0.448369	0.046042	9.738192	0	
E72	0.56665	0.047272	11.98699	0	
E73	0.802941	0.04898	16.39312	0	
E74	1.036558	0.049551	20.9192	0	
E75	1.039332	0.049763	20.88576	0	
E76	1.077814	0.050905	21.17325	0	
E77	1.145924	0.051839	22.10565	0	
E78	1.247301	0.052764	23.63909	0	
E79	1.448075	0.053886	26.87314	0	
E80	1.57362	0.0546	28.821	0	
E81	1.486258	0.055306	26.87356	0	
E82	1.452159	0.055747	26.04915	0	
E83	1.402075	0.056523	24.80554	0	
E84	1.428574	0.057747	24.73832	0	
E85	1.43926	0.058478	24.61186	0	
E86	1.554993	0.05938	26.18732	0	
E87	1.713151	0.06001	28.54782	0	
E88	1.793831	0.061341	29.24362	0	
E89	1.842417	0.062639	29.41325	0	
E90	1.973589	0.063417	31.12098	0	

E91	1.928723	0.063968	30.15135	0
E92	1.959307	0.064407	30.42081	0
E93	1.845448	0.064792	28.48286	0
E94	1.923768	0.065849	29.21502	0
E95	1.983051	0.067364	29.43798	0
E96	1.977455	0.06835	28.93136	0
E97	1.955046	0.069676	28.05908	0
E98	1.945256	0.070849	27.45635	0
E99	1.933462	0.072079	26.82433	0
E00	1.904265	0.073593	25.87569	0
E01	1.857561	0.074339	24.98755	0
E02	1.863174	0.074919	24.86906	0
E03	2.001992	0.075841	26.39729	0
E04	2.112773	0.076686	27.55108	0

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.97823	Mean dependent var	6.739709
Adjusted R-squared	0.977523	S.D. dependent var	2.129826
S.E. of regression	0.319313	Akaike info criterion	0.585786
Sum squared resid	812.8322	Schwarz criterion	0.807373
Log likelihood	-2151.09	F-statistic	1383.084
Durbin-Watson stat	0.207343	Prob(F-statistic)	0

Model Improvements

The model was further improved by running three new equations:

1) Using a better definition of the trade variable to determine the <u>real</u> effect – trade deflated using *national* currency GDP deflators and then converted in to 2000 US$.
2) The EU2 dummy was split into four dummies to separate out the effects of each individual enlargement.
3) The EU2 dummy was split to identify a 'UK effect' (how EU Membership affected the UK's trade with the EU) and 'other' effect.

Results

1) Trade variables using national GDP deflators

Dependent Variable: LOG(T2)
Method: Panel Least Squares
Date: 08/08/05   Time: 17:09
Sample: 1960 2004
Cross-sections included: 210
Total panel (unbalanced) observations: 8109

Variable	Coefficient	Std. Error	t-Statistic	Prob.	
C	-41.0386	1.13329	-36.2119	0	
LOG(Y)	0.936322	0.022589	41.45101	0	
LOG(RER)	-0.02189	0.003135	-6.98072	0	
EU2	0.319474	0.023268	13.73019	0	**38%**
EU1	-0.04791	0.013427	-3.56831	0.0004	**-5%**
SM	0.082662	0.019856	4.163086	0	**9%**
NAFTA	0.609287	0.073045	8.341266	0	**84%**
E61	0.011837	0.041734	0.283639	0.7767	
E62	-0.03982	0.04182	-0.95218	0.341	
E63	-0.08324	0.040726	-2.04397	0.041	
E64	-0.08123	0.041293	-1.96726	0.0492	
E65	-0.11582	0.041123	-2.81631	0.0049	
E66	-0.15199	0.041381	-3.67303	0.0002	
E67	-0.21246	0.042184	-5.03666	0	
E68	-0.24813	0.043264	-5.73522	0	
E69	-0.23253	0.044594	-5.21432	0	
E70	-0.20227	0.045841	-4.41241	0	
E71	-0.25742	0.046819	-5.49827	0	
E72	-0.28547	0.048175	-5.92573	0	
E73	-0.30661	0.049883	-6.14648	0	
E74	-0.21713	0.050482	-4.30112	0	
E75	-0.3229	0.050699	-6.36893	0	
E76	-0.33003	0.051922	-6.35614	0	
E77	-0.32876	0.052915	-6.21297	0	
E78	-0.38321	0.053915	-7.10762	0	
E79	-0.29542	0.055121	-5.35942	0	
E80	-0.28048	0.055877	-5.01961	0	
E81	-0.38648	0.056533	-6.83645	0	
E82	-0.40837	0.056961	-7.16921	0	
E83	-0.42635	0.057752	-7.38241	0	
E84	-0.3963	0.059021	-6.71457	0	
E85	-0.34009	0.059864	-5.68108	0	
E86	-0.38138	0.060736	-6.27932	0	
E87	-0.36816	0.06143	-5.99314	0	
E88	-0.44128	0.06283	-7.02339	0	
E89	-0.4406	0.064186	-6.86449	0	
E90	-0.41207	0.065017	-6.33782	0	
E91	-0.49174	0.065586	-7.49765	0	
E92	-0.47182	0.066067	-7.14147	0	
E93	-0.52493	0.066448	-7.89979	0	
E94	-0.51927	0.067564	-7.6856	0	
E95	-0.53201	0.069015	-7.70865	0	
E96	-0.58078	0.070048	-8.29115	0	
E97	-0.56583	0.071428	-7.92165	0	
E98	-0.4973	0.072659	-6.84434	0	
E99	-0.53694	0.073949	-7.26094	0	
E00	-0.51392	0.07552	-6.80499	0	
E01	-0.51676	0.076296	-6.77317	0	

	Coefficient	Std. Error	t-Statistic	Prob.
E02	-0.58722	0.076913	-7.63487	0
E03	-0.62259	0.077827	-7.99964	0
E04	-0.64922	0.078728	-8.24628	0

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.974729	Mean dependent var	7.25739
Adjusted R-squared	0.973895	S.D. dependent var	1.878164
S.E. of regression	0.303457	Akaike info criterion	0.484383
Sum squared resid	722.7835	Schwarz criterion	0.708849
Log likelihood	-1703.93	F-statistic	1168.882
Durbin-Watson stat	0.220092	Prob(F-statistic)	0

2) Separate enlargement EU effects.

Dependent Variable: LOG(T2)
Method: Panel Least Squares
Date: 08/08/05   Time: 17:20
Sample: 1960 2004
Cross-sections included: 210
Total panel (unbalanced) observations: 8109

Variable	Coefficient	Std. Error	t-Statistic	Prob.	
C	-39.747	1.11477	-35.6549	0	
LOG(Y)	0.90874	0.022228	40.88328	0	
LOG(RER)	-0.008	0.00304	-2.63028	0.0085	
EU273	0.643851	0.029369	21.92261	0	**90%**
EU281	0.378411	0.036203	10.45238	0	**46%**
EU286	0.725171	0.024091	30.10178	0	**107%**
EU295	0.158618	0.0209	7.589509	0	**17%**
NAFTA	0.590965	0.070825	8.343969	0	**81%**
E61	0.013444	0.040616	0.331007	0.7406	
E62	-0.03484	0.040704	-0.85599	0.392	
E63	-0.07461	0.039644	-1.88209	0.0599	
E64	-0.06795	0.04021	-1.68995	0.0911	
E65	-0.09661	0.04007	-2.41102	0.0159	
E66	-0.12067	0.040327	-2.99221	0.0028	
E67	-0.1775	0.041125	-4.31625	0	
E68	-0.20814	0.042199	-4.93243	0	
E69	-0.18788	0.04352	-4.31696	0	
E70	-0.15331	0.04476	-3.42502	0.0006	
E71	-0.20517	0.045731	-4.48653	0	
E72	-0.22985	0.047076	-4.88239	0	
E73	-0.28287	0.04889	-5.7858	0	
E74	-0.18871	0.049509	-3.81158	0.0001	
E75	-0.29139	0.049742	-5.85813	0	
E76	-0.2912	0.050989	-5.71092	0	

E77	-0.28507	0.051994	-5.48274	0
E78	-0.33696	0.052992	-6.3587	0
E79	-0.24546	0.054199	-4.52889	0
E80	-0.22667	0.054964	-4.12396	0
E81	-0.32803	0.055611	-5.89854	0
E82	-0.34331	0.056069	-6.12301	0
E83	-0.35435	0.056884	-6.22946	0
E84	-0.31728	0.058168	-5.4546	0
E85	-0.26253	0.058978	-4.45137	0
E86	-0.34123	0.059554	-5.72967	0
E87	-0.3212	0.060267	-5.32958	0
E88	-0.38986	0.061667	-6.32201	0
E89	-0.38381	0.063029	-6.08941	0
E90	-0.35479	0.063847	-5.55684	0
E91	-0.43142	0.064423	-6.69668	0
E92	-0.39217	0.064803	-6.05171	0
E93	-0.44098	0.065204	-6.76304	0
E94	-0.43299	0.066305	-6.53032	0
E95	-0.4056	0.067706	-5.99058	0
E96	-0.45117	0.068744	-6.56296	0
E97	-0.43088	0.070142	-6.14292	0
E98	-0.35911	0.071372	-5.03147	0
E99	-0.39559	0.07266	-5.44439	0
E00	-0.36645	0.074249	-4.93542	0
E01	-0.36641	0.075031	-4.88341	0
E02	-0.4367	0.075634	-5.77386	0
E03	-0.4694	0.076494	-6.13637	0
E04	-0.49613	0.077372	-6.41222	0

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.976069	Mean dependent var	7.25739
Adjusted R-squared	0.975277	S.D. dependent var	1.878164
S.E. of regression	0.295316	Akaike info criterion	0.430118
Sum squared resid	684.4376	Schwarz criterion	0.655446
Log likelihood	-1482.91	F-statistic	1231.156
Durbin-Watson stat	0.236188	Prob(F-statistic)	0

3) The UK Effect

Dependent Variable: LOG(T2)
Method: Panel Least Squares
Date: 08/08/05   Time: 17:10
Sample: 1960 2004
Cross-sections included: 210
Total panel (unbalanced) observations: 8109

Variable	Coefficient	Std. Error	t-Statistic	Prob.

C	-39.8203	1.133317	-35.1361	0	
LOG(Y)	0.911811	0.022592	40.36036	0	
LOG(RER)	-0.02107	0.003117	-6.7604	0	
UKEU2	0.067083	0.034607	1.938447	0.0526	**7%**
NONUKEU2	0.385614	0.024092	16.00589	0	**47%**
EU1	-0.04472	0.013351	-3.34958	0.0008	**-4%**
SM	0.069887	0.01978	3.533231	0.0004	**7%**
NAFTA	0.610537	0.072606	8.408859	0	**84%**
E61	0.014911	0.041485	0.359431	0.7193	
E62	-0.03439	0.041572	-0.82733	0.4081	
E63	-0.07471	0.040491	-1.84523	0.065	
E64	-0.06964	0.041062	-1.69595	0.0899	
E65	-0.10016	0.040907	-2.4484	0.0144	
E66	-0.1315	0.041185	-3.19296	0.0014	
E67	-0.18978	0.041994	-4.51911	0	
E68	-0.22275	0.043082	-5.17035	0	
E69	-0.20417	0.04442	-4.59623	0	
E70	-0.17133	0.045675	-3.75094	0.0002	
E71	-0.22456	0.046658	-4.81289	0	
E72	-0.2501	0.048021	-5.20811	0	
E73	-0.26356	0.049778	-5.29466	0	
E74	-0.17295	0.050381	-3.43293	0.0006	
E75	-0.27829	0.0506	-5.49979	0	
E76	-0.28329	0.05183	-5.46576	0	
E77	-0.28038	0.052828	-5.30735	0	
E78	-0.33324	0.053833	-6.19016	0	
E79	-0.24356	0.055045	-4.4247	0	
E80	-0.22744	0.055805	-4.07567	0	
E81	-0.33342	0.056453	-5.90616	0	
E82	-0.35467	0.056883	-6.23501	0	
E83	-0.37151	0.057677	-6.44127	0	
E84	-0.33965	0.058951	-5.76155	0	
E85	-0.28178	0.059801	-4.71206	0	
E86	-0.32467	0.060647	-5.35345	0	
E87	-0.30994	0.061349	-5.05206	0	
E88	-0.38111	0.062754	-6.07317	0	
E89	-0.37858	0.064113	-5.90482	0	
E90	-0.3489	0.064947	-5.3721	0	
E91	-0.42781	0.065518	-6.5297	0	
E92	-0.40457	0.066027	-6.12734	0	
E93	-0.45719	0.066409	-6.88441	0	
E94	-0.45006	0.067529	-6.66477	0	
E95	-0.46488	0.068941	-6.74315	0	
E96	-0.51227	0.069977	-7.3206	0	
E97	-0.49551	0.071361	-6.94367	0	
E98	-0.42536	0.072594	-5.85948	0	
E99	-0.46332	0.073887	-6.27064	0	
E00	-0.43827	0.075462	-5.80785	0	
E01	-0.44013	0.076239	-5.77302	0	

E02	-0.50979	0.076858	-6.63288	0
E03	-0.54456	0.077768	-7.00234	0
E04	-0.57003	0.078671	-7.2457	0

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.975034	Mean dependent var	7.25739
Adjusted R-squared	0.974207	S.D. dependent var	1.878164
S.E. of regression	0.301635	Akaike info criterion	0.472456
Sum squared resid	714.0379	Schwarz criterion	0.697785
Log likelihood	-1654.57	F-statistic	1178.868
Durbin-Watson stat	0.223636	Prob(F-statistic)	0