The first studies suggested that the impact of NAFTA liberalisation in terms of tariffs and non-tariff reductions would be in line with US–Canada FTA studies – a welfare gain in each member country and little welfare loss in the rest of the world (Brown et al., 1992). Furthermore, they found that the US–Canada FTA affected the size and productivity of Canadian firms over time (Trefler, 2004). The Burfisher et al. (2001) survey of whether NAFTA would be net trade creating or diverting, found that the NAFTA experience shows that the largest benefits were expected to accrue to Mexico, but important barriers such as jurisdictions/regulations (particularly in banking and other financial services), security concerns, strict rules-of-origin requirement and most favoured nation (MFN) tariffs still impede trade and investment flows following the global economic integration at all levels, as in the EU and APEC. This therefore took the analysis into areas where it could not measure the outcomes satisfactorily.

Most recent CGE studies have moved on from NAFTA to consider a deeper form of integration (for example, a CU) or a broader FTA (or Free Trade Area of the Americas; FTAA) expanding to Central and South America. For example, Georges (2008) found that the adoption of a common external tariff towards the rest of the world would result in an ambiguous net welfare effect globally – lowering the unit costs of production within NAFTA and worsening the terms of trade against the rest of the world. Eliminating the NAFTA rule of origin through a CU could increase real GDP in Canada by 0.9 per cent, of which 0.2 per cent points are due to a CU and 0.7 per cent points are due to eliminating the NAFTA rule of origin. Although these numbers are small, it concludes that the rule of origin liberalisation matters significantly with a deep economic integration within the NAFTA.

For the US Central America Free Trade Agreement, USITC (2004) and Hilaire and Yang (2004) find a small positive economic welfare effect for the US and a significant economic welfare benefit with the full implementation of free trade. Hilaire and Yang indicate a 1.5 per cent GDP increase for Central American countries, but only a 0.01 per cent increase in the US. The significant welfare gain in Central America comes from a sizeable percentage increase in labour-intensive exports (textiles and clothing, food manufacturing and services) to the US market, offsetting trade diversion from the rest of the world. An FTAA is thought to be expansionary for output and employment globally and for agriculture in particular in most Latin American countries (Morley and Pineiro, 2004). However, the welfare benefits of the FTAA are smaller than general free trade, mostly driven by the producer subsidies in FTAA members. Full liberalisation can generate a significant price rise in the agricultural sector due to the elimination of production subsidies in advanced countries (that is, the EU).

CGE analysis has continued to add more realism to the modelling. Brown et al. (2005) introduce imperfect competition into manufacturing and service industries to study the effects of tariff removal in the FTAA, and find that the welfare of FTAA member countries is better, especially in the US – $67.6 billion economic welfare benefit to the US and $118.8 billion to the FTAA countries. But the FTAA may be trade diverting for most of the rest of world, depending on the structure of trade liberalisation – bilateral, unilateral or multilateral free trade. Multilateral free trade can result in a welfare benefit 58 per cent higher than unilateral free trade and 532 per cent more than bilateral FTAA trade liberalisation. With global free trade, the economic benefit to the US is up to eight times higher than FTAA bilateral liberalisation.

Since the early 1990s, NAFTA has represented a significant policy experiment for CGE modelling. However, results show that the models have underestimated the economic importance of the NAFTA on trade in North America over the last 15 years. Better theoretical frameworks featuring imperfect competition, product differentiation and technology improvement are required in order to capture the economic benefits inside/outside the NAFTA more accurately.

Most CGE studies show that southern enlargement of NAFTA would be beneficial in improving the terms of trade of all subscribers, resulting in trade diversion towards the US marketplace. As with EU eastern enlargement, FDI flows from NAFTA to Central and South America in order to benefit from the low production cost (mostly labour) in the emerging markets. One of many challenges in modelling NAFTA and its enlargement relates to the integration of financial markets. The unstable financial situation in parts of South America impedes integration but it is extremely difficult to quantify in the CGE framework. Another key challenge is labour migration, mostly from emerging market economies to the US and Canada, and its related social consequences. More recently, CGE modelling of NAFTA and its enlargement has started to focus on the environmental issues (Adkins and Garbaccio, 2003). These extensions provide a fuller picture and explore consequences from extensive changes in the structure and location of industry that would otherwise be neglected in a simple study of trade flows.

Taken together, these CGE studies show that the strategic objective of regional integration in the Americas (NAFTA and FTAA) is not just a process of maximising potential economic benefits in the sense that trade creation exceeds trade diversion, but that it also entails the mitigation of adjustment costs in labour and capital markets involved in the economic transformation from transition to market-oriented economies and in industry structure with changes in the balance of labour-intensive and capital-intensive focus following the deep trade liberalisation.

APEC Liberalisation

CGE studies of APEC liberalisation have focused both on the overall economic benefits (for example, welfare effects, employment, economic growth and so on) of liberalisation and on key policy issues emerging from the APEC agenda (for example, adoption of 'open regionalism', Early Voluntary Sector Liberalisation: EVSL[19]). As Scollay and Gilbert (2000) write in their survey paper, what divergence there is in the results of APEC liberalisation can generally be related to the model structures and alternative scenarios. Comparative static studies predominate (Lee and Roland-Holst, 1995; Young and Huff, 1997; Wahl, 1998; Davis et al., 2000; Scollay and Gilbert, 2000). But the number of dynamic or recursively dynamic model estimates is increasing (see McKibbin, 1996; Anderson et al., 1997; Lee et al., 1997; Coyle and Wang, 1998; Mai et al., 1998; Scollay and Gilbert, 2000). Some models account for increased capital mobility (see Dee et al., 1996; Adams et al., 1997; Adams, 1998; Walmsley, 1999), while others have imperfect competition in some sectors (Brown et al., 1996; Dee et al., 1996; Ballard and Cheong, 1997). In general, dynamic and imperfectly competitive CGE models predict larger gains than static and perfectly competitive CGE models.

There is a surprising amount of variation in the ranking of the obvious three alternative scenarios for APEC liberalisation: (i) APEC FTA/PTA; (ii) MFN liberalisation

without reciprocation from non-members; and (iii) MFN liberalisation with reciprocation from non-members. Lee and Roland-Holst (1995), McKibbin (1996), Lee et al. (1997), Petri (1997) and Scollay and Gilbert (2000) find that unconditional MFN liberalisation provides larger gains to APEC members. Young and Huff (1997), Coyle and Wang (1998), Yang et al. (1998) and Scollay and Gilbert (2000) find that a preferential agreement would yield slightly higher welfare for the APEC bloc. Other studies find that a conditional MFN may be superior to an FTA.

However, most CGE studies on APEC liberalisation do not consider endogenous capital stocks (except Walmsley, 1999). Walmsley incorporates a long-run closure in which changes in the ownership of capital stocks are determined endogenously and income earned on endowment commodities accrues to the owners of those endowments into GTAP structure and database. One shortcoming of the basic static CGE model is that it fails to account for the positive (inter-temporal) relationship between trade, investment and growth, a linkage which is fairly well established empirically. Foreign ownership of capital can significantly influence the long-run estimation of APEC trade liberalisation. Davis et al. (2000) find that there are economic benefits for all countries in terms of productivity, investment, income and welfare from forming an AFTA–CER Free Trade Agreement. In all, imperfect capital mobility between regions is a common feature of most CGE (especially the GTAP-based) studies of APEC liberalisation.

Europe, the EU and EU Enlargement

CGE models have been developed to analyse the effects of the EU and its eastern enlargement. The general finding is that the impact on current EU members is small or negligible, while there are significant impacts on acceding countries, although the estimates of the benefits they might get are decidedly mixed. One reason for the limited benefits is that quite considerable trade between the EU and the acceding countries has already been conducted freely before the actual accession, with the exception of some sensitive primary agricultural and processed agricultural products.

Lejour et al. (2001) employ a CGE model called WorldScan to study the accession process, using the V.5 GTAP database. In this study, issues such as the accession to the internal market, equalisation of external tariffs and free labour movement are addressed. Lejour et al. find significant changes in agriculture and some light manufacturing sectors such as food processing, due to initial high tariff protection and consequent high internal demand.

Vanags (2002) uses a single-country CGE model to evaluate the economic impact of the Latvian accession, finding that a deeper integration associated with full accession can bring some trade diversion with the Common Economic Space (CES) countries, but this is relatively small in comparison with trade creation from EU membership.

Bchir et al. (2003) use MIRAGE[20] to evaluate the economic impacts of the 2004 accession round assessment. Imperfect competition is introduced to differentiate the products by variety and quality. Bchir et al. find that the impact on existing EU members is small but quite significant but the influence on acceding countries is mixed.

Most studies focus on trade liberalisation in terms of the tariff and non-tariff (that is, anti-dumping) protection. A deeper economic integration with the Single Market is also considered in some selected studies (ibid.).

In most studies, the acceding country's economy is undergoing a deep change in industrial production structure, focusing on sectors of comparative advantage. Inter/intra-regional trade also increases. Due to the economic transition from central-planned economy to market-oriented market, these acceding economies may benefit from the emerging market feature of increasing returns to scale. The trade structure of the Central and Eastern European Countries (CEECs) moves from an economic structure based on low-income (or low-wage cost) to a market based on more diversified and emerging economies. Hence, the classic Stolper–Samuelson theory may not explain the economic impact. This new economic feature is not well modelled in CGE analyses, due to their standard perfect market competition assumption. Due to the cost competitiveness of East European producers, there have been massive FDI flows from the EU eastward. One of the key challenges of the CGE modelling is how to model this type of FDI in the economic context of integration between advanced and developing countries. So far, this issue has been addressed, but not well modelled in CGE analysis.

9 CONCLUDING REMARKS

The debate on the plausible size of the effects of integration continues. Rose (2000) produced remarkable results using a gravity model that suggested that countries with a currency union had a level of mutual trade three times as large as their other characteristics would suggest. While this does not imply that joining a union would generate such a large effect, it nevertheless suggests that the impact could be large. These results were challenged on the grounds that the sample was rather biased and that other factors might be important. But after a commendably open debate where everyone could have access to the data, it appears that there is still a substantial effect (Rose and Stanley, 2005, suggest that a 30–90 per cent increase is the plausible range). Welfare effects will of course be much smaller.

However, the principal cost/gain from being a member of a currency union, implied by the optimum currency area (OCA) criteria (Kenen, 1969) is that the costs of responding to asymmetric shocks (ones which affect only one country) are much higher for the country affected without the ability to change the exchange rate, while the costs of other shocks are lessened because the countries in the area will become more similar and hence the response will be more coordinated.

It is only with the current financial crisis that we are getting a real test of the hypothesis. We have already seen in the EU that the countries with flexible exchange rates have depreciated. The risk premium for Denmark has risen, despite the fact that it is tracking the euro closely. Unfortunately, models are weak in either predicting or analysing these events. CGE models, or rather DSGE models, that have been widely used in analysis suffer because they are tuned to the normal range of shocks and are clearly mean reverting. What is required is an ability to model unusual events. This suggests either multiple equilibria or a regime switching model, where some of the fundamental parameters change. Nevertheless, regime switching implies that once the crisis is over countries will return to the previous (normal) regime.

However, this illustrates the primary conundrum of estimating the effects of integration.

We expect integration to be a major event and to change behaviour (Frankel and Rose, 1998, suggest that the OCA criteria may in fact be endogenous and countries will grow to become more similar after formation of a currency union). Indeed this is the point – countries hope that integration will change behaviour (for the better) (Mayes and Suvanto, 2002). Modelling of such changes in advance is thus likely to be highly speculative. Modelling after the event requires a substantial period of experience to derive satisfactory estimates.

With the advent of the transition economies a great deal of effort has been put into trying to develop suitable models (Botman et al., 2007). These permit parameter change through various 'learning' mechanisms (Smets and Wouters, 2004; Evans et al., 2008) but they seem stronger in their ability to analyse policy issues than to produce widely accepted quantitative estimates.

SUMMARY

This chapter provides a review of the estimates that have been made over the years of the effects of integration on trade. It shows the variety in the estimates and the lack of consensus that exists over the impact of many major projects of economic integration. It explores the continuing difficulty of obtaining estimates whose size reflects the apparent economic importance that is attached to agreements. It offers a critique of many of the methods used, noting the difficulties that even general equilibrium methods have with establishing what would have happened in the absence of integration. The problems appear to be greatest with the estimates of the dynamic effects, yet these are where the main gains are likely to lie. The analysis covers the whole range of integration from tariff and other trade barrier removal through attempts to create single markets and economic and monetary union. It is instructive that in the most recent phases of integration in the European Union, estimates of the potential gains have not been promulgated or at least accorded only a background role.

Keywords

Integration, CGE models, trade, estimation.

JEL Classification

F15, F14, F16.

NOTES

1. Further major contributions towards the basic theory were made by Meade (1955) and Lipsey (1957).
2. This is what is known in the theory of tariffs as the 'deadweight loss' or cost of the tariff that previously existed. Use of the Harberger triangle and the division by 2 assumes that demand and supply functions are straight lines.
3. In the exporting country, producers enjoy increased producer surplus, but consumers suffer a loss of consumer surplus, so the net gain to the exporting country is the difference between the two.

4. Among the first to apply the concept of relative trade intensity were Drysdale and Garnaut (1982).
5. This was first proposed by Brown (1949) and developed later by Kojima (1964). See also Iapadre (2006) for an explanation of this.
6. For a detailed examination of these alternative measures, the reader should consult Iapadre (2006).
7. Iapadre (2006) makes claim for his own symmetric trade introversion index, which shows a moderate upward trend in the four blocs considered – the EU, NAFTA, ASEAN and MERCOSUR – but the results are still very different from those resulting from the use of more conventional measures.
8. The first to propose such a model was Tinbergen (1962), with subsequent developments by Pöyhönen (1963), Pulliainen (1963) and Linnemann (1966).
9. ECO stands for the Economic Cooperation Organisation, SAPTA for the South Asian Preferential Trading Area and SPARTECA for the South Pacific Regional Trade and Economic Cooperation Agreement.
10. For details of the classification of empirical CGE modelling, refer to Thissen (1998).
11. See www.gtap.agecon.purdue.edu (Hertel, 1997).
12. MEGABARE is designed by the Australian Bureau of Agricultural and Resource Economics (ABARE) in Australia, focusing on greenhouse issues.
13. WorldScan is designed by the Central Planning Office (CPU) in the Netherlands, focusing on long-term issues in the world economy.
14. See http://www.monash.edu.au/policy/gempack.htm.
15. However, it is criticised by some economists (for example, Senhadji, 1997 and Tongzon, 2001).
16. The GTAP model is a multicountry model named after its home, the Global Trade Analysis Project based in Purdue University (www.agecon.purdue.edu/gtap/index.htm). The model is documented in Hertel (1997).
17. According to the WTO, developed economies follow the definition in preparing its statistics on world trade by region and selected economies and include North America, the EU, EFTA, Japan, New Zealand, Australia and South Africa. Others are classified as the developing countries, including some new industrialised economies such as Mexico, South Korea and so on.
18. The USA and Canada signed an FTA on 1 January 1989, eliminating nearly all tariffs on USA–Canada trade in goods originating in the two countries. NAFTA came into being in January 1994, including Mexico for the free trade arrangement, resulting in the abolition of almost all tariffs on goods originating in the USA, Canada and Mexico over the course of about a decade.
19. The EVSL was an attempt to liberalise the goods trade of APEC member economies by means of sector-based negotiations.
20. A CGE model developed by the CEPII (www.cepii.fr).

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14 The quantitative effects of European post-war economic integration

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1 INTRODUCTION

The European Union (EU) is the most far reaching and successful integration project in history. Starting from a customs union, limited to steel and coal in the early 1950s, it evolved into a fully integrated single market, characterised by the free movement of goods, services, capital and labour, economic policy coordination in various fields, and a single European currency and centralised monetary policy in the Economic and Monetary Union (EMU). Since its inception in 1958 the then European Economic Community expanded steadily in size. Starting with six founding members it has since increased to 27 countries. Now called the European Union, it already exceeds the United States in size, whether measured by population or by GDP. It is also the major player in world trade, accounting for 16.4 per cent of total world merchandise exports in 2007 compared with China's share of 11.8 per cent and the US share of 11.3 per cent (Japan has 6.9 per cent). More importantly, more than two-thirds of EU27 total trade is done within its borders; only around one-third of total trade of EU member states is exposed to the trade barriers remaining after the GATT (General Agreement on Tariffs and Trade) Uruguay Round liberalisation agreements. Parallel to the deepening and expansion of economic integration in Europe, worldwide multilateral trade liberalisation has taken place within GATT in eight successful tariff rounds.

This chapter is structured as follows. Section 2 gives a brief history of European integration post-1945. In Section 3 we focus primarily on the quantification of the integration effects of the EU during the major steps of integration: the customs union in the 1960s, the single market at the outset of the 1990s and EMU at the brink of the millennium. In addition, we shall examine the effects of EU enlargement. In particular we report the results of studies dealing with the most recent, grand enlargements in 2004 and 2007. Section 4 concludes.

2 A BRIEF HISTORY OF EUROPEAN INTEGRATION POST-1945

The Pioneers

Winston Churchill was the first to herald a far-reaching utopia for Europe. In his famous speech at the University of Zurich on 19 September 1946 he advocated the creation of the United States of Europe. As a first necessary step towards this goal he saw the partnership between France and Germany. Whereas the latter was the cornerstone for the post-war

European integration process, the first goal remain to be realised, although the majority of the European electorate fear this last step towards a 'European state'. Initiated by Jean Monnet on 9 May 1950, the then French foreign minister Robert Schuman presented the plan for merging the French and German coal and steel industries.[1] The Schuman declaration led to the formation of the European Coal and Steel Community (ECSC) by six founding member states: Belgium, France, Germany, Italy, Luxembourg and the Netherlands. The ECSC Treaty (establishing the European Coal and Steel Community or the 'Paris Treaty') was signed in Paris on 18 April 1951 and came into force on 23 July 1952.[2] Its goal was to create a common market for coal and steel.

EC6 (Customs Union)

On 25 March 1957 in Rome the six founding members of the ECSC (EC6) signed two 'Rome treaties': (i) the treaty establishing the European Atomic Energy Community (EAEC or Euratom) and (ii) the treaty establishing the European Economic Community (EEC). The EAEC Treaty aimed at the peaceful use of atomic energy in Europe. The EEC Treaty was the cornerstone of European economic integration. It came into effect on 1 January 1958. As a long-term objective, Article 2 of the EEC Treaty postulated the creation of a common market. In the medium term the formation of a customs union (CU) was envisaged. The CU was completed after reducing step by step the previously existing bilateral import tariffs between the EC6 member states (ranging from 9 to 24 per cent) to zero in July 1968 and establishing a common external tariff (CET) *vis-à-vis* third states of 16.8 per cent on average for manufactured goods (see Breuss, 1983, p. 77). With the 'Merger Treaty', signed in Brussels on 8 April 1965 common institutions for all three communities (ECSC + EEC + EAEC) were created and came into force on 1 July 1967. Since then one speaks of the European Community (EC) or European Communities.

EFTA7 (Free Trade Area)

As a 'parallel action' in European integration history, the remaining European countries which worked together in the OEEC (Organisation for European Economic Cooperation; the OEEC was founded by 16 countries in Paris on 16 April 1948 with the goal of organising the Marshall Plan programme for Europe and starting trade liberalisation in Europe shortly after the Second World War) and not belonging to EC6, formed the European Free Trade Association (EFTA). The EFTA convention was signed in Stockholm on 4 January 1960 by seven countries (EFTA7): Austria, Denmark, Norway, Portugal, Sweden, Switzerland and the United Kingdom. The major objective was to create a free trade area (FTA) by eliminating bilateral import tariffs between member states (ranging from 9 to 20 per cent). The EFTA was completed in December 1966. In contrast to the CU of the EEC, each member state maintained its external import tariff (ranging from 3 to 12 per cent; see Breuss, 1983, p. 77).[3]

First EC Enlargement 1973 (EC9)

On 1 January 1973, three countries (Denmark, Ireland and the United Kingdom) acceded to the EC, two of which were formerly EFTA members. Parallel to the EC

enlargement, a free trade agreement between the member states of the EEC, the ECSC and those of the EFTA was signed in Brussels on 22 July 1972 and came into force on 1 January 1973. The target was the creation of a free trade area between the EC and the EFTA by eliminating the bilateral import tariffs for manufactured goods step by step. On 1 July 1977 the so-called European Free Trade Area between the EC and the EFTA was completed.

Second (EC10) and Third (EC12) EC Enlargements in the 1980s

On 1 January 1981 Greece became the tenth EC member. On 1 January 1986 Portugal and Spain entered the EC.

Single European Act – the First Revision of the Founding Treaties

On 17–18 February 1986, in The Hague and Luxembourg, the 12 EC member states signed the Single European Act (SEA), which came into force on 1 July 1987. With this first revision of the three founding treaties (ECSC, EEC and EAEC), the original goal – the creation of a common market – was codified again with a detailed timetable and law enforcement process. This project was called the 'single market programme' (SMP). It was based on the European Commission's 1985 White Paper 'Completing the Internal Market',[4] a comprehensive blueprint for welding together the fragmented national markets to create a genuinely frontier-free single market by the end of 1992 (see European Commission, 1985).

European Union – Single Market in 1993

With the 'Maastricht Treaty' a second revision of the three founding treaties took place. It was signed in Maastricht on 7 February 1992 and came into force (after some turbulence surrounding the ratification process) on 1 November 1993. Since then there have been two further treaties: (i) the treaty establishing the European Community (ECT) and (ii) the treaty on European Union (TEU), dealing with the political dimension and ultimately the further development of the EU into a political union. The ECT is the revised version of the former EEC Treaty and has two major goals: (i) the completion of the single market (SM) and (ii) the creation of Economic and Monetary Union (EMU). The SM came into force on 1 January 1993 and EMU started on 1 January 1999.

The European Economic Area of EC and EFTA

In order to strengthen the bonds between the remaining EFTA countries and the EU member states, an agreement on the European Economic Area (EEA) was signed in Porto on 2 May 1992, coming into force (one year after the SM) on 1 January 1994. The EEA should create a quasi-single market requiring the takeover of three-quarters of the economic law of the EU's *acquis communautaire* without forming a customs union and not integrating the EFTA countries into the Common Agricultural Policy (CAP). After the fourth enlargement of the EU, only four EFTA countries remained: Iceland, Liechtenstein, Norway and Switzerland. Only three out of these four became members

of the EEA agreement. Switzerland voted against participation in 1992, and subsequently this country developed special relations with the EU in two bilateral agreements (Bilateral I and II), which de facto recapitulate the legal arrangements of the original EEA.

Fourth (EU15) EU Enlargement in 1995

On 1 January 1995, three former EFTA countries (Austria, Finland and Sweden) entered the EU. Norway was also offered (after 1972, for the second time) the opportunity to become an EU member but its electorate voted against EU accession. The EU15 reached its peak in terms of GDP per capita because the newcomers were all rich countries.

Economic and Monetary Union (EMU) in 1999

On 1 January 1999 the EMU started its third phase with 11 EU member states (Austria, Belgium, Finland, France, Germany, Ireland, Italy, Luxembourg, the Netherlands, Portugal and Spain). In 2001 Greece joined the euro area. After the grand EU enlargement, in 2007 Slovenia was the first to adopt the euro; in 2008 Malta and Cyprus and in 2009 Slovakia also joined the euro area. Sixteen of the 27 EU member states are now members of the euro area, with the euro as legal tender (EUR16). The EMU works with a specific, asymmetric policy design: a centralised monetary policy, conducted by the European Central Bank (ECB) is complemented by a decentralised economic policy (primarily fiscal policy) in the competence of the member states. However, the economic policy is coordinated with a complex system of instruments, methods and processes. One of the most prominent is the Stability and Growth Pact (SGP) which aims at a balanced budget over the business cycle (see Breuss, 2007d). With the EMU, European economic integration has reached its highest level, following the CU in the 1960s and the Single Market at the beginning of the 1990s.

Fifth EU Enlargement in Two Steps, 2004 and 2007 (EU27)

On 1 May 2004, 10 member states, primarily former communist countries (after transforming themselves from planned to market economies and establishing democratic regimes), entered the EU (Cyprus, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, the Czech Republic, the Slovak Republic and Slovenia). On 1 January 2007, the fifth enlargement was completed with the accession of Bulgaria and Romania. The fifth enlargement was not only a great one because of the number of countries acceding at the same time, but it was also a grand enlargement step in political terms – it finally brought to an end the political separation as a consequence of the Second World War. Thus, the fifth enlargement is more important politically than economically.

In Search of a Constitutional Treaty

After the Maastricht Treaty, further attempts were made to adapt the legal framework to the enlarging Union. The Amsterdam Treaty (third revision of the founding treaties) was signed in Amsterdam on 2 October 1997, and came into force on 1 May 1999.

Its intention was to establish a Common Foreign and Security Policy for the EU. An extra employment chapter was introduced into the ECT and the Schengen *aquis* was incorporated (with a protocol) into the primary law of the ECT and TEU, allowing EU-wide travelling without a passport. In view of the grand enlargement, the EU had to rule on the necessary provisions and adjustment of its institutions (Council, European Parliament and ruling by qualified majority) and policies (regional policy; CAP). This was achieved in the Nice Treaty, which was signed in Nice on 26 February 2001 and came into force on 1 February 2003. With this treaty, which is still the basis of the legal operations of the enlarged EU, the EU made its fourth revision of its founding treaties.

In a step to set up a Constitution for Europe, the European Convention finalised a Draft Treaty in July 2003 establishing a Constitution for Europe. After some revisions and adjustments by the member states the Treaty establishing a Constitution for Europe (TCE) was signed in Rome on 29 October 2004. It was planned that the TCE – after ratification – should come into force on 1 November 2006. After the no-votes by the electorates of France and the Netherlands in May and June 2005, the TCE was withdrawn. As a compromise, the Treaty of Lisbon (LT) was agreed upon and signed by the 27 EU member states in Lisbon on 13 December 2007. After many hurdles in the ratification process (for example, a second referendum in Ireland, constitutional quarrels in the Czech Republic) the LT came into force on 1 December 2009.

The LT amends the current EU and EC treaties, without replacing them. It will provide the Union with the legal framework and tools necessary to meet future challenges and to respond to citizens' demands. Whereas the TCE would have comprised only one treaty, the LT again consists of two: (i) the Treaty on European Union (TEU), and (ii) the Treaty on the Functioning of the European Union (TFEU). The Charter of Fundamental Rights of the European Union, until recently only a declaration, is integrated into the TEU. Apart from some institutional changes, the primary goals of the Union remain the same: (i) internal market, (ii) EMU, and (iii) the Union offers its citizens an area of freedom, security and justice without internal frontiers, in which the free movement of persons is ensured. The parties create a European Union, henceforth called the 'Union', which will replace and succeed the European Community as its legal successor. The Union has its own legal personality.

Multilateral Trade Liberalisation via GATT and the World Trade Organization (WTO)

Parallel to the economic integration process of the EEC, the EC and the EU (as well as that of EFTA) a multilateral process of trade liberalisation took place at the same time. Eight successful GATT rounds reduced the average import tariffs for manufactured products from 38 per cent in 1947 to 3.8 per cent after the Uruguay Round results were implemented in 1995, thereby stimulating world trade and growth (see Badinger, 2005). The Doha Round (with its Development Agenda), which was initiated at the Ministerial Meeting in Doha (Qatar) on 7–14 November 2001, is still pending with no visible result.

3 THE MAJOR STEPS OF EUROPEAN ECONOMIC INTEGRATION AND THEIR QUANTITATIVE EFFECTS

The Customs Union in the 1960s

The establishment of a CU in 1968 was the first major achievement in the process of European integration. Starting from their individual external tariffs in 1968, the EC6 abolished tariffs on trade within the European Community and harmonised their external tariff over the period from 1958 to 1968.[5]

According to the seminal paper by Viner (1950), forming a CU can affect international trade in two different ways. On the one hand, as a result of the abolition of tariffs on trade within the union, one would expect trade between the partner countries to increase, since member countries' domestic production is partly replaced by cheaper – now freely traded – products from other countries that belong to the CU. This positive welfare effect is referred to as 'trade creation'. On the other hand, as a result of the introduction of the CET, imports from third countries will be replaced by more expensive products from countries of the CU, redirecting trade from third countries to partner countries. This negative welfare effect is referred to as 'trade diversion'.[6] Whether the net welfare effect, that is, the difference between trade creation and trade diversion, is positive or negative, cannot be answered from a purely theoretical perspective and remains to be determined empirically.[7]

Several empirical studies have tried to reach a quantitative *ex post* assessment of the effects implied by the CU, using various methodologies, ranging from simple calculations, assuming that the share of imports from EC members and third countries would have stayed constant without customs union, to more sophisticated constructions of an '*anti-monde*', using estimated import demand elasticities or projections of a simple gravity model. We shall not discuss the methodological issues involved, which are discussed in more detail in Hansen et al. (1992, p. 28ff.), but only summarise briefly the main quantitative results.

Despite the variety in the approaches, a common conclusion emerges: the trade creating effect dominates the trade diversion effect, which is negligibly small in most studies. On average, the CU appears to have raised intra-EU trade by some 19 per cent, whereas the trade diversion effect amounts to 3.8 per cent on average. Accounting for the fact that intra-EC trade made up roughly half of total EC6 trade by the end of the 1960s, the implied increase in terms of intra-EC trade made up some 40 per cent, with estimates ranging from 26 to 52 per cent.

The result that the overall trade diversion effect is fairly small and even negative in one of the studies is not too surprising in light of the fact that the harmonised external tariff was in line with the individual tariffs by Germany and France before the CU, and actually lower than the individual external tariff of Italy. Only for the Benelux countries (Belgium, the Netherlands, Luxembourg) was the adoption of the CET a step towards more protectionism (in absolute terms).

A more recent study by Badinger and Breuss (2004) uses static and dynamic panel data approaches to estimate the determinants of the growth of intra-EU trade over the period from 1960 to 2000, based on the gravity model by Baier and Bergstrand (2001). Their overall finding is that the major force was income growth, accounting for 70 per

Table 14.1 Trade creation versus trade diversions in the EC6: ex-post *evidence*

Study	Year	Trade creation		Trade diversion	
		US$ bn	in % of total EC imports	US$ bn	in % of extra-EC exports
Balassa (1975)	1970	11.3	13	0.3	1
Truman (1972)	1968	8.7	26	0.9(–1.6)	5(–6)
Kreinin (1972)	1967/68	4.3	13	1.8	10
Williamson and Bottrill (1971)	1969	11.2	25	0.0	0
Verdoorn and Schwartz (1972)	1969	11.1	25	1.1	5
Aitken (1973)	1967	9.2	14	0.6	2
Average		9.3	19.33	0.78	3.83

Sources: Hansen et al. (1992, p. 30), based on Balassa (1975, p. 104), and Ohly (1993, p. 17).

cent of intra-EU trade growth. European integration and GATT/WTO liberalisation, reflected in the reduction of tariffs, also played a substantial trade creating role, accounting for approximately one-quarter of the growth of intra-EU trade. The estimates by Badinger and Breuss (2004) of the effects of tariffs on intra-EU trade can also be used to calculate the implied trade creation effect of the CU. Using the degree of the reduction in the average tariff of the three large EC member states Germany, France and Italy, the projected trade creation effect amounts to some 53 per cent of intra-EC trade.[8] This is in line with the average results of the studies reported in Table 14.1.

Finally, in spite of the relatively large trade effects, the welfare effects due to pure static relocation effects, calculated from the welfare triangles of the standard CU model, are fairly small, typically less than 1 per cent of GDP. Such a calculation, however, is likely to miss several important welfare-enhancing aspects of CUs such as the pro-competitive effects of trade, the elimination of X-inefficiencies, the gains from exploiting economies of scale and also the dynamic effects of an increase in trade (Pelkmans, 2001, p. 102).

More Trade Effects: The Early EU Enlargements and the European Free Trade Area

The first enlargement of the EC took place in 1973 by Denmark, Ireland and the UK. As a consequence, tariffs between the EC6 (Benelux, France, Germany and Italy) and the three accession countries (and also the tariffs between the three accession countries) were eliminated; moreover, Denmark, Ireland and the UK adopted the CET over a five-year implementation period from 1973 to 1978.

At the same time the European free trade area was created by free trade agreements between the EC9 (EC6 plus Denmark, Ireland and the UK) and the six EFTA countries at that time (Austria, Switzerland, Iceland, Norway, Portugal and Sweden) as well as Finland. These free trade agreements came into force in 1973 and were implemented between 1973 and 1977. Hence, tariffs on industrial goods were virtually eliminated between the EC and EFTA countries in the late 1970s. As a consequence, the trade effects – at least those associated with tariff reductions – due to the subsequent EU

Table 14.2 Trade effects of EC enlargement in 1973 and the European free trade area

			Trade effects in percent of total trade
(a)	EC accession of DK, IE, UK		
	Trade effects for	EC6	1.4
		Denmark	2.5
		Ireland	16.0
		UK	6.2
(b)	European free trade area		
	Trade effects for	EC6	1.3
		Austria	17.6
		Portugal	14.5
		Sweden	3.6
		Finland	7.0

Note: Trade effects calculated from estimates and data in Badinger and Breuss (2004).

enlargements up to 1995, that is, in 1981 by Greece, in 1986 by Spain and Portugal, and in 1995 by Austria, Finland and Sweden, are likely to be of relatively minor importance (at least as far as their trade effects are concerned) and thus are not considered here.

In order to get some impression of the magnitude of the implied trade effects of the progress in European integration in the 1970s, we use the estimates by Badinger and Breuss (2004) on the effects of tariffs on intra-EU trade, and the respective tariff levels and the trade shares in the early 1970s for a simple simulation exercise. Table 14.2 gives an overview of the implied trade effects of the EC accession of Denmark, Ireland and the UK on the EC6 and the new member states, and the trade effects of the European free trade area on the EC6 and (part of) the EFTA countries as well as Finland.[9]

The implied long-run trade effects are as expected: countries that previously had a relatively large tariff level and sizeable trade relationships with the EC6 and EFTA members (such as Austria) gained most. The effect on the EC6 is relatively small, which is not too surprising in light of the fact that the trade share of the accession and EFTA countries together made up less than 15 per cent in the early 1970s.

The EC enlargements and the European free trade area also offers a good test case for an interesting hypothesis regarding the distribution of the gains from the enlargement of a trade bloc among the existing member states, outlined in a new trade theory model by Casella (1996), which is based on the assumption of increasing returns to scale. The basic argument is simple and intuitively appealing: enlarging a trade bloc increases the size of the market that a firm can reach with relative ease. This increase will be more significant for firms located in small countries, whose own domestic market is small. This means that the increases in competitiveness are relatively larger for (firms in) small countries, so that the entry of new members in a trade bloc will favour particularly small countries. This conclusion is reached by Casella both analytically as well as in a number of numerical simulations.

The message of this model is fairly general. Under increasing returns, large countries may have a starting advantage. But any regime shift that induces an increase in market

size (or the size of the market that can be reached with relative ease) such as an increase in economic integration, triggers a catching-up effect of the small countries, since their relative market expansion is larger.

Empirical tests of the 'Casella hypothesis' were carried out by Badinger and Breuss (2006) for the EC enlargements and the European free trade area, and by Badinger and Breuss (2009) for the introduction of the euro, to which a similar reasoning applies. Overall, there is mild support for the existence of a small country bonus and that country size is an important mechanism shaping economic performance. However, the transmission channel mentioned above, that is, an increase in relative competitiveness as a result of a market expansion, does not appear to be the only relevant one if there are increasing returns to scale, and mechanisms favouring large countries (such as group ties and network effects) are conceivable as well.

The EU Single Market – a Major Step in European Integration

Creating a common market was already an objective in Article 2 of the EC Treaty of 1957. However, the goal was only realised – due to pressure from big business and the competitive pressure by US President Ronald Reagan's 'Strategic Defense Initiative' (SDI) in the 1980s – in 1993 under the heading 'single market' (also called the internal market).[10] The legal basis was the Maastricht Treaty. In 1993, the incumbent EU12 member states stepped up the integration ladder from just a CU with some harmonised policy areas (for example, CAP, 1962; common commercial policy in connection with the CU, 1968; reformed regional and cohesion policy since 1988) to full market integration of the SMP. Since 1993, newly acceding countries not only entered into the EU's CU but also into the SM. The SM aims to bring down all remaining non-tariff barriers (NTBs, for example, border controls), which had been existing under the CU since 1968. The cornerstones of the SM are often said to be the 'four freedoms' – the free movement of people, goods, services and capital. These freedoms are enshrined in the EC Treaty. A common competition law secures fairness as well as supporting policies aiming at combating illegal activities, fostering legitimate trade and protecting the interests of individuals and companies.

The SM is a far more complex integration step than just a CU. It concerns all aspects of economic integration, except tariffs, because these had already been eliminated in the CU of the 1960s. The elimination of border controls reduces transaction costs and hence enhances intra-EU trade. In addition, the SM influences firm and consumer behaviour in several other aspects. It also alludes to all topics of modern industrial and trade economics of imperfect competition. There is a huge literature on the empirical effects of the completion of the SM, derived from a variety of methods and models. Before surveying these studies, the following subsection discusses the theory of SM integration.

A 'unified' theory of SM integration

Whereas most of the worldwide existing RTAs can be analysed with reference either to Viner's CU theory or to the theoretical extensions and generalisations of his followers (for example, Cordon, 1972; Lloyd, 1982; Kennan and Riezman, 1990), the evaluation of the economic integration effects of the EU's SMP requires rather the ingredients of modern trade theory.

An SM integration theory must explain not only the trade aspects of abolishing border

controls and the impact of the four freedoms, but also the microeconomic changes due to full market integration (from imperfect to more competition; the implication of exploiting economies of scale in a larger and more integrated SM). We refer to (and interpret) the theory of regional economic integration in the case of a regional integration agreement (RIA[11]) by Baldwin and Venables (1995) for the case of the SM.

Following Baldwin and Venables (1995, pp. 1616 ff.) suppose that the welfare of a representative consumer of an incumbent or a new EU member state can be represented by an indirect utility function $V(p + t,n,E)$, where p is the vector of border prices, t is a vector of trade costs including the tariff equivalent of import barriers (NTBs such as border controls), n is a vector of the number of product varieties available in each industry, and the scalar E is total spending on consumption. Expenditure of an EU member state is equal to the sum of factor income, profits and rent from trade barriers that accrues to domestic agents (including the government), minus investment and income out of the EU budget under the structural fund transfers: $E = wL + rK + X[(p + t) - a(w,r,x)] + \alpha tm - I + SF$. Total factor income is $wL + rK$, where L and K are the country's supply of labour and capital and w and r are factor prices. The third term on the right-hand side is total profit. It is the inner product of the economy's production vector X and the gap between domestic prices and average costs, $a(w,r,x)$, where average cost in each sector depends on factor prices and production per firm in that sector, x. Domestically accruing trade rents amount to αtm, where m is the net import vector (positive elements indicate imports) and α is a diagonal matrix that measures the proportion of the wedge t that creates income for domestic agents; $\alpha = 1$ for a tariff or other barrier with domestically captured rent (DCR) and $\alpha = 0$ for a barrier where no trade rent is captured domestically (non-DCR). For example, t may represent real trade costs or a quota or voluntary export restraint (VER) under which foreigners capture the quota rents or in the case of integrating into the SM the trade costs of border control. Finally, I denotes investment and SF net income from structural fund transfers out of the EU budget.

By totally differentiating $V(p + t,n,E)$ and dividing through by the marginal utility of expenditure V_E, Baldwin and Venables (1995, p. 1601 and Appendix A) derive an equation (here slightly extended) of welfare change for an incumbent or a new EU member state entering the SM:[12]

$$\begin{aligned} dV/V_E = {} & \alpha t\,dm - md(t - \alpha t) - m\,dp \\ & + (p + t - a)\,dX - xa_x\,dx + (V_n/V_E)\,dn \\ & + (\tilde{r}/\rho - 1)\,dI \\ & + dSF. \end{aligned} \tag{14.1}$$

A 'unified' theory of SM integration should be able to explain at least three major integration effects of creating the SM: *allocation of resources* (static 'trade effects' due to the 'four freedoms' and the elimination of border controls; 'scale effects'), *accumulation or growth effects*; and *location effects* inclusive of factor movements:

1. *Trade effects* The first line of equation (14.1) includes static welfare effects of models with *perfect competition*. The first term is the 'trade volume' effect. The trade

volume changes subject to the wedge created by DCR trade barriers, αt. In the case of forming a CU, trade creation and trade diversion effects would be captured by this term. The second term is the 'trade cost' effect, measuring the change in costs generated by changes in the non-DCR elements of trade barriers. The third is the 'terms of trade' effect. The last effect occurs only if the country is a large country that can influence world trade prices. For a small country the third term would be zero.[13] After EU accession the new member states enter the CU of the EU and participate in the EU's SMP. That means, on the one hand, adjustments of the national external tariff to the EU's CET and the abolition of border controls. Hence, the remaining trade costs are eliminated. Interpreted with equation (14.1), entering the CU requires an adjustment of import tariffs to the CET, either upwards or downwards, depending whether the new member state was a low- or high-tariff country. The abolition of border controls is captured by the second term of the first line of equation (14.1) and increases welfare.

2. *Scale effects* The three terms in the second line of equation (14.1) capture theoretical predictions of models with increasing returns to scale and *imperfect competition*. These effects encompass integration effects which by some authors are called 'full SM integration' effects (see Smith and Venables, 1988; Haaland and Norman, 1992; Haaland, 1993). The first term is the 'output' effect, arising if there is a change in output in industries where price differs from average cost. The second term is the 'scale' effect, which gives the value of changes in average costs induced by changes in firm scale. The third terms gives 'variety' effects which may arise when the number of differentiated consumer products changes, such as in trade models with Dixit–Stiglitz type utility functions and ingredients of the theory of monopolistic competition (see Grossman and Helpman, 1991).
3. *Accumulation effects* The term in the third line captures what is also called the 'growth' effect of regional integration. It implies that a change in investment is instantaneously costly, but it also augments the capital stock with a social rate of return $\tilde{r}$. Discounting this at a social discount rate ρ gives the present value $\tilde{r}/\rho$, and a change in investment has a first-order welfare effect if this ratio differs from one.
4. *Net EU budget effects* The term of the fourth line indicates the welfare improvement or deterioration due to the position of an EU member state *vis-à-vis* the EU budget, either being a net receiver (primarily poor countries) or a net payer (mostly rich countries).
5. *Location or globalisation effects*[14] A 'unified' theory of the SM should also capture effects of 'globalisation' or factor movements. Integration of rich and poor countries – such as in the case of the EU's grand enlargement in 2004 and 2007 – under the conditions of the four freedoms rules of the SM might induce huge factor flows: foreign direct investment (FDI) from the old to the new EU member states because of expected higher rents in the 'emerging markets' of Eastern Europe and labour from the new to the old member states because of the huge wage differential in the order of up to 1:10. Such factor movements and their welfare implications are only indirectly captured in equation (14.1). FDI inflows in the acceding country may renew the capital stock and hence increase investment (third row). Labour emigration leads to a welfare loss ('migration loss') in the sender country and to a welfare gain ('immigration surplus') in the recipient country (the old EU member states).[15]

In the context of equation (14.1) labour migration could be interpreted only if one assumes wage differentials in the expenditure equation E, which would induce migration. In the special case of the EU enlargements in 2004 and 2007, it might well be that the factor movement effects dominate the trade effects.

SM effects in model simulations

The SMP attracted much research not only focusing on the effects within the EU but also within the EFTA,[16] either as partner with the EU via the EEA[17] agreement of 1994 or – as in the case of Switzerland[18] – due to bilateral agreements (mapping the EEA agreement). The EEA was intended to tie in the EFTA countries not willing to become EU members to most of the content of the SM: at least part of the four freedoms (without being a member of the EU's CU) and the common competition policy.

Ex ante *studies* Most of the studies on the economic impact of the SMP were undertaken ahead of its completion. The methods applied to quantify the possible integration effects of the SM and/or that of EEA range from partial-analytical models with imperfect competition (pioneers were Smith and Venables, 1988) to computable general equilibrium (CGE) models for either one or more countries. In addition, macroeconomic models were also used, either for only one country or for a multitude of countries. In Table 14.3 the results of ex ante studies are summarised.

Ex post *studies* Very early after the completion of the SM, the European Commission (1996) published a study evaluating the SM effects so far. The major outcome was that intra-EU trade has increased. Allen et al. (1998) studied the impact of the SMP, distinguishing among its effects on patterns of production and trade and its effects on price–cost margins and industrial restructuring. The SMP was mainly trade creating: the domestic production share of demand has fallen by 5.4 percentage points on average while the shares of both intra- and extra-European trade have increased by 2.95 and 2.45 percentage points, respectively. With respect to the pro-competitive effect of the SM, they find that price–cost margins have fallen by 3.6 percentage points in the high- and medium-sensitive industries. A more comprehensive study on the pro-competitive effects of the SM by Badinger (2007) finds that this result appears to hold up for EU manufacturing industries on average, whereas price-cost margins in service industries have remained constant or even increased in the 1990s.

On the occasion of the 10th anniversary of the SMP in 2003, the European Commission in an internal evaluation via simulation with the QUEST II model came to the following conclusions: real GDP would have been 1.4 per cent lower (with a lower and upper bound of 0.8 and 2.1 per cent) in 2002 without the SMP. Small additional gains are to be expected in the next decades, with an additional GDP effect of 0.4 per cent until 2012 and 0.5 per cent in 2022 (see Roeger and Sekkat, 2002). These results are based on a positive total factor productivity (TFP) and a negative mark-up shock to the economies of the EU.[19]

Given the outcome of most studies, the integration effects due to the SM should have given rise to a considerable improvement in economic growth of the EU countries. However, compared with reference countries such as the United States, the growth performance in the EU since 1993 was disappointing. Even the additional initiative of the

Table 14.3 Results of studies on the economic impact of the SM

Author(s)	Year of study	Method	Results				Other remarks
			Area covered	Variable	Impact	Period	
Cecchini et al.	1988	Surveys, macro-model	EU12	Whole economy, several sectors	+4.3/6.4% (welfare increase in % of GDP)	Medium run	'Cecchini report' commissioned by the EC ('Cost of non-Europe')
Emerson et al.	1988	Micro and macro models	EU12	Whole economy, several sectors	+4.3/6.4% (welfare increase in % of GDP)	Medium run	Summary of the 'Cecchini report' + model simulations
Catinat et al.	1988	Macroeconomic model (Quest)	EU12	Whole economy	+4.5% GDP	6 yrs	With more expansionary fiscal policy +7.5%
			Total effects are sum of: (i) elimination of border controls; (ii) liberalisation of public procurement; (iii) liberalisation of financial markets; (iv) supply-side effects (economies of scale – higher productivity)				
Bakhoven	1989	World macro model	EU12, Netherlands	Whole economy	+2.3% GDP	6 yrs	Pessimistic as to the timely implementation of SM law
Smith and Venables	1988	PE model	Some EU12 countries	10 sectors	+0.6/1.8% welfare of base consumption	Steady state	Case study for electrical household appliances
			Cournot behaviour, 2 scenarios: (i) reduced trade barriers (LTC) by 2.5 of intra-EU trade (ii) integrated (SM) markets (FI) (product variety; higher firm concentration; less segmented market pricing); welfare of (i) is less (0.6%) than that of (ii) (1.8%)				

Table 14.3 (continued)

Author(s)	Year of study	Method	Results				Other remarks
			Area covered	Variable	Impact	Period	
Baldwin	1989, 1992, 1993, 1994	Growth theory	EU12	Whole economy	+3.3/11.7% GDP growth	Long-run steady state	'Baldwin multiplier': $y = \frac{1}{1-(\theta+\alpha)}\omega$, y = GDP growth rate; ω = TFP growth rate; $\theta + \alpha$ = economies of scale; y effects varies by country
Mercenier	1992	GE (CGE) model	5 EU countries + ROW	Whole economy, 7 industries	+0.2/1.1% welfare	Steady state	Alternative oligopolistic market structures (Cournot, Bertrand)
Gasiorek et la.	1992	GE (CGE) model	EU12	64 industries	0.7/17.6% long-run integrated market effects	Steady state	Methodology as in Smith–Venables (1988)
Haaland	1993, 1994	GE (CGE) model	EU12, EFTA, EEA (Norway)	Whole economy + some sectors	+0.2/1.3% EU (LTC) +0.1/2.1% EU (FI) –0.4/2.5% EFTA (LTC) –0.6/3.6% EFTA (FI) (welfare in % of consumption)	Steady state	Two integration scenarios: (i) EU integration (SM); (ii) EEA integration. In both cases LTC and FI integration effects
Norman	1989	GE (CGE) model	EU12, EFTA (Norway, Sweden)	Whole economy, 2 sectors	+0.1/3.8% (EU – LTC/FI – GE) +0.3/7.6% (EFTA – LTC/ FI – GE)	Steady state	Comparison PE vs GE; for EFTA outside and inside EU

Breuss and Schebeck	1989, 1991	Macroeconomic model	Austria	Whole economy	+1.6/3.5% GDP (non-EU/EU member)	6 yrs	EEA scenario +2.3% GDP
Breuss et al.	1994	Macroeconomic model + input–output	Austria	Whole economy + 18 sectors	+2.8% GDP	6 yrs	Integration effect in addition to the passive EFTA and active EEA effect (in total +5% GDP)
Keuschnigg and Kohler	1996	Dynamic GE (CGE) model	Austria (Finland, Norway, Sweden, Switzerland)	Whole economy + 10 sectors	+1.2/1.9% welfare in % of GDP/GDP (FI scenario)	Steady state	Derived welfare effects for: Finland +1%, Norway +1.4%, Sweden +0.6%, Switzerland +1.3%
Antille et al.	1992, 1993	GE (CGE) model	Switzerland	Whole economy, 19 sectors	+2.2/2.7% welfare p.c./GDP (FI)	Steady state	4 scenarios: LTC, immigration, FI, LTC(EU)
Grether and Müller	2000	GE (CGE) model	Switzerland EU15, ROW	Whole economy, 26 sectors	+2.9% GDP	Steady state	EU accession of Switzerland

Note: CGE = computable general equilibrium; PE = partial equilibrium; GE = general equilibrium; EC = European Commission; LTC = lower trade costs due to the abolition of border controls (2.5 per cent of value of trade goods); FI = LTC + full SM integration.

Lisbon Agenda of 2000[20] to boost growth and jobs in Europe, and additional integration steps such as EMU and the grand enlargements of 2004 and 2007 have not resulted in a growth bonus of the EU over the United States. This remains an integration puzzle to be solved (see Breuss, 2006b).

EMU – a Project of World Historic Dimensions

Only six years after the creation of the EU Single Market in 1993, the introduction of the euro in 1999 marks the next milestone in European integration. Considerable research has been devoted both *ex ante* and *ex post* to assess the potential benefits and drawbacks of a single European currency. Research on the effects of the euro can be roughly grouped into two categories. A number of studies addressed the question whether the EU (or which subset of EU countries) constitutes an optimum currency area. The largest amount of research was attracted by the question concerning the trade effects of the euro. We briefly consider the results of these two groups of studies.[21]

Optimum currency areas: an old theory for a modern project

The issue of choosing a fixed or flexible exchange rate regime is one of the most fundamental and important questions of international economics. The mainstream view is that a flexible exchange rate regime is preferable, unless the group of countries constitutes an optimum currency area (OCA). The seminal analysis of the conditions under which a group of countries can be regarded as an OCA is due to Mundell (1961). Roughly speaking, it states that the welfare effects of a common currency exceed its costs, if the economies are 'sufficiently' prepared to adjust to asymmetric shocks through mechanisms other than a change in the exchange rate (which is no longer available under fixed exchange rates), labour mobility in particular. Hence, there is a trade-off between real divergence of economies and the functioning of adjustment mechanisms.

Several studies have extended and refined the seminal contribution by Mundell: McKinnon (1963) emphasises that a group of countries is more likely to form an OCA, the more integrated in international trade it is. The reason is that for very open economies, the nominal exchange rate is not a proper adjustment mechanism anyway, since changes in the exchange rate quickly pass through to domestic prices. Kenen (1969) argues that countries with a high degree of trade diversification and trade dissimilarity are less likely to experience asymmetric shocks and thus are more suited to introduce a single currency.[22]

There is wide agreement among economists that the way the euro has been launched and introduced was a political rather than an economic project. First, the convergence criteria,[23] which define the legal requirements to be fulfilled by EU member states before introducing the euro and which remain applicable for future candidate countries, are poorly motivated from an economic perspective. Krugman (1994, p. 21) even referred to the Maastricht criteria as a 'sheer nonsense'. Since the criteria for the adoption of the euro are entirely unrelated to OCA theory, it comes as no surprise that the group of 11 countries that adopted the euro in 1999 are typically not regarded as an OCA, in particular as far as the labour mobility criterion is concerned. (See Bayoumi and Eichengreen, 1997 for a quantitative analysis of the EU in terms of OCA theory.) This appears to be even more true for the present group of 16 euro area countries,

additionally including Greece (since 2001), Slovenia (2006), Cyprus and Malta (2008) and Slovakia (2009).

A more recent, alternative strand of theory, referred to as endogenous OCA theory (Mundell, 1973a, 1973b; Frankel and Rose, 1998), holds that the criteria for an optimum currency might be endogenous. This means that even if the countries do not constitute an OCA *ex ante*, the single currency and harmonisation of monetary policy might cause the economies, in particular their business cycles, to converge. As a consequence, the degree of real divergence decreases and the group of countries may constitute an OCA *ex post*. The empirical relevance of this argument is still unclear. For example, there is so far hardly any evidence for the emergence of a European business cycle after the introduction of the euro (Giannone et al., 2008), though it is clearly too early for a conclusive empirical assessment.

Trade effects of the euro

A large number of studies used a gravity equation approach to assess the effects of the euro on intra- and extra-EU trade. Baldwin (2006a, 2006b) provides an exhaustive in-depth survey of the literature, to which the reader is referred for a more detailed review of the numerous studies and the methodological issues. The main results can be summarised as follows (Baldwin, 2006a, p. 1).

First, compared with previous estimates of the trade effects of common currencies,[24] the trade effect of the euro is relatively small. The average stimulus to intra-euro area trade amounts to some 10 per cent, the estimates ranging from 5 to 15 per cent.

A second important finding is that the euro caused no trade diversion; in contrast, it appears to have boosted imports from outside the euro trade by some 7 per cent, which is not too different from the effect on intra-euro area trade. Some studies suggest that this might also hold for exports to non-euro area countries.

Third, there is considerable variation in the trade effects across the euro area countries. The largest winners have been Spain, the Benelux countries and Germany, with increases in intra-euro area trade up by more than 20 per cent. Table 14.4 gives an overview of some country-specific estimates.

Fourth, there is also considerable variation in the trade effects of the euro across industries; the largest gains appear to have occurred in scale-intensive industries and industries that require relatively much processing and are differentiated. Ignoring beverages and tobacco,[25] the largest gains appear to have occurred in machinery and equipment and chemicals. Table 14.5 shows the industry variation in the estimated trade effects.

Two further results are that the trade effects of the euro materialised rather quickly and occurred in 1999. However, despite the jump in trade flows there is hardly any evidence for price convergence following the introduction of the euro.

While most previous studies have been concerned with the estimation of the overall trade effect of the euro, more recent research is trying to identify the channels through which the trade effects have been triggered. The finding that many of the greatest winners of the euro are tightly integrated countries that had a relatively small exchange rate variability against the DM before the introduction of the euro suggests that the elimination of exchange rate fluctuations is not the driving force.

The traditional view sees the trade effects of the euro as mainly passing through the channel of a reduction in transaction costs.[26] An alternative view, the so-called 'new

Table 14.4 Trade effects of the euro by country

	Micco et al. (2003)		Faruquee (2004)	
	Intra-EU trade	Extra-EU trade	Intra-EU trade	Extra-EU trade
EMU	12.6	8.6	14.4	8.0
Austria	13.7	8.8	14.8	6.0
Belgium–Luxembourg	16.9	12.0	14.9	9.3
Finland	5.5	–0.7	6.1	–2.1
France	14.9	11.7	14.0	8.2
Germany	15.6	12.5	16.6	6.4
Greece	–2.4	2.1	–	–
Ireland	9.6	10.5	14.6	10.5
Italy	13.5	10.0	15.9	8.7
Netherlands	19.3	21.7	19.3	19.3
Portugal	3.0	–3.0	5.1	0.3
Spain	21.7	10.0	20.9	9.4

Note: Dependent variable is imports plus exports.

Table 14.5 Trade effects of the euro by SITC group (in percent)

		Intra-EU trade	Extra-EU trade
SITC 1–9	Aggregate	17.2	8.9
SITC 0	Food and live animals	1.4	4.7
SITC 1	Beverages and tobacco	35.2	12.9
SITC 2	Crude materials, inedible, except fuels	–3.3	–6.3
SITC 3	Mineral fuels, lubricants and related material	–19.6	–9.6
SITC 4	Animal and vegetable oils, fats and waxes	4.4	18.6
SITC 5	Chemicals and related products	6.9	7.8
SITC 6	Manufactured goods, classified chiefly by materials	12.4	0.2
SITC 7	Machinery and transport equipment	22.4	8.7
SITC 8	Miscellaneous manufactured articles	7.1	–0.2

Source: Flam and Nordstrom (2003, Table 8); dependent variable is exports.

goods' hypothesis, argues that a single currency reduces the fixed costs of market entry, allowing firms that had been just below the efficiency threshold before the introduction of the euro, to introduce new goods into euro area markets. Baldwin (2006a) advocates the view that the new-goods hypothesis is the most likely explanation for the trade effects of the euro, since it is consistent with the non-occurrence of price convergence and trade diversion.

As a final point we note that the large discrepancy between the estimated trade effects of the euro (of around 10 per cent) and the results of empirical studies on other currency unions (of some 200 per cent) is still subject to debate. Three prominent explanations considered by Frankel (2008) are: (i) the euro is still young and the full trade effects have

not yet been realised; (ii) compared with other studies, the euro area is made up by many relatively large countries; and (iii) previous estimates might be seriously biased due to the endogeneity of the decision to introduce a single currency. However, Frankel finds that none of these arguments can explain the large discrepancy between the estimated trade effects of the euro and the estimates for other currency unions.

Tourism effects of the euro

Most *ex post* studies on the trade effect of the euro focus on manufactured bilateral trade. Gil-Pareja et al. (2007) also use a gravity equation approach to study the effect of EMU on tourism. The number of tourist arrivals to country *i* from country *j* (for 12 Euro area countries) over the period from 1995 to 2002 is explained by the usual variables in gravity equations (population, real GDP per capita, distance, relative purchasing power parity (PPP), dummy variables on language, island, land border, FTA, exchange rate volatility and EMU). The tourist flow in the euro area (EUR12) increased by around 6 per cent on average. The largest winners were Greece (+23 per cent), Italy (+18 per cent), the Netherlands (+13 per cent) and Ireland, Finland and Spain (each +11 per cent). Austria (+6 per cent), Germany (+8 per cent) and Portugal (+2 per cent) realised only modest increases. Negative or insignificant effects were found for Belgium–Luxembourg and France.

Ten years of EMU – taking stock

The achievements and shortcomings after 10 years of EMU can be summarised as follows:[27]

- the euro has contributed to price stability within the euro area;
- the euro has become an important reserve currency (25 per cent of total world reserves) besides the US dollar (65 per cent);[28]
- the EMU is characterised by a specific asymmetric policy design: a central monetary policy for the whole euro area is matched with a decentralised but complicated coordinated fiscal policy;
- the trade-enhancing nature of the euro is confirmed by many gravity model studies; and
- the expected growth effects of EMU[29] have not (yet) materialised.

The Grand EU Enlargement 2004 and 2007

After the breakdown of communism and the Soviet Union in 1989 and 1991 there was a strong political movement towards Western Europe and in particular towards the EU. This applied to many former Eastern European states belonging either to the sphere of influence of the Soviet Union directly (for example, the Baltic states Estonia, Latvia and Lithuania) or indirectly by belonging to the Council of Mutual Economic Assistance (CMEA: Poland, the Czech and Slovak Republics, Hungary, Bulgaria and Romania) as well as the countries of the Western Balkans, formerly part of the Yugoslav Republic (for example, Croatia, Slovenia, Bosnia and Herzegovina, Montenegro, FRY Macedonia, Kosovo) and the isolated Albania.

In a generous move the EU offered these countries the prospect of becoming a member.

The first step was the integration via trade liberalisation with the Europe Agreements and the second step was the direct offer to become an EU member if some specific criteria, the so-called 'Copenhagen criteria'[30] are fulfilled. The enlargement process then lasted 10 years from the offer of the heads of state and governments in Copenhagen in June 1993 to the finalisation of the Accession Treaty, again in Copenhagen, in December 2002. The grand fifth enlargement effectively took place on 1 May 2004 with 10 new members, and it was completed with the accession of Bulgaria and Romania on 1 January 2007.[31] With this grand enlargement, Europe ended the political east–west separation which had lasted throughout the Cold War period since shortly after the Second World War.

EU enlargement continues. According to Article 49 TEU each European country can apply for membership. Currently there are three candidate countries (Croatia, FRY Macedonia and Turkey); the EU has been negotiating with two of these (Croatia and Turkey) since October 2005. There are also five potential candidate countries in the Western Balkans (Albania, Bosnia and Herzegovina, Kosovo, Montenegro and Serbia).

The EU is also pursuing an alternative strategy to pure enlargement, namely the European Neighbourhood Policy (ENP[32]) which has been negotiating closer political and economic links with 16 countries, ranging from Northern Africa, the Middle East and the Caucasus to the remaining Eastern European countries. In addition, the EU is trying to establish a special relationship with Russia.

The enlarged EU outperforms the United States in size

With the last, the fifth enlargement, the EU27 increased its population by 26 per cent to 494 million. Hence, the enlarged EU is already bigger than the United States (300 million) and Japan (128 million) but of course smaller than China (1,314 million). Also the EU27's economic capacity has overtaken that of the United States: the absolute GDP of the EU increased with the 2004/07 enlargement by 16 per cent to 11,646 billion PPP compared to that of the United States (10,715 billion). However, with the integration of 12 poor countries, the average GDP per capita of the EU27 (23,588 at PPP) decreased by 11 per cent, increasing the gap to the United States (35,737; see Breuss, 2007c).

Expected economic effects of an enlarged EU

The theoretical foundation of the estimation of the integration effects of EU enlargement for the old and new member states is based on the 'unified' theoretical framework of the SM (see above). Besides the trade effects (the new member states enter the CU and the SM of the EU) and the SM effects (more competition, increased productivity, economies of scale, larger product variety), a major additional role is played by factor movements: FDI from the old to the new member states in Eastern Europe and labour movement from the new to the old member states. The reason is the huge income gap between both regions. The new member states started in 1989 as transformation countries and developed (are still developing) from planned to market economies. All the ingredients of poor countries were there in the early 1990s: low GDP per capita, low entrepreneurial knowledge, old and obsolete capital stock, poorly educated workforce, and institutions not yet fit for a functioning market economy.

The major outcome of the *ex ante* studies summarised in Table 14.6 is that the acceding countries will gain much more from EU enlargement than the incumbent old member states, sometimes in the ratio of 10:1 in the long run.

Table 14.6 Results of studies ahead of EU enlargement on its economic impact

Author	Year of study	Method	Results				Other remarks
			Area covered	Variable	Impact	Period	
Baldwin et al.	1997	GE (CGE) model	EU15	Whole economy	Real income +0.2% +1.5/18%	Steady state	Germany and Austria benefit more
			CEEC7 (Czech Republic, Hungary, Poland, Slovenia, Slovakia, Bulgaria, Romania)			Steady state	Lower risk premium is driver for stronger result
			EU15	Public finance	€19 bn (0.2% of GDP)	1999	Enlargement includes Czech Republic, Hungary, Poland, Slovenia, Slovakia
Barry	2004	Economic integration theory	Ireland	Trade FDI	Agricultural trade (beef, dairy products) is not threatened. No diversion (thanks to technology)		Overall, Ireland should not fear enlargement
				Labour market	Skilled migrants beneficial for economy		
Breuss	2002	OEF world macroecon. model	13 of EU15, Hungary, Poland, Czech Republic	GDP	+0.5% +8/9% +5/6%	2005–10 2001–10 2001–10	For Spain, Portugal and Denmark the costs outweigh the benefits
			New EU member states profit 10:1 more from enlargement than old EU member states: GDP growth p.a. 2004–10: Hungary, Poland, Czech Republic +1%; Austria +0.25%, Germany +0.15%, EU13 +0.10%; CEEC10: +0.5/0.75%				

Table 14.6 (continued)

Author	Year of study	Method	Results				Other remarks
			Area covered	Variable	Impact	Period	
Breuss	2007a	Macro model	Bulgaria, Romania, EU-new10, EU15 Austria	Overall economy	+0.5% +0.01% +0.02% +0.05%	2007–20 GDP growth p.a.	Integration effects: (i) trade (CU, SM); (ii) productivity (FDI, R&ED, structural funds), (iii) migration
European Commission	2001	Growth accounting analysis	AC8 CEEC10 EU15	Whole economy, GDP growth	+1.3/2.1% +1/1.8% +0.5/0.7%	1994–2009 Annual Cumulative	Central/optimistic scenario; significant impact in EU10, modest in EU15
Grassini et al.	2001	Multisectoral model (INTIMO)	Italy	GDP GFCF Imports Exports	+0.5% +0.3% +0.6% +1.2%	2000–10	Specialisation scenario reported, spillovers double the impact
Heijdra et al.	2002	GE (CGE) model	EU15	Overall welfare	+0.3% of GDP	Steady state	Trade, budgetary costs and migration effects are considered
			Smaller than real income effect which does not consider forgone consumption				
Kohler	2004	GE (CGE) model	Individual EU15 countries	Overall welfare, % of GDP	+2 (Austria)/–1.3 (Portugal)	Steady state	Besides Portugal, also a negative impact in Greece, Ireland and Spain.
Keuschnigg and Kohler	2002	GE (CGE) model	Austria	GDP Contribution to EU budget Exports Consumption Wage	+0.56% +1.75% of GDP +15.9% +0.7% +0.5%	Long-run scenario is reported. Fiscal position improves, despite higher net contribution to EU. Expected wage spread constant. Only immigration of unskilled may widen the wage spread	

Keuschnigg et al.	1999	Calibrated dynamic GE (CGE) model	Germany	GDP Welfare neutral net contribution Exports Wage income Skilled and unskilled wage	+0.45% +1.08% of GDP +46.7% +0.5% +0.6%	Long-run membership scenario is reported. Expanded activity swells the tax base. Investment-led expansion. Some potential for adverse redistributive effects	
Kristensen P and Rørmose Jensen	2001	Structural, dynamic, large-scale macroeconometric model of the Danish economy (ADAM)	Denmark	GDP Exports Imports GDP Investment Employment Wage rate	+0.45% +0.63% –0.6% +1.44% +1.27% +1.28% –0.81%	2000–10 2000–65 (scenario of neutralised budget effect)	In the long run, positive effects from immigration and productivity outweigh short-term costs
Lejour et al.	2001	GE (CGE) model	EU15, CEEC7	Welfare effects	+0.1/+0.6 +5.3/–1.8	Long-run % of GDP	SM/labour migration
Lejour and de Mooij	2005	GE (CGE) model (WorldScan)	Turkey NMS10 EU15	Overall economy +15 sectors	+0.8/–2.2% +0.0/+0.7%	2025 (long-run steady-state GDP)	Without/with migration
Lejour et al.	2008	GE (CGE) model (WorldScan)	Croatia NMS12 EU27	Overall economy +15 sectors	+1.0% +0.0% +0.0%	2025 (long-run steady-state GDP)	Export of Croatia +13.9%; biggest increase in textiles, wearing apparel
Maliszewska (CASE Poland)	2003	GE (CGE) model	EU15, Hungary, Poland	Welfare effects of trade liberalisation	+0.03 +7.0 +3.4	Long-run % of GDP	Base scenario
Quaisser and Wood	2004	Survey, own estimates	Turkey EU15	Overall economy	+2.5/5% +10% with FDI	Long-run GDP	
Read and Bradley	2001	Integration theory	Old and new member states	Overall economy	Strongly positive	Increased trade and efficiency. Limited migration consequences	

Source: European Commission (2006, p. 25); OEF (2005).

The first years of the enlarged EU appear to be consistent with this prediction: the GDP growth of the new member states exceeded that of the old EU countries (see Breuss, 2007b, 2007c, 2010). For the next candidate countries (Croatia and Turkey) some model estimations of the economic impact are available, pointing to similar effects as in the case of the EU enlargements in 2004 and 2007 (see Table 14.6).

4 CONCLUSIONS

The different steps of European economic integration had different impacts on the respective member states of the EU. The customs union in the 1960s induced more trade creation than trade diversion effects. The many studies on the Single Market focused primarily on the complex effects on GDP growth and/or its welfare implications. Practically all studies pointed to positive growth and welfare effects for the incumbents of the EU but also for those entering the SM. Studies on EMU mainly point to positive effects on intra-euro-area trade; some also indicate an increase in GDP growth, employment and price stability. As to EU enlargements, the first four concerned only one or a small group of countries at once, whereas the fifth EU enlargement was a grand one: 10 countries acceded together, followed by a further two. This last enlargement gave rise to many studies, first because of its sheer size and second, because it involved two blocs of countries at different stages of development. Whereas in the former enlargements the EU has taken in only highly developed industrial countries with a long market economy tradition, the fifth EU enlargement consisted of primarily poor countries in transition from formerly planned to market economies with new developing democracies. Again most studies find that the last EU enlargement was a win–win game in which the newcomers, however, will gain much more than the incumbents on average. Some of the old EU member states could even lose.

Generally it is easier to conduct *ex ante* studies on economic integration than to analyse the outcome *ex post*. This is also documented by the much larger number of *ex ante* studies. Some of the rare *ex post* studies, in particular those on the SM, are somewhat disillusioning. The expected pro-competitive effects and the implied growth bonus from the SM appear to have not been fully realised so far. To some extent this also applies to EMU. More generally, the fact that the EU performed more weakly than reference countries such as the United States (in terms of GDP growth and employment), which did not experience such a run of integration processes as did the EU in the 1990s remains an 'integration puzzle' waiting to be solved in further studies.

SUMMARY

The European Union is the most far-reaching and successful integration project in history. Starting from a customs union, limited to steel and coal, in the early 1950s, it evolved into a fully integrated single market, characterised by the free movement of goods, services, capital and labour, economic policy coordination in various fields, and a single European currency and centralised monetary policy. As such, the process of European integration has offered an example par excellence to test theories on economic

integration; in fact it has attracted a considerable amount of research over the last decades. This chapter briefly reviews the major steps in European post-war integration and takes stock of what we have learned from empirical research on its quantitative effects.

Keywords

European integration, European Union, quantitative effects.

JEL Classification

F13, F14, Q17, Q18.

NOTES

1. More about the history of the European Union can be found on: at http://europa.eu/abc/history/index_en.htm. The idea that the former enemies, France and Germany, should first work together economically in order to achieve a political partnership is often called the 'Méthode Monnet', named after its inventor, Jean Monnet.
2. The ESCE Treaty ended on 23 July 2002 after a 50 year term.
3. Regional trade agreements (RTAs) such as CUs – like the EEC – or FTAs – like the EFTA – are allowed under the GATT unless they fail to eliminate barriers on 'substantially all the trade' among members and, additionally, that external tariffs 'shall not on the whole be higher or more restrictive' than prior to the formation of the RTA. Sluggish or no progress in the Doha Development Round has accelerated further the rush to forge RTAs.
4. The European Commission uses the terms 'single market' and 'internal market' interchangeably; we use the term 'EU single market' in the following. See 'The EU single market' at: http://ec.europa.eu/internal_market/index_en.htm. The ECT, however uses the term 'internal market' (see Article 3).
5. The individual external tariffs in the 1950s before the establishement of the CU were: Belgium: 9 per cent, Germany: 16 per cent, France: 19 per cent, Italy: 24 per cent, and the Netherlands: 9 per cent (see Breuss, 1983; El-Agraa, 2001).
6. For the sake of brevity, the reader is referred to standard textbooks for a detailed analysis of the Viner model and its extensions (see, for example, Hansen et al., 1992, p. 13; Baldwin and Wyplosz, 2006, p. 124).
7. Corden (1972) expanded the Viner CU theory by studying the effects of economies of scale. Forming a CU increases the market and hence allows exploiting economies of scale. In the home country then, in addition to the trade creation effect, a cost reduction effect increases profits. Supplementing the trade diversion effect, a trade suppression effects comes into play. The partner country within the CU can also profit from economies of scale, which suppresses trade with third countries.
8. One can also use the reduction of the country-specific external tariffs to obtain country-specific effects. This mechanical calculation yields the largest gain for Italy (54 per cent), which had been most protectionist; France gained some 42 per cent, Germany some 35 per cent, and the Benelux countries, which had had a low external tariff of some 9 per cent, gained least (19 per cent).
9. Since the study by Badinger and Breuss (2004) includes only those EFTA members that joined the EU later, Norway, Switzerland and Iceland are excluded from the calculations.
10. Information about the history and the legal framework of the SM can be found on the European Commission homepage, see 'The EU single market' at: http://ec.europa.eu/internal_market/index_en.htm.
11. The total number of (at the WTO) notified preferential agreements (RIAs; also called regional trade agreements – RTAs) such as customs unions and free trade areas in force is currently 170, while a further considerable number are at the negotiation/proposal stage (see Crawford and Fiorentino, 2005, p. 1).

    Pascal Lamy (see: http://www.wto.org/english/news_e/sppl_e/sppl53_e.htm), Director-General of the WTO, recently forecast that by 2010 about 400 such agreements could be active, increasing the complicated web of incoherent rules, coined by Bhagwati (1995) a 'spaghetti bowl' of twisted rules of origin. Whereas the trade purists condemn bilateral 'spaghetti bowls' as second- or third-best welfare solutions

to liberalising world trade, Baldwin (2006c) takes them as political facts and as 'building blocs on the path to global free trade'. Accordingly, moving to global free trade requires the political will of WTO member states to multilateralisation of regionalism. By 2010, Baldwin sees the world as three more or less perfectly formed trade blocs – one in Europe, one in North America and one in East Asia. However, the blocs might be fuzzy since the proliferation of FTAs makes it impossible to draw sharp lines around the Big-3 trade blocs, and leaky since some FTAs create free trade 'canals' linking the Big-3 blocs.

The EU can be taken as a good example of how to tame the 'spaghetti bowl syndrome'. First, by its continuing enlargements from originally six to 27 members it integrated most of the EFTA countries. Second, by pushing through the Pan-European Cumulation System (PECS) in 1997 (on the basis of the European Economic Area – EEA – agreement of 1994) it simplified the spaghetti muddle in Europe. With this the EU15, the EFTA4 (Iceland, Liechtenstein, Norway and Switzerland), and 10 of the then-applicant nations in Central Europe decided to amend their various FTAs by substituting a common set of rules of origin for those they originally contained. Value could thus be cumulated between different European countries without prejudicing the duty-free status of end products. PECS was extended to Turkey (with which the EU has formed a CU since 1996) in 1999. In 2005 the system was enlarged to the Faroe Islands and the Mediterranean countries, and hence is commonly referred to as the Pan-Euro-Mediterranean cumulation system (PEMCS); for more details (general overview, legal framework, specific provisions) on the PEMCS, see the homepage of the European Commission: http://ec.europa.eu/taxation_customs/customs/customs_duties/rules_origin/preferential/article_783_en.htm. The PEMCS comprises 42 countries and is applicable between the EC and Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, Syria, Tunisia, West Bank and Gaza Strip, the EEA/EFTA countries (Iceland, Norway and Switzerland, including Liechtenstein), the Faroe Islands and Turkey. PEMCS members account for about 40 per cent of world trade. For a description of the EU's spaghetti bowl, see Breuss (2007b, p. 649). For a detailed treatment, see the chapters in this Handbook by Fiorentino (Vol. I, ch. 1) and Baldwin (Vol. I, ch. 2).

12. Kohler (2004) derives a similar welfare equation for a single incumbent EU country, in particular for Germany in the case of EU enlargement.
13. Baldwin and Venables (1995, pp. 1604–5) discuss in the context of an RIA with 'large' countries the case of three countries, in which countries 1 and 2 form the RIA and country 3 remains outside. The members of the RIA can influence the terms of trade, and hence, the third term of equation (14.1) becomes relevant. The theoretical analysis of three-country problems (with three goods) becomes easily intractable or delivers ambiguous results (see Lloyd, 1982). The Kemp–Wan theorem (Kemp and Wan, 1976) gives a powerful and beautiful answer to the question what configuration of trade policy (towards non-members) would result in a necessarily welfare-improving CU: collect any subset of countries in a trading world; hold their net trade vector with the rest of the world fixed (at the pre-CU level) and treat it as an endowment; maintaining standard assumptions, direct application of the first welfare theorem suggests that the union's welfare is improved when all internal barriers to trade are eliminated; the difference between external prices and prices within the CU (common to all CU countries) determined the CET of the CU; each country within the union could be made better off than before using a suitable scheme of lump-sum redistributions while the rest of the world is left no worse off. The Kemp–Wan theorem gained further attention in alternative interpretations (see Richardson, 1995) and extensions of free trade areas (see Bond et al., 2004; Ohyama, 2004).
14. Location effects are discussed by Baldwin and Venables (1995, pp. 1616 ff.) in the context of the insights of models of 'economic geography', pioneered by Krugman (1991). This model category also considers factor movements from one location to another, from the 'periphery' to the 'centre' or vice versa.
15. The 2004 EU enlargement, however, allowed transitional arrangements (until 2011), restricting the free movement of workers. For an impact study on East–West migration, see d'Auria et al. (2008).
16. For information about EFTA, its history, its remaining four member states (Iceland, Liechtenstein, Norway and Switzerland), see: http://www.efta.int/.
17. For a detailed description of the EEA project, see: http://ec.europa.eu/external_relations/eea/.
18. The special relations of Switzerland and the EU can be found at: http://www.europa.admin.ch/index.html?lang=en.
19. On the European Commission homepage 'EU single market 10 years' there is a compilation of studies on 'The macroeconomic effects of the single market programme after 10 Years', see http://ec.europa.eu/internal_market/10years/background_en.htm. Mongelli et al. (2005) investigate the link between economic integration and the overall institutional process over the last 50 years.
20. At the Lisbon Summit in March 2000, EU leaders set out a new strategy, based on a consensus among member states, to modernise Europe ('to become the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion'). This became known as the 'Lisbon Strategy'. After initially moderate results, the Lisbon Strategy was simplified and relaunched in 2005 under the heading 'Growth and Jobs' (see: http://ec.europa.eu/growthandjobs/index_en.htm).

21. A small number of studies have attempted to provide a more comprehensive (*ex ante*) assessment of the effects of the euro, using model simulations (for example, Breuss, 1997; IMF, 1997). These studies, however, do not consider the effects of the euro in isolation but the combined effects of EMU, including assumptions about its effects on competition, TFP, and structural reforms (such as labour market flexibility).
22. See De Grauwe (2005) for a more detailed treatment.
23. The convergence criteria were laid down in the Maastricht Treaty and mainly relate to the stability of prices and long-term interest rates as well as fiscal discipline in terms of the budget deficit and the level of government debt. (See Baldwin and Wyplosz, 2006, p. 381 or Breuss, 2006a, p. 410, for more details.)
24. The seminal paper is Rose (2000), who finds that currency unions roughly double trade among their member states. Many subsequent studies in the vein of the Rose study have obtained similarly large effects of currency unions on trade, typically exceeding 100 per cent.
25. Results for this industry might be driven by statistical artefacts, for example, value-added tax fraud (Baldwin, 2006a, p. 1).
26. Some indirect evidence for the relevance of this transmission channel is provided by Badinger and Breuss (2009), who find empirical support for the hypothesis that an enlargement of the market that can be reached with relative ease (through the reduction in transaction costs as a result of the euro) disproportionately favours small countries, since the market expansion is relatively larger for small countries (Casella, 1996).
27. See, for instance, De Grauwe (2009). There are many studies celebrating and analysing the first 10 years of EMU. *Empirica – The Journal of European Economics* 1/2009 devotes a special issue to this topic. See also ECB (2008), European Commission (2008) and OECD (2009). Additional material can be found on the European Commission homepage: http://ec.europa.eu/economy_finance/emu10/index_en.htm or on the homepage of the ECB: http://www.ecb.eu/home/html/index.en.html.
28. For simulations of a shift of foreign reserves to the euro by Asian countries so that the dollar and the euro make up 45 per cent of world total reserves with the QUEST III DSGE World Model, see Breuss et al. (2009).
29. See European Commission (1990) and Breuss (1997).
30. The accession criteria were formulated by the European Council in Copenhagen, 21–22 June 1993 (see Conclusions of the Presidency, p. 13): (i) political criteria (democracy the rule of law, human rights, respect for and protection of minority); (ii) economic criteria (functioning market economy, capacity to cope with competitive pressure and market forces within the Union); (iii) obligations of membership (*acquis communautaire*, aims of EU–EMU); and (iv) accessibility of the Union.
31. Information on the history and the actual status of the EU's enlargement policy can be found at: http://ec.europa.eu/enlargement/index_en.htm.
32. For more information on the ENP strategy, see: http://ec.europa.eu/world/enp/index_en.htm.

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15 Measuring the extent and costs of EU protectionism

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1 INTRODUCTION

What would we say if the EU instead of being an engine of ever-widening free markets became a mechanism by which those of its members who could not reform their economies forced on other hitherto free market members a programme of protection? In a recent analysis, Minford et al. (2005) argued that this indeed was what the EU had become. Their conclusion was that if Britain could not, with whatever free market allies it could find, divert this process back onto the original free market agenda of the EU, then it would be forced to leave or incur massive and increasing net costs of membership. They also found that where they could calculate them, the net costs to EU citizens other than Britain's was roughly as high in percent of GDP as to UK citizens.

'Protection' is a word that refers primarily to trade. But at the heart of the political economy of the current 'sick men of Europe' (Germany, France and Italy) lies the fear of unemployment; so protection also extends to the labour market and to the welfare system designed to buy off the unemployed. In the labour market this protection covers limits on hours (designed to share work around), strong powers for unions, minimum wages, high unemployment benefits of potentially indefinite duration, workers' councils designed to stop job cuts, and much else. Because this protection is not enough to stop firms closing factories, if they could not be controlled somehow by local politicians, it has led to protection against takeover by foreign firms. It is now usual to hear worries about 'economic nationalism' breaking up the single market.

Labour and product market interference by these EU governments is now so well known and so widely attacked by commentators and international bodies such as the Organisation for Economic Cooperation and Development (OECD), the International Monetary Fund (IMF) and even the European Union (EU) Commission, that we spend no space here discussing it further. The focus of this chapter will be instead trade where the extent of EU protectionism has yet to be either appreciated or evaluated. Again, as agricultural trade and the Common Agricultural Policy (CAP) have already been investigated thoroughly, we concentrate on trade in manufactures and in services. For manufactures we have updated previous estimates for 2002 and a wider group of countries. Our aim is to produce some estimates of the extent of protection and to evaluate the welfare costs of it.

This chapter is structured as follows. Sections 2 and 3 discuss protectionism in manufactures and services. Section 4 addresses the issue of the cost of EU protection. Section 5 assesses the overall costs and benefits of UK membership of the EU. Section 6 examines the political economy of protectionism. Section 7 concludes with some broader

comments on the general protectionist disease of the EU, how it might relate to the role of elites in Europe, and whether it can be cured.

2 PROTECTIONISM IN MANUFACTURES

It is usually assumed that since the various General Agreement on Tariffs and Trade (GATT) and World Trade Organization (WTO) rounds have reduced manufactured trade tariffs 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 (Messerlin, 1990); 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 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 is now data on prices on a wide scale owing to the purchasing power parity (PPP) calculations being done by international organisations. A pioneering study by Bradford (2003) 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. Averaging across the EU countries studied (Germany, the Netherlands, Belgium and the UK) Bradford's figures, which are adjusted for distribution margins, tax and transport costs, are 40 per cent tariff-equivalent for the EU against 16 per cent for the US. These percentages are not much different if one looks at 1999 instead of his original 1993.

We have updated these figures to 2002 and extended the comparison more widely now that OECD membership has risen to include Korea in particular; we also cover all EU countries and have made an attempt to update the figures relative to China. For the categories we have here, China is a dominant exporter in textiles, furniture and electrical manufactures; in the rest it still has a fairly small share of world exports. While we do not have prices in separate commodity categories for China, we do have the manufacturing wage cost comparisons made by the US Bureau of Labor Statistics, which estimates Chinese manufacturing wage costs per hour at 7 per cent of Korea's; we also assume that unskilled labour represents 30 per cent of total costs. We estimate Chinese costs for these three categories by adjusting Korean costs on this basis (effectively by 28 per cent). It turns out that China becomes the country with the lowest world price for furniture and textiles, though not for electricals where the US remains the lowest. It would also have the lowest world price for all other products examined here, were it to be or become a significant exporter of these.

The figures for the EU weighted average against lowest-cost non-EU trade partners

are then somewhat lower in 2002; China and the US, followed by Korea, are the lowest price alternatives – Appendix 15A gives details. For the EU as a whole the 2002 figure comes out at 29 per cent, not much different from the 30–40 per cent on Bradford's different basis for the 1990s. For the US, which has also embraced policies of non-tariff protection, the 2002 figure is 12 per cent, just a little lower than the middle double-digit percentages found in the 1990s.

3 PROTECTIONISM IN SERVICES

Throughout the UK debate on the EU it has been implicitly assumed that somehow the UK would gain from the single market in services. We are after all large net exporters of services. It might therefore seem that we must benefit from a customs union in services where we are net exporters just as we lose from one in food and manufactures where we are net importers.

However, there is little parallel between the arrangements in food and manufacturing on the one hand and services on the other. There is no EU customs union in the vast mass of service sectors. Instead there is a patchwork of national protectionism, with the UK having relatively free markets within it.

The idea of the single market is to replace this patchwork with a free deregulated market across the EU; in principle this might be accompanied by some sort of barrier against non-EU service companies which could parallel the customs union in food and manufactures. However service markets within the EU are individually often penetrated by foreign (notably US) firms through FDI and other arrangements (especially in the UK which in practice has liberal access for US firms). Hence once there was EU-wide deregulation it would inevitably allow free access to foreign firms lodged in national markets which in practice cannot be distinguished from their national counterparts, indeed in many cases have merged with them.

Moreover EU-wide deregulation would, independently of such penetration, unleash strong competition between a large swathe of European national firms. Such competition would be deliberately boosted by EU competition authorities whose aim would of course and rightly be to ensure that prices were pushed down to competitive levels. Indeed, they would welcome any assistance in that regard from foreign competitors located in the EU.

Hence the prospects for services sectors would appear to consist of two main possibilities:

1. The Single Market fails to make much progress at all in the face of strong producer-vested interests in national markets; national protection thus remains as now.
2. It is highly successful in the end and produces competitive price levels.

The aim of the EU Commission (the latest services directive, currently being blocked by France and Germany) appears to be to move steadily towards the second by the progressive dismantling of national service barriers.

What of a third option whereby the EU established a customs union in services? Under this the single market would establish EU-wide regulative barriers which put EU-wide

prices somewhere between the most liberal and the most restricted regimes currently in place – that is, typically somewhere between the restricted REU (rest of the EU) average and the current liberal UK regime. We find that such a service customs union would involve substantial transfers to the UK from the rest of the EU as UK service producers displaced REU home producers within the customs union. UK producers of services would receive higher than world prices, this amount on UK net exports being paid for by REU loss of tariff revenue. Such a transfer is unlikely to appeal to the REU majority within the EU's Council of Ministers. If protection is to fall, they would prefer it to fall without a customs union being formed.

Assessing the costs to the UK of these arrangements is rather easy in cases (1) and (2) and those between them. Under both of them the UK's leaving would make no difference on the assumption that the UK's regime is already liberal. Under (1) the UK continues in its liberal regime if out just as when in; the REU too carry on as now. Under (2) if the UK stays in it is part of a competitive market; but if it left it would also enjoy a competitive market – exactly the same situation for its consumers and producers. Thus contrary to the popular perception, the UK faces no prospective gain from being within the EU single market in services; it would be as well off under free trade.

On the other hand it is plain that other EU countries would gain considerably from the reduction of national protection of services since this would usher in competitive prices for consumers and either a rise of efficiency in service production or a displacement of resources out of services into other areas of greater productivity.

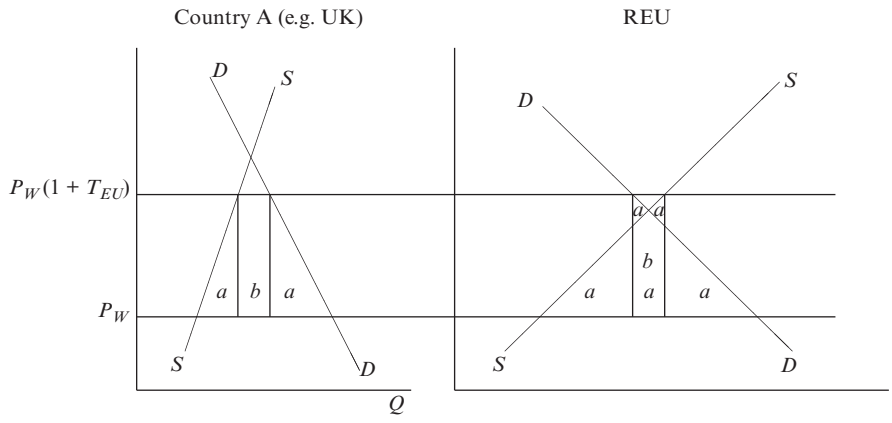
4 THE COST OF EU PROTECTION

In this section we use these estimates of protection to estimate their welfare implications for the UK and for the EU. For this, we use a computable general equilibrium (CGE) world model built by Minford et al. (2005) to generate estimates of changes in trade that result from this protection. From these changes, we calculate the welfare effects in the normal manner: these consist of the terms of trade gains/losses of real income, the customs union transfers effected through trade diversion of rest of world (ROW) sourcing to customs union partners, and the consumer surplus lost through higher internal prices.

We decided to use for our central estimates the usual calculations of consumer surplus, measured in equivalent income variation, but applied to the general equilibrium results of our 4-bloc world trade CGE model. For this purpose we disregarded all effects of increased output and income, solely counting the substitution effects of protection; the reason for this is the standard one that income effects are compensated or compensatable, whereas the substitution effects cause costs via misallocation. Such a standard calculation is illustrated in the well-known diagram of Figure 15.1, where the supply and demand curves can be considered as the result of substitution effects in general equilibrium.

We also considered a calculation using the CGE model alone as the basis and allowing full effects on all industries and land/labour use. We discuss this later.

The calculations fall into three parts for any given trade policy change:



Rubric
T_{EU} = customs union tariff equivalent.
a = reduction in economic surplus.
b = imports of A from REU × ($P_W T_{EU}$) : transfer from A to REU.

Figure 15.1 A customs union for a commodity (illustrated for EU manufacturing)

1. The transfer effect of customs union protection whereby one partner pays more than the world price for imports from another partner.
2. The resource misallocation effect whereby output and demand is switched between sectors – this is the usual 'triangle' of lost consumer surplus. For this we use only the substitution effects predicted by the model.
3. The terms of trade effect whereby the changes brought about by the policy change in net world supplies alter world prices. For this calculation we use the full changes predicted by the model.

We look at the net gains/losses to the UK and to the EU from two basic sets of policy changes:

1. If the UK withdraws from the EU trade arrangements in favour of unilateral free trade.
2. If the EU also moves to unilateral free trade.

We are interested in knowing whether it would pay the UK and the EU for the UK to withdraw from the EU's trade arrangements; and whether it would pay the EU to liberalise its trade arrangements. In all our calculations we take the status quo, existing trade arrangements, as the benchmark.

What we find is that it would indeed pay the EU to move to unilateral free trade in goods and services; the gain for the REU would be several percent of REU GDP and for the UK much the same – these figures become greatly magnified to middle double-digit percentages if one assumes liberal planning laws allowing land to be diverted from farming to service and non-traded industries. However, if we assume that because of the power of existing institutions and vested interests, the EU does not change from its

existing protective setup, then we find that the UK would still gain a similar percentage of GDP from withdrawing alone to unilateral free trade, while there would be some essentially trivial loss to the REU.

In these two estimates resides a dilemma for UK policy: does it stay within the EU and fight on in the hope of EU trade liberalisation from which it would derive the same benefits as from unilateral free trade and without the trauma of leaving the EU, or does it leave in the expectation of the same gains but more certainly and immediately? There is also an interesting choice for the rest of the EU: does it benefit its citizens generally by going to free trade or does it accept that this is impossible because of the way that EU politics is conducted? If it assumes this impossibility, then should it welcome the departure (at rather small cost) of a UK that is fundamentally at odds with it over both the costs of the trade arrangements and the moves to a more federal politics? We return to these policy issues in the conclusion.

We now consider each product category in turn and go through the detail of the figures.

Agriculture

According to Bradford (2003) whose tariff-equivalent estimates we follow for all goods trade, EU agricultural protection is on average 36 per cent. The model, as we have implemented it, prevents agricultural land from responding to price change, in line with planning and CAP restrictions on planting. Also, consumer spending on food is assumed to be highly inelastic. Hence we observe no effects on the terms of trade as net trade volumes are essentially unaffected. Thus the cost of the CAP consists purely of the transfer cost to the UK which is an equal gain of course to the rest of EU.

As UK net imports of food are some 0.8 per cent of GDP, this is 0.3 per cent of UK GDP and 0.06 per cent of EU GDP.

Other studies mostly allow for more trade volume effects; certainly our assumption stretches plausibility as undoubtedly farming interests have had ways of achieving acreage increases which must surely be partially reversed by a 26 per cent (36/136) fall in prices. However, because agriculture is a very small part of GDP – less than 1 per cent in the UK – even adding in more volume effects does not change the size of the estimate unduly as a fraction of GDP.

Basic Manufacturing

Bradford's estimate here is of a 16 per cent average tariff-equivalent;[1] our latest estimates for 2002 for textiles and furniture, the two categories we were able to estimate fully, are 93 per cent including China and 49 per cent excluding China. Thus the entry of China (now with around a quarter of the world export market in these products) would appear on the face of it to have had a dramatic effect on the extent of EU protection. Nevertheless the spread of tariff-equivalents across the full Bradford set of products is very high; many of these products have been subject to competition from cheap labour sources for so long that the domestic industries in the West have largely disappeared as their capital has depreciated; the vested interests pushing for protection should accordingly have seen a reduction of power. It is somewhat puzzling that the latest figures show

such high protection and it is possible that there is an issue of quality comparison with these products – textiles are, for example, notoriously difficult to compare in price given the huge differences in quality between, say, fashion clothing and utility wear. However, the most important factor is likely to be that our selection of only two products is far narrower than Bradford's. In view of these issues we retained Bradford's estimate for basic manufacturing.

Here the UK is twice as big a net importer as it is of food, at 1.7 per cent of GDP. The model's estimated trade effect of the UK eliminating this tariff is that it would effectively eliminate this industry's production (14.4 per cent of GDP). There would be no terms of trade effect, however, given the small size of this effect in terms of the world market. Thus UK withdrawal would save the customs union transfer effect of 0.3 per cent of GDP , which is worth 0.06 per cent of GDP to the REU; and also the consumer surplus burden of 1.1 per cent of GDP – a total saving of 1.4 per cent.

Were the EU to liberalise, then its net exports would contract by 13.7 per cent of GDP against the current GDP share of basic manufacturing at 17.6 per cent. This is large in terms of the world market and induces a rise in world prices of basic manufactures by 4 per cent. Since both the UK and the REU would be, after liberalisation, large net importers of these, the terms of trade cost would be 0.6 per cent of GDP for the UK and 0.5 per cent of GDP for the REU. However, the consumer surplus gain to the REU would be 1.1 per cent of GDP as for the UK. For the REU, liberalisation would thus bring a net gain of 0.5 per cent of GDP. For the UK the gain would be less than going to free trade on its own: because of the terms of trade effect, it would fall to 0.8 per cent of GDP.

High-tech Manufacturing

Bradford's estimate of protection for high-tech manufacturing (which includes the large transport equipment industry as well as electronics, both of them areas where emerging market countries in the Far East and elsewhere have made recent penetration) is 58 per cent.[2] On the updated 2002 figures, the figure we obtain – when we omit China – is lower at 22 per cent. China has made fewer inroads into these industries as yet and also it would seem that there has been substantial progress in improving EU-based industrial productivity relative to competition such as from Korea. Nevertheless, were China to enter these industries in a major way as it may currently be doing, then the protection rate would be 69 per cent. This underlines the exposure of EU manufacturing to rising Chinese competition and it seems most unlikely that it would be left unprotected. For illustration of the potential scale of the problem, we have therefore retained the original Bradford figure for our calculations.

The model estimate of the trade effect of the UK withdrawing from this protection is the effective elimination of the UK's existing modest-sized industry, currently 3.6 per cent of GDP; of course with the decline of such industries as cars and computing equipment this has already contracted greatly. The consumer surplus gain to the UK from withdrawal would thus be 1.1 per cent of GDP (= $3.6 \times 0.58 \times 0.5$). The UK would also gain from not paying the customs union transfer on its net imports for the REU; these net imports run at 0.8 per cent of GDP, hence the transfer is 0.5 per cent (0.58×0.8). Therefore the total gain for the UK from leaving the customs union in high-tech

manufactures would be 1.6 per cent of GDP. For the REU the cost would be the loss of the UK's transfer, worth 0.1 per cent of REU GDP.

For the REU, high-tech manufacture output constitutes 7.9 per cent of GDP, and net exports 1.5 per cent. Plainly certain of these industries have strong comparative advantage and require no protection, while others are weak and under attack from emerging market competition. This latter portion, the model indicates, would be wiped out by the elimination of the protection; we have no good figures for what this portion is but we assume it to be the existing industry minus net exports (6.3 per cent of GDP). Thus the REU would make a consumer surplus gain of 1.8 per cent of GDP ($6.3 \times 0.58 \times 0.5$). However, it would lose the 0.1 per cent customs union transfer it gets from the UK. Furthermore, the model suggests (after allowing for the capping of the output effect at 6.3 per cent of GDP) that the prices of high-tech manufactures would rise by 4.2 per cent as REU supplies were withdrawn from world markets. Since both the REU and the UK would have become net importers after liberalisation (the REU to the tune of 4.8 per cent, the UK 4.4 per cent, of GDP) the terms of trade cost would be 0.2 per cent of GDP for both the REU and the UK. Thus for the REU the total net gain of moving to free trade would be 1.5 per cent of GDP ($= 1.8 - 0.2 - 0.1$).

Services

In this area our estimates of protection are particularly uncertain. The various pieces of evidence we looked at on service trade suggest that it is quite a lot higher in the REU than in the UK. This is supported by the net export figures. The UK's net exports are 3.4 per cent of GDP and 12.4 per cent of service production, suggesting that a large part of the industry must be competing on world markets and hence with no protection. The REU has a rough trade balance.

Available studies, though largely qualitative, suggest that REU protection is rather high – we put it at 30 per cent which seems to be in line with these estimates (McGuire and Schuele, 2000; Nguyen-Hong, 2000; Minford et al., 2005). On the other hand, given its very large rate of net exports, UK prices are likely to be driven down to world price levels by competition to supply world markets; thus we assume both that protection in the UK is effectively nil, and that the protection is carried out by states and not at the EU level; there has been very little penetration of common standards across the EU in services. In consequence, the EU is assumed to have no customs union in services, with free trade inside the union; each country instead has the same barriers against all other countries, including those in the REU.

Under these assumptions it is easy enough to work out the effect of the UK withdrawing from the EU protective system. Since the EU has only state-level protection and the UK is assumed to have no protection in the first place, the effect is simply nil. (Were we to have assumed that the UK had some protection in place, we would have found an additional gain from higher consumer surplus, as this protection was eliminated. However, of course, eliminating protection that is not due to the EU does not require withdrawal from the EU; so again we would not attribute this gain to 'withdrawal from the EU's protective system' as there is no such system in place.)

For the REU matters are different. Reducing each country's protection of 30 per cent on services would theoretically reduce output of services substantially; according to the

Table 15.1 Net gains to the UK and to the REU if the UK withdraws from status quo trade arrangements and adopts unilateral free trade (% of GDP)

	UK	REU
Agriculture	+0.3	–0.06
Basic manufacturing	+1.4	–0.06
Hi-tech manufacturing	+1.6	–0.1
Traded services	–	–
Total	+3.3	–0.22

Table 15.2 Net gains to the UK and to the REU if the EU replaces status quo trade arrangements with unilateral free trade (% of GDP)

	UK	REU	REU*
Agriculture	+0.3	–0.03	–
Basic manufacturing	+0.8	+0.54	+0.6
Hi-tech manufacturing	+1.4	+1.5	+1.6
Traded services	+0.2	+1.3	+1.3
Total	+2.7	+3.3	+3.5

Note: *REU if UK has already gone to free trade; this is column 2 plus transfer effects (these are already eliminated by UK liberalisation).

model, were the REU to do this, service output (20 per cent of GDP) would fall to zero. However, we must recall the assumption here that this policy is applied on its own; this is highly unlikely given that traded services are where most rich countries now think the future lies for their new industrial activity. Given this assumption, however, the estimate is not unreasonable, with internal prices falling by 23 per cent (30/130) on this traded activity. On this assumption, the gain in consumer surplus is 2.3 per cent of GDP (= 20 × 0.23 × 0.5). However, the prices of services would rise on world markets by 6 per cent according to the model; with net imports now of 20 per cent of GDP, the REU would lose 1.2 per cent on the terms of trade, making its total gain 1.3 per cent of GDP. The UK as a net exporter would gain 0.2 per cent of GDP (3.4 × 0.06).

Gains and Losses from Separate Acts of Policy Compared with the Status Quo

We can now use these calculations to draw up a table of gains and losses were the UK to withdraw from various parts of the EU's trade arrangements (see Table 15.1).

This table is relevant to the decision of the UK to withdraw or not from individual parts of the trade treaties. We note that the UK has a strong incentive to withdraw. For the REU the UK's withdrawal creates marginally negative effects.

We can also ask whether the UK and the REU have any incentive to liberalise EU markets and move to free trade, with the UK remaining a member of these common arrangements. For this we create Table 15.2 of net gains and losses for the UK and the REU, comparing a post-liberalisation situation with the assumed benchmark.

Here we can see that there is a strong incentive on welfare grounds for the REU to liberalise.

Examining Policies as a Group

Note, however, that if we want to know what the sum total is of doing all these things together we have to re-examine the estimates under that precise assumption. In practice, UK withdrawal would occur across all the areas of trade; to leave one area would probably not be negotiable. Essentially you must 'leave or not leave'; having left, certain treaty areas might be restorable under a completely new relationship.

As for EU liberalisation, it is difficult to know in what stages it might proceed. Currently, service liberalisation is actively proceeding under the new services directives, though plainly progress differs greatly between industries. But there is no activity at all in the area of manufacturing; no official discussions yet entertain the possibility of dropping anti-dumping actions and of breaking down cartels in order to allow free entry at world prices by low-cost emerging market producers. Nor in agriculture is any change in CAP protection rates actively on the agenda. Hence in evaluating the possible gains of reform in the REU we assume two stages: first, a liberalisation of services, and second, a possible liberalisation of agriculture and manufacturing.

Thus in this section we examine the above policies as packages of reforms, substituting the full CGE model estimates coming from their joint implementation. To calculate these we have taken the CGE model's total predictions of sectoral change with the complete packages.

We now discuss more fully the meaning of this full CGE model simulation. It is carried out on the assumption that the market for land is like the markets for skilled and for unskilled labour: it has a price that sets supply of land (assumed to emerge from a process of owner supply as moderated by the planning process) equal to demand. Thus, for example, as agricultural protection falls, the price of land falls with it, reducing the use of land overall; there is also a switching of land use from agriculture into services and non-traded industry.

The gain of welfare to the UK here is dramatically larger at 17 per cent (this amount is not greatly affected by whether the REU simultaneously liberalises or not; Table 15.3). What is going on is that with agricultural prices at home greatly lowered by the elimination of the CAP tariffs, land prices drop substantially (26 per cent) as demand for land in agriculture contracts sharply, and land is switched into traded services and non-traded activity (with the implicit permission of the planning authorities). These last two sectors are therefore able to expand considerably – services by 35 per cent, non-traded by 15 per

Table 15.3 UK and the REU simultaneously move to free trade

	UK	REU	REU*
Sum of partial effects	+2.7%	+3.3%	+3.5%
CGE full estimate	+17.0%	+14.0%**	+14.2%

Note: *REU if UK has already liberalised. **Does not include liberalisation of services.

cent. Note that both agricultural output and manufacturing fall by about a quarter. One may legitimately have doubts about the political feasibility of this solution, which is why we do not use it as our central estimate. However, it does indicate that in the presence of some planning flexibility, the central estimate we have used, based on partial substitution effects only, could be a significant underestimate – how much so depending naturally on the extent of such planning flexibility.

In this case of the EU as a whole, liberalising services alone in the first step we have not attempted to assess using our CGE model. The reason is that the outcome depends on a complex of factors, not merely the drop in general external protection but also the role of inward investment in services, reconstituting local suppliers with the help of external expertise. An example would be the effect of the liberalisation of airlines on airline provision by continental European airlines; this has resulted in a steep drop in prices but also a surge in domestic operators, drawing on the experience of low-cost airlines from outside the European continent, such as Easyjet. Thus, based on such an example, one might expect liberalisation to strengthen local service providers through competition and expand the market. Our CGE model assumes that competition already exists, albeit at high prices, and that the industry's structure is given; both assumptions are unlikely to hold.

With the liberalisation of services, EU protection then becomes identical with that of the UK, consisting entirely of the EU's external tariff-equivalents. We can now assess the effects of removing protection in an orthodox way. Thus turning to the liberalisation of trade in the EU the effects are naturally highly similar to those in the UK, as is the rise in welfare at 14 per cent (or 14.2 per cent if the UK has already liberalised by leaving). Again we find that there is the same large drop in land prices and a switch of land use into services (up by 35 per cent) and non-traded industries (up by 10 per cent). Politically, as in the UK, this raises questions of realism, in particular with planning consent. Planning is a highly complex phenomenon in the REU, differing both across countries and across regions within countries. On the other hand, given the huge pressures to create employment under the REU conditions of generally high unemployment, the popular pressure might be greater for liberalisation. The essential point we make here is not that the full simulation should be believed but that it reminds us that the central case calculation based on partial substitution effects alone is a minimum which could be added to, depending on the extent of land liberalisation.

5 ASSESSING THE OVERALL ECONOMIC COSTS AND BENEFITS OF UK MEMBERSHIP OF THE EU

In this section we briefly consider the broader economic costs and benefits of membership of the EU. We do it from the UK's viewpoint because we have the relevant data for it. However, the argument can be generalised to other EU members with suitable data. There is every reason to believe that the EU as a whole is being damaged in particular by excessive social intervention, which has caused both unemployment and slow growth. In considering the economics of the EU, we interpret the thrust of future EU policy in the light of recent policy actions by the EU (for example, the decision by France and Germany to scrap reform of the CAP) and of the general thrust (in favour

of protectionism and social rights) of proposed new policies, such as those recently envisaged in the draft constitution and its successor, the Lisbon Treaty.

Using the Liverpool Model of the UK economy we have examined what might be the effects of the social policies, which amount to the reversal of the reforms brought in by the UK government from 1979. On the assumption of rather moderate changes (a minimum wage raised to 50 per cent of male median wages, union power restored to mid-1980s levels, social cost rises worth 20 per cent of current wages), the model predicts that they would raise unemployment by 5.7 per cent – that is, 1.8 million – and cost 6.4 per cent in reduced output. It could of course be either more or less depending on just how extensively this harmonisation was pursued; but the draft constitution indicates clearly enough that what we have seen so far – including the working time directive, the social chapter and the works council directives – is just a beginning.

A further ('bailout') cost comes from potentially insolvent state pensions on the continent. Extensive estimates were made of these pension deficits in an OECD study in the mid-1990s. Recent attempts to recompute these prospects suggest little change (OECD 2001). If we take these 1995 OECD projections as illustrative at least, the deficits projected are: for Germany 10 per cent of GDP by 2030; for Italy about the same; and for France a little bit less. Add up these deficits as a percentage of UK GDP, which is of similar size to each of these countries, and you come to some 30 per cent. If the UK were to pay a quarter of that, for example via some federal system of burden-sharing, then the bill would be some 7 per cent of GDP. Again, like harmonisation, the extent of this is rather uncertain; it could be a lot more or a lot less, depending on both the extent of reforms undertaken by these countries and the extent to which the progress of federalism enables burden-sharing between countries. But this is certainly a burden the UK does not want to risk sharing, at even a modest level.

When one asks what are the countervailing benefits, one finds that they are hard to identify on the economic side. The Cecchini Report (1988) claimed that there would be large benefits in greater specialisation and exploitation of scale economies because of the single market: the logic was that lower barriers within the EU would encourage a better adjustment to market forces. The evidence has not supported gains on the scale predicted by Cecchini; our CGE model by construction does not impute scale economies but it does include any gains (the majority according to studies of UK Cecchini-style effects) from greater competition within the single market, whatever in practice they may have been. Free trade with the whole world (facing whatever unilateral barriers each country chose to levy) would permit the UK to exploit the same processes but in a way consonant with its comparative advantage. The gains we have identified from leaving the EU relate to the UK's exploitation of its true comparative advantage in services essentially; most studies agreed that in services scale economies are unlikely.

The NIESR (2000) claimed that there are gains of foreign direct investment (FDI) from membership of the EU. FDI is related to technology transfer and where it occurs depends on the structure of the economy. As we have seen above, that structure changes dramatically if the UK leaves the EU. Whether FDI as a method of technology transfer is as needed when the economic structure shifts to its true comparative advantage, we simply do not know. But if it is, it will occur equally in the new structure. The essential point concerns whether the economy's technology is at its maximum in the new structure as compared with the old: given that all industries will be competing on a level with the

best in the world, the pressure at least will be maximal. But of course we have no real way of measuring this matter in practice. Thus to summarise, the NIESR rightly observed that in the old structure there was a high FDI level, much of it in manufacturing; and it conjectured that there would be less FDI outside the EU and concluded that this would reduce productivity. However, as our argument indicates, this conclusion is a non sequitur: less could occur because the technology level in the new structure is higher, in which case productivity too would still be higher.

6 THE POLITICAL ECONOMY OF PROTECTIONISM

This chapter has focused on the costs and benefits of EU policies to its citizens and to those of the UK in particular. However, in attempting to understand the political economy of protection, we must explain the behaviour of the elites that make the decisions. These elites only care about these costs and benefits if their own interests are aligned with them. It is a well-known result in political economy that minorities with much to lose generate much bigger pressure on governing elites because they are able to command substantial votes and cash budgets, than do ordinary citizens who each individually have little to lose, even if their total loss dominates that of the minorities by a large margin (Olson, 1971). That is the situation here. Protection brings big gains to small groups such as the protected industries, and widespread costs across the citizenry that are relatively small for each. The situation is often aggravated by ignorance on the part of the general citizenry; indeed that ignorance is individually rational since the costs of acquiring technical knowledge will greatly exceed the possible gains, especially net of the organisational efforts required to deploy it. Again that is true here; ignorance about the true costs of protection is general and indeed the use of non-transparent methods (such as anti-dumping and industry agreements) to produce protection aggravates the problem of discovery.

The problem of getting support for reform is further aggravated by the existence of short-term costs during the transition to the long-term improvement in industrial allocation. Existing industries that cannot compete long term must contract causing unemployment, while the new industries that will take their place may take time to grow and absorb the unemployed. There is a substantial net gain when these two are balanced off but this net gain is not easily seen, and requires popular education. Again, this is hard to achieve in the face of minorities that will vociferously argue that there is a net loss.

Inside a nation the political process can produce mechanisms to get around these problems. Think-tanks can explain problems and mobilise support for solutions, acting as middlemen between the technical issues and the public and politicians. Sometimes a coalition can be built around a reform policy that raises general living standards while causing damage to particular groups; the latter can in these policies be sufficiently compensated out of general taxation that they are willing to go along with the reforms or at least not to obstruct them. However, this process is much more difficult at the EU level because while the EU has certain powers – for example, to set commercial policy – it does not have others (such as taxation) that can be used to compensate losers. (True, it has some regional and social funds but these are tightly allocated to other uses than such *ad hoc* compensation.) Thus, for example, liberalising trade policies that cause

national losers in certain industries are impossible for the EU to pursue without enlisting national support for those policies – which will in practice mean nations raising taxes to compensate the losers.

It so happens that the current EU Commission is in favour of liberalisation of trade, as well as the deregulation of services. However, it has proved powerless to get such policies enacted. They have been effectively vetoed by the nations whose principal industries would be damaged – even if their citizens would benefit from the reforms by more in total. The same nations have been equally unable to reform domestic institutions to reduce unemployment, for example. It is therefore no mystery in political economy why we observe the national elites in the EU finding protection to be in their interest.

Nor is it easy to see how the situation can be changed. One possibility would be to give the EU power to raise extra taxes *ad hoc*. But this would clearly be resisted by many member nations, if not all. Another possibility is for popular education in these issues to be spread more widely around EU citizens. Better information about the trade-offs would then begin to influence debates on domestic reform; these in turn could enable support to form for liberalisation at the EU level, with necessary compensation at the national level. It is easier therefore to understand what is wrong than it is to see ways for solutions to be advanced with any speed. At best the EU seems condemned to suffer poor policies for a long time to come, with reforms arriving at a glacial pace if at all.

A final word about the attitude of the UK elite to the EU: in the face of considerable evidence that the UK would be better off under free trade and accompanying free market policies outside the EU, why is there no agenda on the part of any of the three major UK political parties to leave the EU? Again the answer can be given in terms of the powerful groups ranged against such action – both agricultural and manufacturing industry lobbies are strongly against it for obvious reasons, while the general citizenry is ignorant of the economic case. (There is a debate about political aspects of EU membership focusing on sovereignty; but UK public opinion is ambivalent on this.) The elites of none of the major UK parties show much willingness to engage against these lobbies, or indeed to press for much in the way of further free market reform within the EU. It is as if there is policy exhaustion after the massive reforms of the 1980s and 1990s.

7 CONCLUSIONS

In this chapter we have attempted to estimate the costs, both to the UK and the REU, of the EU's protectionist trade policies in agriculture, manufacturing and services. Contrary to the popular impression that the EU is a mechanism for creating a 'competitive single market', it turns out that the EU is levying costs in wasted resources of the order of 3 per cent of GDP (or under favourable planning assumptions a large multiple of this) by protecting its industries from world competition. These costs apply to UK and REU citizens more or less alike and on a similar scale. However, the economic damage created by the EU does not stop there: because of the widespread welfare lobbies within member countries on the continent, the majority coalition within the EU has pressed for social protection and spending to be 'harmonised' at a fairly high level. It also faces a prospective pensions crisis, in the sense that it cannot be assumed that necessary cuts in pension promises or rises in the taxes to pay for them will be politically feasible. Thus

those member states whose pension plans are affordable and whose social regulations are the least burdensome on business, face the prospect of a potentially severe burden from the pensions problems elsewhere in the EU and from the pressure of harmonisation. We have been able to quantify this potential cost for the UK; but it is also a real threat to many other members, such as those recently joining from the east.

We have discussed briefly how it is that European elites would find it in their interests to perpetuate this protectionist situation. Under the EU institutions, minority groups have considerable power and incentive to block change and exercise this through their own national governments, as well as at the EU level. The EU Commission has no tax resources with which it could buy them off in the interests of EU citizens in general; it relies on its member nations to do this since they have the taxation powers, but even if one nation might get enough support to do so, reform requires that many must have a pro-reform political consensus. Hence the prospects for change are dim in the short term. In the longer term they might very slowly improve if either the EU could raise its own resources for such *ad hoc* needs or there were a general move at the national level towards reform.

SUMMARY

The EU has pursued protectionist policies not merely in food but also in manufacturing at the customs union level. In services it has not dismantled much of the existing national protectionism. The economic costs are calculated here at some 3 per cent of GDP for the UK and some 4 per cent for the rest of the EU – or much larger under liberal planning assumptions. Added to its social interventionism, these costs suggest that the EU has put political integration before economic efficiency. Standard mechanisms for changing the political economy of this protectionism are weak in the EU.

Keywords

Protectionism, manufactures, anti-dumping, tariff equivalent, customs union, competition.

JEL Classification

F13, F14.

NOTES

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1. We compute this as the weighted combination of textiles and furniture.
2. For this estimate we take the weighted average of all industries other than furniture and textiles.

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APPENDIX 15A

Bradford (2003) presented new measures of final goods trade protections in eight developed countries. He argued that the barriers to arbitrage between countries are barriers to trade. To measure the trade barriers, one needs to allow for unavoidable costs associated with shipping goods between countries. Once this is done, if there is a price gap for equivalent goods in two different countries, then the higher-price market is protected. To measure the protection barriers, one needs to use the factory prices of the good, not the retail prices. These factory/producer prices show which industries in which countries are most efficient.

Data

The data are collected by the OECD in order to calculate PPP estimates. We use the basic-heading price data published for the year 2002. (See Tables 15A.1–8.) All prices were converted to US dollars. The margins are calculated using the data from the latest national input–output tables, published for the year 2000. Given the list of prices of the goods and services in the OECD PPP data, we have to find the equivalent margins from the national input–output tables, but the two lists are not identical, so we have to find the best match by aggregating different products and services. For example, in the PPP list there are separate categories for engines and turbines, pumps and compressors, other general purpose machinery and so on; we aggregate them all to get the equivalent of manufacture of machinery except electrical in the input–output tables. The 'EU' figures are obtained by weighting individual EU countries' figures by GDP.

Calculating Protection Levels

The price data obtained for the OECD countries are consumer prices, not the producer prices that one needs in order to measure how much an industry is insulated from the world markets. Bradford's proposal was to convert these consumer prices to producer prices using data on distribution margins, which include wholesale trade, retail trade and transport costs. The method which we also follow here involves three steps.

First, given the consumer prices, one produces estimates of producer prices by peeling off the *ad valorem* margin, which is defined as the ratio of the value of output in consumer prices to the value of output in producer prices:

$$p_{ij}^{p} = \frac{p_{ij}^{c}}{1 + m_{ij}},$$

where:

p_{ij}^{p} = producer price of good i in country j,
p_{ij}^{c} = consumer price of good i in country j, as taken from the OECD data,
m_{ij} = margin for good i in country j, as taken from the national input–output table.

Second, to insulate the market from foreign competition requires us to take account of transport costs from one nation's market to another. The world price is derived using

data on export margin and international transport costs. The idea is that to be sold in the domestic market, a foreign good must travel from the foreign factory to the foreign border and then to the domestic border. Bradford stated that the domestic producer price must be compared with the landed price of the foreign good (world price). Adding the export margins to the producer prices generates the export price for each good in each country,

$$p_{ij}^{e} = p_{ij}^{p}(1 + em_{ij}),$$

where:

p_{ij}^{e} = export price of good i for country j,
em_{ij} = export margin of good i for country j.

The world price is found by adding the international transport cost to the lowest export price in the sample:

$$p_{i}^{w} = p_{iM}(1 + tm_{i}),$$

where:

p_{i}^{w} = world price of good i,
p_{iM} = min $(p_{i1}^{e}, \ldots, p_{in}^{e})$, the minimum of all export prices,
tm_{i} = the international transport margin for good i.

Finally, the ratio of each country's producer price to the world price indicates a preliminary measure of protection, ppr_{ij}:

$$ppr_{ij} = \frac{p_{ij}^{p}}{p_{i}^{w}}.$$

Example This example illustrates the above calculation procedure for the manufacture of cars and other road equipment in two countries.

To find the world price in the manufacture of cars and other road equipment across the countries, first for each country we turn the consumer price into the producer price

by dividing the consumer price by the domestic margin plus one, second recognising that goods must travel and be transported from one country to another, we use the export margin to calculate the export price of the goods (multipling the producer price by the export margin plus one) and see which country has the lowest export price in the category; this price is then used in combination with the international transport margin to derive the world price of this manufacturing category. The protection measure of each country is then just the ratio of that country's producer price over the world price. In the example, the protection measure for the manufacture of cars and other road equipment in the EU area is (0.823/0.662) = 1.243 or 24.3 per cent of protection.

We apply the above calculation in the manufacture sectors to compare the competitiveness between the EU area, Korea and the USA. We report all the steps.

Reference

Bradford, S.C. (2003), 'Paying the price: final goods protection in OECD countries', *Review of Economics and Statistics*, **85** (1), 24–37.

Table 15A.1 PPPs

	AUT	BEL	FIN	FRA	GER	IRL	ITA	NLD	PRT	SPA	DK	SWE	UK	KOR	US	EU
Textiles	1.22	0.96	0.62	0.71	0.79	0.87	0.67	1.09	0.40	0.62	0.78	0.68	1.07	0.57	1.00	0.81
Printing, publishing and allied industries	1.03	1.03	0.83	1.54	0.66	0.97	1.00	1.08	0.95	0.93	0.86	0.82	0.78	0.95	1.00	0.97
Machinery except electrical	1.27	1.30	1.31	1.48	1.32	1.39	1.22	1.25	1.23	1.20	1.45	1.35	1.41	1.04	1.00	1.33
Electrical machinery apparatus, appliances and supplies	1.20	1.21	1.33	1.31	1.34	1.39	1.04	1.33	1.38	1.14	1.34	1.02	1.30	1.25	1.00	1.25
Medical, precision and optical instruments, watches and clocks	1.08	0.93	1.16	1.24	1.15	1.19	1.26	0.94	2.47	1.08	0.99	1.12	1.18	1.04	1.00	1.17
Transport equipment*	1.00	0.92	1.18	0.99	0.96	1.12	0.87	0.98	1.04	0.89	1.39	0.95	1.02	0.65	1.00	0.97
Furniture and other	1.39	1.33	1.33	1.55	1.60	1.36	1.55	1.33	1.46	1.18	1.05	1.21	1.47	0.60	1.00	1.47

Note: *Excluding aircraft, helicopters, hovercraft and other aeronautical equipment due to unclear data.

Table 15A.2 Domestic margins

	AUT	BEL	FIN	FRA	GER	IRL	ITA	NLD	PRT	SPA	DK	SWE	UK	KOR	US	EU
Textiles	1.54	1.19	1.59	1.26	1.45	1.24	1.23	1.28	1.19	1.28	1.41	1.55	1.48	1.31	1.38	1.36
Printing, publishing and allied industries	1.27	1.10	1.33	1.37	1.16	1.05	1.42	0.96	1.22	1.23	1.20	1.17	1.26	1.19	1.12	1.24
Machinery except electrical	1.21	1.21	1.11	1.18	1.14	1.05	1.16	1.24	1.25	1.18	1.30	1.02	1.17	1.07	1.28	1.17
Electrical machinery apparatus, appliances and supplies	1.13	1.17	1.09	1.15	1.13	1.04	1.17	0.88	1.16	1.15	1.22	1.09	1.27	1.07	1.29	1.15
Medical, precision and optical instruments, watches and clocks	1.44	1.22	1.22	1.22	1.27	1.03	1.27	1.52	1.34	1.24	1.29	1.19	1.21	1.17	1.19	1.26
Transport equipment	1.18	1.15	1.45	1.15	1.10	1.37	1.25	1.33	1.27	1.13	1.60	1.15	1.21	1.05	1.20	1.19
Furniture and other	1.47	1.21	1.67	1.56	1.58	1.85	1.51	1.16	1.50	1.41	1.35	1.51	1.79	1.21	1.84	1.54

Note: Domestic margin is identified as the ratio of the total use at purchasers' prices in the use table and the total use at basic prices in the input–output table.

Source: National input–output tables.

Table 15A.3 Producer prices

	AUT	BEL	FIN	FRA	GER	IRL	ITA	NLD	PRT	SPA	DK	SWE	UK	KOR	US	EU
Textiles	0.80	0.81	0.39	0.56	0.55	0.70	0.54	0.85	0.33	0.48	0.56	0.44	0.72	0.44	0.72	0.60
Printing, publishing and allied industries	0.81	0.93	0.62	1.13	0.57	0.93	0.70	1.13	0.78	0.75	0.72	0.70	0.62	0.79	0.89	0.78
Machinery except electrical	1.05	1.08	1.18	1.25	1.16	1.33	1.04	1.01	0.98	1.02	1.11	1.32	1.21	0.98	0.78	1.14
Electrical machinery apparatus, appliances and supplies	1.06	1.04	1.23	1.14	1.18	1.33	0.88	1.51	1.19	0.98	1.11	0.93	1.02	1.17	0.78	1.09
Medical, precision and optical instruments, watches and clocks	0.75	0.76	0.95	1.01	0.90	1.16	1.00	0.62	1.84	0.87	0.77	0.94	0.98	0.89	0.84	0.93
Transport equipment	0.85	0.80	0.81	0.86	0.88	0.82	0.70	0.74	0.81	0.79	0.86	0.82	0.84	0.61	0.83	0.82
Furniture and other	0.95	1.10	0.80	1.00	1.01	0.73	1.03	1.15	0.97	0.83	0.78	0.80	0.82	0.50	0.54	0.95

Note: Producer price = PPP/domestic margin.

Table 15A.4 Export margins

	AUT	BEL	FIN	FRA	GER	IRL	ITA	NLD	PRT	SPA	DK	SWE	UK	KOR	US	EU
Textiles	1.09	1.07	1.05	1.03	1.06	1.00	1.10	0.98	1.00	1.15	1.12	1.03	1.15	1.06	1.07	1.07
Printing, publishing and allied industries	1.04	1.06	0.82	1.06	1.02	1.00	1.10	0.83	1.00	1.17	1.03	1.01	1.12	1.06	1.05	1.05
Machinery except electrical	1.09	1.12	0.97	1.07	1.06	1.00	1.04	1.12	1.00	1.09	1.10	1.11	1.08	1.05	1.07	1.07
Electrical machinery apparatus, appliances and supplies	1.02	1.08	0.83	1.06	1.05	1.00	1.04	0.92	1.00	1.07	1.12	1.03	1.14	1.03	1.05	1.05
Medical, precision and optical instruments, watches and clocks	1.11	1.10	1.01	1.08	1.08	1.00	1.04	1.55	1.00	1.06	1.21	1.08	1.11	1.11	1.10	1.10
Transport equipment	1.01	1.06	1.02	1.02	1.02	1.00	1.08	1.38	1.00	1.04	1.14	1.06	1.04	1.02	1.06	1.06
Furniture and other	1.06	1.08	1.04	1.12	1.06	1.01	1.10	1.05	1.00	1.07	1.07	1.09	1.10	1.10	1.08	1.08

Source: National input–output and use tables. The export margins are available from national input–output tables – the difference between exports at purchasers' prices in the use table and exports at basic prices by product in the input–output table. The EU export margins are used for the US due to unreliable values obtained by using the available data.

Table 15A.5 Export prices

	AUT	BEL	FIN	FRA	GER	IRL	ITA	NLD	PRT	SPA	DK	SWE	UK	KOR	US	EU
Textiles	0.87	0.87	0.41	0.58	0.58	0.70	0.60	0.83	0.33	0.55	0.62	0.45	0.83	0.46	0.78	0.64
Printing, publishing and allied industries	0.84	0.99	0.51	1.20	0.59	0.93	0.77	0.94	0.78	0.88	0.75	0.71	0.69	0.84	0.94	0.82
Machinery except electrical	1.14	1.21	1.15	1.35	1.23	1.33	1.09	1.13	0.98	1.12	1.22	1.47	1.31	1.03	0.84	1.22
Electrical machinery apparatus, appliances and supplies	1.09	1.12	1.02	1.21	1.24	1.33	0.92	1.39	1.19	1.06	1.24	0.96	1.16	1.21	0.82	1.15
Medical, precision and optical instruments, watches and clocks	0.83	0.84	0.96	1.09	0.97	1.16	1.03	0.96	1.84	0.92	0.93	1.01	1.09	0.99	0.92	1.03
Transport equipment	0.86	0.84	0.83	0.88	0.89	0.82	0.75	1.02	0.81	0.82	0.98	0.88	0.88	0.63	0.88	0.86
Furniture and other	1.01	1.19	0.82	1.11	1.07	0.74	1.14	1.20	0.97	0.89	0.83	0.87	0.91	0.55	0.59	1.03

Note: Export price = producer price * export margin.

Table 15A.6 Transport margins

	AUT	BEL	FIN	FRA	GER	IRL	ITA	NLD	PRT	SPA	DK	SWE	UK	KOR	US	EU
Textiles	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
Printing, publishing and allied industries	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
Machinery except electrical	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Electrical machinery apparatus, appliances and supplies	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Medical, precision and optical instruments, watches and clocks	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Transport equipment	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Furniture and other	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13

Source: Transport margin = US cif value of imports/US fob value of imports. The cif values are in the input–output table clearly, but the fob values are in the customs value/international merchandise data. The US transport margin is used as the international transport margin for all countries, where the transport margins in the four equipment manufacturing sectors is the average of international transport margins of machinery except electrical, electrical machinery and transport equipment sectors.

Table 15A.7 World prices

	AUT	BEL	FIN	FRA	GER	IRL	ITA	NLD	PRT	SPA	DK	SWE	UK	KOR	US	EU	CHN
Textiles	1.00	1.00	0.47	0.67	0.67	0.81	0.69	0.96	0.39	0.64	0.72	0.52	0.95	0.53	0.90	0.74	0.38
Printing, publishing and allied industries	1.01	1.18	0.61	1.44	0.70	1.12	0.92	1.12	0.94	1.06	0.89	0.85	0.83	1.01	1.12	0.98	0.60
Machinery except electrical	1.22	1.30	1.23	1.45	1.32	1.43	1.17	1.21	1.05	1.20	1.31	1.58	1.41	1.10	0.90	1.31	0.74
Electrical machinery apparatus, appliances and supplies	1.17	1.21	1.09	1.30	1.33	1.43	0.99	1.49	1.28	1.14	1.33	1.04	1.25	1.30	0.88	1.23	0.93
Medical, precision and optical instruments, watches and clocks	0.89	0.90	1.03	1.17	1.04	1.24	1.11	1.03	1.98	0.99	1.00	1.08	1.17	1.06	0.99	1.10	0.67
Transport equipment	0.92	0.90	0.89	0.94	0.96	0.88	0.81	1.09	0.87	0.88	1.05	0.94	0.95	0.89	0.94	0.93	0.45
Furniture and other	1.14	1.35	0.93	1.26	1.21	0.84	1.29	1.36	1.10	1.01	0.94	0.99	1.02	0.62	0.66	1.17	0.45

Note: Producer price after taking off all the margins = export price*international transport margin.

Table 15A.8 Weighted average protection rates for the EU and the US

	US (weight)	EU (weight)
Textiles	1.89 (0.067)	1.55 (0.060)
Printing, publishing and allied industries	1.00 (0.22)	1.00 (0.130)
Machinery except electrical	1.00 (0.217)	1.27 (0.264)
Electrical machinery apparatus, appliances and supplies	1.00 (0.151)	1.24 (0.183)
Medical, precision and optical instruments, watches and clocks	1.00 (0.100)	1.00 (0.070)
Transport equipment	1.23 (0.175)	1.22 (0.210)
Furniture and other	1.21 (0.068)	2.13 (0.082)
Weighted*	1.12	1.29

Note: Protection = domestic producer price/world price.
*The weights (bracketed) are industry shares of total value added.

16 Econometric evaluation of EU Cohesion Policy: a survey[1]

Tobias Hagen and Philipp Mohl

1 INTRODUCTION

More than one-third of the total budget of the European Union (EU) is spent on the so-called Cohesion Policy[2] via the structural funds (SF). Its main purpose is to promote the 'overall harmonious development' of the EU, to reduce disparities between the levels of development of the various regions, and to strengthen its 'economic, social and territorial cohesion' (Article 158 of the Treaty establishing the European Community). By making explicit the goal of reducing disparities in economic development, the Treaty implicitly requires that EU Cohesion Policy should affect resource allocation and factor endowment to promote growth. Hence, 'cohesion policies are aimed at increasing investment to achieve higher growth and are not specifically concerned either with expanding consumption directly or with redistribution of income' (European Commission, 2001, p. 117).

European Cohesion Policy is successful if disparities between regions are decreased. Therefore, the convergence process of EU regions is a question of high political importance. Generally, the empirical evidence points to a small convergence effect of all or some European regions at least (Barro and Sala-i-Martin, 1991; Sala-i-Martin, 1996; see, for a survey, Eckey and Türk, 2006). However, whether the potential success with regard to convergence results from the Cohesion Policy is an open question. Investigating the impact of the policy on economic growth and convergence is a wide research topic in applied econometric research. Nevertheless, the empirical evidence has provided mixed, if not contradictory, results. While some authors do find evidence of a positive impact of SF on economic growth (for example, Ramajo et al., 2008), others find little (for example, Esposti and Bussoletti, 2008) to no impact at all (for example, Dall'erba and Le Gallo, 2008).

Against this background, the aim of this chapter is to provide a fundamental review of the econometric evaluation of EU Cohesion Policy in order to shed light on the reasons for the diverging results. To be more precise, this chapter forms an introduction to the institutional background, presents the theoretical framework used to evaluate the Cohesion Policy, discusses the main econometric challenges, and surveys the existing literature. Note that this chapter does not include a discussion on the question of whether or not and to what extent the Cohesion Policy may be effective from a theoretical point of view. A more general discussion on the Regional Policy can be found in Baldwin and Wyplosz (2009) or Jovanović (2009). Furthermore, the spatial effects of economic integration – also from the EU – are treated by Camagni and Capello in this Handbook (Vol. II, ch. 7).

This chapter is structured as follows. Following this introduction, Section 2 starts

with a brief introduction to the institutional background, before Section 3 explains how the effectiveness of EU Cohesion Policy can be evaluated. This is followed by a review of the main econometric challenges and an outline of potential solutions in Section 4, while Section 5 discusses the related literature against the background of Sections 3 and 4. Finally, Section 6 concludes and provides some remarks for future research.

2 INSTITUTIONAL SETUP OF EU COHESION POLICY

EU Cohesion Policy started in 1975 with the introduction of the European Regional Development Fund (ERDF). The ERDF focused on expenditure for development projects in the poorer regions. Since that time, the Cohesion Policy has gained importance; several additional funds have been created and it has become the most important budget item, comprising almost 36 per cent of the total EU budget in the 2007–13 period (the second most important item is the Common Agricultural Policy).

The Cohesion Policy can be divided into at least two policy regimes: before and after 1989. Before 1989, the EU budget was implemented annually and the Regional Policy focused on the ERDF, where the main beneficiaries were Italy, the UK, France and Greece. After the passage of the Single European Act in 1987, the Regional Policy was allocated within multiannual 'programme periods', the first of which ran from 1989 to 1993.[3] Most importantly, the explicit purpose of the Cohesion Policy was established, namely to enhance cohesion and to reduce welfare disparities among the EU regions. The EU also introduced a number of further financial instruments to implement the structural policies. The most important of these are the European Social Fund (ESF), the Guidance Section of the European Agricultural Guidance and Guarantee Fund (EAGGF) and the Cohesion Fund. In addition, several allocation rules and guiding principles were introduced. In our context, the main principle of the Cohesion Policy is that the payments by the EU have to be co-funded by the member states and must not crowd out national/regional policy expenditures.

Since 1989, European Cohesion Policy has addressed regional problems under various so-called 'objectives'. These objectives reflect the key priorities for EU expenditures. They are listed for the last two financial periods in Table 16.1. The current Cohesion Policy (for the 2007–13 period) is not described here since it has not yet been taken into account in econometric studies.[4] The most important objective by far is to support lagging regions (the so-called Objective 1 regions), comprising approximately 75 per cent of the total SF. The other objectives are targeted at areas affected by industrial decline (Objective 2), fighting long-term unemployment (Objective 3), adaptation to industrial change (Objective 4), reform of agricultural sectors (Objective 5a), rural areas (Objective 5b) and sparsely populated areas (Objective 6). Note that there is a clear-cut definition on what qualifies a region as an Objective 1 receiver (regional GDP has to be lower than 75 per cent of the EU average), while a clear allocation scheme is missing in the case of the last two objectives. Table 16.1 shows that both the number and the definition of the objectives are not fixed over time, but rather that they may vary over the programme periods. For example, the number of objectives was reduced from six to three in the 2000–2006 financial framework in order to strengthen the concentration of EU support.[5]

Table 16.1 Cohesion Policy objectives 1994–2006

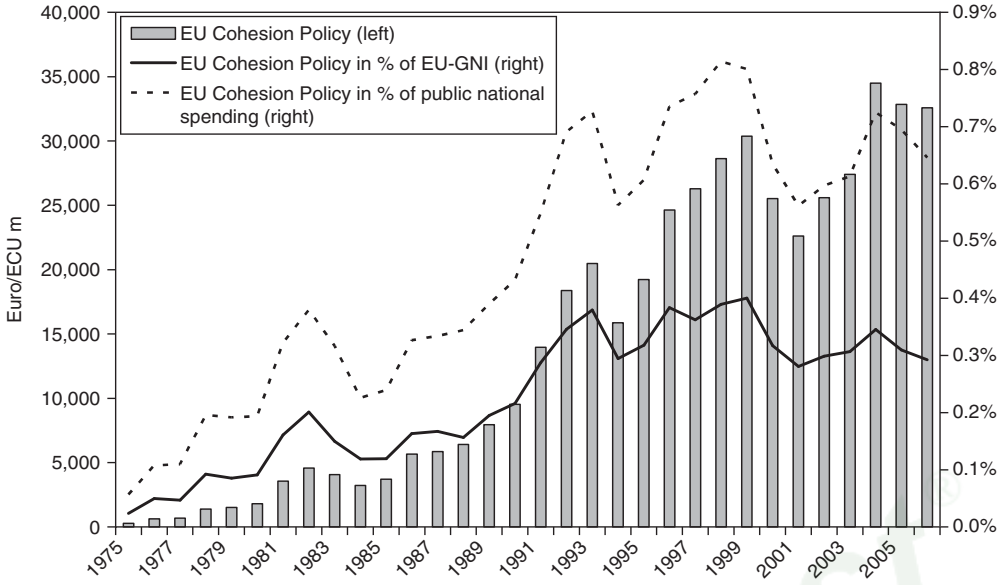
Financial framework: 1994–1999	Financial framework: 2000–2006
Obj. 1: To promote the development and structural adjustment of regions whose development is lagging behind the rest of the EU (comprising 67.6% of total SF)	Obj. 1: Supporting development in the less prosperous regions (69.7% of total SF)
Obj. 6: Assisting the development of sparsely populated regions (Sweden, Finland only) (0.5% of total SF)	
Obj. 2: To convert regions seriously affected by industrial decline (11.1% of total SF)	Obj. 2: To support the economic and social conversion of areas experiencing structural difficulties (11.5% of total SF)
Obj. 5b: Facilitating the development and structural adjustment of rural areas (4.9% of total SF)	
Obj. 3: To combat long-term unemployment and facilitate the integration of young people and of persons excluded from the labour market into working life (9.4 % of total SF)	Obj. 3: To support the adaptation and modernisation of education, training and employment policies in regions not eligible under Obj. 1 (12.3% of total SF)
Obj. 4: To facilitate the adaptation of workers to industrial changes and to changes in production systems (1.6 % of total SF)	

Source: European Commission.

However, this rearrangement was purely cosmetic, as the same eligibility criteria continued under different labels. This corresponds precisely to one conclusion which can be drawn from the history of the Cohesion Policy: once introduced, a particular objective is rarely (completely) phased out in the future.

Figure 16.1 shows the historical development, including the total (nominal) EU Cohesion Policy payments[6] (vertical bars) and their shares relative to the EU-GNI (solid line) and to the public national spending (dotted line). It becomes clear that there is a long-term upward trend in payments when measured in absolute terms, which can be explained, *inter alia*, by the enlargement steps of the EU (1973: EU9; 1981: EU10; 1986: EU12; 1995: EU15; 2004: EU25; 2007: EU27). By contrast, payments measured as a percent of EU-GNI or public national spending have remained almost constant since 1993. Furthermore, Figure 16.1 shows that – on average – SF payments do not seem to be particularly large compared to total public spending, with an EU27 average of below 0.7 per cent in 2007.

However, focusing on the relatively small EU-average share might obscure the fact that the EU Regional Policy is quite important for some countries. Figure 16.2 compares the Cohesion Policy payments with the public investment in the member states. It becomes clear that EU spending is quite important for the poorest countries, that is, those countries receiving money from the Cohesion Fund, namely the so-called 'old' (Spain, Greece, Ireland and Portugal) and 'new' (Eastern European countries) cohesion countries. In addition, focusing on the regional level, EU spending has a particularly high importance for some regions (for example, Extremadura received more than 2.7



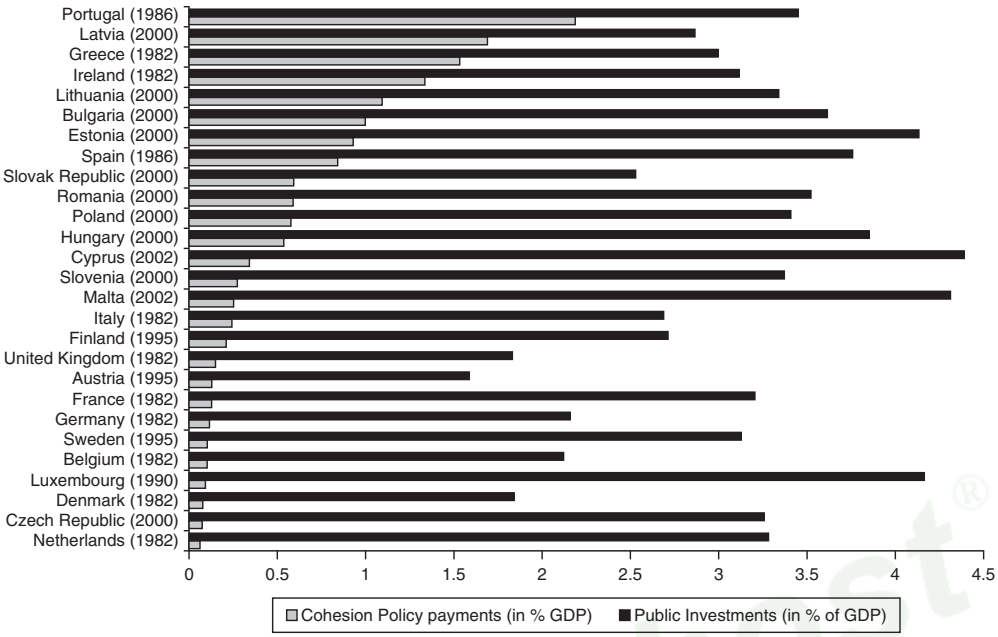
Source: European Commission (2008); own calculations.

Figure 16.1 Development of EU Cohesion Policy payments

per cent of EU support (as a percent of GDP) in 2002). Thus, these figures illustrate two aspects: First, EU policy matters at least in some regions and/or member states. Second, given the volume of the spending, it may indeed be difficult for some countries to absorb the transfers and to co-finance European projects without cutting expenses elsewhere.

Furthermore, it should be noted that ever since the introduction of the multiannual financial framework, the European Commission determines so-called 'commitments', which do not have to be equal to the final flows of EU support, the so-called SF 'payments'. For example, due to missing absorption capability, the commitments may not be entirely depleted or may be called up with a delay of one or two years. In this context, the so-called '$N + 2$ rule' states that SF payments have to be called up with a delay of two years at the latest. This introduces big time lags between the determination of the eligibility for EU funding and the final flows of EU money. Figure 16.3 clarifies this issue by using the current 2007–13 financial framework as an example. The statistical data basis to determine which regions receive EU support is based on the annual averages from 2000 to 2002, whereas the list of supported regions is published in 2006. As the financial framework runs from 2007 to 2013, the latest possibility to call up EU support is in 2015 due to the $N + 2$ rule. Hence, there is a gap of up to 15 years between the underlying statistical data and the calling up of EU support.

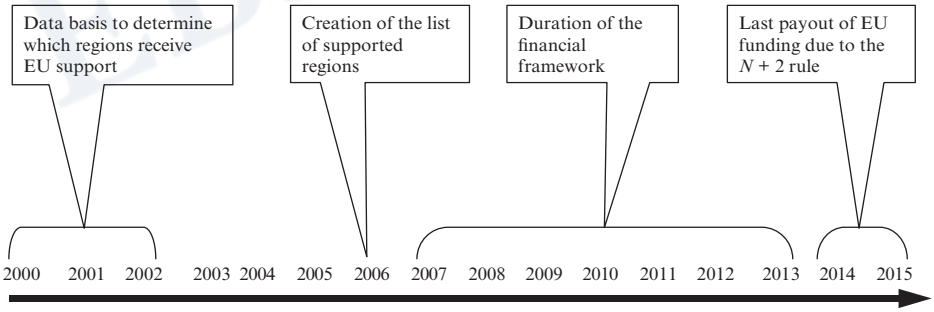
Finally, some studies try to explain the entire development of the EU expenditure (and revenue) side in the light of political negotiation processes. Due to the veto power, Cohesion Policy is affected by side-payments and the bargaining power of the EU member states (see, for example, Blankart and Kirchner, 2003; Feld, 2005; Feld and



Note: The beginnings of the time periods under observation differ between countries. For this reason the first year of observation is listed in brackets.

Source: Own calculations based on European Commission (2008).

Figure 16.2 EU Cohesion Policy payments and public investment until 2007 (as percent of GDP)



Source: Heinemann et al. (2010).

Figure 16.3 Sluggish adaptation process to EU funding

Schnellenbach, 2007). A prominent example is the establishment of the Cohesion Fund in 1994, which can be explained by the fact that the poor countries had to be compensated against losses of the single currency of the European Monetary Union (van der Beek and Neal, 2004).

3 MEASURING THE EFFECTIVENESS OF COHESION POLICY

There are several approaches to the evaluation of Cohesion Policy. One may distinguish between *ex ante* and *ex post* studies on the one hand, and qualitative, as well as quantitative, methods on the other. Case studies are an example of qualitative studies. Since this type of study is beyond the scope of this chapter, a discussion is omitted here (see, for example, Davies et al., 2007; Milio, 2007). With regard to quantitative studies, one may distinguish between macroeconomic simulation studies (which can be used for *ex ante*, as well as *ex post*, evaluations; see, for example, Bradley and Untiedt, 2007) on the one hand and (*ex post*) econometric studies on the other. The results of the simulation studies strongly depend on the – more or less – plausible assumptions. For example, in this respect it is often assumed that EU Cohesion Policy leads to an increase in investments and that these are profitable. However, this assumption typically leads to the result that all models indicate a positive effect of Cohesion Policy. Hence, the results of simulation models can be interpreted as an estimate of the *potential* of Cohesion Policy and should not be taken as empirical evidence in favour of its *effectiveness*.

As a consequence, we focus on (quantitative *ex post*) econometric studies here. In these studies, the sample consists of EU countries or regions. Beyond this, there are micro-econometric studies using individual- or firm-level data evaluating the effects of single programmes (co-)financed by SF on various outcome variables at the micro level. For example, Bondonio and Greenbaum (2006) analyse the effects of (Objective 2) business investment incentives on employment using firm-level data.

So far, theoretically founded econometric evaluations of the Cohesion Policy have mostly been based on the neoclassical growth theory.[7] In the following, it is shown how this theory is applied to panel data, although it was originally applied to cross-sectional data.[8]

The literature on the convergence of income levels (for example, GDP per capita) distinguishes between the so-called β- and σ-convergence. The former predicts that if countries have the same steady-state determinants converging to a common balanced growth path, then those countries with relatively low initial income levels grow faster than richer countries (Durlauf et al., 2005, p. 585). Moreover, β-convergence can be easily evaluated in a linear regression context, for example, of the neoclassical growth model. Assuming that β-convergence holds for $i = 1, \ldots, N$ regions, the natural logarithm of income y of region i at time t (for example, measured as GDP per capita) can be approximated by:

$$\ln(y_{it}) = a + (1 - b)\ln(y_{it-1}) + u_{it}, \tag{16.1}$$

where $0 < b < 1$ and u_{it} is an i.i.d. error term (Sala-i-Martin, 1996; Young et al., 2008). Since a is assumed to be constant across regions, the balanced growth paths are identical. Rearranging (16.1) yields the more common version of the neoclassical growth model (Young et al., 2008):

$$\ln(y_{it}) - \ln(y_{it-1}) = a + b\ln(y_{it-1}) + u_{it}. \tag{16.2}$$

Hence, $b < 0$ implies a negative correlation between growth and initial log income.[9]

The neoclassical growth model assumes that economies (countries or regions) with similar economic conditions converge with respect to their income level. *Absolute/unconditional convergence* refers to an inverse relationship between the growth of income and the initial level if control variables are absent, that is, a significantly negative $\hat{b}$ in the regression framework described above. *Conditional convergence* prevails if this relationship still holds after conditioning on further variables. Hence, the neoclassical growth model predicts a negative $\hat{b}$. Empirical studies provide evidence in favour of both hypotheses (Islam, 1995, 2003 as well as Cuaresma et al., 2008). The estimated convergence rates are typically a little lower in cross-section studies (approximately 2 per cent per year, see Barro and Sala-i-Martin, 2004) than in panel studies (Lee et al., 1998) (see Quah, 1996 for a critical review on the 2 per cent finding).

To make the distinction between conditional and unconditional convergence clear, we plug fixed regional or country effects into equation (16.2) and distinguish two simple regression equations for regional-level data (Ederveen et al., 2002):

$$\ln(y_{it}) - \ln(y_{it-1}) = a + b\ln(y_{it-1}) + c_i + u_{it} \tag{16.3a}$$

$$\ln(y_{it}) - \ln(y_{it-1}) = a + b\ln(y_{it-1}) + \mu_i + u_{it}, \tag{16.3b}$$

with c_i denoting country-specific fixed effects (a set of country dummies) and μ_i region-specific fixed effects (a set of region dummies).

While b in equation (16.2) is a measure of absolute convergence, (16.3a) and (16.3b) provide estimates of conditional convergence. To be precise, equation (16.3a) analyses convergence conditional on whether a region lies in a particular country. Thus, it allows for differences in steady states of income between country 1 and country 2 (country-specific steady states). It assumes, however, that within countries, different regions receive equal income levels. Equation (16.3b) assumes region-specific steady states, that is, there may be income gaps between regions which are never bridged even within countries (see Islam, 2003 for a more detailed discussion on this topic).

The concept of σ-convergence is a measure of statistical dispersion of income at period T (Barro and Sala-i-Martin, 1991, 1992). σ-convergence holds if the dispersion of income levels declines between t and $t + T$ (Durlauf et al., 2005), that is, if:

$$\sigma^2_{\ln Y_t} - \sigma^2_{\ln Y_{t+T}} > 0. \tag{16.4}$$

The concepts of β- and σ-convergence are linked: β-convergence provides the necessary, but not the sufficient, condition for σ-convergence. As a consequence, σ-convergence can only be achieved with β-convergence, whereas this does not hold the other way round. Hence, even if β-convergence can be observed (poorer regions grow faster than richer ones), the dispersion between the income levels of regions may increase, so that there would be no σ-convergence.

Almost all econometric studies analysing the growth effects of EU regional policy are based on a neoclassical growth model of the Solow (1956) and Swan (1956) type, that is, equation (16.2) is augmented by further theory-driven variables. In this context, SF payments are assumed to correspond to investments (Ederveen et al., 2006; Bähr, 2008; Mohl and Hagen, 2008). A regression equation for regional data may be specified as:

$$\ln(y_{it}) - \ln(y_{it-1}) = a + b_1 \ln(y_{it-1}) + b_2 \ln(sf_{it-1}) + b_3 \ln(sav_{it-1}) + b_4(n_{it-1} + g + \delta) + b_5 \ln(educ_{it-1}) + \mu_i + \lambda_t + u_{it}, \quad (16.5)$$

where sav_{it-1} is the savings rate, n_{it-1} is the population growth rate, g and δ stand for the technological progress and the time discount factor. Most authors follow the seminal paper by Mankiw et al. (1992) and assume that g and δ are constant over time and region and jointly amount to 5 per cent. Furthermore, $educ_{it-1}$ measures the education level of the population (for example, percentage share of population with higher education). Finally, equation (16.5) includes fixed region effects (μ_i) as well as fixed time effects (λ_i). The reasons for their inclusion will be discussed in Section 4.

The main variable of interest in this kind of literature is the SF variable (sf_{it-1}), which is expressed as payments as a share of nominal GDP (among others, Bähr, 2008) or as a percentage of persons employed (for example, Esposti and Bussoletti, 2008). If the estimate of b_2 is positive and significantly different from zero, the SF payments positively affect the regions' steady-state growth rate, hence, they enhance the transitional growth rate of each region towards its own steady state (Dall'erba and Le Gallo, 2008).

Most papers focus only on the evaluation of the sign of the coefficient of SF and neglect the size of its impact. However, the latter should be of relevance since an expensive EU Regional Policy with a tiny size effect might be effective but not 'cost-efficient'. Those authors who discuss the size effect usually interpret the short-term elasticity of the impact. Given that the variables of equation (16.5) are specified in logarithmic terms, a 1 per cent increase of the SF variable increases the growth rate by $\hat{b}_2$ per cent. However, note that equation (16.5) equals the dynamic approach shown in equation (16.1), so that it is more convincing to interpret the long-term impact of variables, which can simply be calculated as $\hat{\varphi} = (\hat{b}_2 / - \hat{b}_1)$ in the case of SF payments. The long-term elasticity can be interpreted as showing that a 1 per cent increase of SF payments (as a percentage of GDP) raises the real GDP per capita by $\hat{\varphi}$ per cent. Unfortunately, most studies do not discuss the quantitative long-term impact.

Note that regressions of the equation (16.5) type only allow for an estimation of the effect of SF payments on growth, and hence we cannot learn directly from $\hat{b}_2$ whether or not a poor region *A* catches up with a rich region *B*. However, this is precisely one important aim of the Cohesion Policy. What we learn from $\hat{b}_2$ is 'only' whether and to what extent SF promotes growth. Nevertheless, since the allocation criteria of the SF (in the case of Objective 1 payments, as well as total SF payments) imply a negative correlation between the level of GDP per capita and SF payments, a significantly positive $\hat{b}_2$ can be interpreted as an indication for convergence at least.

In order to directly measure the effects of the Cohesion Policy on convergence, Eggert et al. (2007) propose the following specification using regional data:

$$\ln(y_{it}) - \ln(y_{it-1}) = a + b_1 \ln(y_{it-1}) + b_2 \ln(sf_{it-1}) + c \ln(y_{it-1}) \ln(sf_{it-1}) + \ldots + u_{it}. \quad (16.6)$$

This equation states that the estimated effect of SF payments depends on the initial income level. In this case, $\hat{b}_2$ indicates the impact of SF payments given an initial income

level (y_{it-1}) equalling zero, which is obviously of no use as there are no regions with a GDP of zero. Given a positive $\hat{b}_2$, a negative $\hat{c}$ implies that this positive effect declines with an increasing initial income level, which, in turn, may be interpreted as a sign of convergence. One possibility of deriving meaningful quantitative conclusions from equation (16.6) is to calculate the marginal effects of SF payments across the observed range of initial income level y_{it-1} by $\hat{b}_2 + \hat{c}\ln(y_{it-1})$. Subsequently, these marginal effects might be illustrated graphically including confidence intervals around the slope to show the statistical significance level (see Brambor et al., 2006).

Several studies, especially those using country-level data (for example, Ederveen et al., 2006 and Bähr, 2008), investigate whether the effectiveness of SF payments depends on institutional and economic aspects of the country, such as the quality of institutions,[10] the member states' federal structure (decentralisation) or the openness to trade. They use specifications similar to the following:

$$\ln(y_{it}) - \ln(y_{it-1}) = a + b_1\ln(y_{it-1}) + b_2\ln(sf_{it-1}) + c_1 Cond_{it} + c_2 Cond_{it}\ln(sf_{it-1}) + \ldots + u_{it}, \quad (16.7)$$

where $Cond_{it}$ denotes a variable including the aspects of the country i in year t and $Cond_{it}\ln(sf_{it-1})$ is an interaction term. Solid results should again be derived by calculating and illustrating the marginal effects as indicated above.

A further issue is the question *through which channel* SF payments affect growth. The assumption underlying virtually all empirical studies is that the Cohesion Policy increases regional investments, leading to a higher steady-state capital stock per capita and, ultimately, to a higher GDP. This may be justified by the nature of SF spending which consists predominantly of investments. However, as pointed out by Bouvet (2005) and Esposti and Bussoletti (2008), SF payments may influence long-run growth in two more ways within the neoclassical growth model. First, it may increase the initial level or the growth of the regional total factor productivity (TFP). Second, it may affect the labour market, that is, the growth rate of the initial workforce. One problem here concerns the many neoclassical growth specifications, which (implicitly) assume full employment or constant employment rates over time, as well as across regions. Since the employment rates differ between European states and evolve differently over time, and since SF payments are likely to affect employment, Esposti and Bussoletti (2008) propose using growth of GDP per employment (which corresponds to average labour productivity) rather than growth of GDP per capita as a dependent variable. However, it may be argued that the goal of the Cohesion Policy is to promote convergence of GDP per capita, implying that this variable is more appropriate. Nevertheless, Esposti and Bussoletti's argument points to the fact that it is necessary to evaluate the labour market effects of the Cohesion Policy, an undertaking that has been neglected so far (exceptions are Bouvet, 2005; Becker et al., 2008 as well as Dall'erba and Le Gallo, 2007).

4 MAIN ECONOMETRIC CHALLENGES AND POTENTIAL SOLUTIONS

When estimating the effects of SF payments on economic growth and convergence, several methodological challenges have to be considered.

The estimation of the relationship between SF payments and the growth rates in regions or countries is complicated by the potential endogeneity problem, that is, the fact that within a regression model such as equation (16.5), the covariance between at least one of the explanatory variables (for example, the SF variable) and the disturbance term is not equal to zero (Wooldridge, 2002). This endogeneity may be attributed to the following four issues.

First, there is the danger of biased estimates due to *reverse causality*, leading to an underestimation of the effectiveness. The allocation criteria of the SF commitments are likely to be correlated with the dependent variable 'economic growth'. First and foremost, the allocation of SF is based on the ratio of the regional GDP per capita (in purchasing power parity: PPP) and the EU-wide GDP. If this ratio is below 75 per cent, the region is a so-called Objective 1 region, implying that it is eligible for the highest transfers relative to GDP. Furthermore, the allocation of Objectives 2 and 3 depends, *inter alia*, on the regional unemployment rate, the employment structure and the population density. Moreover, the effective payments by the Commission to the regions depend on the regions' or countries' abilities to initiate and to co-finance these projects. This ability may be higher in times of higher economic growth rates, for example, due to higher tax revenues. Nevertheless, some authors argue that the problem of reverse causality might be mitigated by the multiannual programme periods, in which the determination of the eligibility for EU funding is made several years before the actual flows of EU spending (see in Section 2).

Second, there may be *unobserved variables* (*unobserved heterogeneity*) or (due to missing data availability) *omitted variables*, which have an impact on the regional growth rates, but which are not included in the equation and are thus part of the error term of the specification. If these omitted variables are correlated with one explanatory variable, this explanatory variable is endogenous. A special case of an omitted variable bias is the relevance of spillover effects: SF payments may increase the economic growth rate which, in turn, may affect the neighbour's growth positively. If these spillover effects cannot be separated from the 'original' impulse, the estimated effect of SF payments is biased. This problem might be of less importance when using country data. By contrast, there is strong empirical evidence indicating that regional spillover effects do play a significant role at the regional level (Abreu et al., 2005; Arbia et al., 2008). Hence, the effects of the Cohesion Policy in one region are obviously not limited to that region, since there are regional spillovers to other (neighbouring) regions. The fact that the European classification of regions is based on political, rather than on economic, criteria intensifies this problem.

Third, keeping the identity of equations (16.1) and (16.2) of Section 3 in mind, it is obvious that equation (16.3) equals a dynamic approach. Hence, simply applying a fixed effects estimator in a dynamic setup leads to a correlation of the lagged dependent variable and the error term results in an underestimation of the lagged dependent variable which is well-known as the 'Nickell bias' (Nickell, 1981; Magrini, 2004).

A fourth problem is related to *measurement errors.* This problem is of special concern with regard to the SF variable at the regional level. The annual reports on SF published by the European Commission comprise regional commitments and payments only for the 1994–99 period. Unfortunately, since 2000, these reports contain data only at the country level. Furthermore, before 1994, only SF commitments are available. However, using SF commitments instead of payments might lead to biased results. Depending on the assumptions on how SF commitments and payments are correlated, SF commitments might be correlated with the error term. By contrast, the problem of data availability with regard to SF payments is less severe at the country level. Despite that, to the best of our knowledge, it is not possible to distinguish between the different objectives and funds for a long time period; at least there is information on the total EU Regional Policy payments for the 1976–2007 period (European Commission, 2008).[11]

Apart from these endogeneity-related aspects, the estimations might be biased by a fifth issue. Although growth theory provides well-established suggestions for the estimation of growth relationships, it is *ex ante* not clear which economic growth model to use and which *functional form* is appropriate for the effect of SF payments (Durlauf et al., 2008). There may be nonlinearities and interactions with covariates, which may lead to biased estimates if they are not taken into account. Similarly, the 'real' impact of EU regional policy on growth might be misspecified because the time structure of its effects is *ex ante* unknown. It may be argued that SF projects, such as infrastructure investments, only become effective for growth after some time lag.

Finally, a fundamental – but often ignored – sixth econometric problem is related to the choice of the *appropriate control variables*, that is, which variables should be included in the right-hand side of the regression model. For example, one may derive from growth theory that growth of GDP per capita is affected by (private and public) investments and that an omission may bias the estimated results. However, the inclusion of the investment variable into the regression evaluating the growth effects of SF payments might lead to biased results. Since SF payments may stimulate growth through the channel 'investment' (leading to a higher steady-state capital stock per capita), the inclusion of the investment variable might render it impossible to evaluate the investment increasing effect of SF payments on growth. More generally: one should be careful not to include control variables which may also serve as a dependent variable of the Cohesion Policy (Angrist and Pischke, 2009 call these variables 'bad controls').

Obviously, given the current state-of-the-art econometric models and the available data, it is not possible to deal with all the problems mentioned above simultaneously. However, by taking into account the methodological challenges and by comparing the results of several empirical approaches, one might hope to get an idea about the range of the 'true effect' of SF payments on growth. There exist at least a few potential approaches to coping with the challenges presented above individually, as will be illustrated in the following.

First, using panel data helps to solve some problems. If (un-)observed omitted variables affecting growth are constant over time, they are eliminated by including fixed effects or by first-differencing. If these unobserved variables are not constant, methods such as instrumental variable (IV) estimators are necessary. Moreover, unobserved time effects (such as common macroeconomic shocks) influencing growth might be relevant (Bond et al., 2001). A very common and flexible approach to avoiding parametric assumptions

is to use a set of common (for example, annual) time dummies which can control for effects common to all regional units, such as pan-European business cycles (see equation (16.3) in Section 3). This may also reduce the problem of regional spillovers (Bronzini and Piselli, 2009). In order to avoid the fact that the use of time dummies leads to a significant loss of degrees of freedom (which is most relevant in the case of the popular general method of moments (GMM) estimators due to the matrix of instruments), one may transform the variables into deviations from time means (that is, the mean across the N individual regions for each period) which is equivalent to the use of time dummies (Bond et al., 2001). If necessary, time effects may be modelled in a more complex manner: for example, one may allow for country–time specific effects in regional data by defining country-specific annual dummies. Another approach is to define country- or region-specific time trends (see Wooldridge, 2002, as well as Hagen and Mohl, 2009).

In order to deal with the first and second problems, an IV estimator combined with fixed effects or first differences seems to be the right choice. However, to the best of our knowledge, no convincing external IV has been proposed in the literature (exceptions may be the studies by Dall'erba and Le Gallo, 2008, as well as Bouvet, 2005 summarised above). Hence, identification has to be based on internal instruments via the GMM estimators (Arrelano and Bond, 1991; Roodman, 2009a). In addition, GMM estimators are also suitable for dealing with the third challenge introduced above, by instrumenting the initial income level y_{it-1} (as well as further variables) by lagged values. On the one hand, there is evidence that the first-differenced GMM (FD-GMM) estimator by Arellano and Bond (1991) has a large finite sample bias and poor precisions when the time series are persistent, so that the system GMM (SYS-GMM) estimator by Blundell and Bond (1998) should be preferred. On the other hand, some applications question the superiority of the SYS-GMM estimator because the additional instruments might not be valid (Lucchetti et al., 2001). Hence, one might apply different estimators to draw well-founded conclusions. Note that the consistency of both GMM estimators is based on large N, which might not be given in the analyses using country-level data. However, there is preliminary evidence of Monte Carlo simulations showing that, given predetermined explanatory variables, the SYS-GMM estimator has a lower bias and higher efficiency than the FD-GMM or the fixed effects estimator (Soto, 2006). Nevertheless, country-level data (such as EU15 data) may still be too small for GMM estimations.

One should be careful as regards the use of instruments when applying GMM estimators: using too many instruments can overfit instrumented variables (Roodman, 2009b), reduce the power properties of the Hansen test (Bowsher, 2002) and lead to a downward bias in two-step standard errors (Windmeijer, 2005).[12] One solution might be to include lag limits or to collapse the set of instruments.[13] Since an increasing number of studies on the effects of the Cohesion Policy apply GMM estimators, these aspects are highly relevant and should be taken into account in order to avoid misleading estimation results.

Applying spatial panel econometric techniques helps to control for spatial spillover effects, which is of special concern when using region-level data (for a survey, see LeSage and Pace, 2009). The usual approach is to specify a weight matrix containing information on the number, or distance, of neighbours (Anselin et al., 2004). This is done by focusing on (i) the contiguity of each region, (ii) its k-nearest neighbours, or (iii) the geographical distance (for example, expressed in kilometres) to its neighbours. Sometimes the weight matrices are weighted by some economic variables (for example, using trade

data between regions). However, often geographical distance-based weight matrices are preferred because they are strictly exogenous. Nevertheless, the right choice of the weight matrix is of fundamental concern, as incorrectly specified weight matrices might lead to wrong conclusions (LeSage and Fischer, 2008).

Generally speaking, including a weight matrix does affect the efficiency and/or the consistency of the OLS estimator, leading to biased results. Hence, the spatial econometric estimations are usually estimated by maximum likelihood (Anselin, 1988; Anselin and Hudak, 1992; Elhorst, 2010) or by the GMM (Kelejian and Prucha, 1998, 1999; Bell and Bockstael, 2000). There are two predominant approaches to specifying the spatial model: one can either include a spatially weighted dependent variable (the so-called 'spatial lag model') or a spatially autocorrelated error ('spatial error model') in the regression model. These approaches were originally focused on cross-sectional (Anselin, 1988, 2006; Anselin and Bera, 1998) and static panel datasets (Elhorst, 2003) and they have been extended to the case of dynamic panel estimators (Badinger et al., 2004; Yu et al., 2008). Recently, further approaches have been introduced, such as including both spatial lag and spatial error simultaneously (Kelejian and Prucha, 1998; Lee, 2003) or including spatially weighted independent variables (the so-called 'spatial Durban model', see, for example, Elhorst et al., 2006 or Ertur and Koch, 2007). Unfortunately, there is as yet no estimator that controls for both spatial spillover and endogeneity of further independent variables (besides the lagged dependent variable) within a panel data framework.

The fourth problem should be addressed by using SF payments instead of commitments. As mentioned above, the differences between payments and commitments can be sizeable.

With regard to the fifth problem, almost all studies are based on a neoclassical growth model. Despite some criticism due to its strict assumptions (Dall'erba and Le Gallo, 2008), the use of the neoclassical growth model might be explained by the limited data availability at the regional level.[14] Possible approaches to this problem have been proposed by Becker et al. (2008) as well as by Hagen and Mohl (2008), who avoid strict functional form assumptions by using treatment effect methods (see Austin, 2007 for a recent survey for applied researchers). These studies will be summarised in Section 5 in greater detail.

In order to take into account that SF payments might be effective after some time lag, Rodríguez-Pose and Fratesi (2004) and Mohl and Hagen (2008) include past values of the SF variable besides contemporaneous values. For example, Mohl and Hagen (2008) start their empirical analyses by excluding any SF variable, and then gradually add the lagged SF payments, beginning with a lag of one year and ending up with a specification comprising SF with a lag of one to five years: $\Sigma_{j=1}^{5} \ln(SF_{i,t-j})$.[15]

5 EMPIRICAL EVIDENCE

The main aspects of the previous literature on the impact of the Cohesion Policy on economic growth are summarised in the following. We distinguish between studies using country-level data (Table 16.2), regional-level data in a multicountry framework (Table 16.3), and regional-level data within one country (Table 16.4).

Generally, EU regions are classified into three different groups by the European

Commission according to the 'Nomenclature des unites territoriales statistiques' (NUTS). These units refer to the country level (NUTS-0) and to three lower subdivisions (NUTS-1, NUTS-2 and NUTS-3) which are classified according to the size of population (Eurostat, 2007). The advantage of regional data for econometric analyses is the resulting large sample size which allows the application of methods based on a large number of cross-sections (*N*). Furthermore, regions (as opposed to countries) are usually the unit of interest for the Cohesion Policy. By contrast, using country-level data comes with the advantage of larger data availability but with the drawback of small sample sizes (EU12, EU15 and so on). Moreover, region-specific effects cannot be analysed by definition.

Apart from the choice of the appropriate sample, the studies differ in the period covered, the econometric methods applied, the type of dataset used (cross-section versus panel) and the operationalisation of SF payments. With respect to the last, theory does not provide an unambiguous indication. While most studies operationalise SFs as a continuous variable, some studies use a dummy variable to indicate whether a region is an Objective 1 region or not. The last case has the advantage that data on payments are not necessary, but it comes with the disadvantage that it is not possible to measure the real size effect of regional policy. If SF are operationalised as a continuous variable, the studies differ with regard to the question of whether to express the SF as a percentage of GDP, in PPP and/or in per capita terms. Moreover, not all studies use SF payments – some use data on SF commitments.

With respect to the econometric methods used, there are various approaches to dealing with the challenges described in the last section. Simple cross-sectional or pooled OLS estimators are based on the assumption that, after conditioning on further explanatory variables, many of the problems discussed in Section 4 (reversed causality, omitted/unobserved variables) are not relevant. Thus, it seems to be more convincing to rely on panel data methods which, in fact, most studies do. As mentioned in the last section, using panel data enables the researcher to eliminate unobserved fixed effects affecting SFs and growth simultaneously.

We start the survey with the studies based on *country-level data* (Table 16.2). Ederveen et al. (2002) analyse the effects at the national (EU12) as well as at the regional (NUTS-2) levels. The study only investigates the effects of the ERDF and applies a pooled OLS estimator: only conditionally positive growth effects for an EU12 sample for the 1960–95 period are found (implemented via an interaction term, see equation (16.5)). In particular, cohesion support is more likely to be effective for member states with open economies (such as Ireland) and less likely to be effective in closed ones (such as Spain). According to the explanation of the authors, openness disciplines governments, which stimulates more productive investment of cohesion support.

Beugelsdijk und Eijffinger (2005) restrict their analysis to the programme period from 1995 to 2001. They focus on the dependency of the effectiveness from moral hazard behaviour and substitution effects by interacting the SF variable with a corruption index. According to the authors, the moral hazard effect matters because countries might be inclined not to raise the welfare level of those regions which are close to the critical value of getting EU support, as this would possibly imply a reduction in future financial EU support. Hence, it is possible that the resources are not used for projects that would have the largest direct and indirect impact, so that the moral hazard effect might lead to an inappropriate use of SF. The substitution effect means that SF payments lead to a

Table 16.2 Econometric studies on the effects of the Cohesion Policy using country-level data

Authors	Central results	Operationalisation of Cohesion Policy	Time period	Units	Econometric methods used
Bähr (2008)	Only in countries with a high degree of decentralisation do SF have a positive impact on growth	ERDF commitments (as % of GDP) [exogenous/ endogenous]	1975–1995	13 EU countries	Panel: Pooled OLS, FE, FE-IV
Ederveen et al. (2006)	SF promote growth and convergence given the 'right' institutional setup	ERDF (as % of GDP) [exogenous]	1960–1995	12/13 EU countries	Panel: Pooled OLS, FE, FD-GMM
Beugelsdijk and Eijffinger (2005)	SF promote growth. More 'corrupt' countries do not gain less from Cohesion Policy with respect to growth	SF payments (as % of GDP) [endogenous]	1995–2001	15 EU countries	Panel: FD-GMM
Ederveen et al. (2002)	Only in open economies do SF have a positive impact on growth	ERDF payments (as % of GDP) [exogenous]	1960–1995	12 EU countries	Panel: Pooled OLS

Notes: OLS = ordinary least squares, FE = fixed effects model, IV = instrumental variable, FD-GMM = first difference generalised method of moments estimator (Arellano and Bond, 1991), SYS-GMM = system generalised method of moments estimator (Blundell and Bond, 1998).

crowding out of national spending. Using EU15 data and different dynamic panel data estimators (including an FD-GMM in order to take endogeneity into account) they find that the hypothesis that SF contribute to fewer inter-regional disparities within the current 15 European countries cannot be rejected. Furthermore, the results do not indicate that the more corrupt countries use their SF in a less efficient way.

Ederveen et al. (2006) analyse the effectiveness of the ERDF for the 1960–95 period using dynamic panel approaches for an EU13 sample. Among other econometric techniques, they apply FD-GMM and SYS-GMM estimators, assuming, however, that the SF payments are strictly exogenous. They find that SF as such do not improve the countries' growth performance. However, they find evidence that they enhance growth only in those countries with the 'right' institutions, that is, countries with a high economic openness and high direct measures of institutional quality (such as low inflation and low public debt). From these findings, Ederveen et al. (p. 25) derive consequences for a redesign of the EU regional policy: in the light of the EU enlargement process, the funds should be allocated first and foremost to institution building. Given institutions of a satisfactory quality, the EU regional policy may be effective in stimulating growth.

Recently, Bähr (2008) complemented these results by analysing whether the degree of decentralisation within countries mattered in the EU15 during the 1975–95 period. The hypothesis is that, given the sensitivity of EU Cohesion Policy to specific regional needs, member states with a higher degree of decentralisation should be able to implement more effective programmes. An interaction variable comprising SF and a decentralisation measure is introduced to the model, which is estimated by various panel estimators. Robustness checks are performed, *inter alia*, by instrumenting the SF variable with its own lagged values. While structural funding cannot be said to be unambiguously growth promoting in itself, Bähr finds a significantly positive effect of SF on growth in more decentralised countries. This is explained by the fact that regional authorities have better information on specific growth-inducing projects, so that there is a more effective regional implementation of the programmes in traditionally decentralised countries.

Bradley and Untiedt (2008) criticise the approaches by Ederveen et al. (2002) as well as those by Ederveen et al. (2006), *inter alia*, for the following reasons. First, the time period used includes the time before the fundamental reform of the Cohesion Policy in 1989, a period in which payments were relatively low. Second, they point to misspecifications in the regression (especially with regard to the interaction of SF payments and institutional variables). Third, they criticise the assumption of exogeneity of the Cohesion Policy and show that the econometric results are far from being robust (see also Rodrik, 2005 for the expression of fundamental concerns on the evaluation of growth effects of public policies).

Apart from these country analyses, some studies use more detailed data and focus on the *regional level* (Table 16.3). The conclusions of the analysis of Ederveen et al. (2002) for 183 NUTS-2 regions from 1981 to 1996 using pooled OLS depend on the convergence model used. Assuming that all regions finally catch up to the same income level (absolute convergence, that is, neither further explanatory variables nor country or regional dummies are included), they find a negative effect of SF on growth. By contrast, assuming that the convergence process is limited to convergence within countries (including country dummies and no further explanatory variables), they do not find a significant effect. Finally, when assuming region-specific steady states, that is, including

Table 16.3 Econometric studies on the effects of the Cohesion Policy using European-wide regional-level data

Authors	Central results	Operationalisation of Cohesion Policy	Time period	Units	Econometric methods used
Becker et al. (2008)	Positive and significant growth effect of the Obj. 1 status	Dummy variable = 1 for regions receiving Obj. 1 funding, 0 else [exogenous]	1989–1993, 1994–1999, 2000–2006	Up to 3301 NUTS-3 regions (EU12/25)	Panel: Regression discontinuity design
Dall'erba and Le Gallo (2008)	SF have no statistically significant impact on regional convergence	SF payments and remaining commitments of the period 1994–99 (in % GDP) [endogenous]	1989–1999	145 NUTS-2 regions (EU12)	Cross-section: Spatial lag model with IV
Esposti and Bussoletti (2008)	Limited impact of SF on regional growth	Obj. 1 payments (in PPP) per capita [exogenous]	1989–2000	206 NUTS-2 regions (EU15)	Panel: FD-GMM, SYS-GMM
Mohl and Hagen (2008)	Obj. 1 payments do promote growth, whereas Obj. 2 and 3 do not have a positive impact	Obj. 1,2,3,1+2+3 payments and remaining commitments of the 1994–99 period (in % GDP) [endogenous/exogenous]	1995–2005	122 NUTS-1/2 regions (EU15)	Panel: FE, SYS-GMM, spatial lag and error model
Hagen and Mohl (2008)	SF have a positive, but not statistically significant impact on regional growth	Obj. 1+2+3 payments and remaining commitments of the period 1994–1999 (in % GDP) [exogenous]	1995–2005	122 NUTS-1/2 regions (EU15)	Panel: Generalised propensity score approach
Falk and Sinabell (2008)	SF have a low effectiveness	Dummy variable = 1 for regions receiving Obj. 1 funding, 0 else [exogenous]	1995–2004	1084 NUTS-3 regions (EU15)	Panel: (Pooled) OLS, median regression approach, spatial lag and error model
Ramajo et al. (2008)	Faster conditional convergence of relative income levels of regions belonging to Cohesion countries than in the rest of the regions	Separate regressions for regions belonging to Cohesion countries vs. non-Cohesion countries	1981–1996	163 NUTS-2 regions (EU12)	Cross-section: Robust OLS, spatial lag model

Table 16.3 (continued)

Authors	Central results	Operationalisation of Cohesion Policy	Time period	Units	Econometric methods used
Puigcerver-Peñalver (2007)	Positive effect of SF on growth rates of Obj. 1 regions in 1989–93, but not in 1994–99	Total SF (in % GDP p.c.); total SF; SF of region *i* over total SF received by all regions [exogenous]	1989–1999, 1989–1993	41 NUTS-2 regions (EU10)	Panel: Pooled OLS, FE
Bouvet (2005)	SF have a modest positive impact on regional growth rates. SF work by increasing the growth of TFP and employment and not by increasing investment.	ERDF payments per capita [endogenous]	1975–1999	111 NUTS-1/2 regions (EU8)	Panel: Pooled OLS, FE, IV
Rodríguez-Pose and Fratesi (2004)	Limited impact of SF on growth; only SF funding on education and human capital have positive effects	Obj. 1 commitments (in % GDP) [exogenous]	1989–1999	152 NUTS-2 regions (EU-8)	Cross-section & Panel: OLS, pooled GLS, FE
Cappelen et al. (2003)	SF have a positive and significant impact on the growth rates; they have been more effective since 1988	Obj. 1, 2, 5b (in % GDP) [exogenous]	1980–1997 1980–1988 1989–1997	105 NUTS-1/2 regions (EU9)	Cross-section: OLS
de Freitas et al. (2003)	Obj. 1 regions do not show faster convergence than non-Obj. 1 regions	Dummy variable = 1 for Obj. 1 regions, 0 else [exogenous]	1990–2001	196 NUTS-2 regions (EU15)	Cross-section: OLS
Ederveen et al. (2002)	Results depend on the assumptions underlying the convergence model	SF + Cohesion Fund (in % GDP) [exogenous]	1981–1996	183 NUTS-2 regions (EU13)	Panel: Pooled OLS

Notes: OLS = ordinary least squares, FE = fixed effects model, IV = instrumental variable, FD-GMM = first difference generalised method of moments estimator (Arellano and Bond, 1991), SYS-GMM = system generalised method of moments estimator (Blundell and Bond, 1998).

regional fixed effects, a significantly positive effect is found. The authors conclude from these results (p. 55) 'the more optimistic one is about convergence in the long run, the more pessimistic one should be about the impact of Cohesion Policy, and vice versa . . . . The somewhat grim conclusion must be: either Cohesion Policy is counterproductive, or regional differences will persist'. However, one should keep in mind that there are good reasons to assume that omitting fixed effects (regional dummies) and further control variables results in biased estimates (see Section 4).

Cappelen et al. (2003) focus on the question of whether the SF reform in 1989 has increased the effectiveness of the Cohesion Policy by dividing their sample period into two time periods (1980–88 and 1989–97). Using these two cross-sections and applying OLS, they find a positive impact on regional growth. The authors find evidence that SF are most effective in more developed regions (measured in terms of the unemployment rate, R&D spending and so on), whereas the effectiveness is limited in 'poorer' regions. Furthermore, it turns out that the reform of 1989 has increased the effectiveness.

Esposti and Bussoletti (2008) analyse the impact of Objective 1 spending on regional growth using a dataset with 206 NUTS-2 regions covering the 1989–2000 period. They apply different estimation techniques (such as DIFF-GMM, SYS-GMM). However, it seems that SF payments are treated as strictly exogenous and only the lagged dependent variable is instrumented. They find a positive impact of SF on Objective 1 regions over the whole EU area, even though its size and statistical significance vary across alternative estimators. Generally, the impact is quite limited and becomes negligible or even negative in some regional cases. For instance, when regions are grouped by country, a negative effect may be observed for German, Greek and Spanish Objective 1 regions. By contrast, the French Objective 1 regions show the highest policy treatment effect.

The study by Puigcerver-Peñalver (2007) is based on 41 NUTS 2-regions in the EU12. It analyses whether Objective 1 payments to these regions promoted growth in the 1989–99 period, with SF payments modelled as being affected by the TFP. Using a fixed effects model it is shown that the effectiveness depends on the time period. While the Cohesion Policy (Objective 1) had a positive impact in the 1989–93 funding period, no significantly positive impact can be detected during 1994–99.

Using a cross-sectional approach, de Freitas et al. (2003) analyse whether Objective 1 regions grow faster than non-Objective 1 regions between 1990 and 2001, assuming strict exogeneity of the Objective 1 status. They find evidence of conditional convergence among EU regions. Moreover, the quality of national institutions has a positive impact, while there is no evidence of a correlation between the eligibility for Objective 1 payments and faster convergence.

Rodríguez-Pose and Fratesi (2004) also focus on Objective 1 regions between 1989 and 1999. The study not only analyses the time lags of SF effects but also differentiates between Cohesion Policy categories, such as (a) support to agriculture and rural promotion, (b) business and tourism support, (c) investment in human capital, and (d) investment in infrastructure and environment. However, the analysis is based on SF commitments instead of on SF payments. Applying fixed effects as well as pooled GLS estimators, they cannot find significant effects of SF on infrastructure or, to a lesser extent, on business support. By contrast, support for agriculture has positive short-term effects on growth, but these wane quickly; and only investments in education and human

capital – representing only about one-eighth of the total commitments – show positive and significant returns.

The study by Bouvet (2005) goes one step further by not only investigating the impact of the ERDF spending on economic growth but also analysing through which channels the Cohesion Policy might work, that is, investment, TFP or employment (see Section 3). The database consists of 118 NUTS-2 regions in the EU8 from 1975 to 1999. The SF payments (ERDF) are instrumented with political variables.[16] It turns out that the Cohesion Policy has a positive but modest effect on growth. The study does not find significant evidence that this positive effect works through an increase in regional investment. By contrast, it is found that the Cohesion Policy increases TFP and employment growth, and that these are the channels through which the policy affects GDP growth.[17]

As mentioned in Section 4, a major econometric problem when using regional-level data results from omitting regional spillover effects, which may lead to biased results. Dall'erba and Le Gallo (2008)[18] is one of the few studies that try to cope with this problem. However, this comes with the drawback that other econometric challenges (regional fixed effects, among others) are not taken into account. The authors use spatial econometric techniques for cross-sectional data for 145 regions in 1989–99. The SF payments are instrumented, *inter alia*, with the regions' distances to Brussels using two-stage least squares. The results from Dall'erba and Le Gallo indicate that significant convergence takes place, but that the SF have no impact on it.

Ramajo et al. (2008) apply cross-sectional spatial econometric techniques to estimate the speed of convergence for a sample of 163 regions in the EU12 over the 1981–96 period. First, they find evidence in favour of the existence of two spatial convergence clubs among European regions, namely, the presence of two significantly different spatial clusters formed by regions belonging to Cohesion (Ireland, Greece, Portugal and Spain) and non-Cohesion countries. The estimations indicate that throughout the period analysed, there is a faster conditional convergence in relative income levels of the regions belonging to Cohesion countries (5.3 per cent) than in the rest of the regions of the EU (3.3 per cent). Hence, the results provide support for policies that are explicitly designed to promote regional growth in the less-developed regions located in Cohesion countries.

Based on a sample of 1,084 NUTS-3 regions (EU15) over the 1995–2004 period, Falk and Sinabell (2008) investigate the determinants of Objective 1 payments on the regional growth of GDP per capita in a cross-sectional analysis. As the Lagrange multiplier test statistic does not hint at spatial spillover effects, they focus on robust OLS and weighted-least-squares procedures. The latter is used in order to control for outliers. In addition, Falk and Sinabell decompose the growth following the Blinder–Oaxaca decomposition (Oaxaca and Ransom, 1994) in order to check how much of the growth differential can be explained by observable differences between Objective 1 and non-Objective 1 regions. Their results indicate that there is a significant growth differential, which is, however, almost entirely due to the difference in characteristics such as initial GDP per capita, economic structure and population density. As a consequence, these results point to a low effectiveness of the EU funds.

Mohl and Hagen (2008) use a panel dataset of 124 NUTS-2 regions over the 1995–2005 period, extending the literature with regard to the following aspects. First, they use more precise measures of SF by distinguishing between Objective 1, 2, 3 and 1+2+3

payments and by a more thorough investigation of the impact of time lags. Second, the time period of the investigation is extended, using SF payments of the last financial framework from 2000 to 2006 that have not been analysed before. Third, the paper examines the robustness of the results by comparing various econometric approaches. Apart from SYS-GMM (which allows for endogeneity of SF payments as well as of further variables), spatial panel econometric techniques are applied. The results show that Objective 1 payments in particular promote regional economic growth, whereas Objectives 2 and 3 do not have a positive and significant impact on the EU regions' growth rates. Furthermore, Mohl and Hagen find that time lags substantially affect the results, that is, the growth impact does not occur immediately, but rather with a time lag of up to five years.

Finally, there are two papers that use treatment effect methods in order to deal with the problem of unknown functional form and parameter heterogeneity (see Wooldridge, 2002, Ch. 18). Becker et al. (2008) use up to 3,301 NUTS-3 regions and apply 'regression discontinuity design' techniques.[19] They make use of the relatively clear-cut rule that defines an Objective 1 region: NUTS-2 regions with a GDP per capita level below 75 per cent of the EU average. This enables the authors to use regression discontinuity design techniques, which basically means estimating the effect by comparing 'treated' and 'non-treated' regions near the 75 per cent threshold. On average, the Objective 1 status raises per capita income by about 1.8 per cent relative to similar 'non-treated' regions. Since the authors do not find a positive employment effect, they conclude that the growth effect may work through an investment-increasing effect. Furthermore, they provide a simple cost–benefit analysis: €1 spent on Objective 1 transfers leads to €1.21 of additional GDP in the eligible regions.

Hagen and Mohl (2008) interpret total SF payments (Objective 1+2+3) as a 'continuous treatment' and apply the method of generalised propensity score which leads to the estimation of a dose-response function as proposed by Hirano and Imbens (2004). They use a sample of 122 NUTS-1 and NUTS-2 (EU15) regions for the 1995–2005 period, and find a positive, but not statistically significant, impact on the regions' average three-year growth rates. This would imply that it does not matter which 'dose' of SF payments a region receives.

In addition to the studies presented above, there are further studies focusing on *regions within single countries* (see Table 16.4). Since their focus may be too narrow to draw a conclusion with regard to European integration, we do not discuss them here.

6 CONCLUSIONS AND REMARKS FOR FUTURE RESEARCH

The Cohesion Policy of the European Union has gained importance over recent decades, becoming the most important budget item and amounting to 36 per cent of the total EU budget in the 2007–13 period. With its rising relevance, the attempts to evaluate this policy field have increased. Despite its primary goal to 'reduce disparities among the regions', surprisingly, the focus of these studies is not so much on whether EU Cohesion Policy has decreased divergence, but rather on whether EU support is growth enhancing. One reason for this might be that the question of convergence refers to a long-run concept, which is difficult to evaluate given the available empirical data.

Table 16.4 Econometric studies on the effects of the Cohesion Policy using regional-level data within single countries

Authors	Central results	Operationalisation of Cohesion Policy	Time period	Units	Econometric methods used
Eggert et al. (2007)	SF accelerate a region's convergence, but reduce the average growth rate	SF payments (as % of GDP) [exogenous]	1989–1993, 1994–1999	16 NUTS-1 regions (German federal lands)	Cross-section: Pooled OLS; Regress average growth of 1994–99 (2000–04) on average SF of 1989–93 (1994–99)
Soukiazis and Antunes (2006)	SF promote convergence; small positive impact on growth; more effective in coastal than in interior regions	ERDF per capita [exogenous]	1991–1999	30 NUTS-3 regions (Portugal)	Panel: Pooled OLS, FE, random effects
Percoco (2005)	SF induce a high level of volatility in the level of growth rates	Obj. 1 payments (in % GDP) [endogenous]	1994–1999	6 NUTS-2 regions (Italy)	Panel: GMM-IV
Garcia-Milà and McGuire (2001)	Grants are not effective in stimulating private investment or improving the overall economies of the poorer regions	Grants = European + national grants; Dummy var. = 1 for regions receiving above-average grants, 0 else [exogenous]	1977–1981 1989–1992	17 NUTS-2 regions (Spain)	Panel: OLS and difference-in-difference approach

Notes: OLS = ordinary least squares, FE = fixed effects model, IV = instrumental variable, FD-GMM = first difference generalised method of moments estimator (Arellano and Bond, 1991), SYS-GMM = system generalised method of moments estimator (Blundell and Bond, 1998).

This chapter shows that the econometric evaluation of EU Cohesion Policy is hampered by several econometric challenges, namely reverse causality, measurement error, omitted variables (including spatial spillovers), Nickell bias, strict functional form assumptions and the potential inclusion of inappropriate control variables. Based on these challenges we present potential solutions for coping with these problems individually. Unfortunately, given the econometric methods and the available database, there is currently no method to control for all problems mentioned above simultaneously. As a consequence, by comparing the results of several approaches, one has to derive conclusions on the robustness of the results.

As the data availability for Cohesion Policy payments has improved significantly over the last years, we would argue that meaningful results should be based on panel data, which reduces some of the main econometric problems. Moreover, it is advisable to use studies taking fixed effects into account and/or studies that attempt to solve the problem of reverse causality. With this in mind, we count 10 studies (including two papers applying treatment effects models) that consider these aspects.

At the country level, the most that can be concluded from empirical studies is that the Cohesion Policy seems to be only conditionally effective. Given a good-quality institutional setup (Ederveen et al., 2006), or decentralised governmental structures (Bähr, 2008), the Cohesion Policy has a positive impact on growth. However, the methodological problems discussed in Section 4 should be kept in mind. For example, many studies do not allow for endogeneity of the Cohesion Policy. Hence, one should be careful when interpreting the results.

Using regional-level data might be a preferable alternative because, first, EU Cohesion Policy focuses on the development and convergence of regions and, second, the robustness of the results is increased by the higher number of cross-sections. One drawback is that SF data at the regional level is limited to the 1995–2006 period. There are four studies controlling for the endogeneity problem using regional-level data, three of which find at least a limited positive impact of SF payments. Moreover, using regional data without controlling for spatial spillover effects increases the problem of an omitted variable bias. There are three papers applying spatial techniques that find, again, weak evidence for a positive impact of SF. However, the disadvantage of these methods is that it is currently not possible to control for both spatial spillover effects and the endogeneity of several independent variables.

One explanation for the weak results might be the fact that almost all studies are derived from a neoclassical growth model assuming that the Cohesion Policy increases investments, which ultimately raises the economic growth rate. However, the results by Bouvet (2005) and Hagen and Mohl (2009) suggest that the policy may have only a modest impact on investments. These results might simply indicate that the EU support crowds out national investments. Moreover, we know very little about the labour market impact of the Cohesion Policy. Hence, one task for future studies will be to more thoroughly investigate the channels through which the policy works.

Another reason for the inconclusive empirical results might be that the allocation of funds is at least partly determined by political–economic factors. In this context, the Cohesion Policy is not solely based on clear criteria. Hence, there is room for political bargaining and/or side-payments which might result in the funding of politically feasible, and less economically efficient, projects.

SUMMARY

More than one-third of the European Union's total budget is spent on the so-called Cohesion Policy via the structural funds. Its main purpose is to promote the development of the EU and to support convergence between the levels of development of the various European regions. Investigating the impact of European Cohesion Policy on economic growth and convergence is a wide research topic in applied econometric research. Nevertheless, the empirical evidence has provided mixed, if not contradictory, results. Against this background, the aim of this chapter is to provide a fundamental review on this topic. Taking fundamental methodological issues into account, we review the existing econometric evaluation studies, draw several conclusions and provide some remarks for future research.

Keywords

Economic integration, regional growth, European Union, Cohesion Policy, panel data, spatial econometrics.

JEL Classification

R10, R11, C21, C23.

NOTES

1. The views expressed in this chapter are the authors' and do not necessarily reflect those of the European Central Bank or the Eurosystem.
2. In the following, the terms 'EU Cohesion Policy' and 'EU Regional Policy' are used synonymously. Both refer to the policy of the EU to co-finance national projects mostly carried out at the regional level by payments from the so-called 'structural funds'.
3. The subsequent multiannual frameworks comprise the following time periods: 1994–99, 2000–06 and 2007–13.
4. Since 2007, EU Cohesion Policy has revolved around three new (rearranged) objectives: (1) *Convergence* (formerly Objective 1) (81.7 per cent of total Cohesion Policy payments): support for growth and job creation in the least developed member states and regions (GDP per capita less than 75 per cent of the EU average). (2) *Competitiveness and employment* (formerly Objective 2) (15.8 per cent): designed to help the richer member states to deal with economic and social change, globalisation and the transition to the knowledge-based society. (3) *Territorial cooperation*: to stimulate cross-border cooperation, the development of economic relations and the networking of member states.
5. There has been recent discussion on whether further objectives should be introduced. Proposals focused on aid for regions/countries with climate change, environmental problems or strong demographic changes (European Commission, 2007).
6. These are the ERDF, the ESF, the EAGGF, and the Financial Instrument for Fisheries Guidance (FIFG), as well as the Cohesion Fund and the Instrument for Structural Policies for Pre-accession (ISPA) for the accession countries.
7. Roughly speaking, the theoretical approaches can be classified as growth theories and trade theories and one can distinguish between 'new' and 'traditional' approaches. These have diametric political implications (see Heinemann et al., 2010). For example, while traditional neoclassical growth theory (Solow, 1956; Swan, 1956) implies that regional policies have no long-term effects, the new economic geography (Krugman, 1991; Krugman and Venables, 1995) indicates positive effects on regional convergence under certain circumstances. Nevertheless, the latter also predicts a trade-off between growth and convergence. From the perspective of the new (endogenous) growth theory (Romer, 1986, 1990),

regional policy may have long-term effects if it promotes research and development (R&D) or human capital.

8. A more general survey which includes cross-section as well as time-series data can be found in Magrini (2004).
9. y_{it} may also indicate the GDP per capita of the region i relative to the aggregate GDP per capita of all regions at time t. In doing so, common time effects are cancelled out.
10. Ederveen et al. (2006), for example, use the World Bank governance indicators 'political stability', 'government effectiveness' and 'rule of law'.
11. With respect to further economic and socio-demographic control variables included in estimations using regional data, Eurostat provides a relatively large database with the most relevant variables. However, for a longer period, there are, to the best of our knowledge, no high-quality education data at the regional level like those proposed at the country level by Barro and Lee (2001), de La Fuente and Doménech (2006) or Cohen and Soto (2007). Instead, data are available only since 1999, measuring the population aged 15 years and over with a high, medium or low level of education. For this reason, Mohl and Hagen (2008) use the number of patents per million inhabitants as a proxy for the education variable.
12. Roodman (2009b, p. 156): 'Perhaps, the lesson to be drawn is that internal instruments, though attractive as a response to endogeneity, have serious limitations'.
13. However, the choice of the number of lags used as instruments or the possibility of collapsing the number of instruments might seem arbitrary.
14. For a recent empirical comparison of different theoretical convergence models at the European regional level, see Arbia et al. (2008).
15. Due to multicollinearity, the coefficients and standard errors of the SF variable cannot be interpreted if the variable is included in the regression with several lags. As a consequence, Mohl and Hagen (2008) calculate the joint sum of SF coefficients corresponding to the short-term elasticity and use a simple Wald test to determine whether this short-term elasticity is statistically different from zero. Based on this, it is possible to calculate the long-term elasticity as described above.
16. The following IVs are used: the interaction term of the coincidence between local central governments and the coincidence between the central government and the president of the Commission, the interaction term of the local incumbent dummy and the coincidence between the central government and the president of the Commission, the coincidence between local central governments, the local-incumbent dummy and the national incumbent dummy.
17. Bouvet (2005) also examines the determinants of fund allocation. While more funds are allotted to regions with lower per capita incomes and structural deficiencies, some evidence of political interference in the allocation process is found.
18. In a preceding study, Dall'erba (2005) applies an exploratory spatial analysis and finds a positive relationship between SF payments and regional growth.
19. An introduction to regression discontinuity design can be found in the *Journal of Econometrics*, **142** (2008); see especially Imbens and Lemieux (2008).

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17 Policy liberalisation and US integration with the global economy: trade and investment between 1980 and 2006[1]

Gary Hufbauer and Matthew Adler

1 INTRODUCTION

Over the last three decades the global economy has expanded remarkably. Nominal world GDP increased four times, but world bilateral trade flows grew more than sixfold, while the stock of foreign direct investment (FDI) has expanded roughly 20 times. US trade and investment with the world have likewise grown at a brisk pace. US two-way trade has grown by more than 500 per cent in nominal terms and the US two-way FDI stock has grown by over 1,100 per cent since 1980. The rates of US trade and investment growth far outpace US GDP growth, which has seen a nominal increase of about 370 per cent over the period.[2]

The sources of trade and investment growth are well known – general economic expansion, policy liberalisation, and better communications and technology – but the impact attributable to each source is unclear. In this chapter we attempt to identify the contributing factors to US trade and investment growth. Our primary motivation is to determine the impact of policy liberalisation so that we can have a better sense about the future course of trade and investment.

To draw conclusions we rely on simple estimation procedures: a partial equilibrium model to analyse US trade growth, and stylised facts combined with an unorthodox calculation method to examine US FDI growth. Admittedly, our estimates are rough, but we believe they give a general sense of the impact of policy liberalisation and other sources of trade and investment growth. Our most modest estimates suggest that policy liberalisation since 1980 – defined only as tariff liberalisation – explains about 70 per cent of two-way trade growth beyond the amount explained by nominal GDP growth and exchange rate changes. Policy liberalisation related to FDI explains about 33 per cent of two-way FDI stock growth beyond the amount explained by nominal GDP growth.

This chapter is structured as follows. In Section 2 we present our simple partial equilibrium analysis of US trade growth. We use estimates of the price elasticities of US trade combined with the declines in tariff rates, non-tariff barriers (NTBs), and transport costs to make rough estimates of the role of each force in US trade growth. We also assess the role of GDP growth and currency changes on US trade in this section, and we summarise evidence on the contribution of trade expansion to GDP growth. In Section 3, we present our FDI analysis. After a short review of the relevant FDI literature, and the available data, we estimate the impact of policy liberalisation on FDI expansion, and the contribution that FDI makes to economic growth. Section 4 concludes with a summary of the results from both the trade and investment analyses.

2 TRADE EXPANSION

Using various data sources that stretch back to the Tokyo Round of Multilateral Trade Negotiations (1973–79) conducted under the auspices of the General Agreement on Tariffs and Trade (GATT), we analyse six hypothetical scenarios that allow us to evaluate the impact of major policy liberalisations and the reduction in transport costs since 1980. The data sources and methods are explained in detail in Appendix 17A1. The methodology for each scenario is straightforward: we determine a 'past' and a 'present' set of tariff rates and then using price elasticity estimates we determine the impact on current US trade of moving from the 'present' rate to the 'past' rate. For this analysis we calculate weighted average protection rates of major US partners for US exports, and US average protection rates for US imports from its major partners. The weighted average rates are based on disaggregated tariff and NTB data. The six scenarios that we consider in the partial equilibrium analysis are as follows:

- The first scenario examines the impact of a reversion from current US and 17 major US trading partner actual tariffs (most favoured nation (MFN) applied tariffs or preferential tariffs where applicable) to Uruguay Round bound rates.[3] This scenario examines the impact over the last 10 years of multilateral liberalisation, unilateral liberalisation and preferential tariff liberalisation.
- The second scenario analyses the impact of a reversion for the United States and its major partners from current actual tariffs to Tokyo Round bound rates. This scenario examines the impact of undoing the Uruguay Round concessions and the unilateral and preferential tariff liberalisation over the last 25 years.
- The third scenario examines the impact on US trade if prevailing transport costs reverted to 1980 levels.
- In the fourth scenario we eliminate the preferential tariffs under the North American Free Trade Agreement (NAFTA), the Australia–US FTA, and the Singapore–US FTA.[4] This scenario assumes that the United States applies its MFN applied rate to all partners and all its partners do the same for the United States.
- The fifth scenario investigates a reversion of present *ad valorem* tariff equivalents of NTBs to the NTB rates prevailing in approximately 1990. Our methodology suggests a very large decline in NTB rates since 1990, so this scenario indicates a large impact of policy liberalisation. Due to data limitations we do not consider preferential NTB access under FTAs.[5]
- The sixth, and final, scenario for the partial equilibrium analysis examines the impact of reverting current US and major partner actual tariffs to the MFN applied tariffs of approximately 1990. This scenario analyses the impact of unilateral and preferential tariff liberalisation over the last 15 years.

In an attempt to estimate the costs of a failed Doha Round, Bouet and Laborde (2008) estimate the impact of scenarios similar to ours. They find that a reversion from current MFN applied tariffs to Uruguay Round bound rates by most countries would decrease world trade by 7.7 per cent. The authors believe that a swing this large in protection would be unrealistic, so they also estimate the impact of a reversion from current tariffs to the highest MFN applied tariff over the last 13 years by product for

every country. In this second scenario, they estimate a decrease in world trade of 3.2 per cent.

Before going further, we pause to note an important critique, developed by Kei-Mu Yi (2003), of the method used by various scholars – Bouet and Laborde (2008), ourselves, and many others – who have investigated the role of policy on trade expansion.[6] Currently, a great deal of trade involves vertically integrated supply chains, where the same inputs may criss-cross the same border more than once in the process of assembling the final product. This description characterises the automobile industry in North America (the United States, Canada and Mexico), and many electronic goods. Under these circumstances, any tariff reduction has a multiplied effect in enlarging trade flows, because it cuts the duty more than once. By contrast, in standard models, of the sort we use, trade gains are calculated as if the imported input has only crossed the border once.

To illustrate the difference, Yi (2003) analyses the role of tariff liberalisation on US trade growth from 1962 to 1999 using a standard model and a model that takes into account vertical specialisation – that is, criss-crossing trade. Yi finds, with one set of parameters, that the vertical model explains 35 per cent of trade growth over the period, while the standard model explains only 13 per cent. Using a different set of parameters, the vertical model explains 53 per cent of trade growth versus only 29 per cent for the standard model.[7] The difference between the vertical and standard models is more exaggerated in later periods, suggesting an increasing role for vertical specialisation. An inference from Yi's analysis is that our estimates may understate the impact of policy liberalisation.

Turning first to our data and then to our findings, columns I and II of Table 17.1 show estimates of average MFN applied tariffs for the 17 US major partners in the 'past' and the 'present'. In general, the past rates are the average of three years of available data from 1988 to 1993, with a preference for the oldest data; the present rates are the average of three years of available data from 2002 to 2005, with a preference for the most recent data. For most countries *ad valorem* equivalents of specific tariffs are included in the calculations (for example, a specific tariff of $100 per ton with a ton valued at $1,000 would be expressed as 10 per cent *ad valorem*). Using 1990 US export shares with the 17 partners as weights for the past rates and 2004 export shares as the weights for the present rates, we determine that the average MFN applied rate faced by the United States dropped from around 10.3 per cent in the past (*circa* 1990) to about 7.4 per cent in the present (*circa* 2004).

Columns III and IV of Table 17.1 show our estimates of the average actual tariffs of US partners in the past and the present. These figures take into account preferential rates applied between FTA partners. In the past, tariffs from the early phases of the Canada–US FTA are built into the estimates. In the present, NAFTA, Australia–US FTA and Singapore–US FTA tariffs are built in. Taking these preferential agreements into account, the weighted average actual tariff faced by the United States in the past was 9.4 per cent; by contrast, the present rate is 3.9 per cent, which is slightly more than half the present MFN-only rate.

We present average Tokyo and Uruguay Round bound rates for the 17 major US partners in columns V and VI of Table 17.1. For Mexico and Venezuela, GATT accession bindings are used for past rates because they did not join the GATT until after the Tokyo Round. For China and Taiwan, WTO accession bindings are used for present rates because they did not join the GATT/WTO until after the Uruguay Round. For lack

Table 17.1 Average ad valorem *rates of protection faced by US exports, past and present*

Column	MFN applied tariffs		Actual tariffs		Bound rates		NTBs		Exports		Export shares	
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Country	Past tariffs (%)	Present tariffs (%)	Past tariffs (%)	Present tariffs (%)	Past (Tokyo) tariffs (%)	Present (Uruguay) tariffs (%)	Past NTB (%)	Present NTB (%)	1990 US exports ($ bn)	2004 US exports ($ bn)	Past export share (%)	Present export share (%)
Australia	15.1	4.3	15.1	1.3	20.9	10.5	16.9	8.3	9	14	3	2
Brazil	34.7	13.2	34.7	13.2	62.9	33.6	33.5	16.4	5	14	2	2
Canada	9.1	5.9	5.4	1.0	14.7	7.4	9.1	4.5	83	189	25	27
China	38.9	10.4	38.9	10.4	38.9	13.6	11.5	5.6	5	35	1	5
EU15	7.3	5.6	7.3	5.6	6.5	5.2	21.6	10.6	93	169	28	24
Hong Kong	0.0	0.0	0.0	0.0	0.0	0.0	5.8	2.8	7	16	2	2
India	81.1	23.3	81.1	23.3	113.1	41.2	29.6	14.5	2	6	1	1
Indonesia	18.1	6.2	18.1	6.2	74.5	48.0	9.7	4.7	2	3	1	0
Japan	4.8	4.5	4.8	4.5	6.8	4.6	20.5	10.0	49	54	15	8
Korea	13.1	10.3	13.1	10.3	30.3	17.7	20.5	10.0	14	26	4	4
Malaysia	12.6	7.4	12.6	7.4	16.8	14.8	64.1	31.4	3	11	1	2
Mexico	14.6	13.6	14.6	0.0	50.0	36.0	32.7	16.0	28	111	9	16
Philippines	22.7	5.5	22.7	5.5	32.1	26.6	59.3	29.0	2	7	1	1
Singapore	0.4	0.0	0.4	0.0	18.6	7.4	5.8	2.8	8	20	2	3
Taiwan	10.5	7.1	10.5	7.1	10.5	7.6	64.1	31.4	11	22	3	3
Thailand	37.7	13.8	37.7	13.8	50.6	28.8	9.0	4.4	3	6	1	1
Venezuela	16.9	12.4	16.9	12.4	65.2	51.4	19.3	9.5	3	5	1	1
Totals (rounded)									328	707	100	100
Weighted average	10.3	7.4	9.4	3.9	17.9	13.5	20.5	10.3				

Notes:
Columns I and II: Country rates are the simple average of MFN applied tariffs at the tariff line level, including *ad valorem* equivalents of specific tariffs.
Columns III and IV: Country rates are the simple average of MFN applied or, when applicable, preferential tariffs at the tariff line level, including *ad valorem* equivalents of specific tariffs.
Columns V and VI: Country rates are the simple average of bound rates at the tariff line level. Where specific bound rates exist, the *ad valorem* equivalent of the MFN applied rates are included. Accession rates are used for China, Mexico, Taiwan and Venezuela in the appropriate eras. MFN applied rates are used for China and Taiwan in the 'past' era.
Columns VII and VIII: Present NTB rates are the simple average of NTB rates from Kee et al. (2005). Past rates are derived from the present rates assuming a 51.1 per cent increase in the *ad valorem* rate of protection. Due to data availability, Japan's NTB rates are used as a proxy for Korea's rates, Hong Kong's rates are used as a proxy for Singapore's, and Malaysia's rates are used as a proxy for Taiwan's.

Sources: Kee et al (2005); TRAINS via WITS (2008); UNComtrade via WITS (2008); authors' calculations.