The Theory and Measurement of International Economic Integration

Ali M. El-Agraa

THE THEORY AND MEASUREMENT OF INTERNATIONAL ECONOMIC INTEGRATION

Also by Ali M. El-Agraa

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The Theory and Measurement of International Economic Integration

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Preface and Acknowledgements

Over the past three decades or so, not only have many schemes of international economic integration been experienced, although some have met their demise, but also new schemes are either being hotly pursued (the Canada–US free trade area) or seriously contemplated (Pacific Basin cooperation/integration). The aim of this book is to provide the reader with a comprehensive and critical analysis of both the theoretical and empirical literature on this branch of international economics. The book is not about the various schemes of international economic integration that have been formed since these are comprehensively tackled in my *International Economic Integration* (Macmillan, 1982; second edition, 1988) by distinguished contributors and myself. Moreover, although most of the empirical studies are concerned with the European Community (EC), the book does not discuss the EC itself except when it is vital to do so; this is because it is assumed that those interested in any detailed aspect of the EC will be either familiar with or will consult my *The Economics of the European Community* (Philip Allan, 1980; second edition, 1985), where a number of leading authorities and myself present a comprehensive analysis of the EC – the interested reader may also wish to consult my *Britain within the European Community: the Way Forward* (Macmillan, 1983) where the emphasis is on the effects of EC membership on the UK.

International Economic Integration is concerned with the major schemes of international economic integration that are in existence or have become defunct but whose experience is thought to shed some light on the process of integration. *The Economics of the European Community* is about the history, institutions and policies of the EC. Hence, neither book allows enough space for a thorough and comprehensive presentation and analysis of the pure theoretical and empirical work in this field. This also applies to *Britain within the European Community: the Way Forward*. Indeed, a number of academic colleagues who have been using these books for teaching purposes have communicated to me their desire for a book which deals with these topics. It can, therefore, be stated that the present book aims to fill this vacuum; hence, it is complementary to the three

books. Given this understanding, the book is not simply an up-dated version of my joint book with Anthony J. Jones (*Theory of Customs Unions*, Philip Allan, 1981) since that book tackled only the theoretical issues of customs unions alone without discussing even the relevant aspects of monetary integration. In this book, theoretical issues are the concern of only one part. A substantial part is devoted to the empirical studies: I am certain that it is important that the reader should be made familiar not only with the results of the empirical tests but also with the technical aspects involved in carrying out the tests themselves in order to become familiar with the problems involved. The division of the book into two parts is deliberate. On the one hand, the reader will find that the empirical work has followed a path of its own; hence to deal with the two aspects as if they were completely integrated would be utterly misleading. On the other hand, the two areas deal with the same field; hence, it would not be fruitful to discuss them in two completely separate books. Therefore, it seemed that a good compromise to adopt would be the division employed here.

The book is aimed at those interested in international economics, particularly international economic integration. However, the style of presentation is such that advanced British undergraduates will find it possible to follow the book. Needless to add, the book is generally most appropriate for postgraduate students.

The book could not have taken its present form without the help of many colleagues either directly through their careful reading of parts of the manuscript or indirectly through their contributions to the literature. I am particularly grateful to Anthony J. Jones, my long-standing colleague and friend at the School of Economic Studies in the University of Leeds, for many intensive and helpful discussions over many years. Chapter 6 is typical of his work in this field of international economics. I am also deeply indebted to Professors David Greenaway of Nottingham University, Earl L. Grinols of the US President's Council of Economic Advisers and L. Alan Winters of the University College of North Wales, Bangor, and Dr Howard C. Petith of University College of Swansea not only for their contributions, which account for large sections of Chapter's 11 and 14 and almost the whole of Chapter 13, but also for their thorough checking of these chapters and more. I am deeply indebted to Dr David G. Mayes, Chief Statistician with NEDO, for his thorough and critical reading of the whole manuscript. Finally, as always, I am very grateful to Diana, my wife, for her thorough checking of my faulty

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ALI M. EL-AGRAA

1 General Introduction

INTRODUCTION

'International economic integration' is one aspect of 'international economics' which has been growing in importance in the past three decades or so. The term itself has a rather short history; indeed, Machlup (1977a) was unable to find a single instance of its use prior to 1942. Since then the term has been used at various times to refer to practically any area of international economic relations. By 1950, however, the term had been given a specific definition by economists specialising in international trade to denote a state of affairs or a process which involves the amalgamation of separate economies into larger regions, and it is in this more limited sense that the term is used today. More specifically, international economic integration is concerned with the discriminatory removal of all trade impediments between the participating nations and with the establishment of certain elements of cooperation and coordination between them. The latter depends entirely on the actual form that integration takes. Different forms of international integration can be envisaged and some have actually been implemented:

(i) *free trade areas* where the member nations remove all trade impediments among themselves but retain their freedom with regard to the determination of their policies *vis-à-vis* the outside world (the non-participants), for example, the European Free Trade Association (EFTA) and the Latin American Free Trade Area (LAFTA);

(ii) *customs unions* which are very similar to free trade areas except that member nations must conduct and pursue common external commercial relations, for instance, they must adopt common external tariffs (CETs) on imports from the non-participants as is the case in the European Community (EC); the EC is in this particular sense a customs union, but it is more than that;

(iii) *common markets* which are customs unions that also allow for free factor mobility across national member frontiers, i.e. capital, labour, enterprise should move unhindered between the participating countries, for example, the East African Community (EAC), and the EC (but again it is more complex);

(iv) *complete economic unions* which are common markets that ask for complete unification of monetary and fiscal policies, i.e. a central authority is introduced to exercise control over these matters so that existing member nations effectively become regions of one nation;

(v) *complete political integration* where the participants become literally one nation, i.e. the central authority needed in (iv) not only controls monetary and fiscal policies but is also responsible to a central parliament with the sovereignty of a nation's government.

It should be stressed that each of these forms of economic integration can be introduced in its own right: they should not be confused with *stages* in a *process* which eventually leads to complete political integration. It should also be noted that within each scheme there may be *sectoral* integration in particular areas of the economy, for example the Common Agricultural Policy (CAP) of the EC. Of course, sectoral integration can be introduced as an aim in itself as was the case in the European Coal and Steel Community (ECSC), but sectoral integration is a form of 'cooperation' since it is not consistent with the accepted definition of international economic integration.

It should also be pointed out that international economic integration can be *positive* or *negative*. The term 'negative integration' was coined by Tinbergen (1954) to refer to the removal of impediments on trade between the participating nations or to the elimination of any restrictions on the process of trade liberalisation. The term 'positive integration' relates to the modification of existing instruments and institutions and, more importantly, to the creation of new ones so as to enable the market of the integrated area to function properly and effectively and also to promote other broader policy aims of the union. Hence, at the risk of oversimplification, it can be stated that sectoral integration and free trade areas are forms of international economic integration which require only 'negative integration', while the remaining types require 'positive integration' since they all require the positive act of adopting common external relations, or, as a minimum, a CET. However, in reality, this distinction is unfair since practically all existing types of international economic integration have found it necessary to introduce some elements of 'positive integration'.

ECONOMIC INTEGRATION AND GATT RULES

The rules of GATT allow the formation of regional groupings, on the understanding that, although customs unions, free trade areas, etc. are discriminatory associations, they may not pursue policies which increase the level of their discrimination beyond that which existed prior to their formation, and that tariffs and other trade restrictions (with some exceptions) are removed on substantially all the trade among the participants. Hence, once allowance was made for the proviso regarding the external trade relations of the regional grouping (the CET level, or common level of discrimination against extra-area trade, in a customs union, and the average tariff or trade discrimination level in a free trade area), it seemed to the drafters of Article XXIV (see Appendix to this chapter) that regional groupings did not contradict the basic principles of GATT – liberalism, stability and transparency – or more generally the principles of non-discrimination and reciprocity.

There are various arguments that Article XXIV is in direct contradiction to the spirit of GATT – see, for instance, Dam (1970). However, Wolf (1983, p. 156) argues that if nations decide to treat one another as if they are part of a single economy, nothing can be done to prevent them, and that regional groupings, particularly those like the EC, have a strong impulse towards liberalisation; in the case of the EC, the setting of the CET happened to coincide with the Kennedy Round of tariff reductions.

Of course, these considerations are more complicated than is suggested here, particularly since there are those who would argue that nothing could be more discriminatory than for a group of countries to remove all tariffs and trade impediments on their mutual trade while at the same time maintaining the initial levels against outsiders. Moreover, as we shall see in Chapter 2, regional groupings may lead to resource reallocation effects which are economically undesirable. However, to have denied nations the right to form such associations, particularly when the main driving force may be political rather than economic, would have been a major setback for the world community. Hence, all that needs to be stated here is that as much as GATT's Article XXIV raises problems, it also reflects its drafters' deep understanding of the future development of the world economy.

THE GLOBAL EXPERIENCE

Since the end of the Second World War various forms of international economic integration have been proposed and numerous schemes have actually been implemented. Even though some of those introduced were later discontinued or completely reformulated, the number adopted during the decade commencing in 1957 was so impressive as to prompt Haberler (1964) to describe that period as 'the age of integration'.

The EC is the most significant and influential of these arrangements since it comprises some of the most advanced nations of Western Europe: Belgium, Denmark, France, West Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain and the United Kingdom (UK). The EC was founded by six of these nations (usually referred to as the Original Six) under the Treaty of Rome in 1957, with three of the remaining six (Denmark, Ireland and the UK) joining later in 1973. Greece became a full member in January 1981, and Portugal and Spain joined in January 1986 after a lengthy period of negotiation. Turkey has submitted an application for membership. Although the Treaty of Rome relates simply to the formation of a customs union and provides the basis for a common market in terms of factor mobility, many of the originators of the EC saw it as a phase in a process culminating in complete economic and political integration. Thus the present efforts to achieve harmonisation in member countries' monetary, fiscal and social policies, to accomplish a monetary union and to revive the concept of 'European Union', and to amend the Treaties in a way which will promote a democratic decision-making process (some of this has already been achieved in terms of the so-called Single European Act) can be seen as positive steps towards the attainment of the desired goals.

EFTA is the other major scheme of international economic integration in Western Europe. To understand its membership one has to learn something about its history. In the mid-1950s when a European Community comprising the whole of Western Europe was being contemplated, the UK was unprepared to commit itself to some of the economic and political aims envisaged for that Community. For example, the adoption of a common policy for agriculture and the eventual political unity of Western Europe were seen as aims which were in direct conflict with the UK's interests in the Commonwealth, particularly with regard to 'Commonwealth preference' which

granted preferential access to the markets of member nations of the Commonwealth. Hence the UK favoured the idea of a Western Europe which adopted free trade in industrial products only, thus securing the advantages of 'Commonwealth preference' as well as opening up Western Europe as a free market for her industrial goods. In short, the UK sought to achieve the best of both worlds for herself, which is of course quite understandable. However, it is equally understandable that such an arrangement was not acceptable to those seriously contemplating the formation of the EC. As a result the UK approached those Western European nations who had similar interests with the purpose of forming an alternative scheme of international economic integration to counteract any possible damage due to the formation of the EC. The outcome was EFTA which was established in 1960 by the Stockholm Convention with the object of creating a free market for industrial products only; there were some arrangements on non-manufactures but these were relatively unimportant. The membership consisted of: Austria, Denmark, Norway, Portugal, Sweden, Switzerland (and Liechtenstein) and the UK. Finland became an associate member in 1961; Iceland joined in 1970 as a full member. But, as already stated, Denmark and the UK, together with Ireland, joined the EC in 1973. This left EFTA with a membership consisting mainly of the relatively smaller nations of Western Europe. However, in 1972, due to the insistence of the UK prior to joining the EC, the EC and EFTA entered into a series of free trade agreements which have in effect resulted in virtual free trade in industrial products in a market which includes their joint membership. This outcome has of course provided the cynical observer of British attitudes towards Western Europe with a great deal to reflect upon!

International economic integration is not confined to the so-called 'free' nations of the world. Indeed, the socialist planned economies of Eastern Europe have their own arrangement which operates under the Council for Mutual Economic Assistance (CMEA), or COMECON as it is generally known in the West. CMEA was formed in 1949 by Bulgaria, Czechoslovakia, the German Democratic Republic, Hungary, Poland, Romania and the USSR; they were later joined by three non-European countries: Mongolia (1962), Cuba (1972) and Vietnam (1978). In its earlier days, before the death of Stalin, the activities of the CMEA were confined to the collation of the plans of the member states, the development of a uniform system of reporting statistical data and the recording of foreign trade statistics. However,

during the 1970s a series of measures were adopted by the CMEA to implement the 'Comprehensive Programme of Socialist Integration', hence indicating that the organisation is moving towards a form of integration based principally on methods of plan coordination and joint planning activity, rather than on market levers (Smith, 1977). Finally, attention should be drawn to the fact that the CMEA comprises a group of relatively small countries and one 'super power' and that the long-term aim of the organisation is to achieve a highly organised and integrated economic bloc, without any agreement having yet been made on how and when this will be accomplished.

Before leaving Europe it should be stated that another scheme exists in the form of regional cooperation between the five Nordic countries (the Nordic Community): Denmark, Finland, Iceland, Norway and Sweden. However, in spite of claims to the contrary (Sundelius and Wiklund, 1979), the Nordic scheme is one of cooperation rather than international economic integration since Denmark is a full member of the EC while the other countries are full members of EFTA; hence a substantial group of economists would argue that the Nordic Community has little practical relevance.

In Africa, there are several schemes of international economic integration (Robson, 1987; Inukai, 1987). The *Union Douaniére et Economique de l'Afrique Centrale* (UDEAC) comprises the People's Republic of the Congo, Gabon, Cameroon and the Central African Republic. Member nations of UDEAC plus Chad, a former member, constitute a monetary union. The *Communauté Economique de l'Afrique de l'Ouest* (CEAO) which was formed under the Treaty of Abidjan in 1973 consists of the Ivory Coast, Mali, Mauritania, Niger, Senegal and Upper Volta (renamed Burkina Faso); Benin joined in 1984. Member countries of CEAO, except for Mauritania plus Benin and Togo, are participants in a monetary union. In 1973 the Mano River Union (MRU) was established between Liberia and Sierra Leone. The MRU is a customs union which involves a certain degree of cooperation particularly in the industrial sector. The Economic Community of West African States (ECOWAS) was formed in 1975 with fifteen signatories: its membership consists of all those countries who participate in UDEAC, CEAO, MRU plus some other West African States. In 1969 the Southern African Customs Union (SACU) was established between Botswana, Lesotho, Swaziland and the Republic of South Africa. The Economic Community of the Countries of the Great Lakes (CEPGL) was created in 1976 by Rwanda, Burundi and Zaire. Until its collapse in 1977, there was the

East African Community (EAC) between Kenya, Tanzania and Uganda. In 1981 fifteen states from the Eastern and Southern African region adopted a Draft Treaty for a Preferential Trade Area (PTA): Angola, Botswana, the Comoros, Djibouti, Ethiopia, Kenya, Lesotho, Malawi, Mauritius, Mozambique, Swaziland, Tanzania, Uganda, Zambia and Zimbabwe. In August 1984 a Treaty was signed by Libya and Morocco to establish the Arab-African Union, whose main aim is to tackle their political conflicts in the Sahara Desert. Several other schemes were in existence in the past but have been discontinued while others never got off the ground. Hence, a unique characteristic of economic integration in Eastern, Southern and Western Africa is the multiplicity and overlapping of the schemes. For example, in West Africa alone, there is a total of 32 schemes, which is why a Benin Union (BU) consisting of Benin, Ghana, Nigeria and Togo has been recommended recently (UNECA, 1984) in an attempt to try to rationalise economic cooperation arrangements in West Africa.

There are four schemes of international economic integration in Latin America and the Caribbean. Under the 1960 Treaty of Montevideo, the Latin American Free Trade Association (LAFTA) was formed between Mexico and all the countries of South America except for Guyana and Surinam. LAFTA came to an end in the late 1970s but was promptly succeeded by the Association for Latin American Integration (ALADI) in 1980. The Managua Treaty of 1960 established the Central American Common Market (CACM) between Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua. In 1969 the Andean Group was established under the Cartagena Agreement between Bolivia, Chile, Colombia, Ecuador, Peru and Venezuela; the Andean Group forms a closer link between some of the least developed nations of ALADI. In 1973 the Carribean Community (CARICOM) was formed between Antigua, Barbados, Belize, Dominica, Grenada, Guyana, Jamaica, Montserrat, St Kitts-Nevis-Anguilla, St Lucia, St Vincent, Trinidad and Tobago – CARICOM replaced the Caribbean Free Trade Association (CARIFTA).

Asia does not figure very prominently in the league of international economic integration but this is not surprising given the existence of such large (either in population or GNP terms) countries as China, India and Japan. The Regional Cooperation for Development (RCD) is a very limited arrangement for sectoral integration between Iran, Pakistan and Turkey. The Association of South-East Asian Nations (ASEAN) comprises six nations: Brunei, Indonesia, Malaysia, the

Philippines, Singapore and Thailand. ASEAN was founded in 1967 in the shadow of the Vietnam War. After almost a decade of inactivity 'it was galvanized into renewed vigour in 1976 by the security problems which the reunification of Vietnam seemed to present to its membership' (Arndt and Garnaut, 1979). The drive for the establishment of ASEAN and for its vigorous reactivation in 1976 was both political and strategic. However, right from the start, economic cooperation was one of the most important aims of ASEAN, indeed most of the vigorous activities of the group between 1976 and 1978 were predominantly in the economic field (Arndt and Garnaut, 1979).

A scheme of integration-cum-cooperation that is presently being hotly discussed is that of 'Pacific Basin Integration/Cooperation'. However, given the diversity of countries within the Pacific region, it seems highly unlikely that a very involved scheme of integration will evolve over the next decade or so. This is in spite of the fact that there already exist:

(i) the PECC (Pacific Economic Cooperation Conference) which is a tripartite structured organisation with representatives from governments, businesses and academic circles and with the secretariat work being handled between general meetings by the country next hosting a meeting;
(ii) the PAFTAD (Pacific Trade and Development Conference) which is an academically oriented organisation;
(iii) the PBEC (Pacific Basin Economic Council) which is a private-sector business organisation for regional cooperation; and
(iv) the PTC (Pacific Telecommunications Conference) which is a specialised organisation for regional cooperation in this particular field.

The reason for the pessimism is that the region under consideration covers the whole of North America and Southeast Asia, with Pacific South America, the People's Republic of China and the USSR all claiming interest since they are all on the Pacific. Even if one were to exclude this latter group, there still remains the cultural diversity of such countries as Australia, Canada, Japan, New Zealand and the USA, plus the diversity that already exists within ASEAN. It would therefore seem that unless the group of participants is severely limited, Pacific Basin *cooperation* will be the logical outcome.

While discussing the Pacific area, it should be added that a decade ago Australia and New Zealand entered into a free trade area

arrangement (the New Zealand Australia Free Trade Area – NAFTA). NAFTA was later replaced by the more important Australia New Zealand Closer Economic Relations and Trade Agreement (ANZCERTA): not only have major trade barriers been removed, but significant effects on the New Zealand economy have been experienced as a result – see Mayes (1988). Also, 'Canadians are actively engaged in debating the merits of further trade liberalization through commercial integration with the [US]' (Sarna, 1985, p. 299), with the Canadian Senate Committee taking 'pains to design carefully the contours of a Canada–US free trade regime' (Sarna, 1985, p. 301).

A scheme which covers more than one continent is the Arab League (AL), which consists of 21 independent nations, extending from the Gulf in the East to Mauritania and Morocco in the West. Hence, the geographical area covered by the group includes the whole of North Africa, a large part of the Middle East, plus Somalia and Djibouti. The purpose of the organisation is to strengthen the close ties linking Arab states, to coordinate their policies and activities and direct them to their common good and to mediate in disputes between them. These may seem like vague terms of reference, but the Arab Economic Council, whose membership consists of all Arab Ministers of Economic Affairs, was entrusted with 'suggesting ways for economic development, cooperation, and organisation and coordination' (Sayigh, 1982, p. 123). The Council for Arab Economic Unity (CAEU), which was formed in 1957, had the aim of establishing an integrated economy of all member states of the AL. Moreover, in 1964 the Arab Common Market was formed between Egypt, Iraq, Jordan and Syria, and the Gulf Cooperation Council (GCC) was established between Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates to bring together the Gulf states and to prepare the ground for them to join forces in the economic, political and military spheres.

There are two schemes of sectoral international economic integration. The first is the Organisation of Petroleum Exporting Countries (OPEC), founded in 1960 with a truly international membership. Its aim was to protect the main interest of its member nations: petroleum. The second is the Organisation of Arab Petroleum Exporting Countries (OAPEC), established in January 1968 by Kuwait, Libya and Saudi Arabia. These were joined in May 1970 by Algeria and the four Arab Gulf Emirates (Qatar, Abu Dhabi, Bahrain and Dubai). In March 1972 Egypt, Iraq and Syria became members.

OAPEC was temporarily liquidated in June 1971 and Dubai is no longer a member. The agreement establishing the organisation states that the principal objectives of OAPEC are: the cooperation of the member nations in various forms of economic activity, the realisation of the closest ties among them, the determination of ways and means of securing their legitimate interests, the use of joint efforts to ensure the flow of petroleum to its consumers and the creation of an appropriate atmosphere for the capital and expertise invested in the petroleum industry in the member nations (*Middle East Economic Survey*, 1968). OAPEC was originally conceived as an example of sectoral integration with the political objective of using petroleum as a weapon for international bargaining against the Israeli occupation of certain Arab areas. Recently, however, the organisation has undertaken a number of projects both internally and externally – see Mingst (1977/78).

Finally, there are also the North Atlantic Treaty Organisation (NATO), the Organisation for Economic Cooperation and Development (OECD) and the Organisation for African Unity (OAU) but these and the AL are strictly speaking for political and economic cooperation only.

THE ECONOMIC GAINS FROM INTEGRATION

In reality, almost all existing cases of economic integration were either proposed or formed for political reasons even though the arguments popularly put forward in their favour were expressed in terms of possible economic gains. However, no matter what the motives for economic integration are, it is still necessary to analyse the economic implications of such geographically discriminatory groupings.

At the customs union (CU) and free trade area (FTA) level, the possible sources of economic gain can be attributed to:

(i) enhanced efficiency in production made possible by increased specialisation in accordance with the law of comparative advantage;
(ii) increased production levels due to better exploitation of economies of scale made possible by the increased size of the market;
(iii) an improved international bargaining position, made possible

by the larger size, leading to better terms of trade;
(iv) enforced changes in economic efficiency brought about by enhanced competition; and
(v) changes affecting both the amount and quality of the factors of production due to technological advances.

If the level of economic integration proceeds beyond the CU level, to the common market (CM) or economic union (EU) level, then further sources of gain become possible due to:

(vi) factor mobility across the borders of member nations;
(vii) the coordination of monetary and fiscal policies; and
(viii) the goals of near full employment, higher rates of economic growth and better income distribution becoming unified targets.

It should be apparent that some of these considerations relate to the static resource reallocation effects while the rest relate to the long-term or dynamic effects. The possible attainment of the benefits of these effects must be considered with great caution:

> Membership of an economic grouping cannot of itself guarantee to a member state or the group a satisfactory economic performance, or even a better performance than in the past. The static gains from integration, although significant, can be – and often are – swamped by the influence of factors of domestic or international origin that have nothing to do with integration. The more fundamental factors influencing a country's economic performance (the dynamic factors) are unlikely to be affected by integration except in the long run. It is clearly not a necessary condition for economic success that a country should be a member of an economic community as the experience of several small countries confirms, although such countries may have done even better as members of a suitable group. Equally, a large integrated market is in itself no guarantee of performance, as the experience of India suggests. However, although integration is clearly no panacea for all economic ills, nor indispensable to success, there are many convincing reasons for supposing that significant economic benefits may be derived from properly conceived arrangements for economic integration. (Robson, 1985)

ABOUT THE BOOK

From the above, it should be evident that not only have many schemes of international economic integration been experienced over the past three decades or so, although some have met their demise, but also that new schemes are either being hotly pursued or seriously contemplated. Therefore the aim of this book is to provide the reader with a comprehensive and critical analysis of both the theoretical and empirical literature on this branch of international economics. The book is not about the various schemes of international economic integration that have been formed since these are comprehensively tackled in my *International Economic Integration* (Macmillan, 1988; second edition) by distinguished contributors and myself. Moreover, although most of the empirical studies are concerned with the EC, the book does not discuss the EC itself except when it is vital to do so; this is because it is assumed that those interested in any detailed aspect of the EC will be either familiar with or will consult my *The Economics of the European Community* (Philip Allan, 1985; second edition), where a number of leading authorities and myself present a comprehensive analysis of the EC – the interested reader may also wish to consult my *Britain within the European Community: the Way Forward* (Macmillan, 1983) where the emphasis is on the effects of EC membership on the UK.

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integration. In this book, theoretical issues are the concern of only one part. A substantial part is devoted to the empirical studies.

The book is divided into two parts. Part I is devoted to the pure theory of international economic integration, while Part II is almost entirely about the empirical work in this field. The division into two parts is deliberate. On the one hand, the reader will find that the empirical work has followed a path of its own; hence to deal with the two aspects as if they were completely integrated would be utterly misleading. On the other hand, the two areas deal with the same field; hence, it would not be fruitful to discuss them in two completely separate books. Therefore, it seemed that a good compromise to adopt would be the division employed here.

Part I consists of six chapters. The first five are devoted to the theoretical aspects of economic integration for countries which are predominantly market oriented economies, be they advanced or developing nations. Chapter 2 is on customs union theory and is extended in Chapter 3 to deal with the differences between customs unions and free trade areas. Chapter 4 is devoted entirely to the theoretical issues relating to common markets and economic unions. Chapter 5 treats the aspects specific to economic integration amongst a group of developing nations. This is followed by Chapter 6 on the macroeconomic modelling of economic integration. Finally, Chapter 7 is a brief look at economic integration amongst a group of centrally planned economies – this chapter differs from the previous ones since it is concerned with the institutional factors involved in a discussion of the CMEA, but, as is argued in the chapter, this deviation from pure theory is inevitable, given the basic differences between predominantly market oriented and centrally planned economies.

Part II comprises nine chapters, with Chapter 8 setting out the problem to be empirically investigated and also forming a general introduction to the second part of the book. Chapters 9–11 are devoted to a presentation and discussion of the studies of the effects of economic integration on the manufacturing sector. Chapter 12 deals with the study of the impact of economic integration on agriculture. However, since the study of agriculture is confined to the costs of the *common agricultural policy* (CAP) of the European Community, the chapter includes an analytical presentation of the CAP so as to facilitate a proper understanding of what is being estimated. The reasons for devoting three chapters to manufacturing and one only to agriculture are given in the last section of Chapter 8. Chapter 13

concerns the effects of integration on the terms of trade. Chapters 14 and 15 concentrate on the estimation of the impact of economic integration on the CMEA and the LDCs respectively. The final chapter provides a general critique of the empirical studies, states some broad conclusions and suggests an alternative way for estimation.

APPENDIX: ARTICLE XXIV

Territorial Application – Frontier Traffic – Customs Unions and Free Trade Areas

1. The provisions of this Agreement shall apply to the metropolitan customs territories of the contracting parties and to any other customs territories in respect of which this Agreement has been accepted under Article XXVI or is being applied under Article XXXIII or pursuant to the Protocol of Provisional Application. Each such customs territory shall, exclusively for the purposes of the territorial application of this Agreement, be treated as though it were a contracting party; *Provided* that the provisions of this paragraph shall not be construed to create any rights or obligations as between two or more customs territories in respect of which this Agreement has been accepted under Article XXVI or is being applied under Article XXXIII or pursuant to the Protocol of Provisional Application by a single contracting party.

2. For the purposes of this Agreement a customs territory shall be understood to mean any territory with respect to which separate tariffs or other regulations of commerce are maintained for a substantial part of the trade to such territory with other territories.

3. The provisions of this Agreement shall not be construed to prevent:

(*a*) Advantages accorded by any contracting party to adjacent countries in order to facilitate frontier traffic;

(*b*) Advantages accorded to the trade with the Free Territory of Trieste by countries contiguous to that territory, provided that such advantages are not in conflict with the Treaties of Peace arising out of the Second World War.

4. The contracting parties recognize the desirability of increasing freedom of trade by the development, through voluntary agreements, of closer integration between the economies of the countries parties to such agreements. They also recognize that the purpose of a customs union or of a free-trade area should be to facilitate trade between the constituent territories and not to raise barriers to the trade of other contracting parties with such territories.

5. Accordingly, the provisions of this Agreement shall not prevent, as between the territories of contracting parties, the formation of a customs union or of a free-trade area or the adoption of an interim agreement

necessary for the formation of a customs union or of a free-trade area; *Provided* that:

(*a*) with respect to a customs union, or an interim agreement leading to the formation of a customs union, the duties and other regulations of commerce imposed at the institution of any such union or interim agreement with respect to trade with contracting parties not parties to such union or agreement shall not on the whole be higher or more restrictive than the general incidence of the duties and regulations of commerce applicable in the constituent territories prior to the formation of such union or the adoption of such interim agreement, as the case may be;
(*b*) with respect to a free-trade area, or an interim agreement leading to the formation of a free-trade area, the duties and other regulations of commerce maintained in each of the constituent territories and applicable at the formation of such free-trade area or the adoption of such interim agreement to the trade of contracting parties not included in such area or not parties to such agreement shall not be higher or more restrictive than the corresponding duties and other regulations of commerce existing in the same constituent territories prior to the formation of the free-trade area, or interim agreement, as the case may be; and
(*c*) any interim agreement referred to in sub-paragraphs (*a*) and (*b*) shall include a plan and schedule for the formation of such a customs union or of such free-trade area within a reasonable length of time.

6. If, in fulfilling the requirements of sub-paragraph 5(*a*), a contracting party proposes to increase any rate of duty inconsistently with the provisions of Article II, the procedure set forth in Article XXVIII shall apply. In providing for compensatory adjustment, due account shall be taken of the compensation already afforded by the reductions brought about in the corresponding duty of the other constituents of the union.

7.

(*a*) Any contracting party deciding to enter into a customs union or a free-trade area, or an interim agreement leading to the formation of such a union or area, shall promptly notify the CONTRACTING PARTIES and shall make available to them such information regarding the proposed union or area as will enable them to make such reports and recommendations to contracting parties as they may deem appropriate.
(*b*) If, after having studied the plan and schedule included in an interim agreement referred to in paragraph 5 in consultation with the parties to that agreement and taking due account of the information made available in accordance with the provisions of sub-paragraph (*a*), the CONTRACTING PARTIES find that such agreement is not likely to result in the formation of a customs union or a free-trade area within the period contemplated by the parties to the agreement or such a period is not a reasonable one, the CONTRACTING PARTIES shall make recommendations to the parties to the agreement. The parties shall not maintain or put into force, as the case may be, such agreement if they are not prepared to modify it in accordance with these recommendations.

(*c*) Any substantial change in the plan or schedule referred to in paragraph 5 (*c*) shall be communicated to the CONTRACTING PARTIES, which may request the contracting parties concerned to consult with them if the change seems likely to jeopardize or delay unduly the formation of the customs union or of the free-trade area.

8. For the purposes of this Agreement:

(*a*)A customs union shall be understood to mean the substitution of a single customs territory for two or more customs territories, so that

(i)duties and other restrictive regulations of commerce (except, where necessary, those permitted under Articles XI, XII, XIII, XIV, XV, and XX) are eliminated with respect to substantially all the trade between the constituent territories and the union or at least with respect to substantially all the trade in products originating is such territories, and,

(ii)subject to the provisions of paragraph 9, substantially the same duties and other regulations of commerce are applied by each of the members of the union to the trade of territories not included in the union;

(*b*) A free-trade area shall be understood to mean a group of two or more customs territories in which the duties and other restrictive regulations of commerce (except, where necessary, those permitted under Articles XI, XII, XIII, XIV, XV and XX) are eliminated on substantially all the trade between the constituent territories in products originating in such territories.

9. The preferences referred to in paragraph 2 of Article I shall not be affected by the formation of a customs union or of a free-trade area but may be eliminated or adjusted by means of negotiations with contracting parties affected. This procedure of negotiations with affected parties shall, in particular, apply to the elimination of preferences required to conform with the provisions of paragraph 8 (*a*)(i) and paragraph 8(*b*).

10. The CONTRACTING PARTIES may by a two-thirds majority approve proposals which do not fully comply with the requirements of paragraph 5 to 9 inclusive, provided that such proposals lead to the formation of a customs union or a free-trade area in the sense of this Article.

11. Taking into account the exceptional circumstances arising out of the establishment of India and Pakistan as independent States and recognizing the fact that they have long constituted an economic unit, the contracting parties agree that the provisions of this Agreement shall not prevent the two countries from entering into special arrangements with respect to the trade between them, pending the establishment of their mutual trade relations on a definitive basis.

12. Each contracting party shall take such reasonable measures as may be available to it to ensure observance of the provisions of this Agreement by the regional and local governments and authorities within its territory.

Part I
Theory

2 Theory of Customs Unions

THE BASIC CONCEPTS

Before the theory of second-best was developed (Meade, 1955a; Lipsey and Lancaster, 1956–7), it used to be the accepted tradition that customs union (CU) formation should be encouraged. The rationale for this was that since free trade maximised world welfare and since CU formation was a move towards free trade, CUs increased welfare even though they did not maximise it. This rationale certainly lies behind GATT article XXIV (see Appendix to Chapter 1) which permits the formation of CUs and free trade areas (FTAs) as the special exceptions to the principle of non-discrimination, provided the intra-area dismantling of tariffs applies to a substantial part of the partners' trade.

Viner (1950) and Byé (1950) challenged this proposition by stressing that CU formation is by no means equivalent to a move towards free trade since it amounts to free trade between the members and protection *vis-à-vis* the outside world. This combination of free trade and protectionism could result in *trade creation* (TC) and/or *trade diversion* (TD). TC is the replacement of expensive domestic production by cheaper imports from a partner and TD is the replacement of cheaper initial imports from the outside world by more expensive imports from a partner. Viner stressed the point that TC is beneficial since it does not affect the rest of the world while TD is harmful and it is therefore the relative strength of these two effects which determines whether or not CU formation is to be advocated. It is therefore important to understand the implications of these concepts.

Assuming perfect competition in both the commodity and factor markets, automatic full employment of all resources, costless adjustment procedures, perfect factor mobility nationally but perfect immobility across national boundaries, prices determined by cost, three countries H (the home country), P (the potential CU partner), and W (the outside world), plus all the traditional assumptions employed in tariff theory, we can use a simple diagram to illustrate these two concepts.

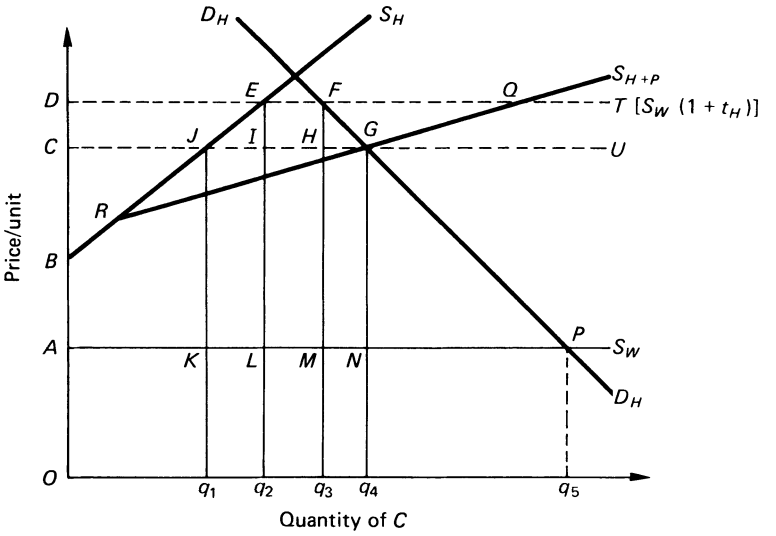


Figure 2.1 *Trade creation and trade diversion*

In Figure 2.1, S_W is W's perfectly elastic tariff free supply curve for this commodity; S_H is H's supply curve while S_{H+P} is the joint H and P tariff free supply curve. With a non-discriminatory tariff imposed by H of AD (t_H), the effective supply curve facing H is $BREFQT$, i.e. its own supply curve up to E and W's, subject to the tariff $[S_W\ (1+t_H)]$, after that. The domestic price is therefore OD which gives domestic production of Oq_2, domestic consumption of Oq_3 and imports of q_2q_3. H pays q_2LMq_3 for these imports while the domestic consumer pays q_2EFq_3 with the difference ($LEFM$) being tariff revenue which accrues to the H government. This revenue can be viewed as a transfer from the consumers to the government with the implication that when the government spends it, the marginal valuation of that expenditure should be exactly equal to its marginal valuation by private consumers so that no distortions should occur.

If H and W form a CU, the free trade position will be restored so that Oq_5 will be consumed in H and this amount will be imported from W. Hence free trade is obviously the ideal situation. But if H and P form a CU, the tariff will still apply to W while it is removed from P. The effective supply curve in this case is $BRGQT$. Price falls to OC resulting in a fall in domestic production to Oq_1, an increase

in consumption to Oq_4 and an increase in imports to q_1q_4. These imports now come from *P*.

The welfare implications of these changes can be examined by employing the concepts of consumers' and producers' (consumer/producer for short) surpluses. As a result of increased consumption, consumer surplus rises by *CDFG*. Part of this (*CDEJ*) is a fall in producer surplus due to the decline in domestic production and another part (*IEFH*) is a portion of the tariff revenue now transferred back to the consumer subject to the same condition of equal marginal valuation. This leaves the triangles *JEI* and *HFG* as gains from CU formation. However, before we conclude whether or not these triangles represent *net* gains we need to consider the overall effects more carefully.

The fall in domestic production from Oq_2 to Oq_1 leads to increased imports of q_1q_2. These cost q_1JIq_2 to import from *P* while they originally cost q_1JEq_2 to produce domestically. (Note that these resources are supposed to be employed elsewhere in the economy without any adjustment costs or redundancies.) There is therefore a saving of *JEI*. The increase in consumption from Oq_3 to Oq_4 leads to new imports of q_3q_4 which cost q_3HGq_4 to import from *P*. These give a welfare satisfaction to the consumers equal to q_3FGq_4. There is therefore an increase in satisfaction of *HFG*. However, the *initial* imports of q_2q_3 originally cost the country q_2LMq_3 but these imports now come from *P* costing q_2IHq_3. Therefore these imports lead to a loss equal to the loss in government revenue of *LIHM* (*IEFH* being a re-transfer subject to the same condition of equal marginal valuation). It follows that the triangle gains (*JEI*+*HFG*) have to be compared with the loss of tariff revenue (*LIHM*) before a definite conclusion can be made regarding whether the net effect of CU formation has been one of gain or loss.

It should be apparent that q_2q_3 represents, in terms of our definition, TD, and $q_1q_2 + q_3q_4$ represent TC (it is now generally accepted that the consumption effect has to be included in TC – Viner and Byé were concerned with production effects only), or alternatively that area *JEI* plus area *HFG* are TC (benefits) while area *LIHM* is TD (loss).[1] It is then obvious that TC is economically desirable while TD is undesirable. Hence Viner and Byé's conclusion that it is the relative strength of these two effects which should determine whether or not CU formation is beneficial or harmful.

The reader should note that if the initial price is that given by the

intersection of D_H and S_H (due to a higher tariff rate), the CU would result in pure TC since the tariff rate is prohibitive. If the price is initially OC (due to a lower tariff rate), then CU formation would result in pure TD. It should also be apparent that the size of the gains and losses depends on the price elasticities of S_H, S_{H+P} and D_H and on the divergence between S_W and S_{H+P}, i.e. cost differences.

THE COOPER/MASSELL CRITICISM

Viner and Byé's conclusion was challenged by Cooper and Massell (1965a). They suggested that the reduction in price from OD to OC should be considered in two stages: firstly, reduce the tariff level indiscriminately (i.e. for both W and P) to AC which gives the same union price and production, consumption and import changes; secondly, introduce the CU starting from the new price OC. The effect of these two steps is that the gains from TC ($JEI+HFG$) still accrue while the losses from TD ($LIHM$) no longer apply since the new effective supply curve facing H is $BJGU$ which ensures that imports continue to come from W at the cost of q_2LMq_3. In addition, the new imports due to TC ($q_1q_2+q_3q_4$) generate tariff revenue of $JILK$ plus $MHGN$. Cooper and Massell then conclude that a policy of *unilateral tariff reduction* (UTR) is superior to CU formation. This proposition is discussed in detail below.

FURTHER CONTRIBUTIONS

Cooper and Massell (1965b) and Johnson (1965a) utilise a 'public good' argument for CU formation with Cooper and Massell's expressed in practical terms and Johnson's in theoretical terms.

Johnson's method is based on four major assumptions:

(i) governments use tariffs to achieve certain non-economic (political, etc.) objectives;
(ii) actions taken by governments are aimed at offsetting differences between private and social costs – they are, therefore, rational efforts;
(iii) government policy is a rational response to the demands of the electorate; and
(iv) countries have a preference for industrial production.

In addition to these assumptions, Johnson makes a distinction between private and public consumption goods, real income (utility enjoyed from both private and public consumption, where consumption is the sum of planned consumption expenditure and planned investment expenditure) and real product (defined as total production of privately appropriable goods and services).

These assumptions have important implications. Firstly, competition among political parties will make the government adopt policies that will tend to maximise consumer satisfaction from both 'private' and 'collective' consumption goods. Satisfaction is obviously maximised when the rate of satisfaction per unit of resources is the same in both types of consumption goods. Secondly, 'collective preference' for industrial production implies that consumers are willing to expand industrial production (and industrial employment) beyond what it would be under free trade.

Tariffs are the main source of financing this policy and protection will be carried to the point where the value of the marginal utility derived from collective consumption of domestic and industrial activity is just equal to the marginal excess private cost of protected industrial production.

The marginal excess cost of protected industrial production consists of two parts: the marginal production cost and the marginal private consumption cost. The marginal production cost is equal to the proportion by which domestic cost exceeds world market cost. In a very simple model this is equal to the tariff rate. The marginal private consumption cost is equal to the loss of consumer surplus due to the fall in consumption brought about by the tariff.

In equilibrium, the proportional marginal excess private cost of protected production measures the marginal 'degree of preference' for industrial production. This is illustrated in Figure 2.2 where: S_W is the world supply curve; D_H is the free trade constant-utility demand curve; S_H is the domestic supply curve; S_{H+u} is the marginal private cost curve of protected industrial production, including the excess private consumption cost. [FE is the first component of marginal excess cost – determined by the excess marginal cost of domestic production in relation to the free trade situation due to the tariff (AB) – and the area GED ($=IHJ$) is the second component which is the dead weight loss in consumer surplus due to the tariff.] The height of VV above S_W represents the marginal value of industrial production in collective consumption and its slope reflects the assumption of diminishing marginal utility.

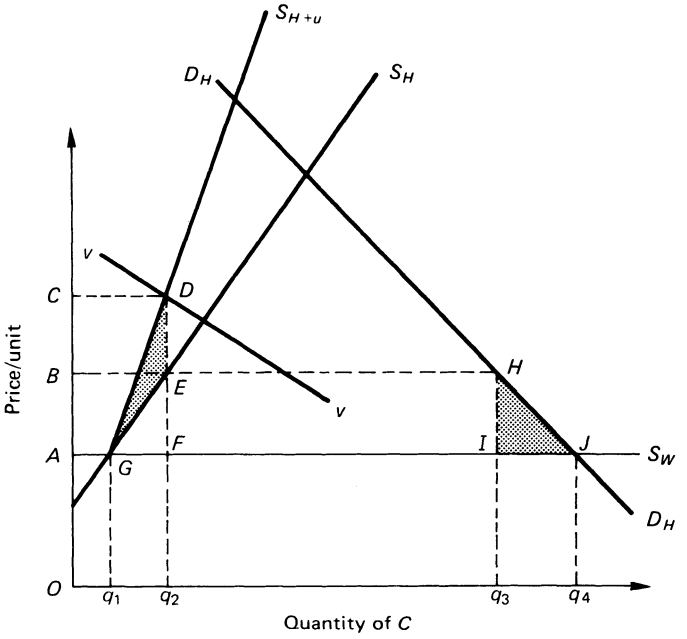


Figure 2.2 *Preference for industrial production*

The maximisation of real income is achieved at the intersection of VV with S_{H+u} requiring the use of tariff rate BA/OA to increase industrial production from Oq_1 to Oq_2. Note that, in equilibrium, the government is maximising real income, not real product: maximisation of real income makes it necessary to sacrifice real product in order to gratify the preference for collective consumption of industrial production.[2]

To make the model useful for the analysis of CU issues it is necessary to alter some of the assumptions. Let us assume that industrial production is not one aggregate but a variety of products in which countries have varying degrees of comparative advantage, that countries differ in their overall comparative advantage in industry as compared with non-industrial production, that no country has monopoly/monopsony power (conditions for optimum tariffs do not exist), and that no export subsidies are allowed.

The variety of industrial production allows countries to be both importers and exporters of industrial products. This, in combination

with the 'preference for industrial production', will motivate each country to practice some degree of protection. A country can gratify its preference for industrial production only by protecting import-competing industries. Hence the condition for equilibrium remains the same: $VV=S_{H+u}$. However, S_{H+u} is slightly different because, firstly, the protection of import-competing industries will reduce exports of both industrial and non-industrial products (for balance-of-payments purposes). Hence, in order to increase total industrial production by one unit it will be necessary to increase protected industrial production by more than one unit so as to compensate for the induced loss of industrial exports. Secondly, the protection of import-competing industries reduces industrial exports by raising their production costs (due to perfect factor mobility). The stronger this effect, *ceteris paribus*, the higher the marginal excess cost of industrial production. This marginal excess cost will be greater, the larger the industrial sector compared with the non-industrial sector and the larger the protected industrial sector relative to the exporting industrial sector.

In the event of CU formation, if reciprocal tariff reductions are arrived at on a 'most-favoured nation' basis, the reduction of a country's tariff rate will increase imports from *all* the other countries. If the reduction is, however, discriminatory (starting from a position of non-discrimination), there are two advantages: firstly, each country can offer its partner an increase in exports of industrial products without any loss of its own industrial production by diverting imports from third countries (TD); secondly, when TD is exhausted, any increase in partner industrial exports to this country is exactly equal to the reduction in industial production in the same country (TC), hence eliminating the gain to third countries.

Therefore, discriminatory reciprocal tariff reduction costs each partner country less, in terms of reduction in domestic industrial production (if any) incurred per unit increase in partner industrial production, than does non-discriminatory reciprocal tariff reduction. On the other hand, preferential tariff reduction imposes an additional cost on the tariff reducing country: the excess of the costs of imports from the partner country over their cost in the world market.

The implications of this analysis are:

(i) both TC and TD yield a gain to the CU partners;
(ii) TD is preferable to TC for the preference granting country since a sacrifice of domestic industrial production is not required; and

(iii) both TC and TD may lead to increased efficiency due to economies of scale.

Johnson's contribution has not achieved the popularity it deserves because of the alleged nature of his assumptions. It can, of course, be claimed that an economic rationale for CUs on public goods grounds can only be established if for political or some such reasons governments are denied the use of direct production subsidies, and while this may be the case in certain countries at certain periods in their economic evolution, there would appear to be no acceptable reason why this should generally be true. Johnson's analysis demonstrates that CU and other acts of commercial policy may make economic sense under certain restricted conditions, 'but in no way does it establish or seek to establish a general argument for these acts' (Krauss, 1972, p. 428).

While this is a legitimate criticism, it is of no relevance to the world we live in: the rules of GATT prohibit the use of subsidies in international trade; hence it should not come as a surprise to learn that most countries use tariffs even though subsidies are superior to tariffs. It is a criticism related to a first-best view of the world, a view which can prevail only if GATT is ruled out of existence, which is not a likely short-term event. Therefore, it seems unfair to criticise an analysis on grounds which do not portray what actually exists; it is what prevails in practice that matters, particularly when the practice seems here to stay. That is what Johnson's approach is all about and that is what the theory of second-best tries to tackle. In short, the lack of belief in this approach is tantamount to a lack of belief in the validity of the distinction between social and private costs and benefits.

DYNAMIC EFFECTS

The so-called dynamic effects (Balassa, 1961) relate to the numerous means by which economic integration may influence the rate of growth of GNP of the participating nations. These include the following:

(i) scale economies made possible by the increased size of the market for both firms and industries operating below optimum capacity before integration occurs;
(ii) economies external to the firm which may have a downward influence on both specific and general cost structures;

(iii) the polarisation effect, by which is meant the cumulative decline either in relative or absolute terms of the economic situation of a particular participating nation or of a specific region within it due either to the benefits of TC becoming concentrated in one region or to the fact that an area may develop a tendency to attract factors of production;
(iv) the influence on the location and volume of real investment; and
(v) the effect of economic efficiency and the smoothness with which trade transactions are carried out due to enhanced competition and changes in uncertainty.

Apart from economies of scale, the possible gains are extremely long term in nature and cannot be tackled in orthodox economic terms: for example, intensified competition leading to the adoption of best business practices and to an American-type attitude, etc. (Scitovsky, 1958) seems like a naive socio-psychological abstraction that has no solid foundation with regard to both the aspirations of those countries contemplating economic integration and to its actually materialising.

Economies of scale which are internal to the industry can, however, be analysed in orthodox economic terms. In Figure 2.3, $D_{H,P}$ is the identical demand curve for this commodity in both H and P and D_{H+P} is their joint demand curve; S_W is the world supply curve; AC_P and AC_H are the average cost curves for this commodity in P and H respectively. Free trade is clearly the best policy resulting in price OA with consumption which is satisfied entirely by imports of Oq_4 in each of H and P giving a total of Oq_6.

If H and P impose tariffs, the only justification for this is that uncorrected distortions exist between the privately and socially valued costs in these countries – see Jones (1979) and El-Agraa and Jones (1981). The best tariff rates to impose are Corden's (1972b) 'made-to-measure' tariffs which can be defined as those which encourage domestic production to a level that just satisfies domestic consumption without giving rise to monopoly profits. These tariffs are equal to AD and AC for H and P respectively, resulting in Oq_1 and Oq_2 production in H and P respectively.

When H and P enter into a CU, P, being the cheaper producer, will produce the entire union output – Oq_5 – at a price OB. Note that this requires a common external tariff (CET) of AB/OA, i.e. a lower tariff than initially in the more efficient partner. This gives rise to consumption in each of H and P of Oq_3 with gains of $BDEG$ and

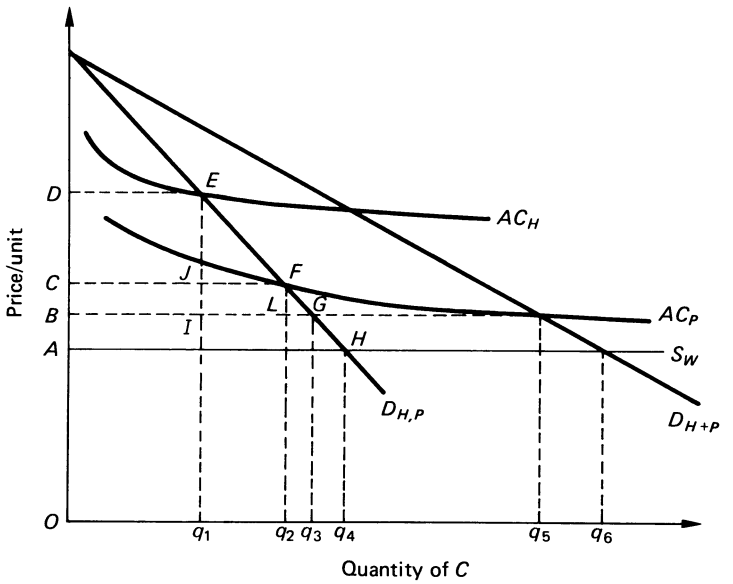


Figure 2.3 *Economies of scale and customs unions*

BCFG for *H* and *P* respectively. Parts of these gains, *BDEI* for *H* and *BCFL* for *P*, are 'cost-reduction' effects, i.e. the initial cost of this amount has been reduced due to economies of scale. There also results a production gain for *P* and a production loss in *H* due to abandoning production altogether.

Whether CU formation can be justified in terms of the existence of economies of scale will depend on whether the net effect is a gain or a loss (in this example *P* gains and *H* loses), as the loss from abandoning production in *H* must outweigh the consumption gain in order for the tariff to have been imposed in the first place. If the overall result is net gain, then the *distribution* of these *gains* becomes an important consideration. Alternatively, if economies of scale accrue to an integrated industry, then the *locational distribution* of the production units becomes an essential issue.

Economies of Scale: a Mathematical Treatment

A mathematical treatment of economies of scale in the context of economic integration is attempted by Choi and Yu (1984). They

employ a standard CU three-country model with two factors of production, but modify the production function to incorporate variable returns to scale. All three countries are assumed to produce two commodities, X_1 and X_2, which use both capital (K) and labour (L), a combination of both of which is needed for production. In terms of the production costs of X_2, it is presumed that country H is the least efficient, while W is the most efficient. Also, countries P and W are 'similar', but different from H, hence they do not trade with each other. Moreover, H is a 'small' country, which exports X_1 to P and W and imports X_2 from either P or W, not from both.

The demand side of the model is represented by a strictly quasi-concave utility function such that:

$$U = U(D_1, D_2) \tag{1}$$

where D_1 and D_2 represent the demand for consumption for the two commodities in H, and $U_i > 0, U_{ii} < 0$ for $i = 1, 2$. Since H exports X_1 and imports X_2, one can specify that:

$$D_1 = X_1 - E_1, \tag{2}$$

$$D_2 = X_2 + E_2, \tag{3}$$

where E_1 and E_2 are the exports of X_1 and the imports of X_2, respectively.

It is assumed that the balance of payments is always in equilibrium such that:

$$E_1 = pE_2$$

where p $(= p_2/p_1)$ is the world price of X_2 in terms of X_1. Given the assumption of a small country, the imposition of a tariff by H alters the price ratio for both producers and consumers in that country such that the domestic relative price of X_2 in terms of X_1 becomes:

$$p_H = p(1 + t). \tag{4}$$

The production side of the model is constructed with the following production functions:

$$x_i = g_i(X_i)F_i(c_i, l_i) \qquad i = 1, 2 \tag{5}$$

$$X_i = g_i(X_i)F_i(K_i, L_i) = g_i(X_i)L_i f_i(k_i) \qquad i = 1, 2 \tag{6}$$

where x_i is the output of a typical firm in industry i, and c_i and l_i are K and L employed by the firm; X_i is the output of industry i; K_i and L_i

are its total employment of K and L; k_i is the K/L ratio; g_i depicts the role of the externality and is assumed to be a positive function defined on $(0,\infty)$ to ensure that increases in the employment of K and L result in increased output; and F_i is homogeneous of degree one.

The output elasticity of returns to scale in the ith industry (e_i) as defined on $(-\infty,1)$ may be written as:

$$e_i = (\mathrm{d}g_i/\mathrm{d}X_i)F_i = (\mathrm{d}g_i/\mathrm{d}X_i)/(X_i/g_i) \qquad {}_i = 1,2 \tag{7}$$

where $e_i > 0$ for an industry subject to increasing returns to scale, and $e_i < 0$ for an industry subject to decreasing returns to scale.

The total differentiation of equation (6) gives:

$$(1 - e_i)\mathrm{d}X_i = g_i(F_{ki}\mathrm{d}K_i + F_{li}\mathrm{d}L_i) \qquad i = 1,2 \tag{8}$$

where F_{ki} and F_{li} are the partial derivatives of F_i with regard to K and L, respectively.

It is assumed that economies (diseconomies) to scale are external to the individual firm but internal to the industry, hence each factor of production receives the value of its marginal product to the individual firm, not the value of its marginal product to the industry:

$$w = p_i g_i F_{li} = p_i g_i F_{Li} = p_i g_i (f_{i-k_i} f_i') \qquad i = 1,2 \tag{9}$$

$$r = p_i g_i F_{ci} = p_i g_i F_{Ki} = p_i g_i f_{i'} \qquad i = 1,2 \tag{10}$$

where a prime indicates a partial derivative, f_i is F_i/L_i and k_i and p_i stand for the K/L ratio and the price of the ith commodity respectively. The prevalence of external economies means that the private marginal product $(g_i F_{ji})$ of factor j $(= K,L)$ is smaller than its social marginal product, $g_i F_{ji}/(1-e_i)$, i.e. the private marginal cost exceeds the social marginal cost.

Assuming factors of production are fully employed, one gets:

$$L_1 + L_2 = L \tag{11}$$

$$K_1 + K_2 = K \tag{12}$$

where K and L are fixed total supplies of the two factors of production.

Total differentiation of equations (11) and (12) gives:

$$\mathrm{d}L_1 = -\mathrm{d}L_2 \tag{13}$$

$$\mathrm{d}K_1 = -\mathrm{d}K_2 \tag{14}$$

Substituting equations (9), (10), (13) and (14) into (8), one obtains:

$$dX_1/dX_2 = \{(1 - e_2)/(1 - e_1)\}p_H \tag{15}$$

where dX_1/dX_2 is the marginal rate of transformation in production, and it is shown to be negative. If $e_1 \lesseqgtr e_2$, the price line (p_H) is flatter (steeper) than the slope of the production possibility frontier.

The model depicted by equations (1)–(15) is then utilised to analyse the welfare implications of the TC and TD effects of CU formation in the presence of economies of scale. This is carried out by following the procedure developed by Batra (1975) and extended by Yu (1981; 1982) for the case of factor market distortions and wage rigidity. Differentiating the social utility function given in equation (1) and employing the consumer equilibrium condition ($U_2/U_1 = p_H$), one gets:

$$dU/U_1 = dD_1 + p_H dD_2 \tag{16}$$

Totally differentiating equations (2) – (4) and using (15) and (16), one obtains:

$$dU/U_1 = \{(e_2 - e_1)/(1 - e_1)\}\, p_H dX_2 + p_t dE_2 - E_2 d_p. \tag{17}$$

Because imports are a function of the tariff and the terms of trade (t/t), $E_2 = E_2(t,p)$ and $dE_2 = (\partial E_2/\partial t)dt + (\partial E_2/\partial p)dp$. Substituting dE_2 into equation (17), one gets:

$$\begin{aligned} dU/U_1 = \; & \{(e_2 - e_1)/(1 - e_1)\}p_H dX_2 + p_t(\partial E_2/\partial t)dt \\ & + \{p_t(\partial E_2/\partial_p) - E_2\}dp. \end{aligned} \tag{18}$$

The first term on the right-hand side captures the welfare effect of variable returns to scale, the second term indicates the effect of an exogenous alteration in the tariff rate and the third term depicts the effect of an exogenous change in the t/t.

Because X_2 depends on t and p, it follows that $X_2 = X_2(t,p)$ and $dX_2 = (\partial X_2/\partial t)dt + (\partial X_2/\partial p)dp$. Therefore equation (18) can be rewritten as:

$$\begin{aligned} dU/U_1 = \; & \{[(e_2 - e_1)/(1 - e_1)]p_H(\partial X_2/\partial t) + p_t(\partial E_2/\partial t)\{\, dt \\ & + \{[(e_2 - e_1)/(1 - e_1)]p_H(\partial X_2/\partial p) + p_t(\partial E_2/\partial p) \\ & - E_2\}dp. \end{aligned} \tag{19}$$

Partially differentiating $p_H = p(1 + t)$ with respect to t and p, one

gets: $\partial p_H/\partial t = p$ and $\partial p_H/\partial p = (1 + t)$. Substituting these into equation (19), one obtains:

$$\frac{dU}{U_1} = \frac{dU}{dt}\Bigg|_{dp=0} dt + \frac{dU}{dp}\Bigg|_{dt=0} dp$$

$$= \{pp_H[(e_2 - e_1)/(1 - e_1)](\partial X_2/\partial p_H) + p^2t(\partial E_2/\partial p_H)\}dt + (1 + t)\{pH[(e_2 - e_1)/(1 - e_1)](\partial X_2/\partial p_H) + pt(\partial E_2/\partial p_H) - [E_2/(1 + t)]\}dp. \quad (20)$$

Equation (20) is the key expression for determining the welfare effects of CU formation. The first term in braces on the right-hand side depicts the change in welfare that results from a discriminatory alteration in the tariff rate, while the second term in braces gives the welfare effect of an exogenous shift in the *t/t* with an unaltered tariff rate.

The signs of the coefficients of d*t* and d*p* in equation (20) can be established in the following manner. To simplify the analysis, define α:

$$\alpha \equiv pp_H\{(e_2 - e_1)/(1 - e_1)\}\partial p_H$$

to capture the production effect of an alteration in the tariff rate through returns to scale. Consider a dynamically stable system in which the output of a commodity responds positively to an increase in its price, i.e. $\partial X_2/\partial p_H > 0$. Assume that the first industry is subject to decreasing returns to scale while the second industry is subject to increasing returns to scale, i.e. $e_2 > 0 > e_1$. Because, e_2 exceeds e_1, then α must have a positive value, i.e. $\alpha > 0$. The term $p_t^2(\partial E^2/\partial p_H)$ captures both the direct production and consumption effects. In the absence of *inferior* goods in social consumption, the term in brackets will be negative, i.e. $\partial E_2/\partial p_H < 0$.

The second set of braces in equation (20) consists of three terms. $p_H\{(e_2 - e_1)/(1 - e_1)\}(\sigma X_2/\sigma p_H)$ is a term which depicts the effect of a change in the *t/t* through variable returns to scale. $p_t(\partial E_2/\partial p_H)$ indicates the direct effect of the *t/t* on production and consumption. The third term, $-E_2/(1 + t)$, represents the *t/t* effect through changes in the value of imports. Since $\alpha X_2/\partial p_H > 0$, the first term is positive (negative) if $e_2 \lesseqgtr e_1$, but both the other two terms are negative.

One has to assume that some restricted trade existed initially between *H* and *W* since prohibitive tariffs will turn the equation $p_H = p(1 + t)$ into an inequality, thus vitiating much of the analysis.

To apply this framework to CU theory, Choi and Yu adopt Yu's (1981) definitions of TC and TD:

(i) TC I is the replacement of H's consumption of the domestically-produced high cost X_2 by imports of the same product from W.
(ii) TD I is the replacement of H's imports of X_2 from W by imports of the same product from P because of the discriminatory tariff abolition by H on imports from P only.
(iii) TC II is the replacement of H's imports of X_2 from producers in P by producers in W.
(iv) TD II is the replacement of H's imports of X_2 from producers in W by producers in P due to the discriminatory tariff on imports from W.

Under TC I, H ends up trading with W only. Its domestic price ratio falls, but the country continues to face the same foreign price ratio as before. This is given by W, i.e. $\mathrm{d}p = 0$. Moreover, the fall in H's tariff rate implies that $\mathrm{d}t < 0$. Since $\mathrm{d}p = 0$, equation (20) reduces to:

$$\mathrm{d}U/U_1 = \{ pp_H[(e_2 - e_1)/(1 - e_1)]\partial X_2/\partial p_H + p^2t(\partial E_2/\partial p_H)\}\mathrm{d}t. \tag{21}$$

If the industries operate under identical returns to scale, $e_1 = e_2$ (constant returns to scale is then a special case), equation (21) reduces to $p^2t(\partial E_2/\partial p_H)\mathrm{d}t$, which is necessarily positive. Therefore, TC I increases welfare, which is consistent with a result obtained by, *inter alia*, Batra (1975), but it is a result that follows automatically from the definition of TC I: the replacement of the highest cost supplier by the least cost one under conditions of equal response by the two industries to output expansion and contraction must necessarily improve welfare! The first proposition ensues:

(i) If the elasticity of returns to scale of the exportable industry is equal to or greater than that of the importable industry, TC I always leads to improvement in welfare, given a positive price-output response.

However, if $e_1 < e_2$, the sign of $\mathrm{d}U/U_1$ is indeterminate. Hence, the second proposition:

(ii) If the elasticity of returns to scale of the exportable industry is smaller than that of the importable industry, TC I may lead to deterioration in welfare.

Under TD I, H removes its tariff on imports from P ($\mathrm{d}t < 0$) such that now it trades with P at P's t/t. Thus H's t/t become less favourable, $\mathrm{d}p > 0$. The welfare effects of TD I are given by equation (20).

Assuming that $e_1 = e_2$, this equation reduces to:

$$\frac{dU}{U_1} = p^2 t \frac{\partial E_2}{\partial p_H} dt + (1 + t) pt \left[\frac{\partial E_2}{\partial p_H} - \frac{E_2}{(1 + t)} \right] dp$$

$$= \frac{dU}{dt} \Big|_{dp=0} dt + \frac{dU}{dp} \Big|_{dt=0} dp.$$

In this case, $dU/dt \mid_{dp = 0} dt > 0$ and $dU/dp \mid_{dt = 0} do < 0$. It is apparent that the sign of dU/U_1 will depend on the relative strength of these opposite forces. Note that this equation shows both the production and consumption gains emphasised by, *inter alia*, Lipsey (1957; 1960) and Bhagwati (1971) and castigated by Johnson (1974) as a useless mathematical superstructure that is rendered redundant when a proper definition of TD is adopted – see the earlier sections of this chapter. However, all that can be stated in this case is the third proposition:

(iii) In the presence of variable returns to scale, TD I may lead to improvement in welfare.

Under TC II, H completely removes its tariffs on imports from W so that H now trades with W only. Hence H's domestic price ratio comes down to W's t/t. Moreover, H gets an exogenous improvement in its t/t ($dp < 0$). Note that the switch in the source of supply of imports in this case leaves H's tariff unaltered ($dt = 0$). Therefore equation (20) reduces to:

$$dU/U_1 = (1 + t\{p_H[(e_2 - e_1)/(1 - e_1)]\partial X_2/\partial p_H + pt(6E_2/\partial p_H) - E_2(1 + t)\} dp. \quad (23)$$

If $e_1 = e_2$, this equation reduces to:

$$dU/U_1 = (1 + t)[pt(\partial E_2/\partial p_H) - E_2/(1 + t)]dp,$$

which is necessarily positive if the price–output response is positive, i.e. $\partial X_2/\partial p_H > 0$. Therefore, TC II improves social welfare, leading to the fourth proposition:

(iv) If the elasticity of returns to scale of the exportable industry is equal to or greater than that of the importable industry, TC II leads to improvement in welfare when there is a positive price–output response.

However, if $e_1 = e_2$, then the sign of dU/U_1 is indeterminate. Hence, proposition five:

(v) If the elasticity of returns to scale of the exportable industry is smaller than that of the importable industry, TC II may lead to a reduction in welfare.

The authors finally consider the welfare implications of TD II. Here, H imposes a discriminatory tariff against imports from W, given, initially, the same tariff on all sources of supply with zero tariffs being a special case. It follows that H trades with P only at P's t/t. Because there is no tariff on imports from P, $dt = 0$. However, the switch in the source of supply from W to P leads to a deterioration in the terms of trade, $dp > 0$. The welfare effects in this case are also given by equation (23). It follows that if $e_1 \geqslant e_2$ then $dU/U_1 < 0$. Hence the sixth proposition:

(vi) If the elasticity of returns to scale of the exportable industry is equal to or greater than that of the importable industry, TD II leads to a deterioration in welfare when there is a positive price–output response.

However, if $e_1 < e_2$ then the sign of dU/U_1 is indeterminate. Hence the final proposition:

(vii) If the elasticity of returns to scale of the exportable industry is smaller than that of the importable industry, TD II may lead to improvement in welfare.

I have singled out this contribution in order to demonstrate the proposition that the mathematical treatment of TC and TD under conditions of economies of scale is either unnecessary (there is nothing in these propositions that could not be derived from pure intuition, and some of the definitions are redundant, i.e. a CU with the least cost supplier – TC I – is tantamount to a policy of free trade) or useless (why should *similar* countries wish to establish a CU? If CU's are to be formed for purely economic reasons, then, as I have demonstrated in this chapter, only those countries which are *initially* competitive but *potentially* complementary would contemplate it!). Thus it appears that the situations tackled in the manner described here are made purely for their mathematical convenience (simple and irrelevant assumptions) rather than to advance our knowledge in this field of economics. That is why the main method of exposition in this book is geometrical, unless the situation dictates otherwise.

DOMESTIC DISTORTIONS

A substantial literature tried to tackle the important question of whether or not the formation of a CU may be economically desirable when there are domestic distortions. Such distortions could be attributed to the presence of trade unions which negotiate wage rates in excess of the equilibrium rates or to governments introducing minimum wage legislation – both of which are widespread activities in most countries. It is usually assumed that the domestic distortion results in a *social* average cost curve which lies below the private one. Hence, in Figure 2.4, which is adapted from Figure 2.3, I have incorporated AC_H^s and AC_P^s as the *social* curves in the context of economies of scale and a separate representation of countries H and P.

Note that AC_H^s is drawn to be consistently above AS_W while AC_P^s is below it for higher levels of output. Before the formation of a CU, H may have been adopting a made-to-measure tariff to protect its industry but the first-best policy would have been one of free trade as argued in the previous section. Hence, the formation of the CU will lead to the same effects as in the previous section with the exception that the cost-reduction effect (area b) will be less by DD' times Oq_1. For P, the effects will be: (i) as before, a consumption gain of area c; (ii) a cost-reduction effect of area e due to calculations relating to social rather than private costs; (iii) gains from sales to H of areas d_1 and d_2 with d_1 being an income transfer from H to P and d_2 the difference between domestic social costs in P and P_W = the world price; and (iv) the social benefits accruing from extra production made possible by the CU area f = which is measured by the extra consumption multiplied by the difference between P_W and the domestic social costs.

This analysis does not, however, lead to an economic rationale for the formation of a CU since P could have used first-best policy instruments to eliminate the divergence between private and social costs. This would have made AC_P^s the operative cost curve, and assuming that D_{H+P+W} is the world demand curve, this would have led to a world price of OF and exports of q_3q_5 and q_5q_6 to H and W respectively with obviously greater benefits than those offered by the CU. Hence the economic rationale for the CU will have to depend on factors that can explain why first-best instruments could not have been employed in the first instance (Jones, 1980). In short, this is not an absolute argument for CU formation.

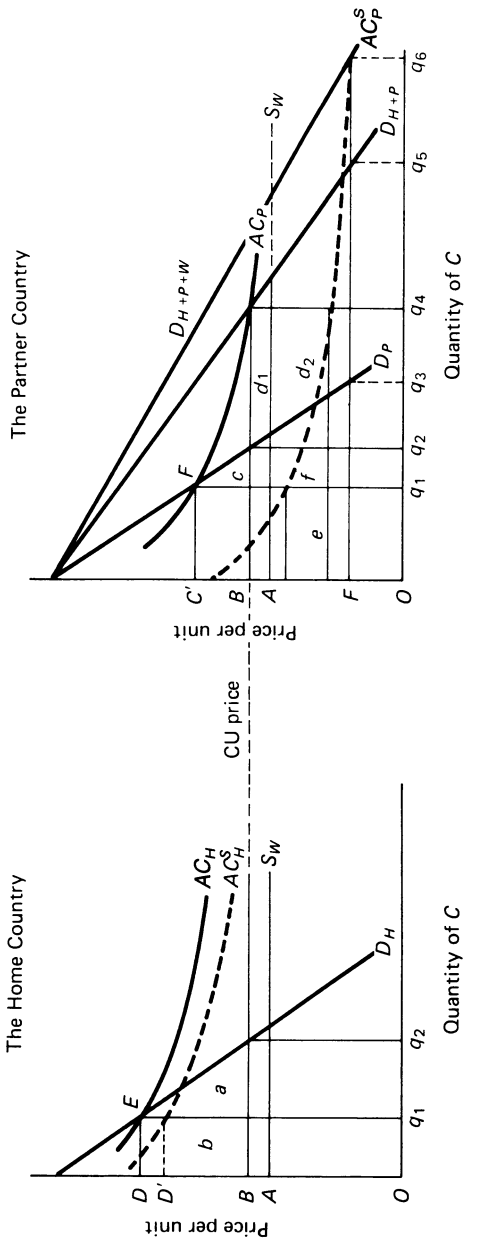


Figure 2.4 *A CU with economies of scale and domestic distortions*

GENERAL EQUILIBRIUM ANALYSIS

The conclusions of the partial equilibrium analysis can easily be illustrated in general equilibrium terms. To simplify the analysis we shall assume that H is a 'small' country while P and W are 'large' countries, i.e. H faces constant t/t (t_P and t_W) throughout the analysis. Also, in order to avoid repetition, the analysis proceeds immediately to the Cooper/Massell proposition.

In Figure 2.5., HH is the production possibility frontier for H. Initially, H is imposing a prohibitive non-discriminatory tariff which results in P_1 as both the production and consumption point, given that t_W is the most favourable t/t, i.e. W is the most efficient country in the production of Clothing (C). The formation of the CU leads to free trade with the partner, P, hence production moves to P_2 where t_P is at a tangent to HH, and consumption to C_3 where CIC_5 is at a tangent to t_P. A unilateral tariff reduction (UTR) which results in P_2 as the production point results in consumption at C_4 on CIC_6 (if the tariff revenue is returned to the consumers as a lump sum) or at C_3 (if the tariff revenue is retained by the government). Note that at C_4 trade is with W only.

Given standard analysis, it should be apparent that the situation of UTR and trade with W results in exports of AP_2 which are exchanged

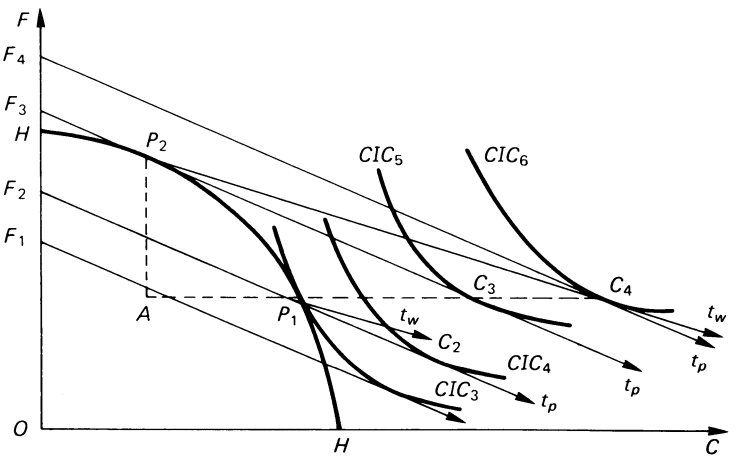


Figure 2.5 *General equilibrium of the Cooper/Massell argument.*

for imports of AC_4 of which C_3C_4 is the tariff revenue. In terms of Johnson's distinction between consumption and production gains and rsis method of calculating them (see El-Agraa, 1983b, Chapters 4 and 10), these effects can be expressed in relation to Food (F) only. Given a Hicksian income compensation variation, it should be clear that: (i) F_1F_2 is the positive consumption effect; (ii) F_2F_3 is the production effect (positive due to curtailing production of the protected commodity); and (iii) F_3F_4 is the tariff revenue effect. Hence the difference between CU formation and a UTR (with the tariff revenue returned to the consumer) is the loss of tariff revenue F_3F_4 (C_4 compared with C_3). In other words, the consumption gain F_1F_2 is positive and applies in both cases but in the Cooper/Massell analysis the production effect comprises two parts: (i) a *pure* TC effect equal to F_2F_4; and (ii) a *pure* TD effect equal to F_3F_4. Hence F_2F_3 is the difference between these two effects and is, therefore, rightly termed the *net* TC effect.

Of course, the above analysis falls short of a general equilibrium one since the model does not endogenously determine the *t/t* – see El-Agraa (1983b, Chapter 5). However, as suggested above, such analysis would require the use of offer curves for all three countries both with and without tariffs. Unfortunately such an analysis is still awaited – the attempt by Vanek (1965) to derive an 'excess offer curve' for the potential union partners leads to no more than a specification of various possibilities; and the contention of Wonnacott and Wonnacott (1981) to have provided an analysis incorporating a tariff by W is unsatisfactory since they assume that W's offer curve is perfectly elastic – see below.

THE TERMS OF TRADE EFFECTS

So far the analysis has been conducted on the assumption that CU formation has no effects on the *t/t*, which implies that the countries concerned are too insignificant to have any appreciable influence on the international economy. Particularly in the context of the EC and groupings of similar size, this is a very unrealistic assumption.

The analysis of the effects of CU formation on the *t/t* is not only extremely complicated but is also unsatisfactory since a convincing model incorporating tariffs by all three areas of the world is still

awaited – see Mundell (1964), Arndt (1968; 1969) and Wonnacott and Wonnacott (1981). To demonstrate this, let us consider Arndt's analysis, which is directly concerned with this issue, and the Wonnacotts' analysis, whose main concern is the Cooper/Massell criticism but which has some bearing on this matter.

In Figure 2.6, O_H, O_P and O_W are the respective offer curves of H, P and W. In section (*a*) of the figure, H is assumed to be the most efficient producer of commodity Y, while in section (*b*), H and P are assumed to be equally efficient. Assuming that the free trade *t/t* are given by OT_O, H will export q_6h_1 of Y to W in exchange for Oq_6 imports of commodity X, while P will export q_1p_1 of Y in exchange for Oq_1 of commodity X, with the sum of H and P's exports being exactly equal to OX_3.

When H imposes an *ad valorem* tariff, its tariff revenue-distributed curve is assumed to be displaced to $O'H'$ altering the *t/t* to OT_1. This leads to a contraction of H's trade with W and, at the same time, increases P's trade with W. In section (*a*) of the figure, it is assumed that the net effect of H and P's trade changes (contraction in H's exports and expansion in P's) will result in a contraction in world trade. It should be apparent that, from H's point of view, the competition of P in her exports market has reduced the appropriateness of the Cooper/Massell alternative of a (non-discriminatory) UTR.

Note, however, that H's welfare may still be increased in these unfavourable circumstances, provided that the move from h_1 to h_2 is accompanied by two conditions. It should be apparent that the larger the size of P relative to H and the more elastic the two countries' offer curves over the relevant ranges, the more likely it is that H will lose as a result of the tariff imposition. Moreover, given the various offer curves and H's tariff, H is more likely to sustain a loss in welfare, the lower her own marginal propensity to spend on her export commodity, X. If, in terms of consumption, commodity Y is a 'Giffen' good in country H, h_2 will be inferior to h_1.

In this illustration, country H experiences a loss of welfare in case (*a*) but an increase in case (*b*), while country P experiences a welfare improvement in both cases. Hence, it is to H's advantage to persuade P to adopt restrictive trade practices. For example, let P impose an *ad valorem* tariff and, in order to simplify the analysis, assume that in section (*b*) H and P are identical in all respects such that their revenue-redistributed offer curves completely coincide. In both sections of the figure, the *t/t* will shift to OT_t, with h_3, P_3 and w_2 being the equilibrium trading points. In both cases, P's tariff improves H's

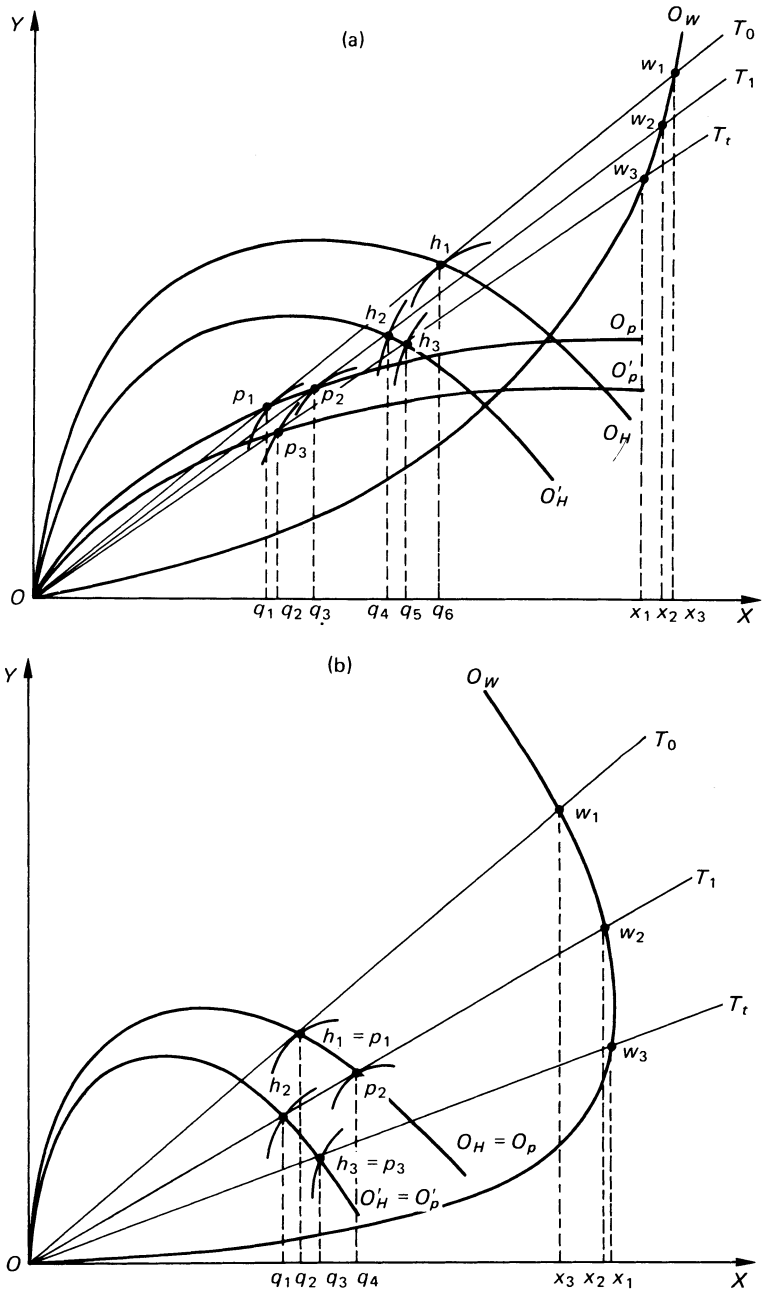


Figure 2.6 *Customs unions and the terms of trade*

welfare but P gains only in case (b), and is better off with unrestricted trade in case (a) in the presence of tariff imposition by H.

The situation depicted in Figure 2.6 illustrates the fundamental problem that the interests, hence the policies, of H and P may be incompatible:

> Country [H] stands to gain from restrictive trade practices in [P], but the latter is better off without restrictions – provided that [H] maintains its tariff. The dilemma in which [H] finds itself in trying to improve its terms of trade is brought about by its inadequate control of the market for its export commodity. Its optimum trade policies and their effects are functions not only of the demand elasticity in [W] but also of supply conditions in [P] and of the latter's reaction to a given policy in [H].
>
> Country [H] will attempt to influence policy making in [P]. In view of the fact that the latter may have considerable inducement to pursue independent policies, country [H] may encounter formidable difficulties in this respect. It could attempt to handle this problem in a relatively loose arrangement along the lines of international commodity agreements, or in a tightly controlled and more restrictive set-up involving an international cartel. The difficulty is that neither alternative may provide effective control over the maverick who stands to gain from independent policies. In that case a [CU] with common tariff and sufficient incentives may work where other arrangements do not. (Arndt, 1968, p. 978)

Of course, the above analysis relates to potential partners who have similar economies and who trade with W, with no trading relationships between them. Hence, it could be argued that such countries are ruled out, by definition, from forming a CU. Such an argument would be misleading since this analysis is not concerned with the static concepts of TC and TD; the concern is entirely with *t/t* effects, and a joint trade policy aimed at achieving an advantage in this regard is perfectly within the realm of international economic integration.

One could ask about the nature of this conclusion in a model which depicts the potential CU partners in a different light. Here, Wonnacott and Wonnacott's (1981) analysis may be useful, even though the aim of their paper was to question the general validity of the Cooper/Massell criticism, when the *t/t* remain unaltered as a result of CU formation. However, this is precisely why it is useful to explain the

Wonnacott's analysis at this juncture: it has some bearing on the *t/t* effects and it questions the Cooper/Massell criticism.

The main point of the Wonnacotts' paper was to contest the proposition that UTR is superior to the formation of a CU, hence the *t/t* argument was a side issue. They argued that this proposition does not hold generally if the following assumptions are rejected:

(i) that the tariff imposed by a partner (P) can be ignored;
(ii) that W has no tariffs; and
(iii) that there are no transport costs between members of the CU (P and H) and W.

Their approach was not based on *t/t* effects or economies of scale and, except for their rejection of these three assumptions, their argument is also set entirely in the context of the standard two-commodity, three-country framework of CU theory.

The basic framework of their analysis is set out in Figure 2.7. O_H and O_P are the free trade offer curves of the potential partners whilst O^t_H and O^t_P are their initial tariff-inclusive offer curves. O^1_W and O^2_W are W's offer curves depending on whether the prospective partners wish to import commodity X (O^1_W) or export it (O^2_W). The inclusion of both O^t_H and O^t_P meets the Wonnacott's desire to reject assumption (i) whilst the gap between O^1_W and O^2_W may be interpreted as the rejection of (ii) and/or of (iii) – see Wonnacott and Wonnacott (1981, pp. 708–9).

In addition to these offer curves, I have inserted in Figure 2.7 various trade indifference curves for countries H and P ($T_{H...}$ and $T_{P...}$ respectively) and the pre-CU domestic *t/t* in H (O_t). $O^2_{W'}$ is drawn parallel to O^2_W from the point c where O_P intersects O_t.

The diagram is drawn to illustrate the case where a CU is formed between H and P with the CET set at the same rate as H's initial tariff on imports of X and where the domestic *t/t* in H remain unaltered so that trade wtih W continues after the formation of the CU. With its initial non-discriminatory tariff, H will trade along O^2_W with both P (Oa) and with W (ab). The formation of the CU means that H and P's trade is determined by where O_P intersects O_t (i.e. at c) and that H will trade with W along $cO^2_{W'}$ (drawn parallel to OO^2_W). The final outcome for H will depend on the choice of assumptions about what happens to the tariff revenue generated by the remaining external trade. If there is no redistribution of tariff revenue in H, then traders in that country will remain at point d. The tariff revenue

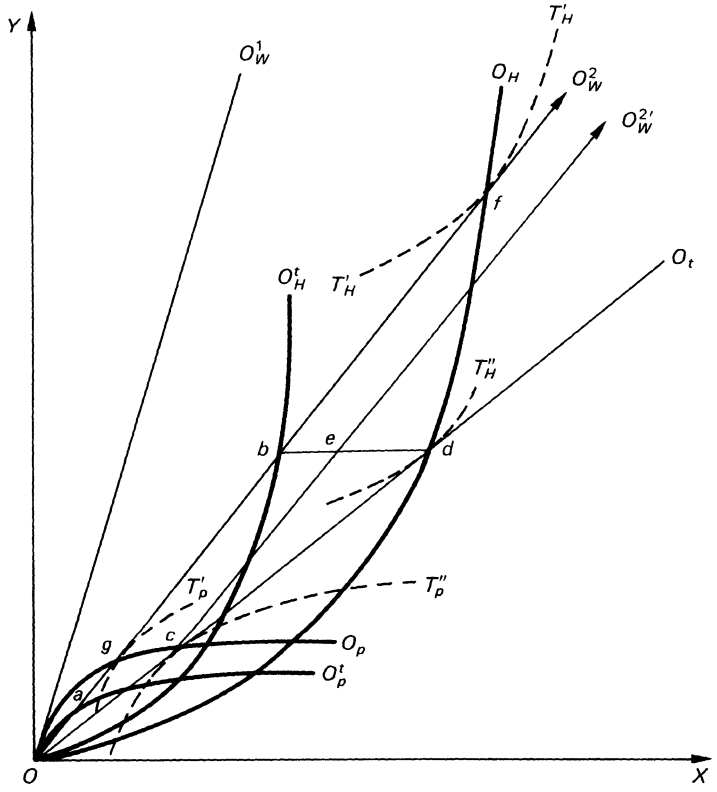


Figure 2.7 *UTR versus customs unions*

generated by the external trade of the CU with W is then shown to be equal to *ed* (measured in units of commodity X) which represents a reduction of *be* compared with the pre-CU tariff revenue in H. Further, if procedures similar to those of the European Community were adopted, the revenue *ed* would be used as an 'own resource' (see Chapter 12) to be spent/distributed for the benefit of both members of the CU whereas the pre-union tariff revenue (*bd*) would be kept by country H.

It can be seen that country P will benefit from the formation of the CU even if it receives none of this revenue, but that H will undoubtedly lose even if it keeps all the post-union tariff revenue. This is the case of pure TD and, in the absence of additional income transfers from P, H clearly cannot be expected to join the CU even if it

considers that this is the only alternative to its initial tariff policy. There is no rationale, however, for so restricting the choice of policy alternatives. UTR is unambiguously superior to the initial tariff policy for both H and P and, compared with the non-discriminatory free trade policies available to both countries (which take country H to T'_H at f and country P to T'_P at g), there is no possible system of income transfers from P to H which can make the formation of a CU Pareto-superior to free trade for both countries. It remains true, of course, that country P would gain more from membership of a CU with H than it could achieve by UTR but, provided that H pursues its optimal strategy, which is UTR, country P itself can do no better than follow suit so that the optimal outcome for both countries is multilateral free trade (MFT).

Of course, there is no *a priori* reason why the CU, if created, should set its CET at the level of country H's initial tariff. Indeed, it is instructive to consider the consequences of forming a CU with a lower CET. The implications of this can be seen by considering the effect of rotating O_t anticlockwise towards O^t_W. In this context, the moving O_t line will show the post-union t/t in countries H and P. Clearly, the lowering of the CET will improve the domestic t/t for H compared with the original form of the CU and it will have a trade creating effect as the external trade of the CU will increase more rapidly than the decline in intra-union trade. Compared with the original CU, H would gain and P would lose. Indeed, the lower the level of the CET, the more likely is H to gain from the formation of the CU *compared with the initial non-discriminatory tariff*. As long as the CET remains positive, however, H would be unambiguously worse off from membership of the CU than from UTR and, although P would gain from such a CU compared with any initial tariff policy it may adopt, it remains true that there is no conceivable set of income transfers associated with the formation of the CU which would make both H and P simultaneously better off than they would be if, after H's UTR, P also pursued the optimal unilateral action available – the move to free trade.

It is of course true that, if the CET is set at zero, so that the rotated O_t coincides with O^2_W, then the outcome is identical with that for the unilateral adoption of free trade for both countries. This, however, merely illustrates how misleading it would be to describe such a policy as 'the formation of a CU'; a CU with a zero CET is indistinguishable from a free trade policy by both countries and should surely be described solely in the latter terms.

One can extend and generalise this approach beyond what has been done here – see El-Agraa and Jones (forthcoming) and Berglas (1983). The important point, however, is what the analysis clearly demonstrates: the assumption that the *t/t* should remain constant for members of a CU, even if both countries are 'small', leaves a lot to be desired. But it should also be stressed that the Wonnacotts' analysis does not take into consideration the tariffs of *H* and *P* on trade with *W* nor does it deal with a genuine three-country model since *W* is assumed to be very large: *W* has constant *t/t*.

CONCLUSIONS

The conclusions reached here are consistent with my (1979b) conclusions and with those of Jones (1979), Jones in El-Agraa and Jones (1981) and Corden (1984); the contributions by Dixit (1975), Berglas (1979), Collier (1979), Riezman (1979), Whalley (1979), McMillan and McCann (1981) and Wonnacott and Wonnacott (1981) do not affect these conclusions sufficiently to merit separate consideration.

The conclusions are:

Firstly, that the rationale for regional economic integration rests upon the existence of constraints on the use of first-best policy instruments. Economic analysis has had little to say about the nature of these constraints, and presumably the evaluation of any regional scheme of economic integration should incorporate a consideration of the validity of the view that such constraints do exist to justify the pursuit of second- rather than first-best solutions.

Secondly, that even when the existence of constraints on superior policy instruments is acknowledged, it is misleading to identify the results of regional economic integration by comparing an arbitrarily chosen common policy with an arbitrarily chosen national policy. Of course, ignorance and inertia provide sufficient reasons why existing policies may be non-optimal but it is clearly wrong to attribute gains which would have been achieved by appropriate unilateral action to a policy of regional economic integration. Equally, although it is appropriate to use the optimal common policy as a point of reference, it must be recognised that this may overstate the gains to be achieved if, as seems highly likely, constraints and inefficiencies in the political processes by which policies are agreed prove to be greater among a group of countries than within any individual country.

Although the first two conclusions raise doubts about the case for

regional economic integration, the third conclusion is that a strong general case for economic integration does exist, in principle at least. In unions where economies of scale may be in part external to national industries, the rationale for economic integration rests essentially upon the recognition of the externalities and market imperfections which extend beyond the boundaries of national states. Under such circumstances, unilateral national action will not be optimal whilst integrated action offers the scope for potential gain.

As with the solution to most problems of externalities and market imperfections, however, customs union theory frequently illustrates the proposition that a major stumbling-block to obtaining the gains from joint optimal action lies in agreeing an acceptable distribution of such gains. Thus the fourth conclusion is that the achievement of the potential gains from economic integration will be limited to countries able and willing to cooperate to distribute these gains so that all partners may benefit compared to the results achieved by independent action. It is easy to argue from this that regional economic integration may be more readily achieved than global solutions but, as the debate about monetary integration in the EC illustrates, the chances of obtaining potential mutual gains may well founder in the presence of disparate views about the distribution of such gains and weak arrangements for redistribution.

It should be emphasised that these conclusions relate only to the customs union and free trade area types of economic integration. One should not jump to the conclusion that they apply in the case of more involved schemes of integration (such as common markets, economic unions, etc.) until one has considered the implications of the analyses of such unions.

Notes

1. The reader should note that I am using Johnson's (1974) definition so as to avoid the unnecessary literature relating to a trade-diverting welfare-improving customs union promoted by Lipsey (1960), Bhagwati (1971) and Kirman (1973) – see El-Agraa and Jones (1981, Chapter 2) and Corden (1984).
2. Note also that this analysis is not confined to net importing countries. It is equally applicable to net exporters, but lack of space prevents such elaboration – see El-Agraa (1984a, Chapter 7) for a detailed discussion.

3 Customs Unions Versus Free Trade Areas

INTRODUCTION

Although the bulk of the theoretical literature on international economic integration deals with the formation of customs unions (CUs), it should be apparent that the basic framework employed can easily be extended to tackle the problems of free trade areas (FTAs). Recall that both CUs and FTAs share the common characteristic of the complete removal of tariffs and other trade impediments on all trade between the partners, but that the two forms of economic integration are distinguishable from each other in two main respects: in a FTA, (i) member nations retain their freedom to determine their extra-union tariffs and general commercial policies, and because this freedom may result in differing tariff rates in the member countries, this creates an atmosphere for importing from third countries via the nation with the lower tariff rate, (ii) they will most likely employ some sort of 'rules of origin' to ensure that only those commodities which are entirely or largely produced within the FTA should be exempt from customs duties. Hence, apart from the features discussed below, there are basically no theoretical differences between CUs and FTAs.

THE DIFFERENCES

When members of a FTA retain different commercial policies against the rest of the world (W), this may lead to certain complications. Assuming that these differences relate to tariffs only, then the

> maintenance of differing tariff rates of duties in trade with [W] will create possibilities for deflection of trade, production and investment. Deflection of trade will occur if the trade barriers of high-tariff member countries are circumvented through the importation of products originating outside the area from low-tariff members. If no precautionary measures were taken and tariff differentials

> exceeded the additional costs of transportation, imports would enter the [FTA] via the country which applies the lowest tariff on the commodity in question . . .
>
> Besides causing deflection of trade, the establishment of a [FTA] may bring about an uneconomic structure of production. The manufacture of products which contain a high percentage of foreign-made materials and semi-finished products will shift to low-tariff countries if differences in tariffs outweigh differences in production. . . . The ensuing reallocation of resources will have detrimental effects on world efficiency since the pattern of productive activity will not follow the lines of comparative advantage but rather the difference in duties.
>
> Deflection of production may also be accompanied by undesirable movements of capital funds. The establishment of the so-called tariff factories is a case in point; other things being equal, foreign investors will move funds to countries with lower tariffs on raw materials and semi-manufactured products. Similarly, factories will be set up to assemble parts produced in [*W*] with low labour costs if tariff advantages make this operation possible. (Balassa, 1961, pp. 70–71)

Before I proceed to examine Balassa's proposition in some detail, let me first discuss the concepts of trade creation (TC), trade diversion (TD) and trade deflection in a manner that makes it easy to distinguish between CUs and FTAs.

TRADE CREATION

Consider a situation where the following conditions hold initially:

$$P_1 < P_3(1 + t_1) \quad (1)$$
$$P_1 < P_2(1 + t_1) \quad (2)$$
$$P_2 < P_3(1 + t_2) \quad (3)$$
$$P_2 < P_1(1 + t_2) \quad (4)$$

where: P is the unit price of a particular commodity; 1, 2 and 3 are the three exclusive and mutually exhaustive areas of the world, with 1 and 2 as the potential integration partners (H and P in the previous chapter) and 3 as W; and t is the *ad valorem* tariff duty levied on imported finished products.

The first and second conditions ensure that country 1 is producing enough to satisfy its domestic demand, i.e. its tariff rate is prohibitive. The third and fourth conditions ensure the same outcome for country 2.

When countries 1 and 2 form a FTA, they maintain their initial tariff rates on imports from 3, but abolish them for mutual trade. Assuming that $P_1 > P_2 > P_3$, the first and third conditions will still hold true. However, since $P_2 < P_1$, country 1 will now give up the production of this commodity and import it from its partner. This is TC: a lower cost FTA partner is substituted for the higher cost home producers without having any repercussions on W. (See Chapter 2 for a more specific definition.) Alternative assumptions either do not affect this outcome ($P_1 > P_3 > P_2$; $P_3 > P_1 > P_2$), or make country 1 the recipient of the gains from TC ($P_2 > P_1 > P_3$; $P_2 > P_3 > P_1$; $P_3 > P_2 > P_1$) given the appropriate specification of the conditions.

If, instead of forming a FTA, countries 1 and 2 decide to establish a CU, they will have to adopt a common external tariff (CET), as well as abolish tariffs on their mutual trade. Let us assume that the CET is set equal to the unweighted arithmetical average of the initial tariff rates, i.e. $[(t + t_2)/2 = t']$.

Now, if t_1 is initially equal to t_2, there is no difference between a CU and FTA. However, if t_1 is initially higher than t_2, t_2 must rise as a consequence of the adoption of a CET. Hence, the third condition will still hold true – country 2 will still not import from W. At the same time, t_1 must fall. The question arises as to whether t_1 will fall to such an extent as to reverse condition (1) $[P_1 > P_3 (1 - t')]$, because if such a situation were to arise, country 1 would import this commodity from W. Since P_2 is less than $P_3(1 + t')$[1] and less than P_1, P_2 can never be higher than $P_3(1 + t')$ at the same time. Hence the only possible outcome is that country 1 will import this commodity from country 2 after the formation of the CU.

If t_2, is initially lower than t_2, t_1 must rise whilst t_2 must fall as a result of the adoption of a CET. When t_1 rises, condition (1) will still hold true. Since $P_2 < P_1$, country 1 will import the commodity from country 2 provided, of course, that P_2 does not exceed $P_3 (1 + t')$. Hence the only possible outcome is that neither country 1 nor country 2 will import this commodity from W; country 2 will capture the CU market. This is TC.

TRADE DIVERSION

Now consider the case where the following conditions hold initially:

$$P_1 > P_3(1 + t_1) \quad (4)$$
$$P_1 < P_2(1 + t_1) \quad (2)$$
$$P_2 < P_3(1 + t_2) \quad (3)$$

Conditions (2) and (4) ensure that country 1 is importing this commodity from W initially, whilst condition (3) guarantees that country 2 has a prohibitive tariff rate with respect to imports from W.

When countries 1 and 2 establish a FTA, both conditions (4) and (3) will still hold true. If one assumes that $P_1 > P_2$, country 1 will start importing this commodity from country 2 (instead of from W), but only if $P_2 < P_3(1 + t_1)$. If $t \geq t_2$ this condition is readily satisfied by implication – condition (3). If, however, $t_1 < t_2$, there is a possibility that country 1 may continue to import from W; this possibility clearly depends on the extent of the tariff rate differential. Apart from this exception, here is a clear case of TD: the substitution of cheaper initial imports from W for more expensive imports from the FTA partner ($P_2 > P_3$). (See Chapter 2 for a more specific definition.)

If, however, $P_1 < P_2$, country 1 will still continue to import from W, i.e. the FTA will have no effect as far as this commodity is concerned.

If countries 1 and 2 form a CU rather than a FTA, there will be no difference between the two schemes if $t_1 = t_2$ initially, assuming that $P_2 < P_1$. If $t_1 < t_2$ initially, t_1 must rise and t_2 must fall to the CET level. When this happens, t_1 may rise to such a level as to reverse condition (4). Under such circumstances t_2 cannot fall to such an extent as to reverse condition (3), since this would imply that $P_2 > P_1$, which is ruled out by assumption. Hence condition (3) must still hold true.

The reversing of condition (4) means that country 1 will no longer import this commodity from W. Since $P_2 < P_1$, country 1 will now import this commodity from country 2, the FTA partner. This is a clear case of TD.

If subjecting t_1 and t_2 to a CET does not lead to a reversal of either condition (4) or (3), TD will still take place particularly since $P_1 > P_3(1 + t')$, $P_2 < P_3(1 + t')$ and $P_2 < P$.

A more interesting outcome is where a higher t_1 does not reverse condition (4) but the lower t_2 reverses condition (3). Under such

circumstances, country 1 will continue to import from W and country 2 will now give up its costly domestic production and import from W. This is external trade creation (ETC), a phenomenon which can only occur in the case of CU formation.

If $t_1 > t_2$ initially, t_1 must fall and t_2 must rise in order to achieve a CET. Under such circumstances conditions (4) and (3) will always hold true. Since $P_2 < P_3(1 + t')$ and $P_1 > P_2$, the only possible outcome is that country 1 will start importing this commodity from country 2 instead of from W. This is therefore the clearest case of TD: the higher cost potential partner has the higher tariff rate initially. In Corden's terms,[2] TD is the only possible outcome when tariffs are 'made to measure'.

TRADE DEFLECTION

It is possible that both countries 1 and 2 are importing a commodity initially. Under such circumstances, the following conditions must be satisfied:

$$P_1 > P_3(1 + t_1) \quad (4)$$
$$P_2 > P_3(1 + t_2) \quad (5)$$

Because of these initial conditions, the assumption that $P_1 \geqslant P_2$ has no significance at this stage. Of course, the calculation of P_1 and P_2 is hypothetical under these circumstances.

Assuming that $t_1 > t_2$, the price of this commodity in country 1 will exceed the price in country 2. It is apparent that country 1 could not have been importing this commodity via country 2, particularly since $[P_3(1 + t_2)](1 + t_1)$ is obviously in excess of $P_3(1 + t_1)$. Hence both countries must be importing directly from W.

When countries 1 and 2 enter into a FTA, country 1 will import this commodity via country 2, provided the price differential exceeds the necessary transportation charges and provided that there are no 'rules of origin'[3] to exclude this possibility. This phenomenon is referred to as 'deflection of trade' (the term is coined by Balassa (1962), p.70): the country that initially imported a commodity *directly* from W now imports if *indirectly* via the partner with the lower tariff rate.

If, however, countries 1 and 2 establish a CU, t_1 will have to fall and t_2 will have to rise in order to achieve a CET. Under such circumstances the price of this commodity will be the same in both

countries [i.e. $P_1 = P_2 = P_3(1 + t')$]. Hence both countries will continue to import this commodity directly from W.

If $t_1 = t_2$ initially, then of course there is no difference between a CU and a FTA.

Comparisons and Conclusions

In spite of the fact that the above analysis is based on highly restrictive assumptions, e.g. constant prices, one can still make some comparisons between CUs and FTAs. With regard to TC, there does not seem to be any fundamental difference between the two types of economic union. If there is any difference, it is likely to be one of magnitude, e.g. the effect of changing tariff rates in a CU on the volume of trade.

As far as TD is concerned, however, there is a possibility that the adoption of a CET may lead to ETC in circumstances which might lead to TD in a FTA. This is by no means a remote possibility, since the requirement of irrational tariff levels cannot be readily discarded. In this respect, a CU is superior to a FTA.

Trade deflection is a phenomenon peculiar to FTAs. If there exist no 'rules of origin', a FTA will produce a CET equal to the minimum tariff rate within the union. If this were the case, then a FTA would be superior to a CU; this conclusion and its implications are rigorously demonstrated by Curzon Price in a book which deals extensively with some of the problems of FTAs (Curzon Price, 1974, Ch. 10).

Overall, one can argue that since most existing FTAs seem to have some sort of 'rules of origin', and since we have no evidence that tariffs are 'made to measure', it seems that the formation of a CU should be more encouraged than the establishment of a FTA. This conclusion is reinforced if one takes into consideration the other phenomena of deflection of production and investment in FTAs, to which I now turn.

DEFLECTION OF PRODUCTION AND INVESTMENT

Deflection of production, unaccompanied by deflection of investment, can occur only if both countries 1 and 2 are producing the same commodity initially. Moreover, it is necessary to assume the existence of excess capacity in the particular commodity in the country to

which production is to be deflected; otherwise, expenditure on additional fixed capital equipment will become necessary and this would obviously represent a deflection of investment.

The assumption concerning the existence of excess capacity undoubtedly raises the problem of the effect of increased/decreased level of output on the marginal and average costs of production. I shall ignore this problem at this stage for reasons that will become apparent shortly.

For both countries 1 and 2 to have been producing the same commodity prior to the formation of the FTA, the following conditions need to have been satisfied *simultaneously* in the initial situation:

$$P_2 < P_1 \qquad \text{(i)}$$
$$P_2(1 + t_1) > P_1 \qquad \text{(ii)}$$

Condition (i) specifies that country 2 is more efficient than country 1, hence there is no need for country 2 to impose a tariff duty on country 1. Condition (ii) ensures that country 1 has a prohibitive tariff rate. The conditions also imply that W either does not produce this product, or does not trade in it. (One could introduce further inequalities to ensure this result, but it is obvious that such conditions would be redundant.)

Let us assume that the price of this commodity is determined by the marginal (equal to the average) cost[4] of production and that this cost is composed of two elements: the cost of the domestic factors employed per unit of extra output ($q \cdot p^*$ where p^* is the factor price and q is the physical quantity), and the cost of imported raw materials ($q \cdot p_3^*$ where P_3 is the price of raw materials charged by W and q is the physical quantity of imported raw materials). It therefore follows that:

$$P_1 = q_1 \cdot p_1^* + q_1^* \cdot p_3^*(1 + t_1^*) \qquad \text{(iii)}$$
$$P_2 = q_2 \cdot p_2^* + q_2^* \cdot p_3^*(1 + t_2^*) \qquad \text{(iv)}$$

where t^* is the *ad valorem* tariff duty on imported raw materials and semi-manufactured goods.

Let us assume that the physical quantities of factor imports are the same for both countries. Then the price definitions become:

$$P_1 = q \cdot p_1^* + q^* \cdot p_3^*(1 + t_1^*) \qquad \text{(iii')}$$
$$P_2 = q \cdot p_1^* + q^* \cdot p_1^*(1 + t_2^*) \qquad \text{(iv')}$$

It is of course more realistic to assume that an imported raw

material for one country is a domestic raw material for another. Such an assumption, realistic as it may be, will obscure the whole issue and will make complete nonsense of Balassa's proposition. The case where the prices of the imported raw materials are different is discussed in a later section.

At this point it is necessary to establish that there is in fact a comparative cost advantage. This obviously cannot be taken to refer to the price charged for imported raw materials or to their physical quantities. If there is any advantage it must be entirely due to a tariff differential. I shall follow Balassa and assume that $t_1^* > t_2^*$. If there exists any true comparative cost advantage it must, therefore, relate to the domestic costs of production.

It is implicit in the price definitions that the commodity is produced under the same technological conditions in both countries. A true comparative cost advantage in country 1 must mean that $q \cdot p_1^* < q \cdot p_2^*$ Since the physical quantity is the same, then the cost advantage must refer to a factor price differential, i.e. $p_1^* < p_2^*$.

This point might require further explanation. In order to avoid the existence of any comparative cost advantage regarding imported raw materials except for the tariff differential, the physical quantities of these materials must be the same for both countries. Since it is assumed that this commodity is subject to the same production function, it follows that the physical quantity of domestic materials must also be the same per unit of output for both countries. The only difference is that the price per unit of domestic materials must be lower in country 1 than in country 2.

Admittedly, this implies that the production function exhibits fixed coefficients of production, i.e. the elasticity of substitution between foreign and domestic inputs per unit of this commodity is equal to zero.[5] But this is unavoidable if comparative cost advantage is to be meaningful in this particular context. Otherwise, if each country substitutes more of the relatively cheaper factor for the relatively dearer one, country 1 will employ more domestic materials and less imported materials. Country 2 will substitute in the opposite direction. This substitution will continue until the cost of production is the same in both countries (after the formation of a FTA).

The final outcome of such substitution is that the initial input composition necessary for producing a unit of this commodity becomes different in the two countries. This by no means suggests that production will be curtailed in country 1 and expanded in country 2, unless the total demand for this commodity changes in such a way as

to bring this result about. Under such circumstances the change in the production pattern has nothing to do with supply conditions. There is, therefore, no plausible reason why such a phenomenon should be associated with Balassa's proposition; it is simply a natural factor substitution situation in its simplest possible (textbook) form.

Establishment of a FTA

When countries 1 and 2 establish a FTA, they abolish their tariff rates of duty on inter-area trade in finished products ($t_1 = 0$) and maintain their CETs on finished products, raw materials and semi-manufactured products coming from W ($t_1^* > t_2^*$). It is then apparent from (i) and (ii) that country 1 will cease production of this commodity and that country 2 will take over its entire production.

Let us examine this situation closely. Substituting the definitional equations (iii′) and (iv′) into (i) gives:

$$q \cdot p_2^* + q^* \cdot p_3^*(1 + t_2^*) < q \cdot p_1^* + q^* \cdot p_3^*(1 + t_1^*)$$

Rearranging and simplifying gives:

$$q(p_2^* - p_1^*) < q^* \cdot p_3^*(t_1^* - t_2^*) \qquad \text{(v)}$$

It is obvious that if this condition is fulfilled, then the domestic cost difference must fall short of the imported cost difference, the latter being entirely due to the tariff differential. This condition, therefore, states more precisely Balassa's proposition that deflection of production will take place when the tariff differential advantage exceeds the comparative cost disadvantage taking into account transport costs. It must be emphasised, however, that the tariff rates of duty referred to are those imposed on semi-manufactured goods and raw materials, not tariffs on finished commodities.

Let me be more precise about what condition (v) actually specifies. It states that for any given ratio of domestic materials to imported raw materials and semi-finished goods (q/q^*) and given the import price of these intermediate goods (p_3^*), the higher (lower) the factor price differential ($p_2^* - p_1^*$), the lower (higher) the tariff differential ($t_1^* - t_2^*$) that is necessary to ensure that deflection of production and investment will take place. Expressed differently, for any given differential in factor prices, intermediate imported goods prices and tariff rates, the higher (lower) the ratio of imported intermediate goods to domestic materials, the more (less) is the likelihood of

deflection of production and investment, which is Balassa's way of expressing it.

Constant Costs

It is now important to discuss the significance of omitting the crucial relationship between optimum output and minimum costs. The justification is that if, as country 2 expands its production of this commodity, the marginal cost (equal to the average) falls to such an extent as to make the cost of production the same in both countries, then the term comparative cost advantage will become devoid of any meaning. In order to make any sense of the term, one has to assume that even if country 2's industry were to operate at an optimum level, its marginal cost would still be higher than country 1's. In other words, even if it is assumed that the optimum level of production and the optimum plant size are exactly the same in both countries, and even if these were actually realised in both countries, country 1 would still produce at a lower marginal cost of production, i.e. the only difference would be due to a factor price differential.

If deflection of investment were also to occur, the marginal cost calculations could be affected in two opposing ways. Firstly, the expenditure on fixed capital equipment, particularly if it is not expected to have a long life, would raise the cost calculations. Secondly, the newly acquired fixed capital might be technologically more advanced (economically more efficient) thus leading to lower cost calculations overall. Bearing in mind the argument of the previous paragraph, it must again be assumed that the net result of these counteracting forces would leave the domestic cost differential intact. Otherwise the term comparative cost advantage must be given a dynamic interpretation, in which case Balassa's proposition becomes completely meaningless.

Only One Country Producing the Commodity

If country 1 had been the only country producing this commodity before the formation of the FTA, the following condition must have been satisfied:

$$P_1(1 + t_2) < P_2 \qquad \text{(vi)}$$

This is the reverse of condition (ii) and it ensures that either country 2 is not consuming this commodity at all, or is importing it from its potential FTA partner. Since this commodity is not produced at all in country 2 initially, the cost calculations are subject to the difficulties regarding hypothetical estimates; Meade (1955b) pioneered a taxonomic approach for calculating costs under such circumstances. It is assumed that such calculations can be accurately made.

The condition that must necessarily be satisfied in order that production should be deflected to country 2 after the formation of a FTA is:

$$P_2 < P_1 \qquad \text{(vii)}$$

subject to the reservation regarding hypothetical cost calculations and that condition (vi) is satisfied prior to the formation of the FTA.

It is quite obvious that if (vi) is fulfilled (with positive tariffs), (vii) will never be satisfied: if P_2 exceeds $P_1(1 + t_2)$, it can never be less than P_1!

Note that when structural changes are being considered, production costs and investment calculations must be made simultaneously. Hence, neither deflection of production nor deflection of investment can occur when only one country is producing the commodity initially. If tariff rates were negative (i.e. subsidies), then Balassa's proposition would make no sense at all: either a country's comparative cost advantage is reinforced or its domestic cost disadvantage is negated!

With regard to this case, the analysis has been conducted on the assumption that country 1 is producing the commodity initially. However, the analysis could very well be conducted on the assumption that country 2 is producing the commodity initially. The conclusion is of course still the same, in that it would not be possible for country 1 to take over the production of this commodity.

What is the implication of this? If country 1 has a true comparative cost advantage in producing this commodity, then in the case when it is the only country producing the commodity initially, country 2 will never be able to compete when a FTA is established. However, when only country 2 is producing the commodity initially, no deflection is possible, even though country 1 has a true comparative advantage. This seems to suggest an historical incidence creating an unfair advantage: an infant industry case!

Price Discrimination

So far I have considered the case of deflection of production and investment where the price of imported raw materials is the same in both countries 1 and 2. Due to certain institutional factors, however, the price may be different for the two countries, even if they import from the same source, i.e. *W* practises price discrimination. Under such circumstances the cost of imported raw materials and semi-manufactured goods will be different for the potential FTA partners, even though the quantity of these factors per unit of output is the same for both countries.

The price equations then become:

$$P_1 = q \cdot p_1^* + q^* \cdot p_{3,1}^*(1 + t_1^*) \qquad \text{(iii'')}$$

$$P_2 = q \cdot p_2^* + q^* \cdot p_{3,2}^*(1 + t_2^*) \qquad \text{(iv'')}$$

where $p_{3,1}^* \neq p_{3,2}^*$

A new definition of comparative cost advantage is then necessary since the cost of both imported raw materials and domestic materials is different for the FTA potential partners. Hence, instead of $p_1^* < p_2^*$, comparative advantage must relate to:

$$q \cdot p_1^* + q \cdot p_{3,1}^* < q \cdot p_2^* + q^* \cdot p_{3,2}^* \qquad \text{(viii)}$$

i.e. comparative advantage relates to the sum of both components of production, and rightly so.

Substituting (iii'') and (iv'') into condition (i) gives:

$$q \cdot p_2^* + q^* \cdot p_{3,2}^*(1 + t_2^*) < q \cdot p_1^* + q^* \cdot p_{3,2}^*(1 + t_1^*) \qquad \text{(i')}$$

If deflection of production and investment were to take place, then the formation of the FTA must result in condition (i') being satisfied. Rearranging (i') gives:

$$q(p_2^* - p_1^*) < q^*[p_{3,1}^*(1 + t_1^*) - p_{3,2}^*(1 + t_2^*)] \qquad \text{(v')}$$

which is Balassa's proposition restated to take into account the different definition of comparative advantage.

This section of course relates to the case where both countries are producing the same commodity initially. The case where only one country is involved prior to the formation of the FTA does not require the price details: deflection of production and investment is never possible under such circumstances.

Moreover, one could consider more complicated situations, but it should be apparent by now that the more complicated the situation, the less clear is Balassa's proposition.

Conclusion

In conclusion it must be emphasised that Balassa is referring to deflection of production and investment in terms of shifts in production, i.e. only one of the potential partners is producing the commodity initially. I have demonstrated that Balassa's proposition has no logical validity under such circumstances: deflection of production and investment can occur only when both potential partners are producing the same commodity initially. It must also be stressed, however, that this possibility is based on very strong assumptions, particularly the assumption that the country with the domestic cost advantage has a higher tariff rate of duty on imported intermediate goods. This suggests that the governments concerned are not only irrational in determining their tariff structures and levels, but also display ignorance of the effective protection afforded by trade impediments.

My analysis also suggests the conclusion that there are situations where countries should be advised to establish CUs rather than FTAs. This can be explained thus: the theory of economic integration states that a CU (or a FTA) is more likely to bring benefits if the potential partners are initially competitive but potentially complementary; deflection of production and investment (given the stated assumptions) is likely to occur only under the same circumstances; the formation of a CU will eliminate the tariff differential and will therefore dispose of the possibility of deflection.

A THEORY OF FREE TRADE AREAS

Shibata (1967) attempts an analysis which specifically incorporates the 'rules of origin' as an integral part of the definition of a FTA:

> a [FTA] is defined . . . as an internal grouping of . . . countries, each of which agrees to exempt from the tariffs and quantitative restrictions which it generally imposes on imported products, that part of those products which have originated or are produced in the territories of the other members of the group. (Shibata, 1967, p. 68)

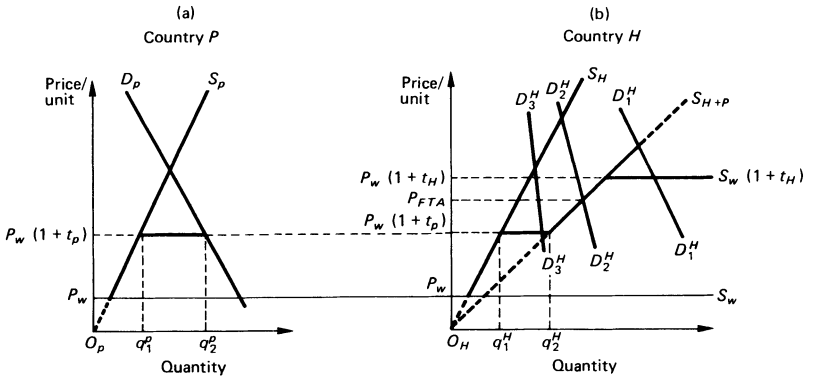


Figure 3.1 *A free trade area with 'rules of origins'*

Shibata's analysis relates to two potential FTA partners (Countries *H* and *P*) and *W*. He assumes the following: (i) both *H* and *P* import an *identical* product from *W*; (ii) both *H* and *P* also produce wholly domestically *perfect substitutes* for this commodity – call them domestic-substitutes for short; (iii) *H* and *P* impose different specific tariffs (*t*s, which remain constant throughout the analysis) such that $t_H > t_p$; and (iv) the traditional trade theory assumptions – normal supply and demand curves for *H* and *P* and a perfectly elastic *W* supply curve for this commodity; perfect competition in both the commodity and factor markets in all three countries; complete absence of transport costs; perfect factor mobility within each country, but complete lack of mobility across national frontiers; the only trade impediment is tariffs, which are defined as 'effective protective duties'; and fixed rates of exchange.

Given these assumptions, the domestic price of this product in the initial situation is equal to $P_W(1 + t_H)$ and $P_W(1 + t_P)$ in *H* and *P* respectively, where P_W is *W*'s import supply price – see Figure 3.1, where section (*a*) depicts *P*'s supply and demand relationships and section (*b*) does so for *H* with three different demand curves. When *H* and *P* form a FTA, the 'rules of origin' dictate that the domestic-substitute can be traded freely, while the identical import remains subject to tariffs. Shibata claims that this differential treatment of the *identical* products may create an 'artificial price differentiation' between the imported product and its identical domestic-substitute. He explains this as follows: since $t_H > t_p$ then $P_W(1 + t_H) > P_W(1 + t_p)$, which means that the formation of the FTA will result in *H* importing

this product from P. This implies that the joint domestic-substitute supply curve for the two partners ($S_H + {}_P$) becomes the effective supply curve for H's market: consumers in P will always import from W if the price in P rises above $P_W(1 + t_P)$. Since both supply curves are normal (by assumption), the joint supply curve must also be upward sloping. If H's demand curve is sufficiently large, the FTA price of this product will rise above $P_W(1 + t_P)$ – country P's price. However, this higher FTA domestic-substitute price (P_{FTA} for the demand curve indicated by D_2^H) will induce producers in P to produce and sell their entire output to consumers in H. Hence the identical product will have two different prices depending on its area of origin.

Shibata then discusses the implications of this differential pricing. When H's domestic-substitute price falls because of the increased effective supply curve, H's producers will curtail their production (production effect) and its consumers will expand their consumption (consumption effect). The combined effect is, of course, TC. Moreover, since the new domestic-substitute price is higher than P's original price, the producers in that country will expand their production (production effect), but because there is no change in the price of the identical import there will be no consumption effect here. Given the specified assumptions, these production and consumption effects will result in certain changes in trade between the three countries, the extent of which depends on the level of demand in H. For instance, if the joint FTA supply produces the same price in H as initially (i.e. the relevant demand curve is D_1^H, then H's producers will remain unaffected, but part of the imports that used to come from W into H will then come via P, disguised in the form of domestic-substitutes produced there.

Shibata's analysis is conducted on the assumption of perfect competition and that the partners import an identical product and produce domestically perfect substitutes of this product. In spite of this, he finds it perfectly acceptable to conclude that the differential treatment of the identical product according to its origin may create an artificial price differentiation between the area–origin product and the non-area–origin product (Shibata, 1967, p. 68) which is of course a direct contradiction of the assumption of perfect competition: how possible is it to identify products by source without differentiating them, i.e. at least labelling them differently? Once the product is differentiated, the assumption of a single demand curve becomes too hard to swallow.

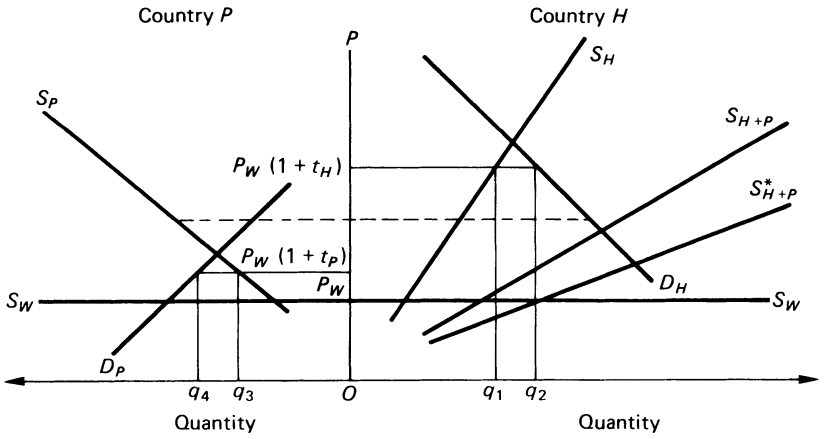


Figure 3.2 *Free trade areas in the long term*

Moreover, Shibata's analysis must be carried further, out of the short term during which producers cannot increase production significantly without incurring rapidly increasing marginal costs, and into the longer term, during which they can increase or decrease capacity according to whether the price they face in the market covers their long-term average cost or not (Curzon Price, 1982, p. 89). She explains this in terms of Figure 3.2 which initially represents a short-term situation. However, if H and P's supply curves are added together – $S_H + {}_P$ – and applied to H's demand curve, the short-term equilibrium price will exceed the long-term equilibrium price in P. But, as long as this situation persists, producers in P will have an incentive to expand their production capacity, since they must have been meeting their long-term average costs at P's pre-FTA price, and are now making excess profits in H. This will cause P's supply curve to shift to the left until the joint P and H supply curve – S^*_{H+P} – eliminates the price differential between H and P, eliminating with it the opportunity for P's producers to make excess profits in H. Hence, price differentials cannot persist in a FTA for commodities which are of area origin. Therefore, no matter which way one looks at it, i.e. whether in terms of the basic assumptions employed or in terms of the persistency of the situation, it is inevitable to conclude that a price differential for an identical product is neither theoretically nor practically feasible under the specified circumstances.

Notes

1. One could argue that the effective price is that facing the government rather than the consumer, in which case both countries will import from the rest of the world. But if that were the case, the initial conditions would have to be stated accordingly. Needless to say, this would be a highly unorthodox procedure!
2. Corden (1972b) coined the term 'made to measure tariffs'. The term is meant to indicate that protection is positively related to inefficiency, hence suggesting rational tariff imposing authorities – see the previous chapter.
3. These relate to the regulations introduced in free trade areas to ensure that member countries claim tariff exemptions only for commodities originating within their territories – see European Free Trade Association (1976) and Curzon Price (1988).
4. The assumption that prices are cost determined is very unrealistic, to say the least. It is, however, a very necessary assumption at this stage and for reasons that will become apparent shortly.
5. The most general type of production function is the CES production function. It could take the form:

$$O_x = [A_x K^{-n_x} + a_x L^{-n_x}]^{-1/n_x}$$

where O_x is the value added in industry x deflated by the price of commodity x; L and K stand for labour and capital respectively (which, for our purposes, can stand for domestic and imported factors) and A_x, a_x, n_x are parameters.

The Stanford Group has proved that $1/(n_x + 1) = z_x$ is the elasticity of substitution between K and L in this industry. It is assumed to be constant.

Here it is assumed that n_x is infinite so that z_x is equal to zero. This reduces the production function to a Leontief fixed coefficients production function – see Minhas (1965) and Arrow *et al.* (1961).

4 Common Markets and Economic Unions

INTRODUCTION

The analysis of customs unions (CUs) needs drastic extension when applied to common markets (CMs) and economic unions (EUs). Firstly, the introduction of free factor mobility may enhance efficiency through a more rational reallocation of resources but may also result in depressed areas, therefore creating or aggravating regional problems and imbalances – see Mayes (1983a) and Robson (1985). Secondly, fiscal harmonisation may also improve efficiency by eliminating non-tariff trade barriers (NTBs) and distortions and by equalising their effective protective rates. Thirdly, the coordination of monetary and fiscal policies which is implied by monetary integration may ease unnecessarily severe imbalances hence resulting in the promotion of the right atmosphere for stability in the economies of the member nations.

These CM and EU elements must be tackled *simultaneously* with trade creation and diversion as well as economies of scale and market distortions. However, such interactions are too complicated to consider here – the interested reader should consult El-Agraa (1983a; 1984a; 1985b). Hence, this chapter will be devoted to a brief discussion of factor mobility, fiscal harmonisation and monetary integration.

FACTOR MOBILITY

The analysis of CMs requires a discussion of factor mobility; this is the only consideration that distinguishes them from CUs. With regard to factor mobility, it should be apparent that the removal (or their harmonisation) of all barriers to labour (L) and capital (K) will encourage both L and K to move. L will move to those areas where it can fetch the highest possible reward, i.e. the highest 'net advantage' since pecuniary rewards are not the only consideration; tax allowances, health benefits, housing allowances, etc. have to be taken into the calculations. This encouragement need not necessarily lead to an

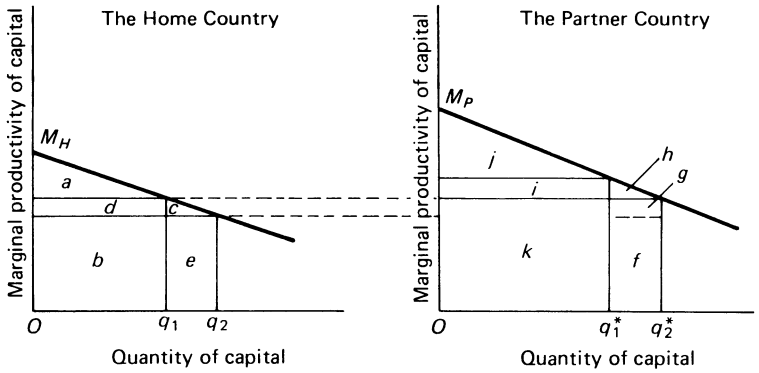


Figure 4.1 *The economic implications of free K mobility in H and P*

increase in actual mobility since there are socio-political factors which normally result in people staying near their birthplace – social proximity is a dominant consideration, which is why the average person does not move. If the reward to K is not equalised, i.e. differences in marginal productivities (*mp*s) exist before the formation of a CM, K will move until the *mp*s are equalised. This will result in benefits which can be clearly described in terms of Figure 4.1 which depicts the production characteristics in countries H (the home country) and P (the potential partner country). M_H and M_P are the schedules which relate the K stocks to their *mp*s in H and P respectively, given the quantity of L in each country, assuming only two factors of production.

Prior to the formation of the CM, the K stock (which is assumed to remain constant throughout the analysis) is Oq_2 in H and Qq_1^* in P. Assuming that K is immobile internationally, all K stocks must be nationally owned and, ignoring taxation, profit per unit of K will be equal to its *mp*, given conditions of perfect competition. Hence the total profit in H is equal to the areas $b + e$ and $i + k$ in P. Total output is, of course, the whole area below the M_P curve but within Oq_2 in H and Oq_1^* in P, i.e. areas $a + b + c + d + e$ in H and $j + i + k$ in P. Therefore, L's share is $a + c + d$ in H and j in P.

Since the *mp* in P exceeds that in H, the removal of barriers to K mobility or the harmonisation of such barriers will induce K to move away from H and into P. This is because nothing has happened to affect K in W. Such movement will continue until the *mp* of K is the same in both H and P. This results in $q_1\ q_2$ ($= q_1^*\ q_2^*$) of K moving

from H to P. Hence the output of H falls to $a + b + d$ while its *national* product, including the return of the profit earned on K in P $(= g + f)$, increases (by g minus c). In P, *domestic* product rises (by $f + g + h$) while *national* product (excluding the remittance of profits to H) increases by area h only. Both H and P experience a change in the relative share of L and K in national product, with K-owners being favourably disposed in H and unfavourably disposed in P.

Of course, this analysis is too simplistic since, apart from the fact that K and L are never perfectly immobile at the international level and multinational corporations have their own ways of transferring K (see McManus, 1972; Buckley and Casson, 1976; Dunning, 1977), the analysis does not take into account the fact that K may actually move to areas of low wages after the formation of a CM. Moreover, if K moves predominantly in only one direction, one country may become a depressed area, hence the 'social' costs and benefits of such an occurrence need to be taken into consideration, particularly if the CM deems it important that the economies of both H and P should be balanced. Hence, the above gains have to be discounted or supplemented by such costs and benefits.

FISCAL HARMONISATION

Fiscal harmonisation is an integral part of fiscal policy. Very widely interpreted, fiscal policy comprises a whole corpus of 'public finance' issues: the relative size of the public sector, taxation and expenditure, and the allocation of public sector responsibilities between different tiers of government (Prest, 1979). Hence fiscal policy is concerned with a far wider area than that commonly associated with it, namely, the aggregate management of the economy in terms of controlling inflation and employment levels.

Experts in the field of public finance (Musgrave and Musgrave, 1976, rightly stress that public finance is a misleading term, since the subject also deals with *real* issues) have identified a number of problems associated with these fiscal policy concerns. For instance, the *relative size of the public sector* raises questions regarding the definition and measurement of government revenue and expenditure (Prest, 1972), and the attempts at understanding and explaining revenue and expenditure have produced more than one theoretical model (Musgrave and Musgrave, 1976; Peacock and Wiseman, 1967). The *division of public sector responsibilities* raises the delicate

quesion of which fiscal aspects should be dealt with at the central government level and which aspects should be tackled at the local level. Finally, the area of *taxation and expenditure criteria* has resulted in general agreement about the basic criteria of *allocation* (the process by which the utilisation of resources is split between private and social goods and by which the 'basket' of social goods is chosen), *equity* (the use of the budget as an instrument for achieving a fair distribution), *stabilisation* (the use of the budget as an instrument for achieving and maintaining a 'reasonable' level of employment, prices and economic growth and for achieving equilibrium and stability in the balance of payments), and *administration* (the practical possibilities of implementing a particular tax system and the cost to the society of operating such a system). However, a number of very tricky problems are involved in a consideration of these criteria. In discussing the efficiency of resource allocation, the choice between work and leisure, for example, or between private and public goods, is an important and controversial one. With regard to the equity of distribution, there is the problem of what is meant by equity: is it personal, class or regional equity? In a discussion of the stabilisation of the economy, there exists the perennial problem of controlling unemployment and inflation and the trade-off between them. A consideration of administration must take into account the problem of efficiency versus practicality. Finally, there is the obvious conflict between the four criteria in that the achievement of one aim is usually at the expense of another; for example, what is most efficient in terms of collection may prove less (or more) equitable than what is considered to be socially desirable.

The above relates to a discussion of the problems of fiscal policy in very broad national terms. When considering fiscal policy in the context of economic integration, there are certain elements of the international dimension that need spelling out and there are also some inter-regional (intra-integrated area) elements that have to be introduced.

Consider the case of taxes (and of course subsidies since they are negative taxes). Very briefly, internationally, it has always been recognised that taxes (and equivalent instruments) have similar effects to tariffs on the international flow of goods and services – non-tariff distortions of international trade (Baldwin, 1970). Other elements have also been recognised as operating similar distortions on the international flow of factors of production (Bhagwati, 1969; Johnson, 1965b; Johnson and Krauss, 1974).

In the particular context of CMs and EUs, it should be remembered that their formation, at least from the economic viewpoint, is meant to facilitate the free and unimpeded flow of goods, services and factors between the member nations. Since tariffs are not the only distorting factor in this respect, the proper establishment of intra-CM/EU free trade necessitates the removal of all non-tariff distortions that have an equivalent effect. Hence, the removal of tariffs may give the impression of establishing free trade inside such schemes of economic integration, but this is by no means automatically guaranteed, since the existence of sales taxes, excise duties, corporation taxes, income taxes, etc. may impede this freedom. The moral is that not only tariffs, but also all equivalent distortions, must be eliminated or harmonised.

In short, there are at least two basic elements to fiscal policy: the instruments available to the government for fiscal policy purposes (i.e. the total tax structure) and the overall impact of the joint manoeuvring of the instruments (i.e. the role played by the budget). As the following discussion will no doubt demonstrate, these two aspects are so intertwined that it is very difficult to handle them separately; this is due to the fact that a tax raises government revenue which, depending on how it is spent, results in macroeconomic effects.

With this background in mind, one should ask: what is tax harmonisation and why is it needed in CMs and EUs? To answer these questions, it may be instructive to examine the experience of the European Community (EC) in this respect. In earlier years, tax harmonisation was defined as tax coordination. Ideally, in a *fully* integrated EC, it could be defined as the identical unification of both base and rates, given the same tax system and assuming that everything else is also unified. Prest (1979, p. 78) rightly argues that *coordination* is tantamount to a low-level meaning of tax harmonisation, since it could be interpreted to be some process of consultation between member countries or, possibly, loose agreements between them to levy tax on a similar sort of base or at similar sorts of rates. Hence it is not surprising that tax harmonisation has, in practice, come to mean a compromise between a low level of coordination (the EC is more than a low level of integration) and the ideal level of standardisation (the EC is nowhere near its ultimate objective of complete political unity).

In case it is not obvious why taxes should give rise to trade distortions, it may be useful to examine the nature of taxes before the

inception of the EC, as well as to consider the treatment given at the time to indirect taxation on internationally traded commodities.

Before considering these aspects, however, one should recall that there are two basic types of taxation: direct and indirect. Direct taxes, like income and corporation taxes, come into operation at the end of the process of personal and industrial activities. They are levied on wages and salaries when activities have been performed and payment has been met (income taxes), or on the profits of industrial or professional business at the end of annual activity (corporation taxes). Hence, direct taxes are not intended to play any significant role in the pricing of commodities or professional services. Indirect taxes are levied specifically on consumption and are, therefore, in a simplistic model, very significant in determining the pricing of commodities given their real costs of production.

Historically speaking, in the EC there existed four types of sales, or turnover, taxes: the *cumulative multi-stage cascade system* (operated in West Germany until the end of 1967, in Luxembourg until the end of 1969 and in the Netherlands until the end of 1968) in which the tax was levied on the gross value of the commodity in question at each and every stage of production without any rebate on taxes paid at earlier stages; *value added tax* which has operated in France since 1954 where it is known as TVA – *Taxe sur la Valeur Ajoutée* – which is basically a non-cumulative multi-stage system; the *mixed systems* (operated in Belgium and Italy) which were cumulative multi-stage systems that were applied down to the wholesale stage, but incorporated taxes which were applied at a single point for certain products; and finally, *purchase tax* (operated in the UK) which was a single-stage tax normally charged at the wholesale stage by registered manufacturers or wholesalers – this meant that manufacturers could trade with each other without paying tax. Although all these tax systems had the common characteristic that no tax was paid on exports, so that each country levied its tax at the point of entry, one should still consider the need for harmonising them.

A variety of taxes also existed in the form of excise duties. The number of commodities subjected to this duty ranged from the usual (or 'classical') five of manufactured tobacco products, hydrocarbon oils, beer, wine and spirits, to an extensive number including coffee, sugar, salt, matches, etc. (in Italy). Also, the means by which the government collected its revenues from excise duties ranged from government-controlled manufacturing, e.g. tobacco goods in France

and Italy, to fiscal imports based on value, weight, strength, quality, etc.

As far as corporation tax is concerned, three basic schemes existed and still exist, but not in any single country at *all* times. The first is the *separate system* which was used in the UK – the system calls for the complete separation of corporation tax from personal income tax and was usually referred to as the 'classical system'. The second is the *two-rate system* or *split-rate system* which was the German practice and was recommended as an alternative system for the UK in the *Green Paper* of 1971 (HMSO, Cmnd 4630). The third is the *credit* or *imputation system* – this was the French system and was proposed for the UK in the *White Paper* of 1972 (HMSO, Cmnd 4955).

Generally speaking, the corporation tax varied from being totally indistinguishable from other systems (Italy) to being quite separate from personal income tax with a single or split-rate which varied between 'distributed' and 'undistributed' profits, to being partially integrated with the personal income tax systems, so that part of the corporation tax paid on distributed profits could be credited against a shareholder's income tax liability.

The personal income tax system itself was differentiated in very many aspects among the six founder countries of the EC, not just as regards rates and allowances, but also administration procedures, compliance and enforcement.

Finally, the variety in the para-tax system relating to social security arrangements was even more striking. The balance between sickness, industrial injury, unemployment and pensions was very different indeed, and the methods of financing these benefits were even more so – see El-Agraa (1985b, Tables 14.4 and 14.5).

In order to explain the distorting nature of taxes, it may be instructive to have a closer look at the problems relating to the EC's taxes, especially its turnover tax: VAT. The first problem relates to the point at which the tax should be levied. Here, two basic principles have been recognised and a choice between them has to be made: the 'destination' and 'origin' principles. Taxation under the destination principle specifies that commodities going to the same destination must bear the same tax load irrespective of their origin. For example, if Italy levies a general sales tax at 8 per cent and France a similar tax at 16 per cent, a commodity exported from Italy to France would be exempt from Italy's 8 per cent tax but would be subjected to France's 16 per cent tax. Hence, the Italian export commodity would compete

on equal terms with French commodities sold in the French market. Taxation under the origin principle specifies that commodities with the same origin must pay exactly the same tax, irrespective of their destination. Hence a commodity exported by Italy to France would pay the Italian tax (8 per cent) and would be exempt from the French tax (16 per cent). Hence, the commodity that originated from Italy would compete unfairly against a similar French commodity.

The second problem relates to the range of coverage of the tax. If some countries are allowed to include certain stages, e.g. the retail stage, and others make allowances for certain fixed capital expenditures and raw materials, the tax base will not be the same. This point is very important, because one has to be clear about whether the tax base (vital for an economically integrated area which adopts a general budget; note also that this is the clearest example of a tax which directly influences budget revenue) should be consumption or net national income. To illustrate, in a 'closed' economy

$$Y \equiv W + P \equiv C + I$$

where Y = GNP, W = wages and salaries, P = gross profits, C = consumption and I = gross capital expenditure. If value-added is defined as $W + P - I$ (i.e. GNP minus gross capital expenditure), then consumption will form the tax base. If instead of gross capital expenditure one deducts only capital consumption (depreciation), then Net National Product will become the tax base. Obviously, the argument holds true in an open economy. It is therefore important that members of a CM or an EU should have a common base for the financing of a common general budget as is the case in the EC.

The third problem relates to exemptions that may defeat the aim of VAT being a tax on consumption. For example, in a three-stage production process, exempting the first stage does not create any problem, since the tax levies on the second and third stages together will be equivalent to a tax levied on all three stages. Exempting the third stage will obviously reduce the tax collection, provided of course that the rates levied at all stages were the same. If the second stage is exempt, the tax base will be in excess of that where no exemptions are allowed for, since the tax on the first stage cannot be transferred as an input tax on the second stage, and the third stage will be unable to claim any input tax from items bought from the second stage. The outcome will be a tax based on the total sum of the turnover of stages one and three only, rather than a tax levied on the total sum of the value added at all three stages.

With regard to the corporation tax, the important question is the

treatment of investment in the different member nations, since, if K mobility within the EC is to be encouraged, investors must receive equal treatment irrespective of their native country (region). Here, Dosser (1973, p. 95) highly recommends the *separate system* since it is 'neutral' in its tax treatment between domestic investment at home and abroad, and between domestic and foreign investment at home, provided both member countries practise the same system. Prest (1979, pp. 85–6) argues that even though a *separate system* does not discriminate against partner (foreign) investment, it does discriminate between 'distributed' and 'undistributed' profits, and that the *imputation system* even though it is 'neutral' between 'distributed' and 'undistributed' profits, actually discriminates against partner (foreign) investment. Prest therefore claims that neither system can be given 'full marks'.

Excise duties are intended basically for revenue-raising purposes. For example, in the UK, excise duties on tobacco products, petroleum and alcoholic drinks account for about a quarter of central government revenue. Hence, the issues raised by the harmonisation of these taxes are specifically those relating to the revenue-raising function of these taxes and to the equity, as opposed to the efficiency, of these methods.

Finally, the income tax structure has a lot to do with the freedom of L mobility. Ideally, one would expect equality of treatment in every single tax that is covered within this structure, but it is apparent that since there is more than one rate, the harmonisation of a 'package' of rates might achieve the specified overall objective.

In conclusion, one hopes that the digression to the particular case of the EC has clarified the need for tax harmonisation, and has also answered the question regarding why fiscal harmonisation is needed only in CMs and more involved schemes of economic integration, although even CUs may find it necessary to have a very close examination of the effect of taxation on member nations' product competitiveness.

MONETARY INTEGRATION

Full monetary integration is required only in very involved schemes of economic integration, such as EUs. Monetary integration has two essential components: an exchange rate union and K market integration. An exchange rate union is established when member countries have what is in effect one currency. The actual existence of one

currency is not necessary, however, because if member countries have *permanently* and *irrevocably* fixed exchange rates amongst themselves, the result is effectively the same. Of course, one could argue that the adoption of a single currency would guarantee the irreversibility of undertaking membership of a monetary union, which would have vast repercussions for the discussion in terms of actual unions (see El-Agraa, 1985b), but one could equally well argue that if a member nation decided to opt out of a monetary union, it would do so irrespective of whether or not the union entailed the use of a single currency.

Convertibility refers to the *permanent* absence of all exchange controls for both current and *K* transactions, including interest and dividend payments (and the harmonisation of relevant taxes and measures affecting the *K* market) within the union. It is of course absolutely necessary to have complete convertibility for trade transactions, otherwise an important requirement of CU formation is threatened, namely the promotion of free trade among members of the CU which is an integral part of an EU. That is why this aspect of monetary integration does not need any discussion; it applies even in the case of a free trade area (FTA). Convertibility for *K* transactions is related to free factor mobility and is therefore an important aspect of *K* market integration which is necessary in CMs, not in CUs or FTAs.

In practice, this definition of monetary integration should specifically include:

(i) an explicit harmonisation of monetary policies;
(ii) a common pool of foreign exchange reserves; and
(iii) a single central bank.

There are important reasons for including these elements. Suppose union members decide either that one of their currencies will be a reference currency, or that a new unit of account will be established. Also assume that each member country has its own foreign exchange reserves and conducts its own monetary and fiscal policies. If a member finds itself running out of reserves, it will have to engage in a monetary and fiscal contraction sufficient to restore the reserve position. This will necessitate the fairly frequent meeting of the finance ministers or central bank governors, to consider whether or not to change the parity of the reference currency. If they do decide to change it, then all the member currencies will have to move with it. Such a situation could create the sorts of difficulty which plagued the Bretton Woods System:

(*a*) Each finance minister might fight for the rate of exchange that is most suitable for his/her country. This might make bargaining hard; agreement might become difficult to reach and the whole system might be subject to continuous strain.

(*b*) Each meeting might be accompanied by speculation about its outcome. This might result in undesirable speculative private K movements into or out of the union.

(*c*) The difficulties that might be created by (*a*) and (*b*) may result in the reference currency being permanently fixed relative to outside currencies, e.g. the US dollar.

(*d*) However, the system does allow for the possibility of the reference currency floating relative to non-member currencies, or floating within a band. If the reference currency does float, it might do so in response to conditions in its own market. This will be the case, however, only if the union requires the monetary authorities in the partner countries to vary their exchange rates so as to maintain constant parities relative to the reference currency. They will then have to buy and sell the reserve currency so as to maintain or bring about the necessary exchange rate alteration. Therefore, the monetary authorities of the reference currency will, in fact, be able to determine the exchange rate for the whole union.

(*e*) Such a system does not guarantee the permanence of the parities between the union currencies that is required by the definition of monetary integration. There is the possibility that the delegates will not reach agreement, or that one of the partners might finally choose not to deflate to the extent necessary to maintain its rate at the required parity or that a surplus partner might choose neither to build up its reserves nor to inflate as required and so might allow its rate to rise above the agreed level.

In order to avoid such difficulties, it is necessary to include in the definition of monetary integration the three elements specified. The central bank would operate in the market so as permanently to maintain the exchange parities among the union currencies and, at the same time, it would allow the rate of the reference currency to fluctuate, or to alter intermittently, relative to the outside reserve currency. For instance, if the foreign exchange reserves in the common pool were running down, the common central bank would allow the reference currency, and with it all the partner currencies, to depreciate. This would have the advantage of economising in the use of foreign exchange reserves, since all partners would not tend to be

in deficit or surplus at the same time. Also surplus countries would automatically be helping deficit countries.

However, without explicit policy coordination, a monetary union would not be effective. If each country conducted its own monetary policy, and hence could engage in as much domestic credit creation as it wished, surplus countries would be financing deficit nations without any incentives for the deficit countries to restore equilibrium. If one country ran a large deficit, the union exchange rate would depreciate, but this might put some partner countries into surplus. If wage rates were rising in the member countries at different rates, while productivity growth did not differ in such a way as to offset the effects on relative prices, those partners with the lower inflation rates would be permanently financing the other partners.

In short,

> Monetary integration, in the sense defined, requires the unification and joint management both of monetary policy and of the external exchange-rate policy of the union. This in turn entails further consequences. First, in the monetary field the rate of increase of the money supply must be decided jointly. Beyond an agreed amount of credit expansion, which is allocated to each member state's central bank, a member state would have to finance any budget deficit in the union's capital market at the ruling rate of interest. A unified monetary policy would remove one of the main reasons for disparate movements in members' price levels, and thus one of the main reasons for the existence of intra-union payment imbalances prior to monetary union. Secondly, the balance of payments of the entire union with the rest of the world must be regulated at union level. For this purpose the monetary authority must dispose of a common pool of exchange reserves, and the union exchange rates with other currencies must be regulated at the union level. Under such a system it may not be possible for a member to calculate its balance of payments with its partners and the rest of the world. (Robson, 1985)

Therefore, monetary integration which explicitly includes the three requirements specified will enable the partners to do away with all these problems right from the start. Incidentally, this also suggests the advantages of having a single currency.

The gains due to membership of a monetary union could be both economic and non-economic, i.e. political, sociological, etc. The

non-economic benefits are too obvious to warrant space, for example it is difficult to imagine that a complete political union can become a reality without the establishment of a monetary union. The discussion will therefore be confined to the economic benefits, which can be briefly summarised as:

(*a*) The common pool of foreign exchange reserves already discussed has the incidental advantage of economising in the use of foreign exchange reserves both in terms of the fact that member nations will not go into deficit *simultaneously* and intra-union trade transactions will no longer be financed by foreign exchange. In the context of the EC this will reduce the role of the US dollar or reduce the EC's dependence on the dollar.

(*b*) In the case of forms of economic integration like the EC, the adoption of the common unit of account (say, the *European Currency Unit*, ECU) as a common currency would transform it into a major world currency able to compete with the US dollar or Japanese yen on equal terms. The advantages of such a currency are too well established to discuss here. However, the use of an integrated area's currency as a major reserve currency doubtless imposes certain burdens on the area, but in the particular case of the EC, it would create an oligopolistic market situation which could either lead to collusion, resulting in a permanent sensible reform of the international monetary system, or intensify the situation and lead to a complete collapse of the international monetary order. The latter possibility is of course extremely likely to result in the former outcome; it is difficult to imagine that the leading nations in the world economy would allow monetary chaos to be the order of the day.

(*c*) Another source of gain could be a reduction in the cost of financial management. Monetary integration should enable the spreading of overhead costs of financial transactions more widely. Also, some of the activities of the institutions dealing in foreign exchanges may be discontinued, leading to a saving in the use of resources (Robson, 1985).

(*d*) There also exist the classical advantages of having permanently fixed exchange rates (or one currency) among members of a monetary union for free trade and factor movements. Stability of exchange rates enhances trade, encourages capital to move to where it is most productively rewarded and ensures that L will move to where the highest rewards prevail. It seems unnecessary

to emphasise that this does not mean that *all L* and *all K* should be mobile, but simply enough of each to generate the necessary adjustment for any situation. Nor is it necessary to stress that hedging can tackle the problem of exchange rate fluctuations only at a cost, no matter how low that cost may be.

(*e*) The integration of the *K* market has a further advantage. If a member country of a monetary union is in deficit (assuming that countries can be recognised within such a union), it can borrow directly on the union market, or raise its rate of interest to attract *K* inflow and therefore ease the situation. However, the integration of economic policies within the union ensures that this help will occur automatically under the auspices of the common central bank. Since no single area is likely to be in deficit permanently, such help can be envisaged for all the members. Hence, there is no basis for the assertion that one country can borrow indefinitely to sustain real wages and consumption levels that are out of line with that nation's productivity and the demand for its products (Corden, 1972a).

(*f*) When a monetary union establishes a central fiscal authority with its own budget, then the larger the size of this budget, the higher the degree of fiscal harmonisation (the *MacDougall Report*, 1977). This has some advantages: regional deviations from internal balance can be financed from the centre; and the centralisation of social security payments financed by contributions or taxes on a progressive basis would have some stabilising and compensating effects, hence modifying the harmful effects of monetary integration (Corden, 1972a).

(*g*) There are negative advantages in the case of the EC in the sense that monetary integration is necessary for maintaining the EC as it exists; for example, the *common agricultural policy* (CAP – see Chapter 12) would be undermined if exchange rates were to be flexible (Ingram, 1973).

These benefits of monetary integration are clear and there are few economists who would question them (see El-Agraa (1985b) for a detailed discussion). However, there is no consensus of opinion with regard to its costs.

The losses from membership of a monetary union are emphasised by Fleming (1971) and Corden (1972a). Assume that the world consists of our usual three countries: *H*, *P* and the rest of the world (*W*). Also assume that, in order to maintain both internal and

external equilibrium, one country (*H*) needs to devalue its currency relative to *W*, while *P* needs to revalue *vis-à-vis W*. Moreover, assume that *H* and *P* use fiscal and monetary policies for achieving internal equilibrium. If *H* and *P* were partners in an exchange-rate union, they would devalue together – which is consistent with *H*'s policy requirements in isolation – or revalue together – which is consistent with *P*'s requirements in isolation – but they would not be able to alter the rate of exchange in a way that was consistent with both. Under such circumstances, the alteration in the exchange rate could leave *H* with an external deficit, hence forcing it to deflate its economy and increase/create unemployment, or it could leave it with a surplus, hence forcing it into accumulating foreign reserves or allowing its prices and wages to rise. Hence if countries deprive themselves of rates of exchange (or trade impediments) as policy instruments, they impose on themselves losses that are essentially the losses emanating from *enforced departure from internal balance* (Corden, 1972a).

In short, the rationale for retaining flexibility in the rates of exchange rests on the assumption that governments aim to achieve both internal and external balance, and as Tinbergen (1952) has shown, to achieve these *simultaneously* at least an equal number of instruments is needed. This can be explained in the following manner. Orthodoxy has it that there are two macroeconomic policy targets and two policy instruments. Internal equilibrium is tackled via financial instruments, which have their greatest impact on the level of aggregate demand, and the exchange rate is used to achieve external equilibrium. Of course, financial instruments can be activated via both monetary and fiscal policies and may have a varied impact on both the internal and external equilibria. Given this understanding, the case for maintaining flexibility in exchange rates depends entirely on the presumption that the loss of one of the two policy instruments will conflict with the achievement of both internal and external equilibria.

With this background in mind, it is vital to follow the Corden/Fleming explanation of the enforced departure from internal equilibrium. Suppose a country is initially in internal equilibrium but has a deficit in its external account. If the country were free to vary its rate of exchange, the appropriate policy for it to adopt to achieve overall balance would be a combination of devaluation and expenditure reduction. When the rate of exchange is not available as a policy instrument, it is necessary to reduce expenditure by more than is

required in the optimal situation with the result of extra unemployment. The *excess* unemployment, which can be valued in terms of output or whatever, is the cost to that country of depriving itself of the exchange rate as a policy instrument. The extent of this loss is determined, *ceteris paribus*, by the marginal propensity to import and to consume exportables, or, more generally, by the marginal propensity to consume tradables relative to non-tradables.

The expenditure reduction which is required for eliminating the initial external account deficit will be smaller the higher the marginal propensity to import. Moreover, the higher the marginal propensity to import, the less the effect of that reduction in expenditure on demand for domestically produced commodities. For both reasons, therefore, the higher the marginal propensity to import, the less domestic unemployment will result from abandoning the devaluation of the rate of exchange as a policy instrument. If the logic of this explanation is correct, it follows that as long as the marginal propensity to consume domestic goods is greater than zero, there will be some cost due to fixing the rate of exchange. A similar argument applies to a country which cannot use the exchange rate instrument when it has a surplus in its external account and internal equilibrium: the required excess expenditure will have little effect on demand for domestically produced goods and will therefore exert little inflationary pressure if the country's marginal propensity to import is high.

This analysis is based on the assumption that there exists a trade-off between rates of change in costs and levels of unemployment – the Phillips curve. Assuming that there is a Phillips (1958) curve relationship (a negative response of rates of change in money wages – $\dot{W}$ – and the level of unemployment – U), Fleming (1971) and Corden (1972a) explain this by using a simple diagram which was first devised by de Grauwe (1975). Hence, in Figure 4.2, the top half depicts the position of H while the lower half depicts that of P. The top right and the lower right corners represent the two countries' Phillips curves while the remaining quadrants show their inflation rates corresponding to the rates of change in wages – $\dot{P}$. *WI* (which stands for *wage rate change* and corresponding *inflation*) and WI_P are, of course, determined by the share of L in total GNP, the rate of change in the productivity of L and the degree of competition in both the factor and commodity markets, with perfect competition resulting in the *WI*s being straight lines. Note that the intersection of the *WI*s with the vertical axes will be determined by the rates of change of L's share in GNP and its rate of productivity change. The diagram has

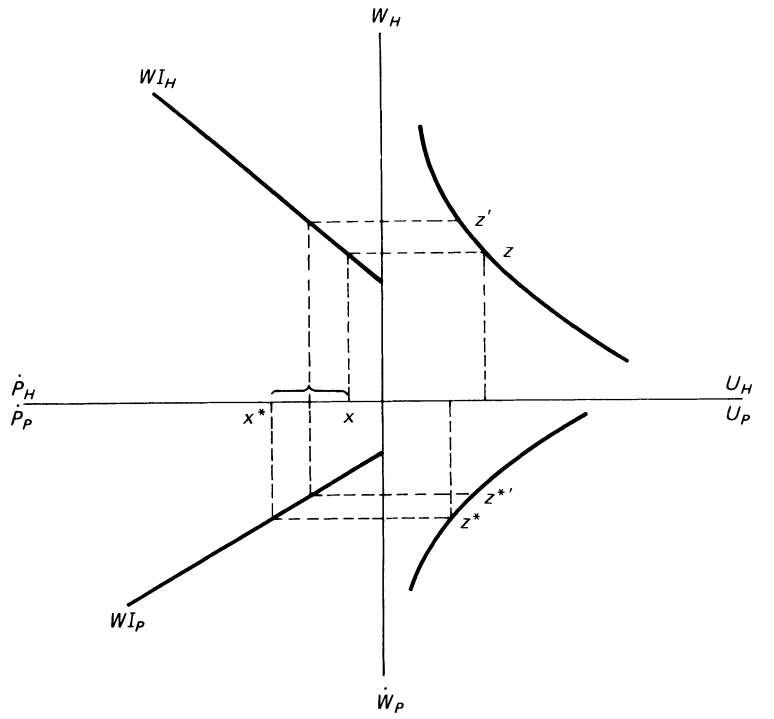


Figure 4.2 *The Fleming/Corden analysis of monetary integration*

been drawn on the presumption that the L productivity changes are positive.

The diagram is drawn in such a way that countries H and P differ in all respects: the positions of their Phillips curves; their preferred trade-offs between $\dot{W}$ and $\dot{P}$; and their rates of productivity growth. H has a lower rate of inflation, x, than P, x^* (equilibria being at z and z^*), hence, without monetary integration, P's currency should depreciate relative to H's; note that it is only a chance in a million that the two countries' inflation rates would coincide. Altering the exchange rates would then enable each country to maintain its preferred internal equilibrium: z and z^* for respectively countries H and P.

When H and P enter into an exchange rate union, i.e. have irrevocably fixed exchange rates *vis-à-vis* each other, their inflation rates cannot differ from each other, given a model without traded

goods. Hence, each country will have to settle for a combination of U and $\dot{P}$ which is different from that it would have liked. Therefore, the Fleming/Corden conclusion is vindicated.

However, this analysis rests entirely on the acceptance of the Phillips curve. The on-going controversy between Keynesians and Monetarists, although still far from being resolved, has at least led to the consensus that the form of the Phillips curve just presented is too crude. This is because many economists no longer believe that there is a trade-off between unemployment and inflation; if there is any relationship at all, it must be a short-term one such that the rate of unemployment is in the long-term independent of the rate of inflation: there is a 'natural rate' of unemployment which is determined by rigidities in the market for L. Hence, the crude version of the Phillips curve has been replaced by an expectations adjusted one along the lines suggested by Phelps (1968) and Friedman (1975), i.e. the Phillips curves become vertical in the long run. This position can be explained with reference to Figure 4.3 which depicts three Phillips curves for one of the two countries. Assume that unemployment is initially at point U_2, i.e. the rate of inflation is equal to zero, given the short-term Phillips curve indicated by ST_1. The expectations-augmented Phillips curve suggests that if the government tries to lower unemployment by the use of monetary policy, the short-term effect would be to move to point a, with positive inflation and lower unemployment. However, in the long term, people would adjust their expectations, causing an upward shift of the Phillips curve to ST_2 which leads to equilibrium at point b. Hence, the initial level of unemployment is restored but with a positive rate of inflation. A repetition of this process gives the vertical long-term curve labelled LT.

If both partners H and P have vertical LT curves, Figure 4.2 will have to be adjusted to give Figure 4.4. The implications of this are that: (i) monetary integration will have no long-term effect on each partner's rate of unemployment since this will be fixed at the appropriate 'natural rate' for each country – U_H, U_P, and (ii) if monetary integration is adopted to bring about balanced growth as well as equal 'natural rates' of unemployment, this can be achieved only if other policy instruments are introduced to bring about uniformity in the two L markets. Therefore, this alternative interpretation of the Phillips curve renders the Fleming/Corden conclusion invalid.

Be that as it may, it should be noted that Allen and Kenen (1980) and Allen (1983) have demonstrated, using a sophisticated and

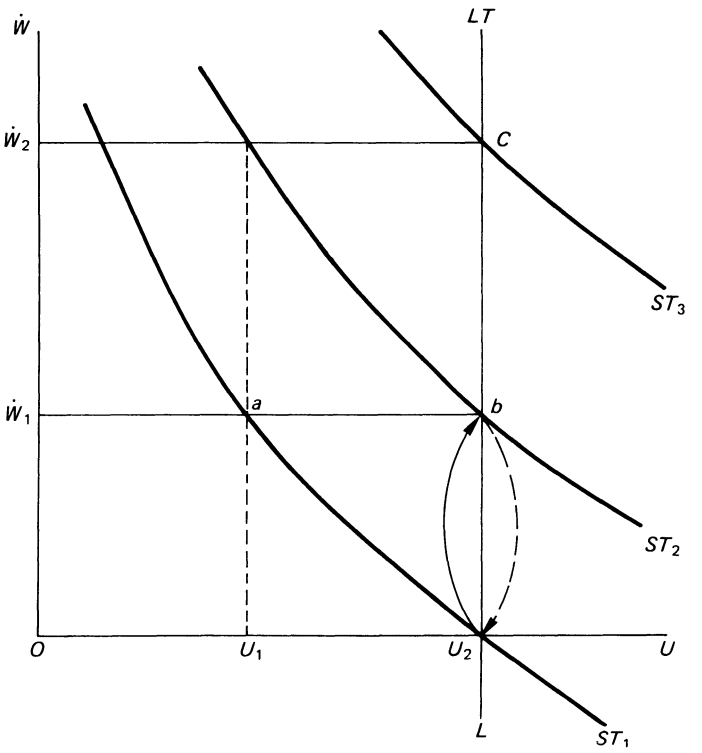


Figure 4.3 *The expectations-augmented Phillips curve*

elaborate model with financial assets, that, although monetary policy has severe drawbacks as an instrument for adjusting cyclical imbalances within a monetary union, it may be able to influence the demand for the goods produced by member countries in a differential manner within the short term, provided the markets of the member nations are not too closely integrated. Their model indicates that economic integration, in this sense, can come about as a consequence of the substitutability between nations' commodities, especially their financial assets, and of country biases in the purchase of commodities and financial assets. The moral of this is that the central bank of a monetary union can operate disparate monetary policies in the different partner countries without compromising their internal and external equilibria, a severe blow to those who stress the costs from monetary integration.

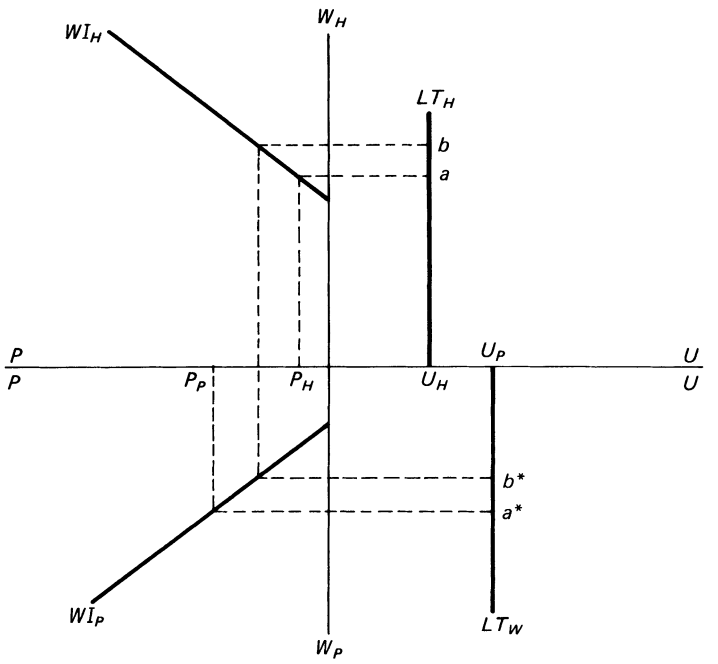


Figure 4.4 *Monetary integration with expectations–augmented Phillips curves.*

Moreover, once non-traded goods are incorporated into the model and/or K and L mobility are allowed for, it follows that the losses due to deviating from internal equilibrium vanish into oblivion, a point which Corden (1972a; 1977) readily accedes to. Finally, this model does not allow for the fact that monetary integration involves at least three countries, hence W has to be explicitly included in the model; Allen and Kenen (1980) tried to develop a model along these lines, but their model is not a straightforward extension of that depicted in Figure 4.2.

In concluding this section, it may be appropriate to highlight the limitations in the argument put forward by Fleming and Corden. These are:

(*a*) It is clearly stated in the definition of monetary integration that the fixity of exchange rate parities within a monetary union (or the adoption of one currency) does not mean that the different

member currencies cannot vary in unison relative to extra-union currencies. Hence the monetary union is not forgoing the availability of exchange rate variations relative to the outside world.

(*b*) In a proper monetary union, an extra deficit for one region can come about only as a result of a revaluation of the union currency – the union as a whole has an external surplus *vis-à-vis* the outside world. Such an act would increase the foreign exchange earnings of the surplus region, and hence of the union as a whole, provided the conditions for a successful revaluation exist. The common central bank and the integration of monetary policies will ensure that the extra burden on the first region is alleviated: the overall extra earnings will be used to help the region with the extra deficit. Needless to add, such a situation does not lead to surplus regions financing deficit regions indefinitely because no single region is likely to be in deficit or surplus permanently and because the policy coordination will not allow one region to behave in such a manner unless there are reasons of a different nature which permit such a situation to be sustained.

(*c*) Even if one were to accept the Fleming/Corden argument at its face value, the assumptions are extremely controversial. For instance, devaluation can work effectively only when there is 'monetary illusion', otherwise it would be pointless since it would not work. Is it really permissible to assume that trade unionists, wherever they may be, suffer from money illusion? Johnson, Ingram and others (in Krause and Salant, 1973, pp. 184–202) have all pointed to the fallacious nature of such an assumption in the context of the EC – see Summer and Zis (1982) for a full discussion of this issue. Corden's response has been to suggest that exchange rate alterations may work if money wages are forced up because the catching-up process is never complete. Such an argument is far from convincing simply because the catching-up process has no validity as a true adjustment; it cannot be maintained indefinitely because, sooner or later, trade unionists will allow for it when negotiating money wage increases.

(*d*) One must remember that in practice there would never be a separation between the exchange rate union and *K* market integration. Once one allows for the role of convertibility for *K* transactions, *K* will always come to the rescue. Corden has reservations about this too since he argues that *K* integration can help in the short run, but, in the long term, while it has its own

advantages, it cannot solve the problem. The rationale for this is that no region can borrow indefinitely on a private market, no matter how efficient and open the market is, to sustain levels of real wages, and hence real consumption levels which are too high, given the productivity level in the region. Clearly, this is a switching of grounds: devaluation is nothing but a temporary adjustment device as the discussion of the monetary approach to the balance of payments has shown. Why then should devaluation be more desirable than short-term K adjustment? Moreover, for a region that is permanently in deficit, all economists would agree that devaluation is no panacea.

(*e*) We have seen that monetary integration can be contemplated only when the countries concerned have an EU in mind. In such conditions, the mobility of L will also help in the adjustment process. This point is conceded by Corden, but he believes that L mobility may help only marginally since it would take prolonged unemployment to induce people to emigrate, and, if monetary integration proceeded far in advance of 'psychological integration' (defined as the suppression of existing nationalisms and a sense of attachment to place in favour of an integrated community nationalism and an American-style geographic rootedness), nationalistic reactions to any nation's depopulation may become very intense. This reasoning is similar to that in the previous case since it presupposes that the problem region is a *permanently* depressed area. Since no region in the union is ever likely to experience chronic maladjustments, L mobility needs only to be marginal and national depopulation is far from the truth (see Chapter 16 of El-Agraa, 1985b).

(*f*) Finally, and more fundamentally, a very crucial element is missing from the Fleming/Corden argument. Their analysis relates to a country in internal equilibrium and external deficit. If such a country were outside a monetary union, it could devalue its currency. Assuming that the necessary conditions for effective devaluation prevailed, then devaluation would increase the national income of the country, increase its price level, or result in some combination of the two. Hence a deflationary policy would be required to restore the internal balance. However, if the country were to lose its freedom to alter its exchange rate, it would have to deflate in order to depress its imports and restore external balance. According to the Fleming/Corden analysis, this alternative would entail unemployment in excess of that prevail-

ing at the initial situation. The missing element in this argument can be found by specifying how devaluation actually works. Devaluation of a country's currency results in changes in relative price levels and is price-inflationary for, at least, both exportables and importables. These relative price changes, given the necessary stability conditions, will depress imports and (maybe) increase exports. Hence, the deflationary policy which is required (to accompany devaluation) in order to restore internal balance should eliminate the *newly injected* inflation as well as the *extra* national income. By disregarding the 'inflationary' implications of devaluation, Fleming and Corden reach the unjustifiable *a priori* conclusion that membership of a monetary union would necessitate extra sacrifice of employment in order to achieve the same target. Any serious comparison of the two situations would indicate that no such *a priori* conclusion can be reached – one must compare like with like.

In addition to the above limitations, one should point out a fundamental contradiction in the analysis of those who exaggerate the costs. If a nation decides to become a member of a monetary union, this implies that it accedes to the notion that the benefits of such a union must outweigh any possible losses and/or that it feels that a monetary union is essential for maintaining a rational EU. It will want to do so because its economy is more interdependent with its partners than with *W*. Why then would such a country prize the availability of the exchange rate as a policy instrument for its own domestic purposes? The answer is that there is no conceivable rational reason for its doing so: it will want to have an inflation rate, monetary growth target and unemployment rate which are consistent with those of its partners. Also, the use of an EU's rate of exchange *vis-à-vis W* plus the rational operations of the common central bank and its general activities should ensure that any worries on the part of the home country are alleviated. Hence, for such a country to feel that there is something intrinsically good about having such a policy instrument at its own disposal is tantamount to its not having any faith in or a true commitment to the EU to which it has voluntarily decided to belong!

Expressed in terms of Tinbergen's criteria of an equal number of policy instruments and objectives, it should be remembered that the formation of a *complete* EU is effectively just a step short of complete political union. However, given that the necessary conditions for an

effective EU require a great deal of political unification, EU and complete political integration are hardly distinguishable in a realistic situation. Hence, in forming an EU, the countries concerned will actually be acquiring a free policy instrument: they will have two instruments for internal policy adjustments and one for external (joint) adjustment when all they effectively need is only one of the former instruments. Therefore, an analysis which does not explicitly incorporate this dimension can hardly claim to have any relevance to the situation under consideration.

CONCLUSION

Since each section finished with a conclusion, all that needs stating here is that not only are the sections very closely related, but also that, particularly in the case of monetary integration, it is inevitable to conclude that its establishment is almost impossible without a general budget which is substantial enough to guarantee and smooth its operation – on this point, the reader is advised to consult the *MacDougall Report* (1977), Allen (1983) and El-Agraa (1985b). This raises the interesting point that the classification of types of economic integration given in Chapter 1 is suitable only for textbook clarification since these problematical considerations clearly indicate that the actual schemes of integration that emerge will be highly coloured by the way they cope with these problems (see El-Agraa (1988) for the actual schemes in existence today or those that have met their demise but whose experience has hopefully taught us a number of lessons).

5 Economic Integration Amongst Developing Nations

INTRODUCTION

The theory of economic integration has evolved, almost exclusively, from discussion of post-Second World War developments: the formation of the European Community (EC), the European Free Trade Association (EFTA), and the Council for Mutual Economic Assistance (CMEA, or COMECON, as it is generally known in the West). The literature to date is certainly biased towards common markets in the 'advanced' or 'industrial' economies – see the references cited by Lipsey (1960), Corden (1965; 1984), Krauss (1972), Robson (1983; 1985), El-Agraa and Jones (1981) and El-Agraa (1982; 1988). This is in spite of the fact that the East African Community (EAC) was one of the poineers in this field, although the EAC was formed for colonial administrative convenience rather than as a voluntary association of independent nations (Hazlewood, 1967).

The first rigorous attempt at a consideration of economic integration in the context of development was made by Brown (1961), and most of the subsequent work has concentrated on the estimate of the gains and losses from such associations – see *inter alia*, Newlyn (1965; 1966), Hazlewood (1966; 1967; 1975), Robson (1968; 1983; 1985), Robson and Lury (1969) and Kahnert *et al.*, (1969). The most notable exceptions are the contributions by Johnson (1965a) – which has already been explained – and by Cooper and Massell (1965b) – which is very similar to Johnson's hence we need not discuss it here.

As far as the developing countries (less developed countries, LDCs) are concerned, it was immediately realised (see Meade, 1955a; Lipsey, 1960; Brown, 1961) that the static resource reallocation effects of trade creation (TC) and trade diversion (TD) have little relevance. The theory suggested that there would be more scope for TC if the countries concerned were *initially* very competitive in production but *potentially* very complementary and that a CU would be more likely to be trade creating if the partners conducted most of

their foreign trade amongst themselves. These conditions are unlikely to be satisfied in the majority of the LDCs – see El-Agraa (1969) for the case of the Arab Common Market and Robson (1983) for West Africa. Moreover, most of the effects of integration in the LDCs are bound to be trade diverting, since most LDCs seek to industrialise at a time when practically all their industrial products are imported from either the advanced nations or the newly industrialising countries (NICs), now economies, i.e. NIEs.

On the other hand, it was also realised that an important obstacle to the development of industry in the LDCs is the inadequate size of their individual markets – see Brown (1961), Hazlewood (1967; 1975), Metwally (1979) and Robson (1983). It is, therefore, necessary to increase the market size so as to encourage optimum plant installations, hence the need for economic integration.

To put it differently:

> the neoclassical analysis of integration among [LDCs] starts from an entirely different developmental standpoint. It is assumed that there is a valid case for protecting certain activities – particularly industry – either for the purpose of increasing income or the rate of growth, or in order to attain certain non-economic objectives that are sought for their own sake. To attain the latter may entail economic sacrifice, but that would not negate the argument.
>
> The implications of economic integration in these terms can best be considered within a broader framework than that often employed, in which account is formally taken of . . . economies of scale . . . and . . . divergencies between private and social costs of production. The gains from integration can then be analysed in the particularly relevant context of opportunities to exploit economies of scale that cannot be secured in single national markets, and the implications of market imperfections can also be brought about. Imperfections typically arise when certain goods and services do not fully pass through the market, thus giving rise to external economies and diseconomies, or when government policies distort the prices of factors and goods. (Robson, 1983, pp. 6–7)

Fortunately, these issues have already been tackled in this book, so we need not go through familiar ground here. What needs discussion is the fact that the necessity to increase the size of the market so as to enable appropriate plant installations would, however, result in industries clustering together in the relatively more advanced of the

LDCs under consideration – those that have already commenced the process of industrialisation; this is the so-called 'back-wash' effect discussed by Brown (1961), Hazlewood (1975) and Robson and Lury (1969).

Brown, using a macroeconomic model, argued that even though the clustering together of industries might be a natural development, the other parties to the CU would gain from such an association and that the benefits could be more equitably distributed if some arrangements were introduced for this purpose; this is the so-called 'spread' or multiplier effect discussed by Brown (1961).

These developments have led to the conclusion that economic integration in the advanced world is a very different matter from that in the LDCs – see Hazlewood (1975), Robson and Lury (1969), Kahnert *et al.* (1969) and Robson (1983). This conclusion is examined in this section in an extended Brown model – see El-Agraa (1979b; 1981; 1985a) for a full explanation of the model.

EL-AGRAA'S VERSION OF BROWN'S MODEL

In my version of Brown's model, I made the same assumptions as he did. Although the assumptions are meant to simplify the analysis, it could be argued that they are very relevant to the LDCs under consideration. The assumptions are:

(*a*) Factors of production are perfectly mobile within each country but lack the freedom to move across national borders. The union is, therefore, not allowed to introduce measures to divert resources to the industrialising partner. Hence, the union is necessarily a customs union (CU) not a common market (CM).
(*b*) There is a plentiful unutilised supply of all factors of production.
(*c*) The newly introduced industrial output is to be sold as a substitute for a product imported from the rest of the world (W); hence the CU is purely trade diverting. This product will be sold at a price equal to the import price plus the customs duty (tariff) – this amounts to assuming that the CU has a common external tariff (CET) equal to the initial (assumed equal) tariff rate(s).
(*d*) Each of the partner nations receives customs revenue from those commodities which are consumed within its territories as well as the revenue from direct and excise taxes collected accordingly.
(*e*) The governments' budgets are to remain balanced throughout, so

that any change in government revenue must bring about an equal change in government expenditure. This change in expenditure must fall on goods and services so that transfers are unaltered.

(*f*) No change in investment takes place in any of the partner countries. This might seem a very strange assumption, particularly when a new industrial output is to be introduced. It will become apparent, however, that the relaxation of this assumption will reinforce the conclusions of the model rather than render them invalid.

The newly produced output of manufactured goods by the partner that has already commenced the process of industrialisation will be indicated by Q. The tax-free value of the imports displaced by this new product is $Q\ (1 - t)$, where t is the *ad valorem* marginal rate of duty in the partner countries, 1, 2 and 3. Country 1 is the partner that has already started industrialising.

x_1 and x_2 of Q are consumed in 1 and 2 respectively while the remainder $Q(1 - x_1 - x_2)$ is consumed in 3. Thus the consumption of Q in 2 and 3 together is equal to $Q(1 - x_1)$.

m_1, m_2, and m_3, are the total marginal propensities to import (*mpi*) of 1, 2 and 3 respectively. These *mpi* are composed of three parts each: a_1, a_2 and $[m_1 - (a_1 + a_2)]$ are 1's *mpi* for imports from 2, 3 and W respectively; a_3, a_4 and $[m_2 - (a_3 + a_4)]$ are 2's *mpi* for imports from 1, 3 and W respectively; and a_5, a_6 and $[m_3 - (a_5 + a_6)]$ are the relevant *mpi* for 3 from 1, 2 and W respectively.

t^* is the direct marginal tax rate.

The change in income in each country due to the newly introduced industrial output is measured in each country by:

$$Y = C + T_d + X - M,$$

where Y is the change in income at factor cost, C is the change in consumption at market price, T_d is the change in direct tax revenue, X is the change in exports at market price and M is the change in imports at factor cost.

The change in direct tax revenue is related to the change in income by t^*, the direct marginal tax rate ($T_d = t^*Y$). Consumption is related to disposable income by c, the marginal propensity to consume (*mpc*), i.e. $[C = c(Y - T_d) = cY(1 - t^*)]$.

T_d appears in the equation because the change in consumption expenditure is related to disposable income. Hence, the government

must receive income tax revenue. Since it is assumed that the budget must remain balanced, tax receipts must be spent on goods and services. Therefore, T_d represents the government sector.

There are two parts to the change in 1's exports. The first part is equal to x_2Q and $Q(1 - x_1 - x_2)$, the sum of the two being $(1 - x_1)Q$. This represents the substitution of part of the newly produced industrial output in 1 for imports from W in 2 and 3. The second part is equal to a_3Y_2 and a_2Y_3. These represent the increased exports to 2 and 3 induced by their respective income changes.

There are also two parts to the change in imports in 1: an increase equal to m_1Y_1 due to the increased income in the country, and a reduction equal to $x_1Q(1 - t)$ which is the consequence of 1's substitution of a portion of the new industrial output for imports from W.

Taking these considerations into account, plus the consumption and the direct tax receipts changes, one gets:

$$Y_1 = [a_3Y_2 + a_5Y_3 + Q(1 - x_1t_1)]/[s_1(1 - t_1^*) + m_1] \tag{1}$$

where s is the marginal propensity to save ($mps = 1 - c$).

For 2, the change in exports is equal to a_1Y_1 and a_5Y_3, which are the exports induced by the income changes in 1 and 3 respectively. The change in imports is equal to m_2Y_2, which is the increased imports in 2 induced by its income change, and tx_2Q, which is the amount of import duty previously collected from imports coming from W now replaced by imports from 1. This customs revenue is now received by 1 as part of the price of the proportion of Q consumed in 2 (assumption c).

This gives:

$$Y_2 = [a_1Y_1 + a_6Y_3 - t_2x_2Q]/[s_2(1 - t_2^*) + m_2] \tag{2}$$

Following exactly the same procedure as in the case of 2, one can derive the income change for 3. Thus, the change in exports is equal to a_1Y_1 and a_4Y_2, and the change in imports is equal to m_3Y_3 and $t_3Q(1 - x_1 - x_2)$. Hence:

$$Y_3 = [a_2Y_1 + a_4Y_2 - t_3Q(1 - x_1 - x_2)]/[s_3(1 - t_3^*) + m_3] \tag{3}$$

These equations are untidy in their present form, particularly since one is interested in the income changes in terms of Q alone. Eliminating the unwanted income changes gives:

$$Y_1 = [\alpha(b_2b_3 - a_4a_6) + \beta(a_4a_5 + a_3b_3) + \gamma(a_3a_6 + a_5b_2)]/\delta, \tag{1'}$$
$$Y_2 = [\alpha(a_2a_6 + a_1b_3) + \beta(b_1b_3 - a_2a_5) + \gamma(a_1a_5 + a_6b_1)]/\delta, \tag{2'}$$

$$Y_3 = [\alpha(a_1a_4 + a_2b_3) + \beta(a_2a_3 + a_4b_1) + \gamma(b_1b_2 - a_1a_3)]/\delta, \qquad (3')$$

where,

$$\begin{aligned}
\delta &= b_1b_2b_3 - a_4a_6b_1 - a_1a_3b_3 - a_1a_4a_5 - a_2a_3a_6 - a_2a_5b_2,\\
\alpha &= Q(1 - x_1t_1),\\
\beta &= -t_2x_2Q,\\
\gamma &= -t_3Q(1 - x_1 - x_2),\\
b_1 &= s_1(1 - t_1^*) + m_1,\\
b_2 &= s_2(1 - t_2^*) + m_2, \text{ and}\\
b_3 &= s_3(1 - t_3^*) + m_3.
\end{aligned}$$

Equations (1′)–(3′) are mathematically too complicated to handle. To make deductions from them I shall insert some hypothetical but representative values: these are consistent with those used by Brown, and are, therefore, subject to the same limitations stated in his article. I have, however, chosen a range of values so that most possible situations can be examined. The data are given in Table 5.1 and the resulting income changes in Table 5.2.

These results lead to the following conclusions:

(*a*) Y_1 is a multiple of the newly introduced industrial output (the results range from $2.225Q$ to $1.787Q$) while Y_2 and Y_3 are a small but positive fraction of this output (the results range from $0.59Q$ to $0.143Q$). These results are clearly indicated by the spillover ratios (the ratios of income in the two partners to Y_1 given in the last three columns), which range from 0.072 to 0.265 (7–25 per cent).

(*b*) Cases II–VII, considered together, clearly indicate that the higher the three countries' *mpi*s from each other, the higher the income changes, and the higher their *mpi*s from the rest of the world, the lower the resulting income changes (Cases VI and VII).

Within this general conclusion one notices the following:

(i) the higher the *mpi*s of the three countries to import from each other, the higher the rates of change of the income changes for countries 2 and 3 (Case II). In other words, the net spillover ratios are at their highest;

(ii) the higher the *mpi* of country 2 (3) to import from country 1, the higher the income change over all. This income change is, however, experienced equally by country 3 (2) – (Cases II and V). This suggests the result that one would expect: *the*

Table 5.1 Representative data

Variable	t_1	t_2	t_3	t_1^*	t_2^*	t_3^*	s_1	s_2	s_3	a_1	a_2	a_3	a_4	a_5	a_6	m_1	m_2	m_3	x_1	x_2	$1-x_1-x_2$
Case 1	0.2	0.2	0.2	0.1	0.1	0.1	0.15	0.15	0.15	0.05	0.05	0.05	0.05	0.05	0.05	0.03	0.03	0.03	0.75	0.125	0.125
	0.2	0.1	0.2	0.1	0.05	0.1	0.15	0.01	0.15	0.01	0.01	0.01	0.01	0.01	0.01	0.35	0.03	0.3	0.75	0.25	0.0
	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.15	0.15	0.05	0.05	0.01	0.05	0.05	0.05	0.3	0.35	0.3	0.5	0.25	0.25
	0.2	0.3	0.2	0.1	0.2	0.1	0.15	0.2	0.15	0.05	0.05	0.05	0.1	0.05	0.05				0.8	0.1	0.1
	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.05	0.05	0.0	0.05	0.05	0.05						
	Cases XIX–XXII			Cases XV–XVIII			Cases XI–XIV			Cases II–V						Cases VI and VIII					Cases VIII–X

Note: Case I is the basic case; all other cases have the same values for their variables except for the variables specified. For each category, the case number is to be read from top to bottom.

Table 5.2 Results

Case	*Result* $Y_1 = P$	$Y_2 = P$	$Y_3 = P$	$\frac{Y_2}{Y_1}$	$\frac{Y_3}{Y_1}$	$\frac{Y_2}{Y_1}$
I	1.999	0.195	0.195	0.097	0.097	1.000
II	2.225	0.590	0.590	0.265	0.265	1.000
III	2.022	0.198	0.198	0.098	0.098	1.000
IV	2.002	0.198	0.218	0.099	0.109	0.097
V	1.976	0.192	0.192	0.097	0.097	1.000
VI	1.787	0.167	0.167	0.094	0.094	1.000
VII	1.996	0.174	0.192	0.087	0.096	0.907
VIII	1.999	0.143	0.246	0.072	0.123	0.581
IX	2.102	0.143	0.143	0.068	0.068	1.000
X	1.978	0.205	0.205	0.104	0.104	1.000
XI	2.002	0.218	0.198	0.109	0.099	1.102
XII	1.806	0.170	0.170	0.094	0.094	1.000
XIII	1.996	0.176	0.192	0.088	0.096	0.915
XIV	1.802	0.151	0.151	0.084	0.084	1.000
XV	1.998	0.191	0.194	0.096	0.097	0.985
XVI	2.072	0.204	0.204	0.099	0.099	1.000
XVII	2.000	0.202	0.196	0.101	0.098	1.032
XVIII	2.074	0.213	0.213	0.103	0.103	1.000
XIX	2.003	0.224	0.198	0.112	0.099	1.130
XX	1.821	0.172	0.172	0.094	0.094	1.000
XXI	1.995	0.165	0.191	0.083	0.096	0.865
XXII	1.813	0.138	0.138	0.076	0.076	1.000

crucial factor is the mpi of country 1 to import from the other two partner countries[1];

(iii) the higher country 2's *mpi* from country 3, the higher the income change in country 3 and the lower the rate of change of income change in country 1 (Case IV) – this result is consistent with the previous conclusion and, of course, with the concept of the multiplier in general.

(*c*) As one would expect, the higher the *mpss*, the lower the income changes (Cases XI–XIV). Also the higher the income tax rates, the higher the income changes (Cases XV–XVIII). This is clearly suggested by the definitional expressions; this is because any income tax revenue is spent by the government to counteract the

effect of the difference between 'earned' and 'disposable' income on consumption, but it is well known that a government expenditure financed by equal taxation has a multiplier effect, particularly in such a highly simplified model. Moreover, the higher the tariff rates, the lower the income changes – this follows from assumption (*c*): the higher the tariff rate, the greater the loss to countries 2 and 3 from such a union.

(*d*) The most significant conclusion is that the lower the proportion of the newly introduced industrial output consumed by a partner, the higher that country's income change (Cases VIII–X).

All these are generally valid conclusions. However, since one is here concerned with only CU theory, the interpretation of these equations should be confined to answering the pertinent question: what happens to these income changes if one of the potential partner countries decides not to participate in the CU? i.e. what happens if country 2 or 3 decides to continue to import from *W* rather than consume any part of the newly introduced industrial product?

Suppose country 3 makes such a decision. For country 1, the components will remain as before. Hence, Y_1 will be determined as in equation (1). However, for 2, M_2 becomes $m_2Y_2 + t(1 - x_1)Q$, all the other components remaining the same as before. Therefore:

$$Y_2 = [a_1Y_1 + a_6Y_3 - t_2Q(1 - x_1)]/[s_2(1 - t_2^*) + m_2]. \tag{7}$$

For 3, M_3 becomes m_3Y_3 with all the other elements remaining the same as before. Hence:

$$Y_3 = [a_2Y_1 + a_4Y_2]/[s_3(1 - t_3^*) + m_3]. \tag{8}$$

Comparing equations (8) and (3), it should be apparent that Y_3 as given by (8) is greater than Y_3 as given by equation (3) by a multiple of $t_3Q(1 - x_1 - x_2)$.

The point that needs emphasising, therefore, is that the crucial consideration is not whether or not Y_2 and Y_3 would be negative or positive (Brown's 1961 main conclusion), but whether or not they would have been greater had 2 and 3 decided to stay out of the CU. The equations clearly indicate that 2 and 3 would be better off staying out of such a CU.

Could one then argue that since it is 1's *mpi* from 2 and 3 which is the most significant element, then it is to the benefit of 2 and 3 to join a CU with 1? It is quite obvious that such an argument would be absurd – these 'spread' effects are the outcome of the three countries'

normal relationships (apart from the new industrial output) and unless country 1 suddenly decides to exercise some compulsion on 2 and 3, there is no reason why these normal relationships should not persist. Moreover, it is to the benefit of country 1 to have a market in which to dispose of its surplus industrial output.

CONCLUSIONS

I have demonstrated that within this limited framework there is no economic justification for a CU of LDCs based on protected industrialisation, i.e. a trade diverting association. However, it would be naive to conclude from this that there is no rationale for CU formation amongst a group of LDCs. This is because this model implies that if such a CU is to be formed, the benefits which accrue to 1, which are a multiple of the pre-CU output, must somehow be equitably distributed so that 2 and 3 also get a share of these benefits. And we have already examined the reasons for the formation of CUs amongst such countries: lack of sufficient markets; the need for economic development; market distortions; etc. Hence, the considerations tackled here plus the general rationale that has already been established for the formation of CUs amongst a certain group of LDCs reinforce each other such that the CU under consideration must incorporate explicit policies for dealing with the equitable distribution of the gains from integration.

Because of the above considerations, it has been claimed that the theory of economic integration as developed for the advanced world has very little relevance to the LDCs. Ignoring the subtle issues raised above, there are three basic considerations for a *purely economic* justification for CUs: the static resource reallocation effects (TC and TD), provided they are on balance beneficial; the terms of trade (*t/t*) effects; and the so-called dynamic effects – economies of scale and external economies.

I have demonstrated in this chapter that with regard to the static resource reallocation effects there is no difference between CUs in the advanced world and the LDCs: TD is detrimental because the country concerned is bound to lose (a multiple of the loss of) its tariff revenue. Moreover, TC and TD are static concepts; their effects are once-and-for-all changes in the allocation of resources.

As for the *t/t* effects, these can materialise only if the CU partners can charge higher export prices and/or bargain for lower import

prices. Here, one is thrown into the world of monopoly/monopsony or oligopoly/oligopsony, or whatever permutation of these, where any outcome is perfectly feasible, particularly if retaliation by the injured parties is allowed for. I cannot, however, see any difference between the advanced world and the LDCs in this particular respect, and, if the immediate past is anything to go by, it is the OPEC countries that seem to have gained from such action, although OPEC is not a CU.

As for scale economies, it should be equally obvious that there is more scope for them in a CU of LDCs than in such associations as the EC and EFTA; economies of scale lie at the very heart of the rationale for CUs amongst certain LDCs. Indeed, it has been argued quite coherently that it is the market size that is an important hindrance to economic development – see Brown (1963), Hazlewood (1967; 1975) and Mikesell (1960). Moreover, Johnson (1957; 1958a; 1958b), Brown (1963), Williamson (1971) and most recently Shepherd (1983) have questioned whether there is great scope for scale economies in the EC.

When it comes to external economies, it should also be obvious that there is much more scope for them (and absolute necessity for them for development purposes, which is why international trade theorists have conceded the 'infant industry' argument as the only exception to free trade but only in the case of certain very underdeveloped economies) in the LDCs than in the advanced world: a pool of skilled labour, the provision of infrastructure and technology are the basic necessities of industry and they are lacking.

It therefore appears that the body of theory developed for economic integration in the advanced world is even *more appropriate* for the LDCs. Of course, the LDCs are very different in structure from the advanced world, hence certain aspects of the theory are more relevant to them. But for the advanced world too, some elements will be more relevant than others depending on the nature of the economies under consideration. Hence, to conclude from the above that the theory of economic integration as developed for the advanced world is very different from that for the LDCs is to confuse broad theoretical generalisations with their specific application to a particular group of nations *whose structure is different from that of advanced nations*: different structures of economies should not be confused with different theoretical structures. Needless to add, the intrinsic differences between the LDCs and their advanced counterparts ensure that one is not referring to a *unified* approach.

Note

1. Brown calculates the crucial value for country 1's *mpi* from country 2 – this is the value of a_1 and a_2 which makes Y_2 and Y_3 equal to zero. The equivalent values for the three country model are given in the Appendix as Table 5.3. They are not discussed at length at this stage for reasons that will shortly become apparent and also because it does not appear very likely that the *mpi* of one country from a neighbour to which it is bound through economic integration will be so small as to bring about this result.

APPENDIX

Table 5.3 Critical a_1 and a_2 values to produce (i) $Y_2 = 0$ (ii) $Y_3 = 0$ (iii) $Y_2 = Y_3 = 0$

	$Y_2 = 0$ $a = a_1$	$Y_3 = 0$ $a = a_2$	$Y_2 = Y_3 = 0$ $a_1 = a_2$
I	0.0084	0.0084	0.0128
II	–0.0079	–0.0079	0.0128
III	0.0084	0.0082	0.0128
IV	0.0084	0.0041	0.0128
V	0.0084	0.0085	0.0128
VI	0.0100	0.0100	0.0143
VII	0.0084	0.0088	0.0128
VIII	0.0195	–0.0028	0.0256
IX	0.0210	0.0210	0.0242
X	0.0057	0.0057	0.0104
XI	0.0084	0.0079	0.0128
XII	0.0099	0.0099	0.0141
XIII	0.0084	0.0088	0.0128
XIV	0.0103	0.0106	0.0141
XV	0.0084	0.0085	0.0128
XVI	0.0079	0.0079	0.0124
XVII	0.0084	0.0082	0.0128
XVIII	0.0077	0.0077	0.0124
XIX	0.0020	0.0076	0.0064
XX	0.0098	0.0095	0.0140
XXI	0.0147	0.0091	0.0192
XXII	0.0175	0.0175	0.0211

6 Macroeconomics of Integration

INTRODUCTION

We have seen that it is now a clearly established result of the orthodox theory of international economic integration that, given a world plagued with tariffs, the *potential* welfare level for the whole of the customs union (CU) is higher than the sum of the welfare levels available to countries following unilateral policies. Of course, it is quite possible, as whenever the gains from collusive action are contemplated, that the political feasibilities for the actual distribution of the gains may not prove sufficient to ensure that all the participants believe that they have received a fair share of those gains or even to ensure that each single participant does in fact benefit compared to the possibilities available to that country through unilateral action. Similarly, although the theoretical potential superiority of membership of a CU (likewise, the enlargement of existing CUs) has been established, it may be the case that constraints on policy choice at the appropriate level of economic integration cause actual policies within the union to fall further away from the theoretically optimal configuration than would be the case for purely national policies. It then follows that a second-best case could be made for withdrawal from a CU [as was proposed by the British Labour Party in its Manifesto for the 1983 general election and as has happened in the case of Greenland in relation to the European Community (EC)] on the empirical argument, which would have to be carefully evaluated in each case, that, within the existing constraints of policy-making, attainable unilateral action may be superior to the results achieved by continued membership of the union.

However, as has already been demonstrated in Chapter 2, the first-best solution within such a framework is to improve joint policy-making within the union and to seek successful cooperation with countries outside the union. Given the heroic abstractions from reality made in neoclassical trade theory, such conclusions are vulnerable to charges of irrelevance particularly insofar as, in most standard presentations at least, full employment is assumed to exist at *all* times in *all* countries.

It is therefore proposed to tackle the problem here in the context of a macroeconomic approach to CU theory which, contrary to the orthodox approach, is based on the assumption of the existence of unemployment within each economy. This approach was pioneered by El-Agraa (in El-Agraa and Jones, 1981, Ch. 7), but it is the extension and development made by Jones (1983) which provides the theoretical foundation for the subsequent argument presented here. In short, the aim of this section is to explain a macroeconomic approach to CU theory but in a context which deals with withdrawal from a CU rather than with the formation of CUs (on which we had a lot to say), thus introducing a refreshing change without deviating from our main task: the argument for joining a CU is almost a mirror image of what is presented here.

THE BASIC MACROECONOMIC FRAMEWORK

The basic macroeconomic framework is a Keynesian one. To simplify the analysis, it is assumed that:

(*a*) Money wage rates are fixed in each of the three countries (1, 2 and 3 which stand respectively for H, the home country, P, the potential CU partner, and W, the rest of the world) for the period under consideration.
(*b*) The marginal product of labour (L) is everywhere constant.
(*c*) Monetary, fiscal and exchange-rate policies in each country are also fixed at levels which are regarded by the national governments as providing the best feasible configuration of such policies which they can achieve.
(*d*) Initially, 1 and 2 impose a common external tariff rate (CET), t^*, on trade with 3, and 3 imposes the same rate on its imports from 1 and 2.

It follows from these assumptions that the various commodities produced within any economy can be grouped together, via the 'composite commodity' theorem, to form a single aggregate national product for which units of measurement can be chosen so that, for each economy, the factor cost price of a unit of its national product is one (measured in any one currency). With the further simplifying assumptions that there are no internal sales or other indirect taxes, that transport costs are zero and that, within each country, the market prices of each national product differ from factor cost prices

only by the amount of any import duty, it follows that the consequences of withdrawal from the CU flow from the effects that this policy has on the market prices of each national product in each of the three separate economies identified in the model.

Of course, the *great unknown* in analysing the consequences of one country's withdrawal from a CU is the reaction to this by other countries but, in order to keep the argument within manageable proportions, the analysis will initially focus on the case in which withdrawal from the CU is accomplished by the adoption by both 1 and 2 of the existing CET (t^*) to apply to their mutual trade flows and to keep on applying it to trade with 3.

Given the assumptions of the model, such a policy change will have no (immediate) impact on the market prices of the domestic output in 1 and 2 or on any prices within 3. Accordingly, the immediate consequences of 1's withdrawal from the CU can be summarised as working through the changes in the market prices within 1 and 2 on their mutual trade, i.e.

$$\Delta P_{12}/P_{12} = \Delta P_{21}/P_{21} = +t^* > 0, \tag{1}$$

where P_{ij} is the market price of country j's product in country i.

Following the standard macroeconomic treatment of the commodity market, the consequential changes in national output can be evaluated by use of the equilibrium conditions:

$$\Delta Y_i = \Delta C_i + \Delta I_i + \Delta G_i + \Delta M_{ji} + \Delta M_{ki} - \Delta M_{ij} - \Delta M_{ik}, \tag{2}$$

where Y_i, C_i, I_i, and G_i are, respectively, national output, private consumption, private net investment and government expenditure on goods and services in 1, all measured at constant factor prices of unity, and where M_{ij} is the factor cost measure of 1's imports from country j and hence, equally, of country j's exports to country i.

To simplify the argument further, it is assumed that the import content of exports, I and G is zero, that, initially at least, I is unaffected by the price changes resulting from the change in trade barriers and that G is subject to the requirement of a balanced budget so that:

$$\Delta G_i = t_i \Delta Y_i + \Delta T^*_{ij} + \Delta T^*_{ik} \tag{3}$$

where $0 < t_i < 1$ is the (constant) marginal rate of direct taxation in country i and T^*_{ij} is the tariff revenue collected by country i on its imports from country j.

It is also assumed (see Jones (1982) for the justification) that:

$$\Delta C_i = c_i \Delta Y_i - \Delta T^*_{ij} \tag{4}$$

where $0 < c_i < 1$, and hence that the change in real domestic expenditure ($\Delta E_i = \Delta C_i + \Delta I_i + \Delta G_i$) is dependent solely on any changes in factor income which result from the formation of the CU, i.e.

$$\Delta E_i = e_i \Delta Y_i \tag{4a}$$

where $0 < e_i = c_i + t_i < 1$ is the marginal propensity to spend in country i.

There are a number of possible ways of modelling expenditure on imports but here it is helpful to use a two-stage share-of-expenditure import function which can be derived from the nested CES utility function originally suggested by Verdoorn and Schwartz (1972) following the work of Armington (1969), i.e.

$$M^*_{ij} = u_i^{\delta i} (P_i^m / P_{ij})^{\delta i - 1} M^*_i, \tag{5a}$$

with

$$M^*_i = v_i^{\varepsilon i} (P_i / P_i^m)^{\varepsilon i - 1} C^*_i, \tag{5b}$$

where $0 < u_i, v_i < 1$ are the parameters reflecting the strength of preferences in country i between competing imports and between all imports and domestic output respectively; $\delta_i \geqslant \varepsilon_i > 1$ are the elasticities of substitution between competing imports and between domestic output and total imports respectively (the restriction that both elasticities exceed unity has been made to simplify the subsequent argument but, although the assumption appears empirically plausible, it should be noted that it is in fact critical to the validity of the general conclusions reached here and that it has a theoretical significance which can be compared with the results of McMillan and McCann, 1981); and P_i and P_i^m are domestic cost-of-living and import prices indices defined to be consistent with the aggregation of national products implied by the underlying utility function. Accordingly, the market price changes resulting from 1's withdrawal from the CU as summarised in (1), can also be represented as having the following effects on the domestic cost-of-living and import prices indices in both 1 and 2 (for $i = 1, 2$):

$$\Delta P_i^m / P_i^m = \mu_{ij} t^* > 0, \tag{5c}$$

and

$$\Delta P_i / P_i = \lambda_{ij} t^* > 0, \tag{5d}$$

where $0 < \mu_{ij} = M^*_{ij}/M^*_i < 1$ is the share of the total expenditure on imports in country i devoted to imports from its former partner j; and $0 < \lambda_{ij} = M^*_{ij}/C^*_i < 1$ is similarly the share of total consumption at market prices in country i taken by the national product of its former partner j.

The total differentiation of (5a, b) when combined with (5c, d) yields the following results for the change in expenditure in either 1 or 2 on imports from 3:

$$\Delta M^*_{i3} = \lambda_{i3}\Delta C^*_i + C^*_i\Delta\lambda_{i3}, \tag{6a}$$

where

$$C^*_i\Delta\lambda_{i3}{}^* = t^* M^*_{i3}[(\delta_i - \varepsilon_i)\mu_{ij} + (\varepsilon_i - 1)\lambda_{ij}] > 0 \tag{6b}$$

Since domestic expenditure on imports also includes the payment of tariff revenue collected by the government of the importing country, the actual change in imports (at factor cost prices) to either 1 or 2 from 3 can be identified as:

$$\Delta M_{i3} = m_{i3}\Delta Y_i + C^*_i\Delta\lambda_{i3}/(1 + t^*), \tag{6c}$$

where $0 < m_{i3} = \lambda_{i3}c_i/(1 + t^*) < 1$ is the marginal propensity of country i to import from 3.

It can be seen from (6c) that the change in demand for imports from 3 can be split into two major components. The first term on the right-hand side is dependent on the ultimate change in national income and may be viewed as a secondary effect induced by whatever changes in income result from the primary price effects of the break-up of the CU. It seems appropriate in the context of the withdrawal of 1 from the CU to define the reverse price effects as the 'trade diversion reversal effect' (d_i), i.e.

$$d_i = C^*_i\Delta\lambda_{i3}/(1 + t^*) = t^* M_{i3}[(\delta_i - \varepsilon_i)\mu_{ij} + (\varepsilon_i - 1)\lambda_{ij}] > 0. \tag{7a}$$

Total differentiation of (5a,b) also enables the change in trade flows between 1 and 2 to be identified as:

$$\Delta M_{ij} = \Delta M^*_{ij} - \Delta T^*_{ij} = \lambda_{ij}\Delta C^*_i - C^*_i\Delta\lambda_{ii} - C^*_i\Delta\lambda_{i3} - \Delta T^*_{ij}, \tag{8a}$$

since, by definition, $\Delta\lambda_{ij} = -\Delta\lambda_{ii} - \Delta\lambda_{i3}$. As the change in tariff revenue on trade between 1 and 2 can be identified as:

$$\Delta T^*_{ij} = t^*\Delta M_{ij} + t^*\mathrm{M}_{\mathrm{ij}}, \tag{9}$$

it follows that (8a) can be rewritten as:

$$\Delta M_{ij} = m_{ij}\Delta Y_i - r_i - d_i - t^*M_{ij}, \tag{8b}$$

where $0 < m_{ij} = \lambda_{ij}c_i/(1 + t^*) < 1$ is the marginal propensity in country i to import from its former partner; and t^*M_{ij} is the (notional) value of the tariff revenue which could be received by i if the new tariff on trade with its former partner was levied on the volume of trade which existed prior to 1's withdrawal from the CU. In addition to the 'trade diversion reversal effect', d_i, (8b) also contains one further term:

$$r_i = C_i^*\Delta\lambda_{ii}/(1 + t^*) = t^*M_{ij}(\varepsilon_i - 1)\lambda_{ii}. \tag{7b}$$

Jones refers to this as the 'trade reduction effect' since it measures, at factor cost prices, the effect on imports from the partner due to the increased share in domestic expenditure gained by domestic output at the expense of imports from the partner. As such, it can also be viewed as a domestic output and employment creation effect; such an increased share of the domestic market seems to lie at the heart of the protectionist case for import controls. In order to see whether this view is justified in this model, however, it is necessary both to complete the formal framework and to solve the model.

COMPLETING AND SOLVING THE MODEL

The first of these tasks is simply achieved by noting that since (by assumption) imports into 3 are unaffected by any price changes, the effects on the trade flows depend solely on income changes, i.e.

$$\Delta M_{3i} = m_{3i}\Delta Y_3, \tag{10}$$

where $0 < m_{3i} = \lambda_{3i}c_i/(1 + t^*) < 1$ is the marginal propensity of 3 to import from country i.

The solution of the model is then obtained by substitution of (3), (4), (6c), (7a), (8b) and (10) into (2) and can be summarised as:

$$\Delta Y_i = K_{1i}F_1 + K_{2i} + K_{3i}F_3, \tag{11}$$

where K_{ij} are the multipliers of the primary effects (F_i) resulting from 1's withdrawal from the CU. For both 1 and 2 these primary effects can be identified as:

$$F_i = -d_j - (r_j - r_i) - t^*(M_{ji} - M_{ij}), \tag{12a}$$

whilst, for 3,

$$F_3 = d_1 + d_2. \tag{12b}$$

The multipliers all involve complex combinations of the parameters but fortunately their signs can be evaluated, as in Jones (1982), from the general restrictions placed in the range of values taken by the parameters. Thus, by defining $0 < h_i = 1 - e_i < 1$ as the marginal propensity to hoard and $0 < b_i = h_i + m_{ij} + m_{ik} < 1$ as the marginal propensity not to spend on domestic output, it can be shown that all multipliers can be expressed in the form:

$$K_{ji} = \alpha_{ji}/D$$

where

$$D = h_i\alpha_{ii} + m_{ij}(\alpha_{ii} - \alpha_{ji}) + m_{ik}(\alpha_{ii} - \alpha_{ki}),$$

where

$$\alpha_{ii} = b_k(h_j + m_{ji}) + m_{jk}(h_k + m_{ki}),$$

and where

$$\alpha_{ji} = m_{ki}m_{jk} + m_{ji}b_k.$$

It then follows that

$$\alpha_{ii} > \alpha_{ji} > 0,$$

that $D > 0$ and that accordingly the multipliers K_{ii} and K_{ij} are unambiguously positive whilst, equally clearly, $K_{ii} > K_{ji}$.

By substitution of (7a, b) into (11), it is then possible to identify the effects of withdrawal from the CU on output (and hence, by implication, employment) in 1:

$$\begin{aligned}\Delta Y_i = &- (K_{11} - K_{31})d_2 - (K_{21} - K_{31})d_1 \\ &- (K_{11} - K_{21})[t^*(M_{21} - M_{12}) + r_2 - r_1].\end{aligned} \tag{11a}$$

From the restrictions so far placed on the value of both multipliers and multiplicands it can be seen that the first term in (11a), i.e. the 'trade diversion reversal effect' in the partner, is a certain source of loss for 1. In order for the policy of withdrawal to make economic sense for 1 within the framework of this model, it is therefore necessary that the remaining two terms should be sufficient sources of gain to outweigh these losses. Although it is theoretically possible that this could be the case, the general presumption here is that this is highly unlikely.

Consider first the second term in (11a), i.e. the consequential

change in the income of 1 which results from the 'trade diversion reversal effect' in that country. It is intuitively improbable that this could have any significant effect in that country itself simply because its direct effects are felt only in the former partner (which suffers a decline in aggregate demand) and in 3 (which benefits from a gain in aggregate demand). Thus the only effects in 1 depend on the relative strengths of the 'repercussion' effects for 1 which stem from the direct changes in the other countries. Formally this is shown by the fact that the sign of $(K_{21} - K_{31})$ is the same as the sign of $[m_{21}(1 - e_3) - m_{31}(1 - e_2)]$. This will only be of a significant negative value (which is the requirement for d to have a significant positive effect on home output) if the marginal propensity to import from 1 and the marginal propensity to spend are much lower in 1 than in 3. Although this is a theoretical possibility which could be explored for any specific case, there is no reason to believe that this is likely to be of any general significance and, indeed, if El-Agraa's (in El-Agraa and Jones (1981), Ch. 7 – see Table 5.1 in Chapter 5 of this book) suggested basic set of hypothetical but representative values for the parameters is employed, the multiplier $(K_{21} - K_{31})$ is zero (Jones, 1983, p. 83).

With regard to the last term in (11a), since the multiplier, $[-(K_{11} - K_{21})]$ is unambiguously negative, the possibility of 1 gaining from the policy of withdrawal is seen to depend on whether the multiplicand $[t^*(M_{21} - M_{12}) + r_2 - r_1]$ is also negative. Proponents of a UK withdrawal from the European Community did in fact point to one component in the multiplicand which does have such a negative effect. This is $(-r_1)$, (the negative of) the 'trade reduction effect' in 1 which provides a stimulus to domestic output as domestic demand switches away from imports from 2 towards domestic output in 1. A crucial feature of Jones's model, however, is to suggest that the 'trade reduction effect' in 2 must also be taken into consideration and that this directly offsets the 'trade reduction effect' in 1. Indeed, if the definition of the 'trade reduction effect' (7b) is employed, the final multiplicand in (11a) can be rewritten as:

$$t^*[M_{21} - M_{12}) + M_{21}\lambda_{22}(\varepsilon_2 - 1) - M_{12}\lambda_{11}(\varepsilon_1 - 1)]$$

which, in the neutral case of initial trade flows between 1 and 2 being balanced, simplifies further to:

$$t^*M_{12}[\lambda_{22}(\varepsilon_2 - 1) - \lambda_{11}(\varepsilon_1 - 1)].$$

Such an expression will be significantly negative only if the share of total expenditure devoted to domestic output and the elasticity of

substitution between domestic output and imports is far higher in 1 than in 2.

Even if 1 did gain, however, it is important to recognise that the same multiplicand is present but with signs reversed in determining the outcome for the former partner. Thus, if the policy of withdrawal is to have any benefit for 1, this will be so only as a result of a 'beggar-thy-neighbour' effect on the former partner.

Of course, if it is believed that 2 will not retaliate to 1's withdrawal from the CU and will continue to offer free access to its market whilst 1 raises its tariff barriers on imports, both r_2 and d_2 will be zero as will t^*M_{21} and there would be a very good chance that the beneficial effects for 1 of r_1 would outweigh any adverse effects which might arise from the 'trade diversion reversal effect' (d_1) in that country. The same applies to any further unilateral increases to trade barriers since these will increase the size of r_1 and the resultant gain to 1 becomes larger. Needless to add, any such gains remain 'beggar-thy-neighbour' effects and are dependent on the assumption of no significant retaliation by 2.

WITHDRAWAL AND THE BALANCE OF PAYMENTS

The above conclusion applies even when the assumption is combined with the argument that higher tariff barriers should be used to remove the balance-of-payments constraint on expansionary domestic policies so that foreign retaliation would be unjustified as total imports would remain unaltered. Such an argument implies rather more faith in the accuracy of the timing and the estimation of the effects of different kinds of policy and in the sympathetic understanding of foreign governments than seems justified – see El-Agraa (1979a; 1984a; 1985b) for further discussion of this. In addition, it fails to recognise the discriminatory change associated with withdrawal from a CU.

Thus consider the basic case analysed above in which the primary effects of 1's withdrawal from the CU on its balance of trade (at the pre-withdrawal income level) can be identified as:

$$[r_1 - r_2 + t^*(M_{12} - M_{21}) - d_2].$$

It is impossible to identify the sign of this effect with complete generality but there is a presumption that it would be negative because, whereas the trade reduction and tariff revenue effects tend

to be offset directly by their counterparts in 2, the loss to 1 of the 'trade discrimination reversal effect' in 2 has no impact. Thus, in general, the consequence of withdrawal from a CU could be expected to be a worsening rather than an improvement in any balance-of-payments constraint. The same would be equally true for 2, whilst it is 3 which could be expected to gain.

If domestic expansion to full employment is constrained for both 1 and 2 by the balance of payments and unwillingness or inability to use devaluation of the exchange rate, Jones's model clearly points to the superiority of continued membership of the CU in which domestic expansion is combined with an expenditure-switching policy by the CU as a whole. In the absence of the possibility of devaluation, perhaps the most obvious expenditure-switching policy for the CU is the raising of its CET.

Of course, at least two major problems arise with such a policy. The first is the possibility of retaliation by 3. This may indeed be a real danger which might effectively make such a policy option counter-productive. However, if 1 and 2 are genuinely constrained from reaching full employment by balance-of-payments considerations, then, unless 3 is willing to countenance some form of expenditure-switching policy which the CU members could adopt, the problem must be traced to this source and the solution to the global problem of payments adjustments should be sought on an appropriately wider scale. Failing such a solution, however, continued membership of the CU does still offer at least two potential advantages over withdrawal. The first concerns the relative bargaining strength (in a world where retaliatory action is common) of a CU compared with individual members each acting alone. The second concerns the fact that, with membership of the CU, both 1 and 2 will have lower marginal propensities to import from 3 than otherwise would be the case. Accordingly, domestic expansionary policies within the CU will have less adverse effects on such members' balance of payments *vis-à-vis* 3 than would be the case in non-membership of the CU.

This point, however, leads to the second major problem associated with the possibility of joint CU action. As is pointed out by Beg, Cripps and Ward (1981), the balance-of-payments constraint is unlikely to be equal for both 1 and 2. Accordingly, the general policy of combating unemployment within the CU may be constrained once full employment is reached in one partner. However, the existence of such a problem merely points to the need for the possibility of

expenditure-switching policies between the member states – at least until the time when factor mobility is sufficient to reduce the scale of the problem to be amenable to the type of 'regional' policies currently attempted within many nations. However, it is not at all clear why devaluation should not be the obvious way of pursuing this, or if constraints on the possibility or effectiveness of devaluation are introduced, why it would be that the unilateral use of barriers to trade offers scope for greater success.

Jones concludes his analysis by emphasising the problems involved:

> Of course . . . this argument does nothing to negate the general conclusion of the orthodox analysis. Real problems do exist in identifying and in agreeing on optimal policies and it may be that constraints on national policy choice within the union and/or distributive problems cause one member to be able to gain from withdrawal from the union in order to pursue less-constrained national policies. Equally, however, given the assumed existence of constraints on the use of domestic and exchange-rate policies to achieve full employment, the . . . model points to the general potential superiority of continued union membership to a policy of withdrawal. (Jones, 1983, p. 86)

CONCLUSION

Although conceding the point that the macroeconomic framework can teach us a lot about the contemporary economy, 'for it is clear that unemployment is very costly', Winters (1987) claims that the macroeconomic approach is not suitable for analysing the impact of economic integration. He advances three reasons to support his claim. Firstly, the assumption of a *single* commodity (although perfectly adequate for a consideration of macroeconomic changes which have an approximately *equal* impact on the prices of *all* goods, thus enabling the use of the composite commodity theorem) cannot cope with the changes in *relative* prices (hence the gains from specialisation) which accompany the establishment of a scheme of integration. Secondly, the impact of economic integration on the overall level of output and employment is negligible; therefore, there is no need to stress the employment effects of integration. He explains this in the following manner. Because of the currency float in the mid-1970s, the

overall current account deficit can be explained better in terms of macroeconomic and asset market factors rather than by trade policy: any increase in the deficit in, for example, manufactures brought about by economic integration must be largely countered by other parts of the trade account; thus integration changes the *composition* of the account rather than its *overall level*. Thirdly, the Keynesian approach completely discards the reality that people seek more foreign goods (variety leading to an increase in *real* income), thus missing the essence of trade policy.

Let me conclude this chapter by responding to this rationale. Firstly, as the monetary approach to the balance of payments clearly demonstrates, devaluation is a *temporary* measure for correcting trade imbalances; therefore it is no alternative to deflation. Secondly, the mid-1970s was not, strictly speaking, a period of free currency floating, rather one of managed ('dirty') float. Thirdly, as demonstrated in this chapter, the macroeconomic approach is quite capable of dealing with a variety of products, hence the composite commodity theorem is equally applicable here. Finally, provided it is valid to incorporate the composite commodity theorem in the Keynesian framework, it follows that the preference for variety has not been passed over. However, be that as it may, we are simply suggesting that the macroeconomic approach should be seen as an *addition* to furthering our understanding of the economic integration process rather than a *complete alternative* to the general equilibrium analysis; we are not discarding orthodoxy, rather supplementing it.

7 Economic Integration Amongst Centrally Planned Economies

INTRODUCTION

The previous five chapters were essentially about the theory of economic integration as developed for countries which are predominantly market economies, be they advanced or developing nations. However, one of the fundamental conclusions reached was that the basic rationale for economic integration at the customs union/common market level rested almost entirely on the achievement of economies of scale, which, in the case of developing countries, are essential for economic development given the limited size of most of the individual economies, which prevents the attainment of optimum plant efficiency. For advanced nations, the possible achievement of economies of scale is to be determined by sheer market forces. For developing nations, the implication is that *industries* should either be equitably distributed (in the case where economies of scale are due to horizontal integration) or that the *benefits* from economies of scale should be equitably distributed (in the case where economies of scale are due to vertical integration) via some appropriate monetary/fiscal arrangements. It should be apparent that, in either case, some sort of joint planning among the participating nations is warranted. For example, the equitable distribution of industries requires the setting up of some sort of common organisation, whose membership should consist of representatives (numbers chosen on equity grounds?) of the participating nations, responsible for taking allocative decisions, i.e. the organisation should be entrusted with taking decisions regarding the geographical distribution of the plants. However, such allocative responsibility is meaningless unless the industries comprising the plants have already been decided upon; no doubt the same organisation, or a similar body, should be entrusted with that responsibility. Similar conclusions are reached in the cases of the common monetary or fiscal authority and of policy coordination or harmonisation at the economic union level. However, those who concentrate on advanced nations alone would argue that the market

mechanism will take these decisions; hence, under such circumstances, planning is needed only if the market forces are hindered from operating efficiently. Planning is, therefore, of somewhat secondary importance. It should therefore be instructive to learn about how economic integration affects centrally planned economies (the so-called communist/socialist countries) before pursuing this point further.

FUNDAMENTAL DIFFERENCES AND SIMILARITIES

As we have seen, in the earlier days economic integration was equated with the division of labour within a geographical area, although it was usually not made clear what minimum level of trade justified the term integration, but this was later qualified to mean that countries should not contemplate economic integration unless a substantial part of their trade is conducted among them, and that they are *initially* competitive economies but *potentially* complementary ones. Depending on the type of scheme to be pursued, we have also seen that economic integration has recently come to mean not only the internationalisation of the markets for goods and services, but also those of capital and labour, technology and entrepreneurship, money and credit, as well as the supporting economic institutions. The institutional aspects of economic integration cannot be measured with statistical indicators, but their effects will presumably be reflected in the level and composition of trade and other sorts of measurable economic links among the members of an integrated area. Economists concerned with market oriented countries, by contrast, tend to seek statistical measures of the commercial ties among the members of the group.

At this juncture, it may be sensible to clarify the meaning of the term 'centrally planned economies'. It should be noted that characterising national economies as either *capitalist* or *socialist* is an oversimplification. There is substantial state ownership and control over the means of production in market oriented countries as well as a degree of supra-national planning. Conversely, market-type relations can be found both in the domestic economies of individual communist/socialist countries and also in their relationships with each other. However, the *basic* features of the two groups justify characterising them as essentially market oriented and centrally planned.

The fundamental difference between market oriented and centrally

planned types of economic integration can be found in the institutions facilitating or hindering integration. In market oriented economies, in spite of the public sector and other deviations from *perfect competition*, the bulk of international trade is conducted by private enterprises, seeking profit opportunities wherever they can find them. Hence, a reduction or complete elimination of barriers to the movement of goods, factors of production and money across national borders goes a long way towards the achievement of economic integration. By contrast, once the market is replaced by central planning, all movement of goods and factors within the integrated area as well as with the rest of the world necessitates an explicit action by the government concerned. The economic integration of centrally planned economies, therefore, requires more overt management and thus a more elaborate bureaucratic structure.

The fundamental similarity between the two types is that the aims for economic integration, depending on the form it takes in market oriented economies, tend to be similar: better division of labour (improved economic efficiency) desired as a source of economic growth; economic discrimination in favour of member nations; and enhanced political power for the integrated group.

In short, the *approach* of the centrally planned countries to economic integration differs from that of countries which are predominantly market oriented. At the customs union and free trade area level, the process of economic integration among nations in the latter group aims to create a distortion-free market so that the pattern and composition of trade are determined by the fundamental forces of comparative advantage. Of course, this is a gross oversimplification, since the existence of powerful monopolies/oligopolies will require a joint approach for tackling them, rather than cooperative efforts to reduce them to the purely competitive firms described in elementary undergraduate texts. In common markets, and more involved forms of economic integration, the aim is also to equalise/harmonise all the aspects that affect the movement of factors of production and whatever common objectives the scheme in question seeks to achieve. In socialist countries, practically all enterprises are publicly owned and the economic forces are controlled through comprehensive economic planning which determines the levels of production, investment and prices, i.e. these parameters are not determined by supply and demand forces, but in accordance with what is deemed necessary or appropriate for the nation. Under such circumstances, the trade and factor distortions which are the concern of market economies have no

relevance to centrally planned economies; for example, foreign trade is part of the economic plan, hence it is determined through administrative means, and inevitably the state trading organisations in charge of it frequently emerge as monopoly institutions, if only for administrative convenience. Needless to add, this does not mean that market forces are superior to comprehensive economic planning, and as we have just seen, nor does it mean that every aspect of society need be organised in planning terms since some areas can be left, and do get left, to free enterprise within the context of the overall plan.

THE CMEA

The above is abstract; hence it is consistent with the aims of this part of the book. However, given the fundamental differences between market oriented and centrally planned economies, it may be illuminating to describe an actual situation.

The only example of economic integration amongst a group of centrally planned countries is the *Council for Mutual Economic Assistance* (CMEA), generally referred to in the West as COMECON. In order to appreciate why it is difficult to tackle this type of association within the confines of the theoretical structure advanced for countries which are essentially market oriented economies, it may be useful to point out a few characteristics of this organisation.

Ten countries have *full membership* of the CMEA: the six nations which formed the CMEA in January 1949, namely Bulgaria, Czechoslovakia, Hungary, Poland, Romania and the USSR (Albania joined a month later but has taken no part in CMEA activities since 1961); the GDR (1950), Mongolia (1962), Cuba (1972) and Vietnam (1978). According to the *interested party* provision of the CMEA charter, member countries can decide whether or not to partake in CMEA programmes. Since 1964 *associate membership* has governed the affiliation of Yugoslavia which participates in 21 of 32 key CMEA institutions as if it were a full member. *Non-socialist cooperant status* was granted to Finland in 1973 and Iraq and Mexico in 1976. Since these countries have no foreign trade plans and their governments cannot conclude agreements on behalf of firms, cooperant countries do not participate in the work of CMEA organisations. Each country has mixed commissions, composed of government and business representatives which sign various kinds of 'framework' agreements with the CMEA's *Joint Commission on Cooperation*, specially designed

for this purpose. The agreements are subsequently accepted by the relevant permanent commission of the CMEA but the implementation is up to the interested CMEA country(ies) and cooperant country firms. There are also provisions for *observer status* and *interested country* affiliations: the former applies to a mixed group of communist or communist-leaning governments, while the latter seems to apply to a group of developing nations – see Marer and Montias (1982; 1988) for full details.

The most distinctive feature of the CMEA is the disparity in size, resource endowment and political power among its members. The USSR accounts for about two-thirds of the population and aggregate GNP of the bloc and is endowed with over nine-tenths of its crude oil, gas and iron ore resources. As well endowed as the USSR is, there is a shortage of supply in the CMEA in natural resources, minerals, foodstuffs and other primary commodities. This is partly due to forced industrialisation, which required a growing quantity of these resources for domestic industries and for exports, and partly due to the fact that primary commodities, which are generally under-priced, can be traded more easily outside the CMEA for convertible currency.

There is wide disparity in the level of industrial development of the CMEA countries, although the least developed member nations (Bulgaria and Romania) are growing fast. However, it is argued (Marer and Montias, 1982; 1988) that as long as the technological gap between the more and less advanced members persists, the former will not, on the whole, abandon lines of production to the latter and become dependent on suppliers that may not be capable of meeting their requirements. The implications of this for CMEA integration are too obvious to warrant discussion.

The foreign trade activities of a traditional centrally planned economy are determined or influenced by the following institutional arrangements:

(i) In each country, production and trade levels are set by highly placed officials in the party or in the government and carried out by the ministerial hierarchies concerned. Plans – sets of *ex ante* production and trade decisions slated to be carried out in a given period of time by producers and foreign trade enterprises (FTEs) – are geared to a system of interlocking material balances. Decisions are implemented via orders that come down through hierarchic lines. Information about the environment of producers is transmitted chiefly from subordinates to superiors in the hierarchies.

(ii) FTEs, subordinated to the Ministry of Foreign Trade, purchase output from producers for export and sell imports to producers and wholesalers. The monobank in each country, on behalf of the FTEs, pays producers for goods exported and charges consumers for goods imported in local currency. The producer of exports and the consumer of imports deal with the FTEs only, so they are isolated from the foreign buyers of exports and the foreign suppliers of imports. Managers of producing enterprises and the FTEs are subject to material incentives for fulfilling physical output or foreign trade plans, for economising on production costs and in certain instances for carrying out other assigned tasks. Given this system, quality and orientation towards the needs of the user often leave a lot to be desired (Marer and Montias, 1982; 1988).

(iii) Export and import transactions entered into by the FTEs with non-CMEA countries are valued according to current world market prices and settled in a convertible currency; with CMEA countries, transactions are valued according to an agreed set of past (*historical*) world market prices and settled in *transferable rubles* (TRs). The TR is an artificial accounting unit which takes a world market price expressed in a convertible currency and translates it into rubles at the prevailing official exchange rate for the ruble.

(iv) The official exchange rates of the individual CMEA countries, in terms of convertible currencies or against the TR, are set arbitrarily and may not reflect or even approximate the equilibrium exchange rates which are based on the purchasing power of the currencies or some other equilibrium concept. FTEs, therefore, must keep two sets of accounts in domestic currency: one expressing the value of transactions with foreign buyers and sellers translated into domestic currency via the official exchange rate, and the other expressing the value of transactions with domestic sellers of exports and users of imports according to the domestic prices fixed (to some extent arbitrarily) by the domestic authorities in the country. The gains and losses on foreign transactions, reflected by the difference in the two sets of accounts, are settled automatically with the state budget, a procedure known as *automatic price equalisation*.

(v) Within the CMEA, representatives of each country negotiate the pattern of specialisation in production with other CMEA nations either bilaterally or multilaterally. The exchange of

goods among countries is almost always agreed upon bilaterally. Prompted by the domestic planning system in the CMEA nations, which is based on *material balances*, trade negotiations in the CMEA focus mainly on the type and quantity of goods each country wishes to import. When negotiating the quotas to be included in the five-year agreements, it is necessary to forecast domestic demand for all kinds of machinery as far ahead as eight years because plan coordination in the CMEA begins three years before the current plan period ends. Practically speaking, this is a difficult situation, not designed to facilitate the ready matching of product specifications in the exporting and importing countries (Marer and Montias, 1982; 1988).

(vi) Bilateralism discourages economic integration in several ways. One reason is that barter deals tend to be struck to keep bilateral accounts in approximate balance. Any surplus beyond an exporter country's planned supply must be sold outside the CMEA. It is for this reason that the value of a given surplus or deficit with one CMEA partner, expressed in TRs, is indeterminate and cannot be used automatically to offset deficits or surpluses with other CMEA partners. Lack of convertible currency sometimes leads to egregiously inefficient decisions:

> Hungary, for example, has a chemical complex whose operation requires a large quantity of salt. About 35 miles from the complex, across the border in Romania, is one of Europe's largest salt mines. But Romania ships the salt to the USA and other countries where it gets paid in convertible currency while Hungary imports salt from Algeria because that source does not require a direct outlay of scarce hard currency. (Marer and Montias, 1982, p. 112)

Sometimes such problems are solved by agreeing to settle certain intra-CMEA trade transactions in convertible currency, a growing tendency which may be favourable to CMEA-wide integration, insofar as it mitigates the integration-reducing effects of bilateral clearing accounts.

(vii) There is no mechanism in the CMEA for joint risk taking. Risks inevitably arise when a country undertakes an investment to build export capacity for either the CMEA or the world market. Demand in the CMEA (as in the world market) may fluctuate due to technological or other factors or because central planners

in partner countries change their minds regarding imports. The risks of specialisation for the CMEA market fall relatively more heavily on the smaller East European nations than on the USSR because the former can specialise in only a relatively few products so their risks are concentrated, while the USSR produces and specialises in many products, hence its risks are spread more widely.

Since the early 1950s, when the above system was in force throughout the CMEA, partial reforms have been implemented at various times and in various degrees by all the CMEA nations and comprehensive reforms were introduced in Hungary in 1968. However, Marer and Montias (1982; 1988) conclude that, in spite of the introduction of partial reforms in all CMEA countries since the late 1950s and the nurturing of the comprehensive reform that has been evolving in Hungary since 1968, the *traditional* foreign trade mechanism is still essentially intact, at least as far as trade with the block is concerned.

In short, the economic system within the CMEA perpetuates a fundamental lack of interest of domestic producers in becoming integrated with both consumers and producers in other member nations. The integration policies of member countries must focus on the mechanism of state-to-state relations rather than on domestic economic policies which would make CMEA integration more attractive to producers and consumers alike. That is, integration must be planned by the state at the highest possible level and imposed on ministries, trusts and enterprises. Also, the CMEA operates different pricing mechanisms for intra- and extra-area trade: with partners outside the bloc they trade at current world prices, while prices in intra-bloc trade are linked to the market prices in the Western world for an earlier period, according to various formulas periodically agreed upon since shortly after the Second World War – see Marer and Montias (1982; 1988) for detailed information. Moreover, the attitude of the USSR is extremely important since the policies of the East European members are somewhat constrained by the policies adopted by the organisation's most powerful member, for economic as well as political reasons. However, although CMEA integration has to be approached within an entirely different framework (the concepts of trade creation and trade diversion seem to have no clear relevance here and economies of scale are treated in a very different way altogether), Chapter 14 is nevertheless devoted to the empirical

estimates of the integration effects of this bloc. Be that as it may, this book is not the appropriate place for discussing the CMEA at length since doing so would entail essentially institutional discussion, and this is ruled out from this book, hence the interested reader is advised to consult Marer and Montias (1982; 1988). What may be in order, however, is a short list of the integration measures that have been achieved, but these cannot be described without some historical perspective.

CMEA Economic Policy and Integration

Tracing the efforts made during the CMEA's existence to find policies acceptable to all member countries shows how difficult it is to reach agreement about specialisation and then to find a workable mechanism for the group as well as to implement agreed policies effectively in each country. Linked closely with alternative policies on specialisation, suggestions for reforming the CMEA mechanism have ranged from proposals for a supra-national authority which would create the traditional institutions of central planning at the regional level, to those favouring greater reliance on market mechanisms.

The best known proposal for integration was that advocated by the USSR during 1962–4 for the organisation to become a supra-national organ. They suggested that the CMEA should make decisions and allocate resources *ex ante* rather than try to coordinate *ex post* the decisions taken by the national planning authorities. This proposal brought to the surface the fear of the comparatively small East European countries that CMEA integration under a supra-national authority would mean more domination by the USSR. The most uncompromising stand against this form of integration was taken by Romania, whose ruling party issued its famous 1964 statement, which brought the conflict to world attention:

> forms and measures have been proposed such as joint plan and a single planning body for all member countries. . . . The idea of a single planning body for CMEA countries has most serious economic and political implications. The planned management of the national economy is one of [the] fundamental, essential, and inalienable attributes of sovereignty of the socialist state[;] . . . transmitting such levers to the competence of superstate or extra-state bodies would turn sovereignty into a meaningless notion. (Cited in Montias, 1969, p. 217)

In the face of Romania's stand, and perhaps remembering that intensified pressure on Albania just a few years earlier had led to that country's defection from the group, the USSR decided not to press its proposals.

The 1964–70 period was one of much discussion, debate and experimentation in each CMEA country about required reforms in the traditional centrally planned economic system. Also, the proposals usually incorporated suggestions to reform the CMEA mechanism too. One such proposal, most clearly articulated by Hungarian economists, favoured a greater reliance on market mechanisms for socialist integration. The advocates of this approach predicted better prospects for the realisation of gains from regional specialisation and for the maintenance of greater national autonomy. Other proposals, including those by Soviet economists, favoured planned integration relying on the traditional concepts and institutions of central planning (McMillan, 1978).

After the events in Czechoslovakia of 1967–8, it became more urgent for the USSR to promote the cohesiveness of the CMEA network through which it could maintain its dominion without resorting to coercion. The USSR probably also desired a system of economic integration that would place external limits on the economic reforms undertaken by any East European country. At the same time, this system would compensate the USSR better than the then current CMEA price and trading system for becoming an increasingly large supplier of energy and raw materials to Eastern Europe. Accordingly, Soviet economists began to float new proposals in the late 1960s. Realising that supra-national planning was not politically feasible, they thought that it could nevertheless be approximated through joint planning of the key sectors of the national economies.

The outcome of this debate was the 1971 *Comprehensive Programme for Socialist Integration* (*Comprehensive Programme* hereafter). Although the document appears to be a compromise between those advocating market mechanisms and those favouring a joint planning approach, the emphasis since 1971 has been on joint planning and the initiation of joint investment projects in certain priority sectors. Aspects of the *Comprehensive Programme* which stress the market approach to socialist integration, such as its timetable to introduce a degree of convertibility into CMEA currency relations or to establish direct and autonomous trade links among enterprises in the different member countries, appear to have been more lip ser-

vice, or perhaps a recognition of need rather than a statement of resolution (McMillan, 1978).

With regard to the latter point, a reform proposal that was codified in the *Comprehensive Programme* is the classification of traded goods into three categories: *important commodities* with fixed quantities in physical terms, *fixed value quotas* with physical contents to be negotiated between buyer and seller and *non-quota commodities*. It was envisioned by the reformers that trade at least in the third category would encourage direct export-import links between autonomous producer and user enterprises. However, due to the many institutional obstacles, the trade flows in the third category remained small (about 2 per cent, some say between 2 and 5 per cent of intra-CMEA trade) so that the reformers' hopes were not realised. According to Brus (1979), it was clear that any extension of the enterprises' autonomy would have been meaningless as long as the functions of CMEA money continued to be passive and subordinated to barter-type exchange. In turn, the activation of money would have required major changes in the system of exchange rates, in domestic prices and in the economic management system.

To lessen the fears of the East European countries about compulsory supra-nationalism, one important compromise recognised by the *Comprehensive Programme*, which appears to have become a permanent feature of the CMEA, is the *interested party principle*. This allows member countries to participate only in those CMEA projects or programmes in which they have a material interest.

Three types of activities contained in the *Comprehensive Programme* were stressed: improved plan coordination, cooperation in long-term target programmes and joint CMEA investment projects. With regard to the first two, according to Marer and Montias (1982; 1987), it is difficult to learn from the CMEA literature how much has been agreed upon in principle only, whether comprehensive and detailed blueprints for implementation have yet been accepted, or the extent to which implementation of these programmes is under way. It seems that the progress made can be stated as follows:

(*a*) *Improved Plan Coordination*. In earlier periods, *coordination* commenced when for all practical purposes the national plans had been completed and the pattern of investment (officially not subject to coordination) had already been decided. Coordination used to mean little more than exchanging background information preparatory to bilateral trade negotiations. Presently, improved plan coordi-

nation means the procedure starts earlier (three years before the end of the current quinquennium) so that there is at least the possibility that, as a consequence of discussions, a member country's investment plans could be altered (Brus, 1979). Moreover, a 1973 agreement specified that each country must include a special section in its national plan document for 1976–80, elaborating the specific economic details of its integration measures.

Plan coordination appears to involve a standardisation of economic information concerning projects that involve a long-term linking of the economies of two or more CMEA countries. This should enable a more reasonable assessment of what is really happening in the CMEA and make it possible to check both the bilateral and multilateral consistency of national plans, but it does not appear to have any impact on the substance of CMEA integration (Marer and Montias, 1982; 1988).

(*b*) *Cooperation in Long-term Target Programmes*. This involves selected sectors and key projects of major importance, where coordination takes a more binding and all-embracing form. The blueprint for this type of cooperation reportedly (Trend, 1977) consists of:

(i) joint forecasting for 15 to 20 years of production, consumption and trade trends to identify prospective shortages and surpluses;
(ii) coordination of medium- and long-term plans for the sector's main branches of production and key commodities;
(iii) joint planning of the production of selected key commodities and joint research and development programmes; and
(iv) continuous exchange of information on planning experiences.

It has been agreed that cooperation in long-term target programmes should encompass five sectors: fuels, energy and raw materials; machine construction; industrial consumer goods; agriculture, especially feedstuffs; and transportation. Joint planning of production for selected commodities has been agreed in principle.

Implementing these programmes would involve substantial investments by the East European countries in the USSR beyond those detailed in the next section. But in June 1980 the CMEA adopted a policy that once again places the emphasis on *cooperation and specialisation* in manufacturing in preference to *joint investment projects* (Pécsi, 1981). But the systemic obstacles to specialisation in manufacturing remain formidable (Marer and Montias, 1982; 1988).

(*c*) *Joint CMEA Investment Projects*. These represent the major new form of CMEA activity. About a dozen such projects were implemented during the 1976–80 five-year plan, most of them located in the USSR. The biggest by far is the Orenburg gas pipeline; other large projects include asbestos mining facilities at Kiembayev, a cellulose plant at Ust Ilim and an electric power transmission line between the USSR and Hungary. The planned value of joint CMEA projects in 1976–80 was 9 billion TRs (approximately $14.5 billion), about half financed by the USSR, the other half by the East European countries.

Since the *Comprehensive Programme* was accepted, the USSR has been pressing the other CMEA countries to participate in the joint projects, drawing attention to the fact that its territory has the natural resources which most of these joint projects are designed to exploit or transport, and that these investments represent partial compensation for supplying its CMEA partners with energy and raw materials – hard goods which the USSR can readily sell to Western countries for convertible currency. On the other hand, the East European countries argue that investing in the CMEA joint projects (which take the form of delivery of labour, capital and consumer goods and the provision of technical know-how for projects located on USSR soil) is not necessarily economic from their point of view. They stress the high manpower and hard-currency costs of these joint projects, the low interest rates received and the disadvantageous terms of repayment, made in kind yet valued in continually depreciating TRs as intra-CMEA prices follow the rise of prices on the world market (Marer and Montias, 1982; 1988). The East European countries, therefore, emphasise that these liabilities must be juxtaposed with assurances that the promised supplies will be forthcoming.

While this system determines or narrowly confines the channels through which policies can be implemented and the environment imposes restrictions on each member country's set of possible actions, there are still many options for policymakers to give effect to their preferences on matters of integration. First, the preferences of the highest authorities in the various CMEA countries and the policies that they announce differ markedly with respect to the nature and extent of specialisation that they are willing to accept. Bulgaria has specialised in the export of agricultural products (both raw and processed) as far as was compatible with its goal of rapid industrialisation. In contrast, Romania has neglected her agriculture until fairly

recently to press all available resources into industrial expansion. Within the industrial sector, Romania and Bulgaria also differed in that the former insisted on 'balanced, complex and multisided development', meaning that no branch of industry was to be sacrificed for the sake of realising the advantages of specialisation, whereas the latter was distinctly more willing to go along with CMEA-wide specialisation.

Relative to the other aims they may pursue, not all members of the CMEA have the same preference for promoting the economic interests of the CMEA as a whole. In recent years, the USSR at times appears to have forsaken its short-term economic advantage, for example by its willingness to become an increasingly large net supplier to Eastern Europe of oil and other 'hard goods' at a time when those commodities could have been sold more advantageously on the world market. Of course, policies on such matters involve difficult-to-quantify trade-offs between a country's economic and political objectives and may well involve economic or political quid pro quos between the USSR and the East European countries. For example, there could well be a link between the GDR's economic and military assistance to countries in sub-Saharan Africa and the level, composition and prices of commodities it trades with the USSR.

The attitudes of individual CMEA member countries towards trade and industrial cooperation with Western countries and their reliance on Western credit differ considerably. The share of the industrial West in the total trade of the European CMEA countries ranges from about 20 per cent for Bulgaria to almost 50 per cent in the case of Romania and Poland. Only Romania and Hungary allow equity joint ventures with Western corporations within their borders; Poland permits only small-scale joint ventures in certain sectors. The acceptance of Western credit, or the active search for it in the early 1970s, ranges from avid in the case of Bulgaria and Poland, to eager in the case of Hungary, the GDR and Romania, to cautious in the case of Czechoslovakia (Marer and Montias, 1982; 1988). Western credits facilitate the expansion of trade with the West, both through an immediate rise in imports by the credited nation and an eventual rise in exports to repay the loans.

In spite of these differences within the CMEA, there was a substantial expansion in the trade of most CMEA countries with the West during the 1970s. Increasing reliance on imports from the West – whether energy, raw materials, semi-manufactures, grain, technology or consumer products – reflects the growing unavailability (in

both quantity and quality) of products most in demand by CMEA producers; this is a consequence of the economic system as well as of the easy availability of Western credits and new policies by the CMEA countries.

The relationship between East–West trade and CMEA integration can be both complementary and competitive. Complementarity obtains, for example, insofar as the enlarged scale of production for the East European countries, prompted by specialisation in exports for the CMEA market, may facilitate production for the Western markets too. At the same time, the inflow of Western goods, technology and managerial know-how can give an impetus to product specialisation in the CMEA. Some imports from the West and a few of the industrial cooperation agreements with Western firms are motivated in part by the desire of the smaller East European countries to be designated the sole or principal supplier of machinery or other products under CMEA specialisation agreements (Marer, 1980). For Western corporations, the possibility of penetrating the entire CMEA, especially the Soviet market, through industrial cooperation with an East European partner can be an important commercial incentive. These types of complementarities are illustrated by the 1972 agreement between the US firm International Harvester and the Polish firm BUMAR to jointly manufacture crawler tractors in Poland (Garland and Marer, 1981).

Examples of complementarity between East–West trade and CMEA integration should not suggest that the two are typically complementary and mutually supporting. Many examples can illustrate just the opposite. The CMEA countries have no common agreed strategy with respect to the purchase of Western technology or regarding industrial cooperation with Western firms. This leads to unnecessary duplication of effort amongst them. For example, during the first half of the 1970s, every European CMEA country bought polyvinyl chloride (PVC) technology from the West and planned to export a large part of the output to pay for the import. Lack of coordination in the CMEA, inadequate CMEA-wide planning for domestic utilisation of the output and long delays in installing the plants (during which worldwide over-production had cut the world price of PVC by nearly half) resulted in excess production capacity and cut-throat competition to sell PVC for convertible currency.

East–West trade and CMEA integration can be competitive in other respects too. The substantial expansion in the trade of CMEA countries with the West during the 1970s created economic links that

cannot easily be severed. The large indebtedness of the CMEA countries to the West mortgages a substantial share of future exports to the West by Eastern European countries, with evident consequences for CMEA integration.

What form of integration?

Given this background, it may be asked: what type of economic integration is the CMEA? We have seen that the CMEA has plan coordination as well as joint investment projects. Although there is factor mobility, it is low particularly within Eastern Europe proper. The initial decision not to open Eastern Europe to free labour and capital movement may be traced to Soviet policies imposed on Eastern European clients in the early postwar period. These actively discouraged the formation of deep commercial ties amongst the East European countries. However, these policies eventually became part of the CMEA economic environment. With few exceptions, there have been no significant transfers of labour within the CMEA. In addition, these countries do not take advantage of low-cost foreign labour from countries outside the bloc.

Until recently, capital exports from one CMEA country to another have also been small and were often determined *ex post*, when credits were granted to finance an unplanned imbalance in trade flows, or on the basis of political considerations. An example of the latter is the flow of Soviet credits granted to several East European countries to finance their deteriorating terms of trade with the USSR after 1975, when the price of energy was increased. Such Soviet credits often cannot be utilised fully by the East European countries because the goods most needed, energy and raw materials, are not available and what is readily available (e.g. standard machinery, watches, cameras) is not wanted. In recent years, large credit transactions have been initiated under the joint CMEA investment projects discussed earlier.

The nature of CMEA integration itself has been affected by external factors. The rapid growth of trade with the West during the 1970s has made the East European countries, and to a lesser extent the USSR, increasingly sensitive to international economic disturbances, such as the OPEC-triggered energy crises, rapid world inflation and recession in the Western economies. The 1973–4 OPEC oil price increases raised the opportunity cost to the USSR of supplying energy and raw materials to Eastern Europe, hence intensifying the pressure on the USSR to reorient its export supplies to the West.

Although the actual reorientation was modest due to political considerations, it has forced the East European nations to rely increasingly on alternative sources of energy and raw materials, which is somewhat dis-integrative. However, to the extent that the world market price explosion increased the cost of Soviet energy and raw materials to Eastern Europe, given a time-lag, the Eastern European countries had to export more to the USSR to finance their deteriorating terms of trade. They also had to become more willing to invest in the large energy and raw material projects located in the USSR. Both these outcomes may be viewed as integrative, even though the cost–benefit calculations on the joint projects are unclear and the terms of investment participation are in dispute (Marer and Montias, 1982; 1988).

Perhaps the most important impact of world events since 1973 on CMEA integration was the effect of developments in the international financial markets. Large OPEC surpluses had to be recycled just at a time when the deep Western recession reduced corporate demand for loanable funds, creating large excess liquidity on world financial markets. The recession also induced Western governments to subsidise the financing of their countries' exports. These developments, together with the new political environment created by *détente*, brought about a situation in which exceedingly large private and official credits were made available by the West to the CMEA countries. At the end of 1979, the gross indebtedness of the six East European countries and the USSR to the West totalled about $70 billion, the net indebtedness (subtracting the assets of the CMEA countries held in Western banks) was in excess of $60 billion. It could be argued that because of the availability of these credits, the extraordinary expansion of imports from the West was not at the expense of CMEA integration; intra-bloc trade continued to expand during this period, albeit at a slower rate.

The impact of the large indebtedness of the CMEA on the future of CMEA integration is exceedingly difficult to evaluate. Much will depend on the productivity of the borrowed resources in terms of generating hard currency earning exports. Although the debt may continue to rise, the need to service it makes claims on resources. As the ability of the CMEA countries to import from the West is impaired, sooner or later due to debt servicing, this may encourage intra-bloc division of labour.

There is another consideration: successive international crises, both political (like those regarding the events in Afghanistan) and

economic (like those regarding the growing difficulties encountered by the CMEA countries in Western markets due to, for example, protectionism) are supporting those in Eastern Europe who argue that the CMEA, but especially the USSR, offers a more stable and more easily accessible market and source of supply than does the West.

Finally, one should not forget that the CMEA is essentially a political organisation. Within this, the attitude of the USSR is vital since the policies of the East European member countries are somewhat constrained by the policies adopted by the organisation's most powerful member. However, the enlargement of the CMEA by the incorporation of Mongolia in the early 1960s, Cuba in the early 1970s and Vietnam in 1978, makes integration more difficult politically and institutionally even if these countries play only a marginal role in CMEA specialisation agreements. Given their geographical locations, their membership would appear to serve principally Soviet foreign policy interests, according to which the East European countries are called upon to subsidise the less developed allies of the USSR. Be that as it may, the CMEA remains essentially a powerful political organisation.

Therefore, the answer to the question regarding the form of economic integration adopted by the CMEA, is the usually difficult one that it does not fit into the neat classification adopted in elementary texts. In spite of the low factor mobility, it is more than a common market, given the comprehensive planning nature of the scheme and the joint investment projects, and it is closer to a political union, given the level of political cooperation within the group.

CONCLUSION

Given the fundamental differences between centrally planned and market oriented economies, the main concern of this chapter has been with institutional factors. This is because the concepts of trade creation and trade diversion do not make sense within this context of central planning: trade impediments take the shape of implicit quotas and emanate from planning decisions; hence they cannot be evaluated, and, in any case, they are irrelevant. Moreover, the centrally planned economies are concerned with rational economic development with the object of achieving economies of scale within the overall criterion of equal economic development within the members

of the group. In this sense, their approach to economic integration is similar to that of developing countries, and we saw there that trade creation and trade diversion are irrelevant too.

Moreover, at present, CMEA (being the only scheme of economic integration amongst a group of centrally planned economies) policy-makers concerned with the pace of integration would place considerable weight on the *deepening* of intra-CMEA division of labour, i.e. on the increased specialisation within branches and on *vertical* specialisation by two or more countries contributing inputs, components or final assembling capacity to the manufacture of a product. Deepening does not necessarily mean an increase in the share of intra-CMEA trade in the bloc's total trade: two members, each agreeing to specialise in a particular line of production, may find that as their output and exports of the specialized product expand, their imports from the West, needed to sustain the increased output, have to be stepped up *pari passu*. Gains in real income, due to specialisation, may also lead to larger imports from the outside world. These may appear similar to external trade creation, but they are not, since there has been no realignment of external tariffs; as we have seen, tariffs do not exist in the CMEA.

Therefore, an appropriate way in which to measure integration amongst a group of centrally planned economies is to estimate the extent to which the prices of any pair of identical/similar products are equalised, the implication being that economic integration leads to commodity price equalisation. A *process of integration* would then consist of moving from an initial state, where relative prices differed substantially in each partner country, through a series of states, each marked by a convergence of relative prices compared to the last. However, amongst centrally planned economies (or, even market oriented economies where the government plays an active role in production and investment decisions), convergence towards equal relative prices is a necessary but not a sufficient condition for integration because government planners may order, or induce, levels of output or investment projects that are inconsistent with comparative advantage. In reality, there is considerable evidence that CMEA investment decisions are often systematically made with the aim of equating relative scarcities within each country. Moreover, in centrally planned economies, prices and costs generally diverge from marginal rates of transformation in production (due, *inter alia*, to low capital charges and to large differences in the extent of indirect taxes on profits levied on various goods). Furthermore, wholesale ac-

counting and retail prices have not had much influence on the planners' choice of tradeable goods, nor have the prices of exports and imports been reflected systematically in wholesale and retail prices. Under such circumstances, it would be difficult to use changes in the relative prices of commodities to give even an impression of the extent to which relative scarcities within the CMEA have tended to converge or to diverge over time. There are also problems with regard to relative output measures over time: one usually thinks of increased specialisation as one country *expanding* output at the expense of other countries; but if one country *reduces* output to let several other countries expand production a little, might that not also be construed as a move towards increased specialisation?

Therefore, one is left with the following questions: how does one evaluate the economic rationale of comprehensive planning within the scheme? How can one evaluate the effect of the geographical distribution of industries, as dictated by joint planning, on the welfare of the individual member countries? Does acquiescence with a particular distribution mean that economic equity is satisfied, or does it simply reflect political unity? How does one evaluate the benefits of political unity on the group as a whole and on the individual member nations? Has economic convergence been achieved and what are the costs and benefits for the bloc and its constituent member countries? etc. Some simple answers may be forthcoming. For example, it could be argued that joint comprehensive planning is superior to the market mechanism, since the former may achieve the same result without the costs of market failure, but this is not an answer that many would agree with. However, proper answers can be reached only through the use of a comprehensive model which explicitly incorporates these elements, and within a dynamic structure which puts economies of scale at the very heart of the model: clearly an impossible task. Even if it were possible, the required data for testing the model would also be impossible to obtain (for more on this, see Chapter 14). Finally, how can one estimate the economic and political benefits of a united political front?

Part II
Measurement

8 Measuring the Impact of Economic Integration

A growing area of research in the field of international economic integration is concerned with the measurement of the impact of the formation of such schemes as the European Community (EC), the European Free Trade Association (EFTA), the Council for Mutual Economic Assistance (CMEA, or COMECON as it is generally known in the West) and similar associations on the economies of member states and on the rest of the world (W). The purpose of this part of the book is to explain the nature of the problem of estimation, to provide a comprehensive and critical survey of the major attempts at empirical calculation of the effects and to suggest an alternative approach for future studies. This chapter explains the nature of the problem.

NATURE OF THE PROBLEM

It is extremely important to understand the nature of the methodology of measuring the impact of international economic integration in order to appreciate the difficulties associated with such measurement.

Assume that the world is constituted of three mutually exclusive and collectively exhaustive areas: the EC, EFTA and the W. The object of the exercise is to contrast the world trade matrix [an equivalent world production matrix is also necessary, see (*a*)–(*c*) below] Y as it appears in period t (indicated by a subscript), with the situation that would have materialised in year t if the EC and EFTA had not been established. The latter is referred to as the '*anti-monde*' – alternative world in which all events except one are identical – or non-integration position. The difference between this hypothetical position and the actual one can then be attributed to:

(*a*) trade creation – the substitution of cheaper imports from the partner country for expensive domestic production;
(*b*) trade diversion – the replacement of cheaper *initial* imports from the W by less cheap imports from the partner country;
(*c*) external trade creation – the replacement of expensive domestic production by cheaper imports from the W due to a reduction in

the common external tariff rates (CET) which is necessary in a customs union (CU) but not in a free trade area (FTA);

(*d*) 'supply-side diversion' – the replacement of exports to the *W* by exports to the partners; and

(*e*) balance-of-payments induced adjustments due to (*a*)–(*d*) – which are made necessary for equilibrating purposes.

Let us adopt the notation used by Williamson and Bottrill (1971) where:

c_{ii} = intra-*i*th area trade creation;
d_{ij} = diversion of the *i*th area's imports from area *j*;
$d_{ii} = d_{ij}$ = diversion of *i*th area's imports (to area *i*);
e_{ij} = increase in *i*th imports from *j* caused by external trade creation;
$e_i = e_{ij}$ = total external trade creation of area *i*;
r_{ij} = increase in *i*'s imports from *j* caused by balance-of-payments reactions;
s_{ij} = reduction in *j*'s exports to *i* caused by supply-side constraints;
x_{ij} = (hypothetical) imports of area *i* from area *j* in the non-integration position;
$x_i = x_{ij}$ = (hypothetical) imports of area *i* in the non-integration positions;
y_{ij} = actual imports of area *i* from area *j*; and
$y_i = y_{ij}$ = actual imports of area *i*.

The world trade matrix *Y* is:

		Exports by			
		EC	*EFTA*	*W*	*Total*
Imports of	*EC*	y_{11}	y_{12}	y_{13}	y_1
	EFTA	y_{21}	y_{22}	y_{23}	y_2
	W	y_{31}	y_{32}	y_{33}	y_3

The world trade matrix can be disaggregated to show the various effects that followed the formation of the EC and EFTA. Both these areas could have led to internal trade creation and/or could have diverted imports from the *W*. Also, the EC may have been responsible for external trade creation (in the partner countries that levelled down their external tariff rates) and external trade destruction (in the low-tariff partner countries which raised their external tariff rates to the level of the CETs). The attraction of partner markets may have directed some EC and EFTA exports away from the *W* markets, but

this effect may have been partially, wholly, or more than fully offset by the greater competitiveness of exports from those blocs resulting from the advantage of a larger 'home' market (Williamson and Bottrill (1971), pp. 424–5). Also, every trade flow in the matrix may have been affected by reactions made necessary in order to re-equilibrate payments positions.

The Y matrix can be disaggregated to show all these changes:

$$\begin{bmatrix} y_{11} & y_{12} & y_{13} \\ y_{21} & y_{22} & y_{23} \\ y_{31} & y_{32} & y_{33} \end{bmatrix} = \begin{bmatrix} x_{11} + c_{11} + d_{11} + r_{11} & x_{12} - d_{12} + e_{12} - s_{12} + r_{12} & x_{13} - d_{13} + e_{13} + r_{13} \\ x_{21} - d_{21} - s_{21} + r_{21} & x_{22} + c_{22} + d_{22} + r_{22} & x_{23} - d_{23} + r_{23} \\ x_{31} - s_{31} + r_{31} & x_{32} - s_{32} + r_{32} & x_{33} + r_{33} \end{bmatrix} \tag{1}$$

Most of the studies in this field have disregarded some of these effects, particularly the supply-side constraints and the balance-of-payments re-equilibrating reactions, which amounts to assuming that s_{ij} and r_{ij} are equal to zero and leads to the much simpler framework:

$$\begin{bmatrix} y_{11} & y_{12} & y_{13} \\ y_{21} & y_{22} & y_{23} \\ y_{31} & y_{32} & y_{33} \end{bmatrix} = \begin{bmatrix} x_{11} + c_{11} + d_{11} & x_{12} - d_{12} + e_{12} & x_{13} - d_{13} + e_{13} \\ x_{21} - d_{21} & x_{22} + c_{22} + d_{22} & x_{23} - d_{23} \\ x_{31} & x_{32} & x_{33} \end{bmatrix} \tag{2}$$

This implies that:

$$y_i = x_i + c_{ii} + e_j.$$

This methodology is not only very useful for analysing the *overall* effects of the establishment of the EC and EFTA, but is also adaptable for analysing the effects on a particular member of either integrated bloc. For example, the matrix can be further disaggregated to separate the EC sections into the UK and the rest of the EC, and the EFTA sections in a similar fashion. One can then use the appropriate matrix to analyse the consequences for the UK of membership of the EC. Similarly, the W sections could be classified accordingly to enable, for example, a study of the effects of the formation of the EC on a country like Australia or New Zealand. In short, the methodology is fairly flexible. However, for the majority of

studies, the most significant consideration that remains is the effect of the formation of the EC and EFTA on their economies and on the *W*.

Thus the problem of measuring the impact of economic integration relates to the empirical calculation of the indicated changes in the world trade matrix. However, it should be added that any sensible approach to the analysis of changes in trade shares following economic integration should have the following characteristics:

(i) it should be capable of being carried out at the appropriate level of disaggregation;
(ii) it should be able to distinguish between trade creation, trade diversion and external trade creation/destruction;
(iii) it should be capable of discerning the effects of economic growth on trade that would have taken place in the absence of economic integration;
(iv) it should be 'analytic', i.e. it should be capable of providing an economic explanation of the actual post-integration situation; and
(v) it should be a general equilibrium approach capable of allowing for the effects of economic integration on an interdependent world.

THE TRADE EFFECTS

The general trend of the empirical work on economic integration has been to examine various specific aspects of integration, mainly the effects on trading patterns, and to analyse them separately. The most important practical distinction is made between *price* and *income* effects. This is due largely to the fact that the main initial instruments in economic integration are tariffs, quotas and other trade impediments which act mainly on relative prices in the first instance. However, all sources of possible economic gain incorporate income as well as price effects.

The immediate difficulty is thus the translation of tariff changes and other agreed measures in the integrated area into changes in prices and other variables which are known to have an impact on economic behaviour. Such evidence as exists suggests that there are wide discrepancies among the reactions of importers benefiting from tariff cuts and also among competitors adversely affected by them (EFTA, 1968) and that reactions of trade to tariff changes are different from

those to price changes (Kreinin, 1961). Two routes would appear to be open: (i) to estimate the effect of tariff changes on prices and then estimate the effect of these derived price changes on trade patterns; and (ii) to operate directly with observed relative price movements. This latter course exemplifies a problem which runs through the estimation of the effects of economic integration and makes it almost impossible to obtain generally satisfactory results. It is that to measure the effects of integration one must decide what would have happened if integration had not occurred. Thus, if in the present instance any observed change in relative prices were assumed to be the result of the adjustment to tariff changes, all other sources of variation in prices would be ignored, which is clearly an exaggeration and could be subject to important biases if other factors were affecting trade at the same time.

THE DYNAMIC EFFECTS

In the discussion of the exploitation of comparative advantage the gains from a favourable movement in the terms of trade, and often those from economies of scale, are expressed in terms of comparative statics, but it is difficult to disentangle them from feedback onto incomes and activity. The essence of the gains from increased efficiency and technological change is that the economy should reap dynamic gains. In other words, integration should enhance the rate of growth of GDP rather than just giving a step up in welfare. Again, it is necessary to explain explicitly how this might come about.

There are two generalised ways in which this can take place, either through increased productivity growth at a given investment ratio or through increased investment itself. This is true whether the increased sales are generated internally or through the pressures of demand for exports from abroad through economic integration. Growth gains can, of course, occur temporarily insofar as there are slack resources in the economy. Again, it is possible to observe whether the rate of growth has changed, but it is more difficult to decide whether that is attributable to economic integration.

Krause (1968) attempted to apply a version of Denison's (1967) method of identifying the causes of economic growth but suggested that all changes in the rate of business investment were due to the formation of the EC or EFTA in the case of those countries. Mayes (1978) showed that if the same contrast between business investment

before and after the formation of the EC or EFTA were applied to Japan, there was a bigger effect observed than in any of the integrating countries. Clearly changes in the rate of business investment can occur for reasons other than integration.

ON THE PREVIOUS STUDIES

A truly comprehensive survey of previous studies is not available in any single source. The works of Louvain University (1965), Sellekaerts (1973), Aitken (1973), Balassa (1975), Dayal and Dayal (1977), Waelbroeck (1977), Mayes (1978; 1982; 1985) and Winters (1987) between them come very close to it. The aim of this part of the book is to fill this gap by providing a more or less complete coverage of the existing literature. However, it should be pointed out from the start that in a survey of this kind, it is neither practical nor useful to attempt a consideration of each and every contribution since space limitations necessarily dictate that presentation and discussion should be confined to those contributions which have had a marked influence on the subject area. Before doing so in the following chapters, however, a few comments may be in order.

Most of the measurements can be broadly classified as *ex ante* or *ex post*. The *ex ante* estimates are based on *a priori* knowledge of the pre-integration period (i.e. they are structural models) while *ex post* studies are based on assumptions about the actual experience of economic integration (i.e. they are residual-imputation models). However, recall that either type can be *analytic* or otherwise.

There are two types of *ex ante* studies: those undertaken before the EC and EFTA were actually operative and those undertaken after they became operative; see for instance, Verdoorn (1954), Janssen (1961) and Krause and Salant (1973). The most influential studies to use this approach are those of Krause (1968) who predicted the trade diversion that would be brought about by the EC and EFTA on the basis of assumptions about demand elasticities, and of Han and Liesner (1971) who predicted the effect on the UK by identifying those industries that had a comparative cost advantage/disadvantage *vis-à-vis* the EC and finding out how they were likely to be affected by membership, on the assumption that the pattern of trade prior to UK membership provided an indication of the underlying cost conditions and that this would be one of the determinants of the pattern of trade and domestic production after membership. This approach is of very

limited advantage, however, for the simple reason that 'it does not provide a method of enabling one to improve previous estimates on the basis of new historical experience' (Williamson and Bottrill, 1971, p. 326). Therefore, this part will not tackle these studies.

The most significant studies to use the *ex post* approach are those of Lamfalussy (1963), Verdoorn and Meyer zu Schlochtern (1964), who used a relative shares method, Balassa (1967b; 1975), who used an income-elasticity of import demand method, the EFTA Secretariat (1969; 1972), who used a share of imports in 'apparent consumption' method, Williamson and Bottrill (1971), who used a more sophisticated share analysis, Prewo (1974), who used an input-output method, and Barten, d'Alcantra and Cairn (1976), who used a medium-term macroeconomic model. The advantage of the *ex post* method is that it can be constructed in such a way as to benefit from new historical experience and hence to provide a basis for continuous research. However, the major obstacle in this approach concerns the difficulty regarding the construction of an adequate hypothetical pre-integration picture of the economies concerned. The rest of this part of the book will be devoted to a critical presentation of the most significant of these studies.

ABOUT THIS PART OF THE BOOK

The major areas of empirical research in this field deal with the effects of economic integration on three components of GNP: manufacturing, agriculture and the terms of trade. In spite of the fact that the services sector is now the major single area of economic activity in most nations, there have been no major studies on it. This should be expected since, until recently, this has been the non-tradable sector. However, services are increasingly becoming internationalised to the extent that the next round of GATT has scheduled it for negotiations.

Given the predominance of manufacturing industry in the economy, it is natural that the majority of the studies are concerned with this sector. Hence the distribution of the chapters in this part of the book simply reflects that reality. Manufacturing industry is tackled in five chapters (9–11 and 14–15), with Chapter 9 dealing with the earlier studies, Chapter 11 with the latest works and Chapter 10 with the major contributions made between the earlier and most recent periods for EFTA and the EC with those for the CMEA and the

LDCs being tackled in Chapters 14 and 15, respectively. The classification is not as clear cut as is suggested here since some of the studies covered in Chapters 14 and 15 also contain some estimates for the EC, but, as explained in these chapters, it seemed convenient not to split these studies. Chapter 12 deals with agriculture and Chapter 13 with the terms of trade. The final chapter provides a general critique of the literature, gives overall conclusions and suggests an alternative way for estimating the impact of economic integration.

9 Estimating the Impact of Integration on Manufactures: the Earlier Studies

As stated at the end of the previous chapter, the purpose of this chapter is to survey some of the earlier attempts at the empirical estimation of integration effects. The chapter begins with a section on Verdoorn's pioneering study and goes on to consider the major earlier works, finishing just before Balassa's (1967b) contribution.

VERDOORN'S PIONEERING STUDY

Verdoorn's study (1954) is acknowledged as the pioneering attempt at the empirical testing of the effects of Western European integration on the economies of the participating nations as well as on the rest of the world (*W*). Verdoorn's methodology is based on the assumption that the demand for imports from a particular country is governed by the ratio of the export price concerned to the average price of all competing exports of the same class of product. Moreover, it is governed by the ratio of average import prices and prices of home production in the importing countries (Verdoorn and Meyer zu Schlochtern, 1964, p. 164).

Regarding the numerical values of the elasticities, Verdoorn simply accepted those given in previously published works, particularly since he was of the opinion that these elasticity values were representative of most European countries. In the case of finished and semi-finished commodities, the numerical values of the elasticity of substitution were found to cluster around minus 2.0, and the elasticity of demand for imports around minus 0.5.

Verdoorn then applied these elasticity values to the then existing pattern of European trade in order to calculate the effects of abolishing import duties among the participating countries when they maintain a common external tariff rate (CET) against the non-participants, *W*. The participants are ten member countries of the Organisa-

tion for European Economic Cooperation (OEEC), with the three Scandinavian countries forming one unit.

He took the starting year for the pattern of trade to be 1952 but excluded raw materials and the products (steel and coal) under the control of the European Coal and Steel Community (ECSC). He calculated the CET as the weighted average tariff prevailing in 1952 for each of the nine commodity groups considered. Verdoorn then distinguished between two consequences of a customs union (CU): those relating to changes in the volume and pattern of trade, and those relating to changes in the balance of payments of the member countries – what he referred to as the 'monetary effects of the union'. This monetary effect was measured by the required percentage change in the rate of exchange of each member nation, on the assumption that such a change left each member nation with the initial deficit/surplus on current account.

Having carried out the necessary calculations, Verdoorn reached the conclusion that:

> The most important result of the total abolition of [the] tariff walls between participating countries will be an increase in intra-bloc trade of roughly $1 billion, or 19 per cent, assuming that all member countries refrain from revising their rates of exchange [Table 9.1]. If revisions were undertaken to the full extent given in Table [9.2], so as to maintain the *status quo ante* in the balance of payments [on current account], the expansion of intra-bloc trade would amount to only $750 million, or 14 per cent. Without exchange rate revisions, total exports of the member countries will increase by 6.5 per cent; if revisions are applied, this figure will fall to nearly zero (Verdoorn, 1954, pp. 489–90).

Verdoorn then pointed out that 60 per cent of the total increase in intra-bloc exports was due to trade diversion (TD). However, he was quick to reassure 'free-traders' that, under the conditions assumed, the overall change in world trade would have been an increase of $400 million, and in the case of currency revisions, there would have been no 'significant decrease' in total trade (Verdoorn, 1954, p. 490).

With regard to the overall changes in each participating country's exports and imports (as given in Table 9.1), Verdoorn was of the opinion that a CU would not dislocate the overall position of the individual members with regard to the bloc as a whole. His conclusion was that, in fact, a participating country's imports and exports

Table 9.1 Expected changes in total intra-bloc trade (in $ million; 1952 prices)

	Exports		*Imports*	
	NC	*C*	*NC*	*C*
Denmark, Norway and Sweden	233	113	118	134
Belgium and Luxembourg	85	50	72	49
Netherlands	141	15	47	56
United Kingdom	147	152	310	192
France	120	129	139	97
Italy	103	94	88	71
Western Germany	164	197	219	151
Total	993	750	993	750

Notes: NC = no correction in rates of exchange.
C = with correction in rates of exchange.

Source: P. J. Verdoorn (1954) 'A customs union for Western Europe: advantages and feasibilities', *World Politics*, July, p. 491.

Table 9.2 Required exchange rate correction and pre-union tariffs

	Required correction of exchange rates (%)	*Weighted average of tariffs prior to union (%)*
Denmark, Norway and Sweden	+10.0	9.7
Belgium and Luxembourg	+5.7	10.2
Netherlands	+9.7	11.0
United Kingdom	+3.4	12.4
France	+2.3	21.9
Italy	+3.8	24.9
Western Germany	+1.9	33.5

Source: P. J. Verdoorn (1954) 'A customs union for Western Europe: advantages and feasibilities', *World Politics*, July, p. 489.

would tend to change by about the same proportion. He interpreted this to mean that the formation of a CU would foster, at least in its initial effects, the exchange of commodities within an industry through an extended division of labour, rather than upset the balance between exports and imports (Verdoorn, 1954, p. 490).

As to the monetary consequences of the establishment of a CU,

Verdoorn emphasised that the overall position of the balance of payments of each participating country would improve (recall that he found TD to exceed trade creation – TC), and that the extent of improvement can be measured by the exchange rate changes given in Table 9.2. According to the figures in this table, and assuming that each participating nation would want to maintain its initial balance-of-payments position, no country should have to contemplate devaluation as an immediate consequence of the tariff cuts. 'This seems to imply that the general monetary chaos which, it is often predicted, would result from a complete abolition of tariffs against member countries does not necessarily follow' (Verdoorn, 1954, p. 489).

The figures also seemed to indicate that the higher the average level of the tariff rates prevailing prior to the formation of the CU the less would be the need for currency appreciation. This only means that high tariffs are equivalent to overvaluing the currency of the country under consideration' (Verdoorn, 1954, p. 489).

Verdoorn was of the opinion that currency depreciation could be avoided even when relatively high tariffs are abolished, since the CET against imports from *W* would ensure that exports increased faster than imports. The consequent surplus on current account should then be sufficient to prevent the necessity of depreciation, even in those cases where only small increments in imports from *W* would be expected. 'The level of the uniform tariff therefore appears to be of vital importance. Monetary difficulties will begin as soon as it falls as low as 50 per cent of the former average [see Table 9.3]' (Verdoorn, 1954, p. 489).

Verdoorn emphasised that the calculations given in Table 9.3 showed the *minimum* estimates of the effects of the formation of the CU, due to the fact that no account was taken of the quota and other quantitative restrictions that were prevalent at the time or of secondary effects such as increased productivity and intensified export promotion. Moreover, Verdoorn also emphasised that the computational techniques employed may have the tendency to underestimate the shifts of trade in the case of tariffs that are prohibitive, but he did not specify why. Given these reservations, Verdoorn was categorical in his overall conclusion that his findings left no doubt as to the favourable effects of the formation of a CU on the economic well-being of the bloc of participating nations, *taken together*, nor did he suggest that any single member nation would be the loser, at least in the short run, i.e. in the long term certain participants may be unfavourably disposed.

Table 9.3 The required correction in the rate of exchange corresponding to different levels of the uniform tariff against non-participating countries (+: percentage of appreciation; −: percentage of depreciation)

	No tariff against non-participating countries	*Uniform tariff equals*		
		50 per cent of average tariff prior to union	*Average level of tariff prior to union*	*125 per cent of average tariff prior to union*
Denmark, Norway and Sweden	−2.1	+4.0	+10.0	+13.0
Belgium and Luxembourg	−5.0	+0.4	+5.7	+8.4
Netherlands	−4.7	+2.5	+9.7	+13.3
United Kingdom	−7.2	−1.9	+3.4	+6.1
France	−10.2	−3.9	+2.3	+5.4
Italy	−8.7	−2.5	+3.8	+6.9
Western Germany	−10.3	−4.2	+1.9	+5.0

Source: P. J. Verdoorn (1954) 'A customs union for Western Europe: advantages and feasibilities', *World Politics*, July, p. 490.

Finally, Verdoorn used his technique to estimate the economic effects of the formation of the union between Belgium, the Netherlands and Luxembourg (BENELUX). He tried to compare the share of industrial exports to the partners with their overall exports of that commodity group. He chose the years 1938 and 1954 for his comparison as BENELUX was formed in 1948 and he wanted to eliminate the repercussions of the *Reconstruction* period. The results of this exercise are given in Table 9.4.

The table shows a considerable increase in intra-bloc exports of

Table 9.4 BENELUX: exports of partner countries (as per cent of total exports)

	Year		*Increase (%)*
	1938	*1954*	
BENELUX	10.2	16.5	65
Belgium and Luxembourg	12.2	21.6	77

Source: Compiled from P. J. Verdoorn (1954) 'A customs union for Western Europe: advantages and feasibilities', *World Politics*, July.

industrial products, about three to four times as much as that estimated for the OEEC countries. However, Verdoorn warned that in the case of BENELUX the estimates are for the total effects of the Union, not just the *initial* effects. He was also of the opinion that it was justifiable to assume that the smaller the geographical area covered by the CU the more would be the increase in intra-area trade, since the effects of differences in prices would tend to fade away as the geographical area involved became more distant.

What Verdoorn found to be most striking about the BENELUX estimates is that they corroborated the findings of the *a priori* estimates insofar as the increase in exports from the Netherlands to Belgium and Luxembourg appeared to be of the same magnitude as the increase in the opposite direction, although wage costs in the Netherlands were lower than in Belgium. To Verdoorn, this tended to confirm the view that a CU would not necessarily dislocate the balance-of-payments position of the countries concerned, even if differences in production costs were considerable (Verdoorn and Meyer zu Schlochtern, 1964, pp. 167–9).

Conclusion

A criticism of Verdoorn's pioneering study will become apparent at a later stage in this chapter and in subsequent chapters, particularly since the later contributions indicate, both explicitly and implicitly, the shortcomings of earlier attempts. The criticism is directed mainly at his methodology, especially the calculation of elasticities from cross-section analysis.

THE STUDY BY THE *ECONOMIST INTELLIGENCE UNIT*

In 1957, The *Economist Intelligence Unit* (EIU) published its own findings regarding the effects that Western European integration would have on the economy of the UK by 1970. They assumed two alternative courses of action. One alternative presumed that the European Community (EC) member nations would have achieved a CU with some elements of extra cooperation by the year 1970. The second alternative assumed that Austria, Denmark, Norway, Sweden, Switzerland, the UK and all members of the European Community (EC) would have set up a 'free trade area' (FTA) with some elements of extra cooperation by the same year. They then estimated

the effects of these alternatives on the UK economy on the understanding that 'food, drink and tobacco' would be excluded from these preferential arrangements.

In order to calculate these effects, it was necessary to predict the size of the European economy by 1970. For this purpose, OEEC studies of GNP and population growth in the past, available data on the level of investment and existing opportunities for the better use of economic resources were all taken into consideration to extrapolate both GNP and population for all the members of the FTA.

The results of these extrapolations are given in Table 9.5. The 1970 population estimates will be found to differ slightly from those published by the OEEC since they were adjusted to allow for migration. The GNP estimates were generally allowed to grow at a slower pace during 1955–70 relative to 1950–55 on the understanding that the post-war reconstruction effect would have withered away by then. It was also assumed that the actual growth of the population of working age (men aged 16 to 64; women aged 16 to 59) would be somewhat less than the growth in *total* population because European populations were generally ageing.

The 1970 GNP estimates for the proposed CU members allowed for the stimulating effects of economic integration on economic growth in these countries as well as for exchange rate adjustments in France and West Germany – a depreciation of the Franc and an appreciation of the Mark.

The GNP estimates for the rest of the proposed FTA countries were given in two sets separated by the assumption that a slightly higher growth rate would ensue if a FTA rather than a CU were established. Table 9.5 shows that in 1970 Europe was expected to have a population of about 255 million (about 6 per cent higher than in 1955)and a GNP of nearly £113 billion (about 55 per cent higher than in 1955). The table also shows that consumption expenditure per head of population was expected to increase throughout the area by about 47 per cent during the same period.

With regard to the direction of trade, 1955 intra-European trade was estimated at £5343 million, or 47 per cent of the total exports of the prospective FTA countries. It was assumed that this percentage would be higher in 1970 even without both the proposed FTA and CU, and that the trend would be greatly reinforced if either were established.

It was further assumed that the European direction of trade would give less scope for TD in the proposed FTA than had been the case in

Table 9.5 Estimated growth of Europe's population and GNP: 1955/70

	Total Population ('000)		*Percentage increase in population*	*GNP at constant 1955 prices and exchange rates (£ million)*		*Percentage increase in GNP*	*Annual percentage rate of increase in GNP*	
	1955	*1970*	*1955/70*	*1955*	*1970*	*1955/70*	*1950/55*	*1955/70*
Germany	50 318	52 955	5.2	13 910	24 880[I]	79[I]	9.8	4.0[I]
Belgium/Lux.	9 207	9 460	2.7	3 425	4 845	42	3.1	2.3
France	43 441	46 365	6.7	17 020	23 770[I]	40[I]	4.2	2.3[I]
Italy	48 107	51 890	7.9	7 730	13 555	75	5.9	3.8
Netherlands	10 882	12 410	14.7	2 730	4 645	70	4.9	3.6
CM	161 895	173 080	6.9	44 815	71 695	60	6.0	3.1
UK	51 334	53 370	4.0	19 130	26,940* 27 745[I]	41* 45[I]	2.9	2.3* 2.5[I]
Austria	6 976	6 980	0.1	1 370	2 090* 2 115[I]	52* 54[I]	6.9	2.8* 2.9[I]
Denmark	4 454	4 940	10.8	1 480	2 160* 2 190[I]	46* 48[I]	1.5	2.5* 2.7[I]

Norway	3 441	3 875	12.6	1 210	1 920*	59*	3.5	3.1*
					1 945[I]	61[I]		3.2[I]
Sweden	7 290	7 545	3.5	3 105	4 815*	55*	3.0	3.0*
					4 905[I]	58[I]		3.0[I]
Switzerland	4 990	5 175	3.7	2 190	3 145*	44*	2.6	2.4*
					3 220[I]	47[I]		2.6[I]
FTA	240 380	254 960	6.1	73 295	112 760*	54*	4.9	2.9*
					113 805[I]	55[I]		3.0[I]
FTA excluding UK	189 046	201 590	6.6	54 165	85 820*	58*	5.5	3.0*
					86 060[I]	59[I]		3.1[I]

Notes: (*a*) I allowing for adjustment in exchange rates.
(*b*)* If there is a CM only.
(*c*) I If there is an FTA.
(*d*) Figures may not add to totals because of rounding. The 1955 GNP figures for various countries, being based on OEEC adjusted estimates, may not agree with national statistics. They are intended to indicate orders of magnitude, rather than as firm figures. In the estimates for 1970 no allowance is made for short-term fluctuations.

Source: Economist Intelligence Unit (1957) *Britain in Europe* (London: EIU), p. 10.

BENELUX because, except for the UK, most of the countries involved conducted a high proportion of their trade within Europe (see Table 9.6), and also because non-European trade was indispensable. It was further assumed that TD would be greater in the CU than in the FTA, most particularly at the expense of the UK.

Finally, it was assumed that the exceptional interest of British businessmen in the European market since the announcement of the plan for a FTA would be maintained; that British firms individually and collectively would devote far more attention to Europe; that the opportunities created by free trade would lead them to study the market, to adapt themselves to Continental practices, to design goods suited to European tastes and standards; and that they would change their habits not merely passively as they came face to face with competition, but actively there and then (EIU, 1957, p. 16).

Given this methodology and these assumptions, the EIU then studied individual industries in the UK which covered about 85 per cent of the net output of manufacturing industry (except for food, drink and tobacco) as shown in the 1950 *UK Census of Production*. When changes in the pattern of industrial output were allowed for, these industries accounted for 35 per cent of the 1955 UK GNP.

The EIU reached the conclusion that only a handful of industries, whose output was at most about 15 per cent of those studied, were likely to produce less or employ fewer people if there were a FTA rather than a CU only. Of the remainder, most would produce more and a very few would be comparatively little affected (EIU 1957, p. 36). Hence, their overall conclusion was that the 'greater part of manufacturing industry in the UK would benefit from British membership of an [FTA]. To put it in a less palatable but no less true form the majority of British industries would suffer if a [CU] only were set up' (EIU, 1957, p.36).

The industries studied were classified into five groups:

(i) *Industries gaining*. These were listed in order of the estimated additional increase in output that would be secured by 1970 if a FTA were formed: motor vehicles, chemicals, wool, electrical engineering, general engineering, rubber manufactures, steel, hosiery, and clothing. The relative gains varied widely from 10 to 20 per cent of total output by 1970 for the first two, between 5 and 10 per cent for the next four and 5 per cent or less for the remaining three.

(ii) *Industries which might benefit as much from a FTA as those listed*

Table 9.6 Direction of European trade in 1955 (countries sending less than 50 per cent of exports and/or obtaining less than 50 per cent of imports within Europe)

Percentage of total exports f.o.b.:

				To				
From	*Germany*	*Benelux*	*France*	*Italy*	*UK*	*Scandinavia**	*Austria and Switzerland*	*Total*
Germany	x	16.2	7.1	5.6	4.0	12.7	11.2	56.8
France	10.5	10.0	x	3.9	7.4	3.9	5.2	40.9
Italy	12.5	5.1	5.8	x	7.2	4.5	11.0	46.1
UK	2.6	5.9	2.5	2.0	x	8.3	1.3	22.6

Percentage of total imports c.i.f.:

				From				
Into	*Germany*	*Benelux*	*France*	*Italy*	*UK*	*Scandinavia**	*Austria and Switzerland*	*Total*
Germany	x	13.0	8.7	4.3	3.5	8.9	5.9	44.1
France	9.2	8.4	x	2.2	3.8	3.3	2.5	29.4
Italy	12.7	4.6	6.6	x	5.3	4.0	7.5	40.7
UK	2.3	5.1	3.5	1.4	x	8.0	0.9	21.2

Note: * Denmark, Norway and Sweden.

Source: Economist Intelligence Unit (1957) *Britain in Europe* (London: EIU), p. 15.

in (i), but for which no 1970 production estimate was made: non-ferrous metals, metal manufactures, aircraft, ship-building, oil refining, building materials, glass, scientific instruments etc., and sports goods. The gains were estimated to be nowhere much more than 5 per cent and to be least in building materials and sports goods. The EIU was unable to estimate the order of gain in the others.

(iii) *Industries losing*, i.e. production and/or employment were likely to be lower if a FTA were established: cotton, rayon, paper, leather, and watches and clocks. The EIU did not deem it appropriate to provide a ranking list for this or the following category.

(iv) *Industries which might lose as much as those listed in (iii)*, but where the balance of gain and loss remained doubtful: china, footwear and toys.

(v) *Industries least affected*: railway engineering, jute manufactures and furniture.

Table 9.7 gives the EIU's estimates of the effects on part of the UK trade with the Continent. These estimates covered about 50 per cent by value of UK exports to a Continental FTA in 1955, but only just over 25 per cent of UK imports from it. The difference in coverage was mainly due to the exclusion of food, drink and tobacco, and 'raw materials' which were very significant in the case of the UK.

The EIU did not attempt to calculate the final 1970 balance of UK trade with a Continental FTA since for this purpose it would have been necessary to estimate the trade balance in agricultural products which had been and was presumed to continue to be unfavourable to the UK. Also, no attempt was made to calculate the UK *net balance* of gain and loss in terms of the total value of industrial output and employment in manufacturing by 1970. However, Table 9.8 shows that the greatest gains would be most likely to accrue to the major producers and employers, except for 'cotton', 'rayon', 'weaving' and 'paper'.

Conclusion

The EIU's work is interesting in that it tried to distinguish between the effects of the formation of a FTA which excluded agricultural products and a CU. However, the methodology adopted left a lot to be desired since it was built on a list of assumptions a verification of

Table 9.7 Gains and losses in trade

	UK exports to FTA			*FTA exports to UK*			*Net UK trade with FTA*		
	1955	*1970[a]*	*1970[b]*	*1955*	*1970[a]*	*1970[b]*	*1955*	*1970[a]*	*1970[b]*
Iron and steel (£m)	27	70	45	43	85	50	−16	−15	−5
Non-ferrous metals (£m)	25	40	25	15	45	25	+10	−5	—
Metal manufactures (£m)	15	38	11	7	28	16	+8	+10	−5
General engineering (£m)	108	280	160	44	100	78	+64	+180	+82
Electrical engineering (£m)	29	225	92	15	190	90	+14	+ 35	+2
Passenger cars ('000 units)	69	312	63	12	87	34	+57	+225	+29
Commercials vehicles ('000 units)	17	116	20	*	2	*	+17	+114	+20
Chemicals (£m)	49	125	37	50	108	84	+1	+17	−47
Cotton fabrics (million lb.)	9	29	7	15	44	24	−6	−15	−17
Wool fabrics (million lb.)	15	40	15	7.5	17.5	10	+7.5	+22.5	+5
Man-made fibre fabrics (million yards)	5	50	5	45	150	70	−40	−100	−65
Hosiery (£m)	5	20	5	1.8	12	3	+3.2	+8	+2
Clothing (£m)	4	24	4	2	10	3	+2	+14	+1

Notes: (i) *a* if there is an FTA.
(ii) *b* if there is a CM only.
(iii) * negligible.

Source: Economist Intelligence Unit (1957) *Britain in Europe* (London: EIU), p. 42.

Table 9.8 Production and employment in British manufacturing industry

	Net value of output in 1950 (£m)	*Per cent of total net output*	*Employment in 1955 ('000)*	*Per cent of total employment*
Industries gaining				
Motor vehicles	232	7.2	331	5.1
Chemicals	219	6.8	401	6.2
Wool	142	4.4	209	3.2
Electrical engineering	3	9.6	699	10.8
General engineering	427	13.2	953	14.7
Rubber manufactures	58	1.8	121	1.9
Iron and steel	301	9.3	458	7.0
Hosiery	64	2.0	126	1.9
Clothing	144	4.5	511	7.9
Industries probably gaining				
Non-ferrous metals	81	2.5	116	1.8
Metal manufactures	229	7.1	519	8.0
Aircraft	80	2.5	252	3.9
Shipbuilding and marine engineering	138	4.3	316	4.9
Oil refining	17	0.5	37	0.6
Building materials	93	2.9	101	1.6
Glass	38	1.2	75	1.2
Scientific instruments, etc.	42	1.3	91	1.4
Sports goods	3	0.1	—*	—*
Industries losing				
Cotton	155	4.8	274	4.2
Man-made fibres	69	2.1	95	1.5
Paper	121	3.7	199	3.1
Leather	33	1.0	37	0.6
Watches and clocks	6	0.2	19	0.3
Industries probably losing				
China	29	0.9	79	1.2
Footwear	55	1.7	121	1.9
Toys	10	0.3	—*	—*
Industries least affected				
Railway vehicles	77	2.4	163	2.5
Furniture	49	1.5	138	2.1
Jute	7	0.2	20	0.3
Total	3 229	100.0	6 492	100.0

Notes: (a) The table is intended only as a rough guide to the relative importance of various industries.

(b)* Employment in toys and sports goods industries = 31 000 (5 per cent of total employment).

Source: Economist Intelligence Unit (1957) *Britain in Europe* (London: EIU), p. 43.

which should be the aim of empirical estimation of the impact of international economic integration: does economic integration affect the rate of growth? does it affect the pattern of trade? and if so, in what way would it do so? would business mentality be changed in the face of enhanced competition from the partner countries? would there be both TC and TD? if so, which one would predominate? The study by the EIU did not address any of these questions; it simply assumed that they could be answered in a manner consistent with what the theory of economic integration specifies as the necessary conditions for determining an economically rational outcome from CU formation.

JOHNSON'S CONTRIBUTION

Johnson made three contributions in this field (1957; 1958a; 1958b), but most of these are criticisms or scrutinies of attempts by others at the quantitative estimation of the economic effects of Western European integration. However, one of his contributions was devoted to a new approach to calculating the gains and losses for the UK from joining or abstaining from a European FTA.

The many effects of economic integration stated in Part I of this book could be condensed into three: static resource reallocation effects, dynamic effects, and terms of trade effects. Professor Johnson was of the opinion that for the UK, the only important source of benefit would come from increased specialisation and division of labour, particularly since the dynamic effects (then interpreted to mean enhanced competition) were thought too difficult to define, let alone quantify. To estimate these gains, he utilised the data provided by the EIU.

Johnson drew attention to the fact that the way given by the EIU for deriving the increase in the value of trade for the UK from trade with Continental Europe did not actually measure the gains that would have resulted from the FTA since exports consumed resources that could have been used in other ways, and imports must be financed by exports. He elaborated on this in the following fashion.

On the export side, the gains arise from the opportunity to sell a country's products on better terms than would have been possible otherwise, and these could be measured by the loss of income that would have resulted if the productive factors employed in meeting the additional demand created by the FTA had to be diverted to producing for the domestic or other foreign markets. He claimed that this loss was not estimable on the information available to him, but argued that it would not have been great since manufactures were fairly close substitutes in world markets. However, he claimed that it was possible to fix a maximum for the loss, since at the very worst the prices of the products concerned could have been lowered enough to overcome the disadvantages of the EC tariff and permit their disposal in Europe.

This approach led to two estimates, according to what was assumed about the nature of the market and the price reductions necessary to offset the tariff. If the prices of all exports to Europe had to be reduced to the same extent, the maximum loss estimate would have been the value of exports to Europe under a FTA multiplied by the proportion in the final price of the EC tariff rate which had to be offset. This proportion was related to the tariff rate by the formula

$$p = t/(1 - t),$$

where p is the proportion and $100t$ per cent is the *ad valorem* rate of duty on imports. Johnson pointed out that this estimate would have been unrealistically large, since the prices of some products to some markets could have been maintained while others were being lowered. At the opposite extreme, price reductions might have been confined to the minimum necessary to promote the particular transactions which would not have taken place in the absence of a FTA. In such a case, the maximum loss estimate would have been (approximately) the value of the difference in exports to Europe due to the FTA multiplied by half the proportion of the relevant tariff rate in the final price since the price reductions that would have been required to offset the full weight of the tariff would have been necessary only in extreme cases.

For either estimate, it was essential to calculate the EC's CET. Johnson gave approximate values for these – the CETs as well as the alternative estimates are given in Table 9.9. It should be noted that the maximum possible total loss for the industries considered using the first assumption would have been £192 million annually. If the second assumption had been used, the maximum loss would have

Table 9.9 Estimated maximum gains on exports from a FTA

Industry	*Assumed CM tariff rate (%)*	*Total exports to a FTA 1970*		*Additional exports under a FTA as against CM 1970*	
		Value (£m)	*Maximum loss estimate (£m)*	*Value (£m)*	*Maximum loss estimate (£m)*
Iron and steel	10	70	6.4	25	1.1
Non-ferrous metals	10	40	3.6	15	0.7
Metal manufactures	17.5	38	5.7	27	2.0
General engineering	17.5	280	41.7	120	8.9
Electrical engineering	17.5	225	33.5	132	9.8
Chemicals	17.5	125	18.6	88	6.6
Hosiery	20	20	3.3	15	1.2
Clothing	20	24	4.0	20	1.7
Passenger cars	30	187	43.2	149	17.2
Commercial vehicles	30	70	16.1	58	6.7
Cotton fabrics	17	17	2.5	13	0.9
Wool fabrics	17	50	7.2	31	2.3
Man-made fibre fabrics	20	38	6.3	34	2.8
Totals		1 184	192.1	727	61.9

Note: Assumed unit values: passenger and commercial vehicles £600, cotton fabrics 12 shillings per pound, wool fabrics 25 shillings per pound, and man-made fibre fabrics 15 shillings per yard.

Source: H. G. Johnson (1958) 'The gains from freer trade with Europe', *Manchester School*, vol. 26, p. 250.

been only £62 million per annum. Johnson emphasised that these were maximum estimates obtained on the assumption that the commodities under consideration were worthless outside Continental Europe.

With regard to imports, Johnson pointed out that the gains from freer trade with Europe would have arisen from the opportunities provided to consume imported goods in place of more expensive

domestically-produced commodities to which the consumer had previously been attracted because of the tariff. He claimed that these gains could be measured by the additional tariff revenue that the government could have collected if it had reduced the tariff on each item of the additional imports from the FTA just sufficiently to induce the purchaser to buy it. He pointed out that whether the tariff reduction was assumed to apply to the previous volume of imports did not matter since this would have affected merely the distribution of income between the purchasers of these goods and the government. The gains would be approximately equal to the change in the value of imports from the FTA multiplied by half the tariff rate that had previously been levied.

The gains estimated from this source are given in the fourth column of Table 9.10. They amounted to £28 million per year.

Johnson then pointed out that the abolition of tariffs on trade with a European FTA would no doubt have influenced the value of trade with *W*, hence affecting the tariff revenues collected on them. These gains should be calculated and added to the gains from increased imports from Europe. Johnson's estimates of the difference that a FTA, as against a 'common market' only, would have made to UK imports from *W* are given in the sixth column of Table 9.10; they amounted to £3.5 million per annum. Johnson found this figure rather suspect and attributed this to the EIU's assumptions regarding the rate of growth of GNP in a FTA and a CU.

When exports and imports were considered together, the maximum possible gains on the export side were about £62–192 million per annum and the gains on the import side were £31 million per annum for the industries considered. Johnson pointed out that these figures suggested orders of magnitude for the UK economy *as a whole* of about £125–400 million annually as the maximum gains on the export side, and about £100 million as the gains on the import side (bearing in mind that the industries considered were more important in exports than in imports). If the minimum figure for the maximum export gains were regarded as an approximation (probably excessive in Johnson's opinion) to the likely gains on that side, this would have implied total gains of the order of £225 million annually – a difference of about 1 per cent of what the EIU had estimated the UK GNP to be in 1970.

In spite of the fact that his estimates were very crude indeed, Johnson was of the opinion that this order of magnitude was most unlikely to be substantially affected by considerable changes in the

Table 9.10 Estimated gains on imports from a FTA

Industry	*Assumed British tariff rate (%)*	*Additional imports from a FTA 1970*		*Additional imports from other countries 1970*		*Total gain or loss*
		Value (£m)	*Estimated gain (£m)*	*Value (£m)*	*Estimated gain (+) or loss (–) (£m)*	
Iron and steel	10	35	1.8	−21	−2.1	−0.3
Non-ferrous metals	15	20	1.5	+30	+4.5	+6.0
Metal manufactures	20	12	1.2	−2	−0.4	+0.8
General engineering	17.5	22	1.9	+ 3	+0.5	+2.4
Electrical engineering	17.5	100	8.8	0	0.0	+8.8
Chemicals	17.5	24	2.1	−12	−2.1	0.0
Hosiery	20	9	0.9	+2	+0.4	+1.3
Clothing	20	7	0.7	+1	+0.2	+0.9
Passenger cars	30	32	4.8	0	0.0	+4.8
Commercial vehicles	30	1	0.2	0	0.0	+0.2
Cotton fabrics	17.5	10	0.9	+6	+1.0	+1.8
Wool fabrics	17.5	5	0.5	+1	+0.2	+0.7
Man-made fibre fabrics	22.5 + 11 *d* per lb.	12	2.5	+3	+1.3	+3.8
Totals		290	27.7	+11	+3.5	+31.2

Note: Assumed unit values: passenger and commercial vehicles £600, cotton fabrics 10 shillings per pound from a FTA, 5 shillings per pound from the rest, wool fabrics 15 shillings per pound, man-made fibre fabrics 3 shillings per yard and 5 oz. per yard.

Source: H. G. Johnson (1958) 'The gains from freer trade with Europe', *Manchester School*, vol. 26, p. 253.

assumed unit values or tariff rates on which they were based. He attributed this entirely to the way the estimates were calculated.

Conclusion

Given historical incidence, Johnson's method was very interesting indeed. However, it did concentrate entirely on the *static effects* of

economic integration. Moreover, his calculations were based on the estimates made by the EIU for 1970, and as pointed out in the previous section, these are subject to some severe criticisms.

Other criticisms of Johnson's method will reveal themselves later: as stated earlier, new significant contributions are by implication a criticism of previously published estimates. However, one major criticism still remains. Johnson assumed that there was not much room for economies of scale for the UK since at that time Britain had access to a very wide market. This missed the point that it is not the geographical spread but the purchasing power and similarity of consumption patterns that determines the scale of consumption; hence the scope for economies of scale. True, at that time the UK had easy access to the markets of the Commonwealth countries, but most of these were developing economies, while the European markets were not only just across the English Channel but also had *broadly* similar incomes per head of population and consumption patterns. Hence, this assumption left a lot to be desired since, as a minimum, it needed a proper investigation in its own right.

CONTRIBUTIONS AFTER JOHNSON'S AND BEFORE BALASSA'S

After Johnson's (1957) contribution and before the next major work by Professor Balassa in 1967, there are a number of significant studies, particularly on the methodology of the empirical testing of the economic effects of Western European integration (Major, 1962; Tinbergen, 1962; Lamfalussy, 1963; Poyhonen, 1963a; Pulliainen, 1963; Verdoorn and Mayer zu Schlochtern, 1964; Waelbroeck, 1964a; Clavaux, 1964; GATT, 1967). Some of these are considered in this section, not because they do not merit individual sections of their own, but rather because space limitations dictate that only very substantial undertakings should be so dealt with, and these studies concentrate on the sophistication of existing approaches and make largely similar points. Hence, the first part of this section is devoted to a brief general survey of this literature with the remaining part being exclusively devoted to a somewhat detailed examination of a representative study.

A General Survey

In most of the discussion on the actual effects of economic integration on the flow and pattern of trade, the rise of intra-bloc trade as a proportion of the total (intra- and extra-bloc trade) exports and imports of the EC countries had often been interpreted as evidence of the TC effects of this bloc. However, such results could be due to the increasing importance of the EC in world markets and the changing competitive position of the EC in world markets. In order to allow for the influence of the latter factors, Lamfalussy (1963) suggested that one should compare changes in the share of the EC, as an important market, in the exports of member nations and *W*, and should examine the relative performance of the EC countries in the EC markets as well as in *W*. Lamfalussy did precisely that by considering the changes in trade flows between 1958 and 1960 as well as between 1960 and 1962 (first three quarters). He found no clear evidence of either a positive (trade-creating) or a negative (trade-diverting) effect of the EC. Major (1962), of the National Institute of Economic and Social Research (UK), examined the share of individual exporters in the EC imports of eleven major commodity groups to reach conclusions similar to Lamfalussy's.

Although Lamfalussy's method avoided the problem of arguing from a comparison of the relative proportions of intra- and extra-bloc trade, it was open to the objection that, by proceeding in a piecemeal fashion, it did not provide fully consistent results. To remedy this shortcoming, Waelbroeck (1964) proposed that comparisons be made between *actual* and *hypothetical* trade flows, with the latter being calculated under the assumption that the structure of world trade as indicated by the relevant world trade matrix of an earlier year *remained unchanged*. This procedure amounted to the application of a solution for examining changes in input–output tables which was suggested at the time. Extrapolating the 1951–2 world trade matrix to 1959–60, and the 1960 matrix to 1962 and the first half of 1963, Waelbroeck concluded that the existence of an 'EC effect' on the composition of world trade 'can hardly be doubted' (Waelbroeck, 1964b). Using a similar method, Verdoorn and Mayer zu Schlochtern (1964) reached analogous conclusions. However, Waelbroeck was quick to stress that the results obtained by following his procedure did not permit one to conclude whether the observed 'deformation' of the world trade matrix was due to TC or TD, since the finding that

actual intra-EC trade exceeded hypothetical trade, calculated under the assumption of an unchanged composition of world trade, was compatible with both TC and TD: increased trade between member countries of the EC could have been due either to enhanced trade between them made possible by the elimination of intra-bloc tariffs or by trade diverted from *W* to trade with the partners.

In order to estimate the extent of TC and TD caused by the formation of the EC, Waelbroeck suggested the application of a method used by Tinbergen (1962) and the two Finnish economists Poyhonen (1963a,b) and Pulliainen (1963). These three tried to explain trade flows by using regression analysis, with GNP and geographical distance as the main determining variables. The Finnish economists used the following formula to describe the factors influencing the exports of country i to country j:

$$x_{ij} = cc_ic_j[y_i^a y_j^b / r_{ij}^b]$$

where y_i and y_j are the two countries' respective GNPs, c_i and c_j are their export and import parameters indicating the extent of openness of their economies, r_{ij} is the distance between them and c is a scale factor.

Waelbroeck had assumed that the coefficients c, c_i and c_j would remain unchanged over time, and utilised the values of the coefficients (a) and (b), estimated from a cross-section investigation of world trade in 1958, to extrapolate the matrix of world trade from 1958 to 1962. Comparing the hypothetical trade figures derived by the use of this method with actual trade, he found that intra-EC trade increased considerably more than the model used by the two Finnish economists would have led him to expect. At the same time there was no evidence of TD on imports from North America and from the EFTA countries, inasmuch as actual imports exceeded hypothetical imports in trade with these two areas.

However, similar developments had taken place between 1954 and 1958. Hence, these results did not provide clear evidence of the effects of TC and TD of the EC. In any case, it is quite reasonable to shed doubt on the validity of an approach which applied average income elasticities of export supply and import demand, calculated in a cross-section analysis of *all* trading countries, to the EC. Indeed, there is evidence to suggest that these elasticities are generally higher in the industrial economies, and lower in the LDCs, 'since increased international specialisation within the manufacturing sector tends to raise the share of foreign trade in [GNP] in the former group of

countries, while industrialisation cum protectionism have the opposite effect on the latter. Thus, the relatively high income elasticities of export supply and import demand in the [EC] countries will explain, in part, the presumed internal *and* external trade creation' (Balassa, 1967b, p. 3). Moreover, a consideration of total exports and imports is of only limited interest due to the fact that the aggregate results may conceal changes in opposite directions with respect to particular commodities and commodity groups.

In a cross-section analysis of 38 commodities, Verdoorn and Meyer zu Schlochtern (1964) tried to explain inter-commodity differences in the expansion of EC imports by using as explanatory variables a weighted average of internal and external tariff reductions and an index representing 'effective import demand'. The latter was calculated as an unweighted average of the rates of change of imports of the commodities in question into Denmark, Sweden, Switzerland and the UK; this was taken to reflect the expansion of trade that would have taken place in the absence of the formation of the EC.

This approach may need elaboration. Verdoorn and Meyer zu Schlochtern started with the assumption that the effect of a given tariff reduction on mutual trade depended on both the price elasticities of demand and supply. They then reached the formula:

$$A_{ij} = [X_{ij}(2 - m_{ij} - b_{ij})]/[(1 - b_{ij})M_i + (1 - m_{ij})B_j]$$

where: m_{ij} is the initial import share of j in i; b_{ij} is the initial export share of i in j's total exports; M_i is a value-index of i's total imports; B_j is a value-index of j's total exports; X_{ij} is a value-index of exports of j to i; and A_{ij} is an 'apparent integration effect'.

According to this formula, any deviation of A_{ij} from unity can be attributed to any of three factors: (i) a change in X_{ij}/M_i; (ii) a change in X_{ij}/B_j; and (iii) $M_i \gtrless B_j$. A change in M_i greater or smaller than in B_j will cause a change in X_{ij}/M_i if $X_{ij} = B_j$, and in X_{ij}/B_j if $X_{ij} = M_j$. The value of A_{ij} will in this case be unequal to unity. It will exceed unity if: (i) $X_{ij} = B_j$; (ii) $M_i < B_j$ or if; (iii) $X_{ij} = M_i$; and (iv) $M_i > B_j$. It will be less than unity if: (v) $X_{ij} = B_j$; (vi) $M_i > B_j$ or if; (vii) $X_{ij} = M_i$; and (viii) $M_i < B_j$. When X_{ij}, M_i and B_i are not equal, the direction of change of A_{ij} is indeterminate.

Utilising this methodology, Verdoorn and Meyer zu Schlochtern reached the conclusion that, depending on the form of the regression equation used, the apparent impact of the tariff changes on trade corresponded to an elasticity of minus 2.1 or 3.9 with respect to price, when the latter, but not the former, was significantly different from

zero at the 5 per cent confidence level. To the authors, these results seemed to provide evidence of TC only as the effect of the formation of the EC.

The authors regarded a value of A_{ij} greater than unity as an indication of TC in the EC, and a value less than unity as one of TD. However, A_{ij} can exceed unity because of an increase in the share of intra-EC exports (X_{ij}/B_i) and it can be smaller than unity because of a decline in either X_{ij}/M_i or X_{ij}/B_j. Moreover, the total exports and imports which were used to calculate A_{ij} could themselves have been influenced by the TC and TD which could have taken place during the period covered by the study, and since this analysis cannot distinguish between TC and TD, the results should be viewed with a great deal of scepticism since these results, given the stated criticism, seem to provide evidence of *both* TC and TD. Moreover,

> the method utilised is open to the usual objections against calculating substitution elasticities from cross-section data. Further, one may question the validity of using the data of four [EFTA] countries with lower growth and rather different economic structures as a yardstick for the expansion of trade that would have taken place in the absence of the [EC's] establishment, especially in view of the fact that by 1962 – the terminal year of the calculations – there might have already been an '[EFTA] effect' (Balassa, 1967b, p. 5).

The GATT Study

The GATT Secretariat's study (1967) utilised a similar method to that employed by Major (1962) and Lamfalussy (1963). It is therefore subject to the same criticisms made against these studies. In spite of this, there is a good reason why space should be devoted to this study: the results may provide a useful check on the order of magnitude of the total integration effects obtained by the other methods.

GATT used a sample which utilised about one hundred commodity groups of carefully selected and well defined products; they excluded 'fuels', 'oil seeds', 'mineral ores', 'natural textile fibres', 'non-ferrous metals' (except aluminium) and 'tropical beverages'. The authors stressed that the excluded products amounted to about 15 per cent of total European imports in the case of primary goods and less than 3 per cent in the case of manufactured commodities.

1955, 1960 and 1965 were used as reference years. Attention was drawn to the fact that the choice of these years may have led to

imprecisions in the calculations since 1955 and 1960 were years of marked economic expansion while 1965 was one of moderate growth, but the authors were of the opinion that the degree of imprecision was not likely to have been substantial.

The results were given separately for primary products and for manufactured commodities since the former are excluded from the EFTA arrangements and the *common agricultural policy* (CAP) was only partially formulated and implemented during 1960–65. The overall results of this investigation are to be found in Tables 9.11, 9.12 and 9.13.

Before presenting the conclusions of this study, it is necessary to explain some of the terminology used in the tables. Changes in the relative shares of an exporting area in the market of an integrated region were attributable to:

(i) the 'relative importance of markets', which took account of the fact that an area whose exports to a regional grouping went mainly to the markets of member countries of the integrated area whose imports had grown most rapidly, gained an advantage from this more rapid economic growth;
(ii) the 'commodity composition', which took note of the fact that for each importing country, import requirements developed in a different way for different commodity groups – an area whose exports were mainly composed of products that had experienced a rapid import increase gained an advantage from this rapid increase; and
(iii) 'the residual deviation', i.e. the negative or positive changes in the share of an exporting area in the market of a regionally integrated bloc due to the operation of factors other than (i) and (ii), which embodied the influence of the formation of the regional bloc as well as of factors such as other changes that could have occurred in the competitive position of an exporting country.

The calculation of the 'residual deviation' was made on the assumption that, had none of the relevant factors distorted the picture, the share of an exporting country in the market of an integrated grouping would have remained the same at the end as at the beginning of a reference period.

The study's conclusions were:

(i) The exports of *W* to the EC and EFTA rose less rapidly between

Table 9.11 Evolution of imports of primary commodities into EC and EFTA countries and changes in the respective shares of three groups of countries of origin, 1955–60 and 1960–65 ($ billion and percentages)

Regions of origin and periods	EC						EFTA					
		Deviations						Deviations				
	Actual trade end of period	Total	Relative importance of markets	Commodity composition	Residual deviation	Residual deviation as percentage of actual trade	Actual trade end of period	Total	Relative importance of markets	Commodity composition	Residual deviation	Residual deviation as percentage of actual trade
Period 1955–60												
EC	1.86	+0.30	+0.02	+0.12	+0.16	+9	0.79	−0.02	+0.03	−0.03	−0.08	−10
EFTA	1.25	−0.12	+0.04	+0.10	−0.26	−21	0.99	+0.03	+0.01	+0.10	−0.08	−8
Third countries	4.91	−0.18	−0.06	−0.22	+0.10	+2	4.70	−0.01	−0.04	−0.13	+0.16	+3
Total	8.02						6.48					
Period 1960–65												
EC	3.39	+0.61	+0.01	+0.24	+0.36	+11	1.14	+0.19	+0.07	+0.04	+0.08	+7
EFTA	1.67	−0.21	+0.02	−0.05	−0.18	−11	1.34	+0.14	−0.01	+0.04	+0.11	+8
Third countries	6.95	−0.40	+0.03	−0.19	−0.18	−3	5.27	−0.33	−0.06	−0.08	−0.19	−4
Total	12.01						7.75					

Note: (a) See text for a definition of deviation. (b) This table covers sample products.

Source: GATT (1967) *International Trade 1966* (Geneva: GATT), p. 22.

Table 9.12 Evolution of imports of manufactures into EC and EFTA countries and changes in the respective shares of three groups of countries of origin, 1955–60 and 1960–65 ($ billion and percentages)

Regions of origin and periods	*EC*						*EFTA*					
		Deviations						*Deviations*				
	Actual trade end of period	*Total*	*Relative importance of markets*	*Commodity composition*	*Residual deviation*	*Residual deviation as percentage of actual trade*	*Actual trade end of period*	*Total*	*Relative importance of markets*	*Commodity composition*	*Residual deviation*	*Residual deviation as percentage of actual trade*
Period 1955–60												
EC	6.44	+0.19	−0.13	−0.21	+0.53	+8	4.96	+0.18	+0.07	+0.01	+0.10	+2
EFTA	2.51	−0.40	+0.09	+0.11	−0.60	−24	2.13	−0.30	−0.08	−0.03	−0.19	−9
Third countries	2.57	+0.21	+0.40	+0.10	+0.07	+3	2.76	+0.12	+0.01	+0.02	+0.09	+3
Total	11.52						9.58					
Period 1960–65												
EC	13.85	+1.40	−0.08	+0.14	+1.34	+10	7.13	−0.27	+0.13	+0.15	−0.55	−8
EFTA	4.12	−0.71	+0.01	+0.16	−0.88	−21	3.93	+0.56	+0.04	+0.08	+0.44	+11
Third countries	4.27	−0.69	+0.07	−0.30	−0.46	−11	4.17	−0.29	−0.17	−0.23	+0.11	+3
Total	22.24						15.23					

Note: (a) See text for a definition of deviation. (b) This table covers sample products.

Source: GATT (1967) *International Trade 1966* (Geneva: GATT), p. 24.

Table 9.13 Evolution of imports into EC and EFTA countries by groups of manufactures, 1955–60 and 1960–65 ($ billion and percentages)

Regions of origin and groups of products	*EC*						*EFTA*					
	Actual trade in 1960	*1955–60 Residual deviation*	*Ratio between deviation and trade*	*Actual trade in 1965*	*1960–65 Residual deviation*	*Ratio between deviation and trade*	*Actual trade in 1960*	*1955–60 Residual deviation*	*Ratio between deviation and trade*	*Actual trade in 1965*	*1960–65 Residual deviation*	*Ratio between deviation and trade*
EC												
Chemicals	0.76	—	—	1.68	+0.30	+18	0.65	+0.01	+2	1.07	+0.03	+3
Metals, road motor vehicles	2.10	+0.17	+8	3.95	+0.29	+7	1.33	+0.05	+4	1.83	−0.14	−8
Machinery, miscellaneous articles	2.58	+0.25	+9	5.89	+0.50	+8	1.94	—	—	3.26	−0.24	−7
Textiles	0.89	+0.06	+7	2.14	+0.21	+10	0.60	−0.04	−7	0.74	−0.15	−21
Total[a]	6.44	+0.53	+8	13.85	+1.34	+10	4.69	+0.10	+2	7.13	−0.55	−8
EFTA												
Chemicals	0.35	−0.04	−11	0.54	−0.10	−18	0.27	−0.02	−6	0.49	+0.03	+7
Metals, road motor vehicles	0.49	−0.12	−24	0.79	−0.09	−12	0.49	+0.04	+9	0.87	+0.17	+19
Machinery, misc. articles	1.34	−0.28	−21	2.31	−0.50	−21	0.95	−0.12	−12	1.79	+0.13	+7

Textiles	0.28	−0.10	−34	0.40	−0.20	−50	0.24	−0.02	−8	0.51	+0.11	+23
Total[a]	2.51	−0.60	−24	4.12	−0.88	−21	2.13	−0.19	−9	3.93	+0.44	+11
EFTA and EC combined												
Chemicals	1.11	−0.04	−4	2.22	+0.20	+9	0.92	−0.01	−1	1.56	+0.06	+4
Metals, road motor vehicles	2.59	+0.05	+2	4.74	+0.20	+9	1.82	+0.09	+5	2.70	+0.03	+1
Machinery, mis. articles	3.92	−0.03	−1	8.20	—	—	2.89	−0.12	−4	5.05	−0.11	−2
Textiles	1.17	−0.04	−3	2.54	+0.01	—	0.84	−0.06	−7	1.25	−0.04	−3
Total	8.95	−0.07	−1	17.97	+0.46	+3	6.82	−0.09	−1	11.06	−0.11	−1
Third countries												
Chemicals	0.56	+0.04	+8	0.83	−0.20	−25	0.42	+0.01	+2	0.66	−0.06	−10
Metals, road motor vehicles	0.43	−0.05	−13	0.50	−0.20	−39	0.49	−0.09	−19	0.55	−0.03	−5
Machinery, mis. articles	1.05	+0.03	+3	2.20	—	—	1.22	+0.12	+10	2.12	+0.11	+5
Textiles	0.22	+0.04	+16	0.48	−0.01	−3	0.42	+0.06	+15	0.62	+0.04	+6
Total[a]	2.57	+0.07	+3	4.27	−0.46	−11	2.76	+0.09	+3	4.17	+0.11	+3

Note: (i) [a] Including products not listed separately.
(ii) This table covers sample products. The ratio between deviations and trade has been calculated before rounding. In some cases, the calculations made from the figures given in the table would show slightly different results.

Source: GATT (1967) *International Trade 1966* (Geneva: GATT), p. 27.

Table 9.14 Evolution of total imports into EC and EFTA countries from all origins and from third countries between 1960 and 1965 ($ billion and index numbers 1960 = 100)

	EC				*EFTA*			
	All origins		*Third countries*[a]		*All origins*		*Third countries*[a]	
	Value in 1965	*1965 (1960 = 100)*	*Value in 1965*	*1965 (1960 = 100)*	*Value in 1965*	*1965 (1960 = 100)*	*Value in 1965*	*1965 (1960 = 100)*
Sample products	34.25	176	11.22	150	22.98	143	9.44	126
Primary products	12.01	149	6.95	141	7.75	119	5.27	112
Manufactures	22.24	194	4.27	168	15.23	160	4.17	149
Other products[b]	13.49	140	9.89	135	8.49	121	6.21	115
Non-European products	6.25	123	4.68	114	3.73	114	3.10	110
Fuels	5.47	156	4.38	170	3.13	126	2.10	126
All products listed	47.74	164	21.11	143	31.47	136	15.66	121

Notes: (i) a = countries outside EC and EFTA.
(ii) b = including products not listed separately.

Source: GATT (1967) *International Trade 1966* (Geneva: GATT), p. 35.

Table 9.15 Evolution of export prices[a] for manufacturers in the EC and three EFTA countries

	Evolution 1955–60 (1955 = 100)	*Evolution 1960–65 (1960 = 100)*
EC	102	106
United Kingdom	111	110
Sweden	110	108
Switzerland	103	117

Note: *a* = Expressed in dollars.

Source: GATT (1967) *International Trade 1966* (Geneva: GATT), p. 29.

1960 and 1965 than the total imports of these two groupings as shown in Table 9.14. If exports by *W* to both areas had been able to grow at the same rate as total imports of the EC and EFTA since 1960, they would have reached $42 billion in 1965, i.e. they would have been $5 billion more than the actual figures.

(ii) Very negative 'residual deviations' were recorded for exports of manufactured products from North America between 1960 and 1965, whereas Japan and, to some extent, European countries not belonging to either the EC or EFTA were able to increase their shares in the markets of these two regional groupings. With regard to primary products, North America was able to maintain its share in the European markets while the exports of the rest of *W* were accompanied by 'residual deviations'.

(iii) For intra-European trade taken *as a whole*, 'residual deviations' between 1960 and 1965 amounted to 1 per cent of the transactions carried out in 1965 in the case of manufactured products and about 5 per cent in the case of primary commodities. Nevertheless, especially for manufactured commodities, trade between the EC and EFTA developed substantially less rapidly than trade between countries belonging to each of these two blocs. In the absence of 'residual deviations', the trade in manufactured commodities between the EC and EFTA would, in 1965, have been 5 per cent higher than the figure actually achieved, and the internal trade of each bloc would have been reduced by about 10 per cent.

(iv) These changes in the share of Western European markets were wholly attributed to the formation of the EC and EFTA. The authors of the study claimed (GATT, 1967, pp. 34–6) that this

was clear enough in the case of agricultural products, which had been only partly included in the arrangements in force during 1960–65. In the case of industrial products, the trend in the exports of the different countries had then recently been influenced by divergent movements of prices and, more generally, by the various factors which had an influence on the competitive capacity of the different countries – see Table 9.15.

10 Estimating the Impact of Integration on Manufactures: More Sophisticated Attempts

The previous chapter was devoted to a survey of some of the earlier attempts at the quantitative estimation of the effects of economic integration. This chapter aims at tackling some of the later and more sophisticated studies. It begins by considering Balassa's work and goes on to discuss those of the Secretariat of the European Free Trade Association (EFTA, 1969; 1972), Williamson and Bottrill (1971), Kreinin (1972), and finishes with Aitken's (1973) contribution. The following chapter will tackle the most recent attempts.

BALASSA'S CONTRIBUTION

A major contribution to the empirical testing of the economic effects of Western European integration was made by Balassa (1967b); he had already made three relevant studies (1963a, b, c) and the 1967 study can be seen as a culmination of earlier attempts by him, with his 1974 paper simply providing a reassessment of his major contribution.

Balassa wanted a method that would:

(i) omit the influence of economic growth on trade flows;
(ii) make it possible to distinguish between trade creation (TC) and trade diversion (TD);
(iii) make it possible to disaggregate the results by main commodity groups; and
(iv) show the effects on individual supplier countries.

He proposed that a comparison of *ex post* income elasticities of import demand (defined as the ratio of average annual rate of change of imports to that of GNP at constant prices) in intra-bloc and extra-block trade, for periods prior to and after economic integration, may take care of the first two aspects of the problem: assuming

that income elasticities of import demand for intra-area imports would have remained the same in the absence of economic integration, a rise in the income elasticity of demand for intra-area imports would indicate 'gross trade creation' (GTC, i.e. new trade created as well as diverted from the rest of the world, *W*), while an increase in the import elasticity of demand for imports from *all* sources of supply would give rise to TC proper. In turn, a fall in the income elasticity of demand for extra-bloc imports would provide evidence of the trade diverting effects of the integrated bloc.

If one makes the following definitions:

e_1 = average annual rate of change of imports before integration,
e_2 = average annual rate of change of imports after integration,
E_1 = average annual change of GNP before integration, and
E_2 = average annual change of GNP after integration,

Balassa's hypotheses can be expressed as:

(i) if in intra-area trade

$$e_1/E_1 < e_2/E_2$$

there would be GTC; and

(ii) if in trade with the *W*

$$e_1/E_1 > e_2/E_2$$

there would be TD.

Balassa assumed that the formation of the European Community (EC) had been the most important factor to influence trade flows between the participating nations so that long-term effects and other 'special factors' would have no appreciable influence on the relationship between imports and GNP during the period under consideration. He therefore claimed that for a comparison of the relationship of internal and external trade to GNP between the pre- and post integration periods, his method allowed for changes in the growth rate of national income and provided comparable estimates of TC and TD. He also claimed that his method took care of the remaining two problems.

The commodity categories considered were: beverages and tobacco, chemicals, fuels, machinery, other manufactured goods, raw materials, temperate zone foods and transport equipment. The period 1953–9 was taken to represent the pre-integration period and 1959–5 the post-integration period.

Balassa claimed that his method of using *ex post* income elasticities of import demand for all commodities lumped together gave evidence of TC in the EC and no evidence of TD – see Table 10.1. Between the periods 1953–9 and 1959–65 the elasticity rose from 1.8 to 2.1 with respect to total (intra- and extra-area) imports, it rose from 2.4 to 2.8 for intra-area trade and it remained virtually unchanged for imports from *W* (1.6 as against 1.7). He was, of course, quick to add that these and other results should be considered as indicative of general tendencies rather than expressing exact magnitudes.

However, the results for the different commodity groups varied considerably. There was no evidence of TC in beverages and tobacco and food, while there was evidence of TD in food and raw materials. On the other hand, fuel showed an increase in extra-area imports and Balassa attributed this to a 'deliberate' EC policy.

Balassa observed that, except for semi-manufactures, the formation of the EC appeared to have led to TC in manufactured products. At the same time, he found no evidence of TD in two of these commodity groups, and took the increase in the income elasticity of demand for extra-area imports with regard to machinery and transport equipment to indicate 'external trade creation' (ETC). He suggested that the enhanced purchases of machinery from *W* were due to the investment boom that accompanied the formation of the EC.

Balassa then analysed the factors which influenced the export performance of third countries in the EC–see Table 10.2. He separated these factors into:

(i) a 'common market effect', which was the difference between two sets of estimates of hypothetical imports into the EC, calculated by applying actual growth rates of total extra-area imports in the periods 1959–65 and 1953–9 respectively to the 1959 imports of the main commodity groups:
(ii) a 'competitive effect', which was determined by the changes in the shares of the seven supplying areas in the extra-area imports of these commodity categories into the EC; and
(iii) a 'price effect', which measured the difference between imports expressed in current and constant prices.

Table 10.2 is otherwise self-explanatory. Balassa concluded by stating that the continuation of past trends in the extra-area imports of the eight commodity groups would have led to relatively small

Table 10.1 Ex-post income elasticities of import demand in the European Common Market

		Annual rate of growth		*Ex-post income elasticity of import demand*		
		1953–9	*1959–65*	*1953–9*	*1959–65*	*Difference*
Total imports						
0 + 1 − 07	Non-tropical food, beverages, tobacco	9.0	8.3	1.7	1.6	−0.1
2 + 4	Raw materials	5.9	5.9	1.1	1.1	0
3	Fuels	8.9	12.2	1.6	2.3	+0.7
5	Chemicals	16.1	18.0	3.0	3.3	+0.3
71 + 72	Machinery	8.0	15.4	1.5	2.8	+1.3
73	Transport equipment	14.2	18.4	2.6	3.4	+0.8
6 + 8	Other manufactured goods	14.4	13.3	2.6	2.5	−0.1
0 to 8 − 07	Total of above	9.6	11.2	1.8	2.1	+0.3
Intra-area imports						
0 + 1 − 07	Non-tropical food, beverages, tobacco	13.8	13.2	2.5	2.4	−0.1
2 + 4	Raw materials	10.3	10.3	1.9	1.9	0
3	Fuels	5.9	7.0	1.1	1.3	+0.2
5	Chemicals	16.2	21.4	3.0	4.0	+1.0

71 + 72	Machinery	11.3	16.9	2.1	3.1	+1.0
73	Transport equipment	15.6	20.6	2.9	3.8	+0.9
6 + 8	Other manufactured goods	15.1	15.8	2.8	2.9	+0.1
0 to 8 − 07	Total of above	12.8	15.1	2.4	2.8	+0.4
Extra-area imports						
0 + 1 − 07	Non-tropical food, beverages, tobacco	7.7	6.3	1.4	1.2	−0.2
2 + 4	Raw materials	5.3	5.0	1.0	0.9	−0.1
3	Fuels	9.9	13.6	1.8	2.5	+0.7
5	Chemicals	16.0	14.8	3.0	2.7	−0.3
71 + 72	Machinery	5.0	13.6	0.9	2.5	+1.6
73	Transport equipment	12.1	14.1	2.2	2.4	+0.2
6 + 8	Other manufactured goods	13.7	10.3	2.5	1.9	−0.6
0 to 8 − 07	Total of above	8.3	9.0	1.6	1.7	+0.1
	Gross National Product	5.4	5.4			

Note: To express import values in current prices, unit value indices have been derived by utilising the appropriate indices for individual countries. An exception has been made in the case of tropical products, machinery and transport equipment, where the indices have been calculated from the original data.

Source: B. Balassa (1967) 'Trade creation and trade diversion in the European Common Market', *Economic Journal*, vol. 77, p. 8.

Table 10.2 Extra-area imports into the European Common Market, 1959 and 1965

		Actual imports 1959	*Hypothetical imports in 1965 calculated at growth rates of extra-area imports for the period*		*Actual imports, 1965*		*Differences between actual and hypothetical imports in 1965*			
			1953–9	*1959–65*	*In 1959 prices*	*In 1965 prices*	*'Common Market Effect,' (3) − (2)*	*'Competitive Effect,' (4) − (3)*	*'Price Effect' (5) − (4)*	*Together (5) − (2)*
			(In 1959 prices)							
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1.	*United States*									
0 + 1 − 07	Food, beverages, tobacco	502	782	722	969	1 117	−60	+247	+148	335
2 + 4	Raw materials	591	807	793	890	947	−14	+97	+57	+140
3	Fuels	279	492	600	401	343	+108	−199	−58	−149
5	Chemicals	226	551	517	658	552	−34	+141	−106	+1
71 + 72	Machinery	375	502	808	928	1 074	+306	+120	+146	+572
73	Transport equipment	142	282	314	303	318	+32	−11	+15	+36
6 + 8	Other manufactures	331	716	597	800	860	−119	+203	+60	+144
0 to 8 − 07	All of above	2 446	4 132	4 351	4 949	5 211	+219	+598	+262	+1 079
07	Tropical beverage	2	3	3	3	0	0	0	0	0
0 to 08	All commodities	2 448	4 135	4 354	4 952	5 214	+219	+598	+262	+1 079
2.	*United Kingdom*									
0 + 1 − 07	Food, beverages, tobacco	51	79	74	147	170	−5	+73	+23	+91
2 + 4	Raw materials	159	217	213	172	183	−4	−41	−11	−34
3	Fuels	58	102	125	109	93	+23	−16	−16	−9
5	Chemicals	120	292	274	292	245	−18	+18	−47	−47

71 + 72	Machinery	308	412	664	572	663	+252	−92	+91	+251
73	Transport equipment	114	227	252	244	256	+25	−8	+12	+29
6 + 8	Other manufactures	486	1 051	877	858	922	−174	−19	+64	−129
0 to 8 − 07	All of above	1 296	2 380	2 479	2 394	2 532	+99	−85	+138	+152
07	Tropical beverages	2	3	3	6	5	0	+3	−1	+2
0 to 8	All commodities	1 298	2 383	2 482	2 400	2 537	+99	−82	+137	+154
3. *Continental EFTA*										
0 + 1 − 07	Food, beverages, tobacco	455	708	655	496	572	−53	−159	+76	−136
2 + 4	Raw materials	666	910	893	915	973	−17	+22	+58	+63
3	Fuels	12	21	26	22	19	+5	−4	−3	−2
5	Chemicals	148	360	338	335	281	−24	−3	−54	−79
71 + 72	Machinery	359	481	774	648	751	+293	−126	+103	+270
73	Transport equipment	44	87	98	96	101	+11	−2	+5	+14
6 + 8	Other manufactures	758	1 640	1 368	1 356	1 458	−272	−12	+102	−182
0 to 8 − 07	All of above	2 442	4 207	4 152	3 868	4 155	−55	−284	+287	−52
07	Tropical beverages	6	8	8	6	5	0	−2	−1	−3
0 to 8	All commodities	2 448	4 215	4 160	3 874	4 160	−55	−286	+286	−55
4. *Other developed countries*										
0 + 1 − 07	Food, beverages, tobacco	541	843	778	705	813	−65	−73	+108	−30
2 + 4	Raw materials	1 005	1 373	1 349	1 277	1 359	−24	−72	+82	−14
3	Fuels	5	9	10	21	18	+1	+11	−3	+9
5	Chemicals	33	80	76	112	94	−4	+36	−18	+14
71 + 72	Machinery	19	25	41	116	134	+16	+75	+18	+109
73	Transport equipment	7	14	15	24	25	+1	+9	+1	+11
6 + 8	Other manufactures	254	549	458	689	741	−91	+231	+52	+192
0 to 8 − 07	All of above	1 864	2 893	2 727	2 944	3 184	−166	+217	+240	+291
07	Tropical beverages	2	3	3	11	10	0	+8	−1	+7
0 to 8	All commodities	1 866	2 896	2 730	2 955	3 194	−166	+225	+239	+296

Table 10.2 continued

		Actual imports 1959	*Hypothetical imports in 1965 calculated at growth rates of extra-area imports for the period*		*Actual imports, 1965*		*Differences between actual and hypothetical imports in 1965*			
			1953–9	*1959–65*	*In 1959 prices*	*In 1965 prices*	*'Common Market Effect,' (3) − (2)*	*'Competitive Effect,' (4) − (3)*	*'Price Effect' (5) − (4)*	*Together (5) − (2)*
			(In 1959 prices)							
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
5. *Communist economies*										
0 + 1 − 07	Food, beverages, tobacco	248	386	357	379	437	−29	+22	+58	+51
2 + 4	Raw materials	265	362	356	517	550	−6	+161	+33	+188
3	Fuels	195	344	419	353	302	+75	−66	−51	−42
5	Chemicals	48	117	110	99	83	−7	−11	−16	−34
71 + 72	Machinery	18	24	39	41	47	+15	−2	+6	+23
73	Transport equipment	8	16	18	21	22	+2	+3	+1	+6
8+8	Other manufactures	158	342	285	282	303	−57	−3	+21	39
0 to 8 − 07	All of above	940	1 591	1 584	1 692	1 744	−7	+108	+52	+153
07	Tropical beverages	2	3	3	8	7	0	+5	−1	+4
0 to 8	All commodities	942	1 594	1 587	1 700	1 751	−7	+113	+51	+157
6. *Associated countries*										
0 + 1 − 07	Food, beverages, tobacco	469	730	675	412	475	−55	−263	+63	−255
2 + 4	Raw materials	441	602	592	536	570	−10	−56	+34	−32
3	Fuels	32	56	69	556	476	+13	+487	−80	+420
5	Chemicals	12	29	27	12	10	−2	−15	−2	−19

71 + 72	Machinery	1	1	2	0	0	+1	−2	0	−1
73	Transport equipment	0	0	0	0	0	0	0	0	0
6 + 8	Other manufactures	193	417	348	265	285	−69	−83	+20	−132
0 to 8 − 07	All of above	1 148	1 835	1 713	1 781	1 816	−122	+68	+35	−19
07	Tropical beverages	196	278	267	260	225	−11	−7	−35	−53
0 to 8	All commodities	1 344	2 113	1 980	2 041	2 041	−133	+61	0	−72
7. *Other less-developed countries*										
0 + 1 − 07	Food, beverages, tobacco	927	1 443	1 334	1 487	1 716	−109	+153	+229	+273
2 + 4	Raw materials	1 602	2 189	2 150	2 039	2 203	−39	−111	+164	+14
3	Fuels	1 879	3 313	4 040	3 827	3 259	+727	−213	−568	−54
5	Chemicals	95	232	217	51	84	−15	−166	+33	−148
71 + 72	Machinery	1	1	2	25	44	+1	+23	+19	+43
73	Transport equipment	4	8	9	18	15	+1	+9	−3	+7
6 + 8	Other manufactures	693	1 499	1 250	933	989	−249	−317	+56	−510
0 to 8 − 07	All above	5 201	8 685	9 002	8 380	8 310	+317	−622	−70	−375
07	Tropical beverages	569	806	774	767	666	−32	−7	−101	−140
0 to 8	All commodities	5 770	9 491	9 776	9 147	8 976	+285	−629	−171	−515
8. *Extra-area imports, total*										
0 + 1 − 07	Food, beverages, tobacco	3 193	4 971	4 595	4 595	5 300	−376	—	+705	+329
2 + 4	Raw materials	4 729	6 460	6 346	6 346	6 785	−114	—	+439	+325
3	Fuels	2 460	4 337	5 289	5 289	4 510	+952	—	−779	+173
5	Chemicals	682	1 661	1 559	1 559	1 349	−102	—	−210	−312
71 + 72	Machinery	1 081	1 446	2 330	2 330	2 713	+884	—	+383	+1 267
73	Transport equipment	319	634	706	706	737	+72	—	+31	+103
6 + 8	Other manufactures	2 873	6 214	5 183	5 183	5 558	−1 031	—	−375	−656
0 to 8 − 07	All of above	15 337	25 723	26 008	26 008	26 952	+285	—	+944	+1 229
07	Tropical beverages	779	1 104	1 061	1 061	921	−43	—	−140	−183
0 to 8	All commodities	16 116	26 827	27 069	27 069	27 873	+242	—	+804	+1 046

Source: B. Balassa (1967) 'Trade vocation and trade diversion in the European Common Market', *Economic Journal*, vol. 77, pp. 18–21.

discrepancies in the exports of the seven groups of countries to the EC, with deviations from the overall index of 166.5 rarely exceeding ten percentage points. However, changes in the commodity composition of imports after the formation of the EC widened *inter-area* differences in export performance: the range of relevant index numbers was 146.3 and 191.2.

Conclusion

Balassa's method is no doubt more subtle when compared with previous attempts. However, his study is based on three major assumptions, each of which requires an empirical investigation in its own right. These are that: (i) under normal circumstances, i.e. in the absence of economic integration, his *ex post* income elasticities of import demand would have remained constant; (ii) the commodity pattern of trade would have remained constant under the same circumstances; and (iii) an investment boom followed the formation of the EC. Moreover, as Winters (1984a) pointed out, Balassa had never stated the reason why economic integration should increase the *sensitivity* of imports to increases in GNP rather than merely raise the *level* of imports associated with any particular level of GNP in a step fashion. Winters argued that if one were to plot the log of imports against the log of GNP (see Figure 10.1), Balassa's method would imply that at the time of the formation of the EC the relationship of partner imports would shift up to *BC*, and one should contrast this with the *anti-monde BD* to calculate the integration effect. However, Winters argued that economic integration would shift the intercept of this relationship rather than the slope – see Figure 10.2. He tested this by examining whether the income coefficients in his equation (3) – see the section in the following chapter on Winters's analysis – were affected by integration. It should be added, however, that Winters did point out that his income coefficients were not strictly income elasticities, but that they were close enough to provide a satisfactory test of Balassa's assumption. The results of his test indicated that both slope and intercept shifts had significant roles to play, but that of the two, the intercepts contributed more. The further details of his result showed that in two of their appearances, the 'Balassa-partner' effects were implausible (negative) and in two they were insignificant. Winters concluded that his results cast considerable doubt on Balassa's *ex post* income elasticities of demand approach. He was quick to add that although his results were not conclusive, if they were

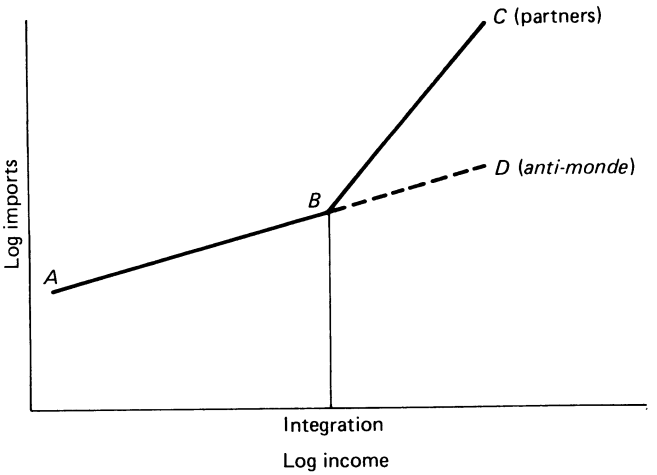


Figure 10.1

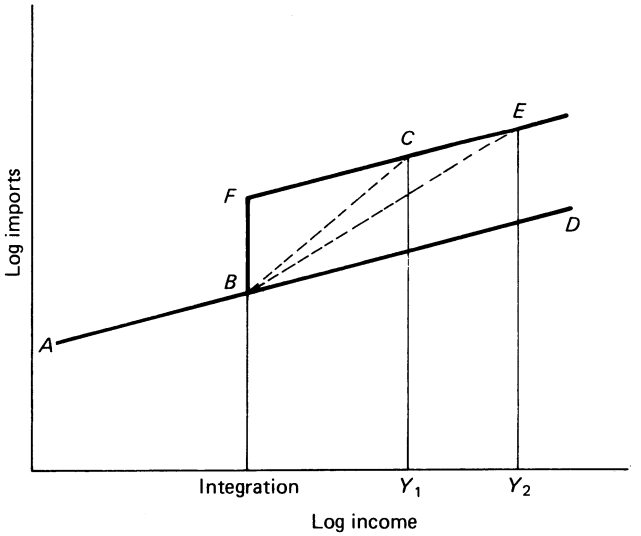


Figure 10.2

replicated in further research they would provide one explanation of why Balassa's estimates of TC dropped over time (Balassa, 1974). He explained this in the following fashion. Assume that GNP grew fairly steadily prior to and after economic integration, such that when one came to measure the impact of economic integration it had reached Y_1 in Figure 10.2. Ignoring the dynamics of the situation, for simplicity purposes, Winters argued that his own method would measure the integration effect by *BF*. However. Balassa's method would measure it by the slope of *BC* minus the slope of *BD*. A few years later, when GNP grew to Y_2, Winters's method would give an unchanged estimate, but Balassa's, being based on the slope of *BE*, would have fallen.

THE CONTRIBUTION BY THE EFTA SECRETARIAT

In 1969, the EFTA Secretariat published its own estimates of the economic effects of the formation of EFTA on its own members. This was later followed by a study of the effects of both EFTA and the EC (1972).

The 1969 study assumed that in the absence of the formation of EFTA, the import shares from EFTA and from *W* in the 'apparent consumption' of a particular commodity in any of the EFTA countries would have developed during 1959–65 in precisely the same fashion as they had during 1954–9. The calculation of the overall EFTA effect, *X* (the extent to which imports from EFTA producers, valued in millions of US dollars, were higher due to the establishment of EFTA), was given by the formula:

$$X = F_{65} - [(f_{59} - f_{54})6/5 + f_{59}]C_{65}, \qquad (1)$$

where *F* is imports from EFTA countries, *C* is 'apparent consumption', $f = F/C$ and the figures attached to *F*, *C* and *f* indicated the three reference years of the study 1954, 1959 and 1965.

The assumption that the trend in the pre-integration period would have been maintained in the absence of the formation of EFTA was covered by the expression inside the square brackets; it is a linear extrapolation of the change between 1954 and 1959. The expression in the square brackets multiplied by C_{65} gave an estimate of what the level of imports from EFTA would have been in 1965 in its absence. The difference between this hypothetical figure and *actual* imports in

1965 was considered to be a measure of the impact of the establishment of EFTA, i.e. it included both TC and TD.

Total imports from EFTA were calculated by aggregation from individual EFTA member countries. This was justified on the understanding that the linear approach adopted made summation across countries produce the same result as a direct calculation for EFTA as a whole.

It should be noted that the methodology was based on four underlying assumptions:

(i) governments maintain full employment all the time;
(ii) no spontaneous developments in the pattern of demand;
(iii) monopolistic and other restrictive tendencies remain unaffected by the formation of EFTA; and
(iv) no supply constraint restrictions.

In order to distinguish between TC and TD, the EFTA Secretariat adopted an approach which utilised the following further assumptions:

(v) that where there was a significant tariff on a particular commodity, this was due to the fact that domestic production costs (including profits) were higher than those of some potential suppliers; and
(vi) that since all foreign sources of supply were subject to the same tariff before the formation of EFTA, the country pattern of supply in the pre-integration period would have reflected the relative costs of production in foreign countries.

The implication of these two assumptions is that if the share of imports in 'apparent consumption' rises, TC will have occurred, and if the share in 'apparent consumption' of non-EFTA sources of supply falls benefiting EFTA sources, there will have been TD. Of course, there may be trade movements of both kinds over the same period of time, so it was further assumed that

(vii) there was an underlying process of TC as a result of the various measures to promote free trade on a global scale, through GATT tariff reductions (the Dillon and Kennedy Rounds), increased consumer preference for foreign goods (for various reasons), greater international specialisation through competition, etc.

These developments were covered by the extrapolated trend.

TD was calculated according to the following equation:

$$TD = N_{65} - [(n_{59} - n_{54})6/5 + n_{59}]C_{65}, \quad (2)$$

where N is imports from W and $n = N/C$. If TD were to occur, the solution to this equation would give a negative value, implying that imports from W were short of those projected.

TC was estimated according to the equation:

$$TC = M_{65} - [(m_{59} - m_{54})6/5 + m_{59}]C_{65}, \quad (3)$$

where M is total imports and $m=M/C$.

The EFTA Secretariat stressed that the three formulae amounted to only a *basis* for calculating the influence of EFTA on trade. To obtain the overall estimate of the influence of EFTA on imports, hence on the exports of supplying countries, other *subjective* factors had to be taken into consideration (EFTA Secretariat, 1969, pp. 14–17).

The results are given in Table 10.3. The overall influence of the establishment of EFTA on intra-area trade in 1965 was estimated at $830 million. Of this estimate, $475 million represented TD and only $375 million represented TC. These estimates implied that the overall EFTA trade balance would have shown a deficit of $475 million more in 1965 had EFTA not been established.

It was claimed that 25 per cent of the total rise in intra-EFTA trade during 1959–65 was due to the formation of EFTA – see Table 10.4. The export effect amounted to 9 per cent of the actual increase in the total exports of the EFTA countries between 1959 and 1965, and the rise in imports (the TC effect) amounted to about 3 per cent of the corresponding increase in imports. Calculated as a proportion of the trade (or changes therein) in the commodities covered by the EFTA tariff reductions, the effects, of course, showed higher percentage rates – see Table 10.5.

The estimates of the influence of the formation of EFTA on the individual member countries are also given in Table 10.5. The Secretariat drew attention to two points shown by this table. Firstly, Portugal, with a different structure of production relative to the rest of EFTA, experienced TD only. This tended to support the proposition that complementarity in production in member countries would be more likely to result in TD. Secondly, the sizes of the EFTA effects did not exhibit any clear pattern in relation to high- and low-tariff countries: calculated as a percentage of the change in

Table 10.3 EFTA effects on trade among member states in 1965 ($ million)

	Effects on imports			*Effects on exports (4)*	*Effects on the trade balance (4) − (1) = (5)*
	Trade creation (1)	*Trade diversion (2)*	*Total (1) + (2) = (3)*		
Austria	11	23	34	40	29
Denmark	77	75	152	77	0
Finland	30	41	71	74	44
Norway	51	34	85	90	39
Portugal	0	37	37	38	38
Sweden	118	135	253	161	43
Switzerland	14	41	55	85	71
United Kingdom	72	71	143	265	193
Total	373	457	830	830	457

Source: EFTA Secretariat (1969) 'The effects of EFTA on the economies of member states', *EFTA Bulletin*, January, p. 10.

Table 10.4 EFTA effects on trade between member states in 1965 (in percentage of total trade)

	Total import effect as percentage of		*Trade-creation effect as percentage of*		*Export effect as percentage of*[a]		*Export effect as percentage of*[a]	
	Total imports from EFTA	*Change in total imports from EFTA*	*Total imports*	*Change in total imports*	*Total exports to EFTA*	*Change in total exports to EFTA*	*Total exports*	*Change in total exports*
	1965	*1959–65*	*1965*	*1959–65*	*1965*	*1959–65*	*1965*	*1959–65*
Austria	11	19	1	1	14	23	3	6
Denmark	15	31	3	6	7	16	3	9
Finland	13	22	2	4	16	33	5	13
Norway	9	19	2	6	14	28	6	14
Portugal	19	39	0	0	31	52	7	15
Sweden	18	31	3	6	10	18	4	9
Switzerland	10	18	0	1	15	28	3	7
United Kingdom	7	17	1	3	14	33	3	7
Total	12	24	1	3	12	25	3	9

Note: [a] As the effects are calculated on a c.i.f. basis and exports on an f.o.b. basis the percentage rates slightly exaggerate the export effects.

Source: EFTA Secretariat (1969) 'The effects of EFTA on the economies of member states', *EFTA Bulletin*, January, p. 10.

Table 10.5 EFTA effects on trade among member states in 1965 (in percentage of trade in commodities covered by EFTA tariff reductions)

	Total import effect as percentage of		*Trade-creation effect as percentage of*		*Export effect as percentage of*[a]		*Export effect as percentage of*[a]	
	Imports from EFTA	*Change in imports from EFTA*	*Imports from world*	*Change in imports from world*	*Exports to EFTA*	*Change in exports to EFTA*	*Exports to world*	*Change in exports to world*
	1965	*1959–65*	*1965*	*1959–65*	*1965*	*1959–65*	*1965*	*1959–65*
Austria	13	20	1	1	16	26	3	7
Denmark	17	33	4	8	18	28	8	15
Finland	15	25	2	4	17	34	6	13
Norway	14	27	4	8	19	37	10	22
Portugal	21	44	0	0	41	64	10	19
Sweden	21	37	4	7	13	23	5	11
Switzerland	12	22	1	1	16	35	3	9
United Kingdom	9	22	1	2	14	32	2	7
Total	15	29	2	4	15	31	4	10

Note: *a* As the effects are calculated on a c.i.f. basis and exports on an f.o.b. basis the percentage rates slightly exaggerate the export effects.

Source: EFTA Secretariat (1969) 'The effects of EFTA on the economies of member states', *EFTA Bulletin*, January, p. 11.

imports from EFTA during 1959–65, the total import effect was above average for countries with initially low tariffs such as Denmark and Sweden, while it was below the average for countries with relatively high tariffs such as Austria and the UK (see Table 10.4), but the largest percentage change was experienced by Portugal, a country with highly protective trade barriers.

Table 10.6 gives the influence of EFTA on trade flows by the main commodity groups considered. The highest influence was recorded in the case of textiles and clothing. The rise in intra-area trade in this group was estimated at $200 million of which about $115 million was TC. Trade in pulp and paper rose by about $100 million of which 80 per cent was TC.

Conclusion

The criticisms of Balassa's study apply equally to the contribution by the EFTA Secretariat; consequently there is no need to repeat them here.

THE CONTRIBUTION BY WILLIAMSON AND BOTTRILL

Williamson and Bottrill (1971) adopted the framework described in Chapter 8 to estimate the economic effects of the formation of the EC. They used equation (2) and the simplifying assumptions leading to:

$$y_i = x_i + c_{ii} + e_i.$$

Recall that y_i is the actual imports of area i, x_i is the hypothetical imports of area i in the absence of economic integration, c_{ii} is intra-ith area TC and e_i is the total ETC of area i, i.e. they wanted to estimate TC ($c_{11} + c_{22}$), total TD ($d_{11} + d_{22}$) and EC ETC (e_1).

Williamson and Bottrill had little confidence in the share analyses conducted before them due to the absence of a coherent theoretical structure in constructing them. However, they still felt that share analysis remained attractive, partly because there was some evidence to indicate that, in the absence of preferential tariff changes, shares tended to display a useful degree of constancy, and partly because the use of share performance automatically normalised for changes in competitiveness and income (Williamson and Bottrill, 1971, p. 129).

Table 10.6 EFTA effects on trade in some commodities between member states in 1965 ($ million)

	Effects on imports		*Total import effect = export effect*
	Trade creation	*Trade diversion*	
Leather, rubber and footwear	18	17	35
Wood and paper industry products	87	32	119
Textiles and clothing	116	85	201
Chemical and petroleum products	37	43	80
Non-metallic mineral manufactures	0	6	6
Metals and metal manufactures	24	75	99
Machinery	57	128	185
Land transport equipment	26	45	71
Watches, clocks and instruments	2	6	14
Beverages, tobacco and miscellaneous products	0	20	20
Total	373	457	830

Source: EFTA Secretariat (1969) 'The effects of EFTA on the economies of member states', *EFTA Bulletin*, January, p. 16.

In order to explain their share analysis, they added two notations to those described in Chapter 8:

$$u_{ij} = x_{ij}/x_i$$

and

$$v_{ij} = y_{ij}/y_i,$$

where u_{ij} is the hypothetical share of bloc j in i's imports in the *anti-monde* and v_{ij} is the actual share of bloc j in i's imports. They argued that if one could calculate u_{ij}, the hypothetical share, one would be well on the way to estimating the X-matrix. This would not be sufficient since x_i would be equal to y_i only if the sum of c_{ii} and e_i were equal to zero. However, they still felt that the area of ignorance

would be substantially narrowed and proceeded to investigate how to determine plausible values of u_{ij}.

They believed that Lamfalussy's (1963) hypothesis offered the most promise. This hypothesis could be stated simply as: the share performance of the *j*th supplier in markets where he neither gained nor lost preferential advantages gave a good indication of his hypothetical performance in markets which were in fact being affected by economic integration. Thus given their adopted framework, this hypothesis suggested that W was the control group which indicated what the share performance would have been in the EC and EFTA in the absence of their formation. For example, the actual change in y_{31} (the share of the EC in the imports of W), over a specified period, depicted the simultaneous change in u_{11} (the share of intra-trade in the imports of the EC) that could have been expected in the *anti-monde*.

After an elaborate investigation of the possibilities for formalising this hypothesis, Williamson and Bottrill settled on two methods. One of these was an *a priori* equation for u_{ij}:

$$u_{ij}^t = v_{ij}^0 + \{[v_{ij}^0(1 - v_{ij}^0)]/[v_{3j}^0(1 - v_{3j}^0)]\}\,(v_{3j}^t - v_{3j}^0) \qquad (4)$$

The essence of this formula is to ensure that the predicted gain in market share would be insignificant if the previous market share was either very insignificant, indicating an insignificant level of potential trade between the two areas, or very substantial, indicating a small chance of gaining market share at the expense of the other area. However, this equation had the shortcoming that the predicted shares may not add up to unity, but Williamson and Bottrill overcame this by multiplying u_{ij}, given by equation (4), by $1/\Sigma_j u_{ij}$.

The second method was to regress u_{ij} on v_{3j} over the period 1954–9, then utilise the equation obtained to predict the value of u_{ij} in the 1960s. Williamson and Bottrill also introduced the constraint that the market shares should add up to unity, just as in the first method.

In addition to the estimates obtained from these two methods, Williamson and Bottrill also tried a third estimate on the assumption that without the formation of the EC and EFTA the post-1959 market shares would have remained at the 1959 level. They admitted that this was a crude assumption, but they thought it provided a check against their results being due to spurious fluctuations in third markets or to supply constraints.

Williamson and Bottrill stressed that being able to construct the U-matrix did not allow one to proceed directly to the estimation of

TC and TD. For the EC, the estimation of c_{11}, d_{11} and e_1 was made possible by two equations:

$$y_{11} = x_{11} + c_{11} + d_{11} = u_{11} + d_{11} + d_{11} \tag{5}$$

and

$$y_1 = x_1 + c_{11} + e_1. \tag{6}$$

But these two equations had x_1 which was a fourth unknown, and although the matrix equation (2) provided two more equations with x_1, d_{1j} and e_{1j}, they also brought with them two more unknowns (the breakdown in terms of blocs of TD and ETC); hence, they did not solve the problem. Therefore, two more assumptions or relationships were needed.

They believed that the best way to complete the system was to adopt the estimates for *relative size* of TC, TD and ETC that were suggested by previous studies. Thus their approach was incapable of adding to our knowledge in this respect since it could do nothing other than provide estimates of the *total* effects of economic integration.

Stating this assumption in technical terms meant that:

$$d_{11} = \alpha c_{11} \tag{7}$$

and

$$e_1 = \beta c_{11}. \tag{8}$$

Substituting these in equations (4) and (5) gave:

$$c_{11} = [y_{11} - u_{11}y_1]/[1 + \alpha - u_{11}(1 + \beta)]. \tag{9}$$

Hence, equations (7) and (8) can be solved for d_{11} and e_1.

For EFTA, the two independent equations were:

$$y_{22} = x_{22} + c_{22} + d_{22} = u_{22}x_2 + c_{22} + d_{22},$$

and

$$y_2 = x_2 + c_{22}.$$

Since there were three unknowns (c_{22}, d_{22} and x_2) in these equations, only one additional assumption or relationship was needed. Again, Williamson and Bottrill chose the *relative size* of TD and TC, such that:

$$d_{22} = \gamma c_{22}.$$

This enabled them to solve for c_{22} (and, of course, for d_{22}):

$$c_{22} = (y_{22} - u_{22}y_2)/(1 + \gamma - u_{22}). \tag{10}$$

Having established the procedure for the splitting of the total trade effects, Williamson and Bottrill then turned their attention to the division of the estimates into TD and ETC for each of the blocs. EFTA, being a free trade area, could not have led to ETC; hence, this task was straighforward. Since x_2, was determined simultaneously with $c_{22}(x_{22} = y_2 - c_{22})$, equation (2) yielded:

$$d_{21} = u_{21}x_2 - y_{21} \tag{11}$$

and

$$d_{23} = u_{23}x_2 - y_{23}. \tag{12}$$

Doing likewise for the EC by extracting from the first row of equation (2) gave:

$$d_{12} - e_{12} = u_{12} - y_{12} \tag{13}$$

and

$$d_{13} - e_{13} = u_{13}x_1 - y_{13}. \tag{14}$$

Thus an extra assumption or relationship was needed to enable a breakdown of gross TD and ETC in the case of the EC. However, Williamson and Bottrill felt that the estimates generated by equations (13) and (14) were sufficient for relaxing the assumption that $r_{ij} = 0$.

This method was first applied to data on manufacturing exports which was published periodically by, among others, the UN and the UK Department of Trade and Industry. Although for each such source the data series were collected in accordance with a consistent definition and coverage and were not subjected to a substantial amount of estimation, Williamson and Bottrill faced significant discontinuities when they tried to extract a series, covering the period 1954–69, from *different* sources. So they repeated the estimates on a series which was specially prepared for them by the UK Department of Trade and Industry; they stressed that the use of the uncorrected data resulted in slightly lower economic integration effects, without altering the general picture. They adopted 1959 as their base year for applying equation (4).

Table 10.7 sets out the hypothetical shares for the period 1954–69, calculated on the basis of Williamson and Bottrill's two methods. The table clearly suggests that the hypothetical shares of intra-trade for

Table 10.7 Predicted and actual shares 1954–69

		1954 base						*1959 base*									
		1954	*1955*	*1956*	*1957*	*1958*	*1959*	*1960*	*1961*	*1962*	*1963*	*1964*	*1965*	*1966*	*1967*	*1968*	*1969*
u_{11} Formula	ROW (3)		0.535	0.527	0.539	0.563	0.571	0.580	0.580	0.571	0.567	0.569	0.575	0.580	0.592	0.595	0.589
v_{11} Actual	ROW (3)	0.526	0.542	0.543	0.539	0.543	0.573	0.569	0.585	0.594	0.615	0.635	0.655	0.663	0.670	0.679	0.687
u_{11} Regression	ROW (T)							0.511	0.509	0.502	0.499	0.500	0.503	0.506	0.512	0.514	0.510
v_{11} Actual	ROW (T)	0.473	0.488	0.486	0.491	0.495	0.519	0.518	0.536	0.549	0.571	0.590	0.602	0.605	0.613	0.618	0.625
u_{12} Formula	ROW (3)		0.292	0.288	0.277	0.273	0.269	0.262	0.260	0.258	0.260	0.245	0.241	0.234	0.222	0.214	0.217
v_{12} Actual	ROW (3)	0.298	0.280	0.286	0.281	0.274	0.268	0.240	0.242	0.237	0.226	0.215	0.206	0.198	0.189	0.179	0.174
u_{12} Regression	ROW (T)							0.242	0.239	0.237	0.237	0.227	0.225	0.220	0.212	0.208	0.209
v_{12} Actual	ROW (T)	0.269	0.252	0.256	0.256	0.250	0.243	0.218	0.222	0.219	0.210	0.200	0.191	0.180	0.472	0.163	0.158
u_{13} Formula	ROW (3)		0.173	0.185	0.184	0.165	0.159	0.158	0.160	0.171	0.174	0.186	0.184	0.186	0.186	0.191	0.195
v_{13} Actual	ROW (3)	0.176	0.178	0.171	0.180	0.183	0.158	0.191	0.173	0.169	0.159	0.150	0.139	0.139	0.141	0.142	0.139
u_{13} Regression	ROW (T)							0.247	0.252	0.261	0.264	0.273	0.272	0.275	0.275	0.278	0.281
v_{13} Actual	ROW (T)	0.258	0.260	0.258	0.253	0.255	0.239	0.264	0.242	0.232	0.219	0.210	0.207	0.215	0.215	0.219	0.217
u_{21} Formula	ROW (3)		0.526	0.519	0.530	0.554	0.563	0.563	0.563	0.554	0.549	0.551	0.558	0.563	0.576	0.579	0.572
v_{21} Actual	ROW (3)	0.517	0.514	0.529	0.536	0.551	0.556	0.541	0.553	0.549	0.537	0.517	0.515	0.503	0.481	0.480	0.484
u_{21} Regression	ROW (T)							0.491	0.485	0.471	0.466	0.461	0.465	0.466	0.473	0.474	0.468
v_{21} Actual	ROW (T)	0.443	0.440	0.454	0.470	0.488	0.487	0.480	0.491	0.487	0.473	0.457	0.454	0.440	0.425	0.419	0.427
u_{22} Formula	ROW (3)		0.310	0.306	0.295	0.290	0.286	0.277	0.275	0.273	0.274	0.260	0.255	0.248	0.235	0.227	0.230
v_{22} Actual	ROW (3)	0.316	0.293	0.293	0.285	0.288	0.283	0.262	0.281	0.289	0.303	0.302	0.311	0.323	0.336	0.332	0.345
u_{22} Regression	ROW (T)							0.242	0.238	0.235	0.234	0.223	0.221	0.215	0.208	0.203	0.204
v_{22} Actual	ROW (T)	0.271	0.251	0.251	0.250	0.255	0.248	0.232	0.249	0.256	0.267	0.267	0.274	0.283	0.297	0.290	0.304
u_{23} Formula	ROW (3)		0.164	0.176	0.175	0.156	0.151	0.160	0.162	0.173	0.176	0.189	0.187	0.189	0.189	0.194	0.198
v_{23} Actual	ROW (3)	0.167	0.192	0.178	0.179	0.161	0.161	0.197	0.166	0.162	0.161	0.181	0.175	0.174	0.182	0.188	0.170
u_{23} Regression	ROW (T)							0.267	0.277	0.294	0.300	0.316	0.314	0.319	0.319	0.323	0.328
v_{23} Actual	ROW (T)	0.287	0.309	0.295	0.280	0.256	0.265	0.288	0.259	0.257	0.261	0.276	0.272	0.277	0.279	0.291	0.269
v_{31} Actual	ROW (3)	0.265	0.274	0.264	0.274	0.301	0.310	0.317	0.316	0.304	0.298	0.295	0.302	0.306	0.317	0.318	0.310
v_{21} Actual	ROW (T)	0.236	0.244	0.235	0.244	0.269	0.277	0.281	0.275	0.261	0.255	0.251	0.256	0.257	0.266	0.267	0.260
v_{22} Actual	ROW (3)	0.292	0.287	0.280	0.270	0.271	0.269	0.264	0.261	0.257	0.257	0.241	0.237	0.230	0.219	0.210	0.212
v_{22} Actual	ROW (T)	0.260	0.256	0.249	0.240	0.242	0.240	0.233	0.227	0.221	0.220	0.204	0.201	0.193	0.183	0.176	0.177
v_{22} Actual	ROW (3)	0.443	0.439	0.456	0.456	0.428	0.420	0.419	0.423	0.440	0.440	0.464	0.460	0.464	0.464	0.472	0.478
v_{23} Actual	ROW (T)	0.504	0.500	0.516	0.516	0.489	0.482	0.486	0.498	0.518	0.525	0.545	0.543	0.550	0.551	0.556	0.562

Source: J. Williamson and A. Bottrill (1971) 'The impact of customs unions on trade in manufactures', *Oxford Economic Papers*, vol. 23, p. 337.

both the EC and EFTA began to lag behind their actual shares starting from 1961. Moreover, these effects grew fairly steadily and became substantial in the later years of the study.

To enable the splitting of these effects into TC and TD, Williamson and Bottrill had to choose values for α, β and γ. They relied on the only estimates available: Truman (1969), Balassa (1967b), for α and β, and EFTA Secretariat (1969), for γ. These studies suggested the following values:

Truman:	$\alpha = \beta = 0.25$
Balassa:	$\alpha = \beta = 0.5$,
EFTA Secretariat:	$\gamma = 1.25$.

Table 10.8 gives the estimates of TC and TD that were obtained after inserting into equations (9) and (10) these values and the shares of u_{ij} given in Table 10.7. With regard to the EC, Williamson and Bottrill drew attention to two conclusions. Firstly, the total EC effect on intra-trade [i.e. $(c_{11} + d_{11})/x_{11}$] remained almost unaffected by values given to α and β, provided the two were assumed equal. Secondly, the results did not vary greatly between the two different methods adopted in the study: the total EC effect only varied between 53 per cent and 60 per cent in 1969. However, they were quick to warn against the conclusion that, given the similarity in results, they should have confined themselves to their preferred method, the first approach. This was due to the fact that the total EC effect was found to be fairly sensitive to *differential* changes in α and β: increases in α tended to reduce while increases in β tended to raise the total EC effect. Note that the table does not reveal these results.

With regard to EFTA, it was found that, unlike the case of the EC, the estimates depended largely on the prediction method adopted. More specifically, the assumption that market shares would have remained the same in the absence of economic integration, gave much lower results. This was attributed to the fact the EFTA was losing ground in its share of W markets during the 1960s, a factor which implied that the other two methods took the share of EFTA in its own markets to have declined in the absence of economic integration. For this, and other reasons discussed in the appendix to their paper, Williamson and Bottrill opted for their first method, and were reassured of their decision by the similarity of the results of the first and second methods.

Table 10.8 does not depict the effect of different values for γ since

Table 10.8 New estimates of integration effects, 1960–69 ($ billions or ratio)

Year, area, and assumptions	Method I: Formula D, W(3) to W (inc. OSA)					Method II: Linear regression, W(T) to W (inc. OSA)					Method III: $u_{ij}^{t} = v_{ij}^{59}$, W(T) to W (inc. OSA)				
	c_{11}	c_{11}/x_{11}	d_{11} $(= e_1)$	d_{11}/x_{11}	$\frac{c_{11}+d_{11}}{x_{11}}$	c_{11}	c_{11}/x_{11}	d_{11} $(= e_1)$	d_{11}/x_{11}	$\frac{c_{11}+d_{11}}{x_{11}}$	c_{11}	c_{11}/x_{11}	d_{11} $(= e_1)$	d_{11}/x_{11}	$\frac{c_{11}+d_{11}}{x_{11}}$
1960 EC: $\alpha = \beta = 0.25$	. .	. .	. .	. .	. .	0.2	0.02	. .	. .	0.02	. .	. .	. .	. .	. .
1961	0.1	0.02	. .	. .	0.02	0.7	0.09	0.2	0.02	0.11	0.4	0.06	0.1	0.01	0.07
1962	0.7	0.08	0.2	0.02	0.10	1.3	0.17	0.3	0.04	0.21	0.9	0.10	0.2	0.03	0.13
1963	1.7	0.17	0.4	0.04	0.21	2.3	0.27	0.6	0.07	0.34	1.8	0.19	0.4	0.05	0.24
1964	2.6	0.25	0.7	0.06	0.31	3.3	0.38	0.8	0.09	0.47	2.7	0.27	0.7	0.07	0.34
1965	3.4	0.31	0.9	0.08	0.39	4.0	0.39	1.0	0.10	0.49	3.5	0.32	0.9	0.08	0.40
1966	4.2	0.34	1.0	0.09	0.43	4.6	0.39	1.2	0.10	0.49	4.1	0.33	1.0	0.08	0.41
1967	4.2	0.32	1.0	0.08	0.40	4.9	0.41	1.2	0.10	0.51	4.7	0.37	1.2	0.09	0.46
1968	5.3	0.35	1.3	0.09	0.44	6.0	0.42	1.5	0.11	0.53	5.8	0.40	1.4	0.10	0.50
1969	7.7	0.42	1.9	0.11	0.53	8.3	0.48	2.1	0.12	0.60	7.8	0.44	2.0	0.11	0.55
1960 EC: $\alpha = \beta = 0.5$	. .	. .	. .	. .	. .	0.1	0.02	0.1	0.01	0.03	. .	. .	. .	. .	. .
1961	0.1	0.01	0.1	0.01	0.02	0.6	0.08	0.3	0.04	0.12	0.4	0.05	0.2	0.02	0.07
1962	0.6	0.07	0.3	0.03	0.10	1.1	0.14	0.6	0.07	0.21	0.7	0.09	0.4	0.04	0.13
1963	1.4	0.14	0.7	0.07	0.21	1.9	0.22	1.0	0.11	0.33	1.5	0.15	0.7	0.08	0.23
1964	2.2	0.21	1.1	0.11	0.32	2.8	0.29	1.4	0.15	0.44	2.3	0.22	1.1	0.11	0.33
1965	2.9	0.26	1.4	0.13	0.39	3.4	0.33	1.7	0.16	0.49	2.9	0.27	1.5	0.13	0.40
1966	3.5	0.29	1.7	0.14	0.43	3.8	0.33	1.9	0.16	0.49	3.4	0.28	1.7	0.14	0.42
1967	3.5	0.27	1.7	0.13	0.40	4.1	0.34	2.1	0.17	0.51	3.9	0.31	1.9	0.16	0.47
1968	4.4	0.29	2.2	0.15	0.44	5.0	0.35	2.5	0.18	0.53	4.8	0.33	2.4	0.17	0.50
1969	6.4	0.35	3.2	0.18	0.53	6.9	0.40	3.5	0.20	0.60	6.5	0.37	3.3	0.18	0.55
	c_{22}	c_{22}/x_{22}	d_{22} $(= e_2)$	d_{22}/x_{22}	$\frac{c_{22}+d_{22}}{x_{22}}$	c_{22}	c_{22}/x_{22}	d_{22} $(= e_2)$	d_{22}/x_{22}	$\frac{c_{22}+d_{22}}{x_{22}}$	c_{22}	c_{22}/x_{22}	d_{22} $(= e_2)$	d_{22}/x_{22}	$\frac{c_{22}+d_{22}}{x_{22}}$
1960 EFTA $\gamma = 1.25$	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
1961	. .	0.01	. .	0.01	0.02	0.1	0.02	0.1	0.03	0.05	. .	. .	. .	. .	. .
1962	0.1	0.03	0.1	0.04	0.07	0.1	0.05	0.2	0.06	0.11	0.1	0.02	0.1	0.02	0.04
1963	0.2	0.05	0.2	0.07	0.12	0.2	0.07	0.3	0.09	0.16	0.1	0.04	0.2	0.05	0.09
1964	0.3	0.08	0.4	0.11	0.19	0.3	0.10	0.4	0.13	0.23	0.2	0.04	0.2	0.05	0.09
1965	0.4	0.11	0.5	0.14	0.25	0.5	0.12	0.6	0.15	0.27	0.2	0.05	0.3	0.07	0.12
1966	0.6	0.16	0.8	0.20	0.36	0.6	0.16	0.8	0.20	0.36	0.3	0.07	0.4	0.09	0.16
1967	0.9	0.23	1.1	0.28	0.51	0.9	0.22	1.1	0.27	0.49	0.5	0.10	0.6	0.13	0.23
1968	1.0	0.24	1.3	0.30	0.54	0.9	0.22	1.2	0.27	0.49	0.5	0.09	0.6	0.11	0.20
1969	1.3	0.26	1.6	0.33	0.59	1.2	0.25	1.6	0.32	0.57	0.7	0.12	0.9	0.15	0.27

Notes: OSA is 'Overseas Sterling Area'.

Source: J. Williamson and A. Bottsill (1971) 'The impact of customs unions on trade in manufactures', *Oxford Economic Papers*, vol. 23, p. 135.

the published evidence only provided a single calculation. However, access to the preliminary results of the revised study by the EFTA Secretariat enabled Williamson and Bottrill to reflect on possible values for γ. These estimates from EFTA suggested a larger EFTA effect in 1965, mainly due to TC. This was interpreted to mean that β was close to one. This implied a total EFTA effect $[(c_{22} + d_{22})/x_{22}]$ of 26 per cent, just one percentage point larger than with γ equal to 1.25. Moreover, the preliminary estimates suggested that γ fell to about 0.7 in 1967, implying a total EFTA effect of 53 per cent as opposed to 51 per cent with γ equal to 1.25. Williamson and Bottrill concluded that more confidence should be placed in the estimates given in the last column of Table 10.8 since large changes in the value of γ made insignificant changes to the total EFTA effect.

As to the geographical breakdown of net TD, Williamson and Bottrill solved for equations (11)–(14) by using the figures in Tables 10.7 and 10.8; these are given in Table 10.9. Recall that as far as the EC was concerned, assuming that was equal to β meant that net TD was zero: EFTA's gain would have been *W*'s loss. Therefore, all that was needed was to decide the winner and the extent of the gain. The table shows that, with the first method, EFTA lost in the earlier years but gained substantially starting from 1964. However, with the second method, EFTA lost in the early 1960s, gained in the mid-1960s and lost again in the late 1960s. As to EFTA, the table clearly shows that the results are more inconsistent: both methods gave negative TD (i.e. ETC) in some years, which is unthinkable in the case of a free trade area, and the second method contradicts the conventional wisdom that the EC was the major loser from EFTA-induced TD, while the first method supported it.

Williamson and Bottrill then considered the question of whether substantial distortions in the calculations may result from the consequences of efforts to neutralise the balance-of-payments effects of economic integration. Since they had reached the conclusion that TD and ETC were of about the same magnitude for the EC, it followed that the net impact on the balance of payments was zero. Therefore, both the EC and *W* had a change in their balance of payments to the extent of their TD loss with EFTA. Since TD by EFTA must have affected EFTA more than the EC plus *W* (the two share the same total effect), they decided to concentrate on the impact on EFTA alone. According to their calculations, in 1969, EFTA's trade balance was stronger by more than $1 billion than it would have been in the absence of economic integration. They set out the implications of this in the following way:

Table 10.9 The geographical breakdown of net trade diversion ($ millions)

Year	*EC*, $\alpha = \beta$				*EFTA*, $\gamma = 1.25$			
	Method 1		*Method 2*		*Method 1*		*Method 2*	
	$d_{12} - e_{12}$	$d_{13} - e_{13}$	$d_{12} - e_{12}$	$d_{13} - e_{13}$	d_{21}	d_{23}	d_{21}	d_{23}
1960	—	—	280	–290	—	—	—	—
1961	210	–210	60	–60	90	–50	–110	190
1962	120	–120	–70	80	10	100	–260	420
1963	100	–80	–140	140	50	150	–190	460
1964	–170	170	–320	320	310	60	–90	520
1965	–240	240	–280	280	430	110	–10	580
1966	–280	–280	–130	150	640	130	190	590
1967	–250	250	–130	100	1 170	– 50	560	530
1968	–310	310	0	0	1 340	–90	760	410
1969	–340	380	70	–80	1 230	–370	470	1 090

Source: J. Williamson and A. Bottrill (1971) 'The impact of customs unions on trade in manufactures', *Oxford Economic Papers*, vol. 23, p. 340.

> Suppose that \$400 millions of this increase were neutralized by lesser exports, \$400 millions by higher imports, and the remainder by capital movements or reserve changes. If the effects on exports and imports were distributed in proportion to the value of trade with each region, r_{22} would be close to zero since the increased imports would cancel out the fall in exports. The value of r_{22} would be about −\$200 millions. This would mean that $x_{32} > y_{32}$, that the use of y_{32} in predicting u_{22} would bias u_{22} down and therefore bias c_{22} and d_{22} upwards. But the effect is quantitatively trivial: substitution of the amended value of x_{32} merely increased u_{32} from 0.212 to 0.213 (Williamson and Bottrill, 1971, p. 341).

They concluded, therefore, that because this was the largest effect they could possibly find, it was perfectly valid to follow the usual assumption that the balance-of-payments effects of economic integration could be ignored.

The overall conclusion reached in this study was that, in 1969, intra-EC trade was approximately 50 per cent more than it would have been in the absence of the EC, and the bulk of the increase was due to TC rather than TD, with the loss of exports by W from TD being largely offset by positive ETC. In 1965, the formation of EFTA was found to increase intra-EFTA trade by 25 per cent, but this was expected to rise to 60 per cent when more recent results were published by the EFTA Secretariat, mainly due to larger TD.

Conclusion

The main reservations against this approach are basically two. Firstly, the use of W as a normaliser begs a number of questions; these are discussed in the following section on Kreinin's study. The second criticism is that the study does not shed light on the relative strength of TC and TD: to utilise the proportions suggested by other studies, themselves deemed inadequate, leaves a lot to be desired.

KREININ'S CONTRIBUTION

Kreinin (1972) tried to calculate *ex post* estimates of yearly TC and TD by the EC in 1967/68 and 1969/70 in nine manufacturing industries, both individually and in aggregate, using a static framework, i.e. dynamic growth effects were assumed away.

Kreinin's method was essentially Vinerian and is best depicted by a schematic example. Consider one product group in one member nation of the EC under the assumption that the only influence on trade flows is the formation of the EC, i.e. the creation of the EC does not affect consumption. The illustration below helps in identifying the effects of economic integration.

It should be apparent that this country has a comparative disadvantage in this commodity. The formation of the EC leads to a reduction in its domestic production by $200 million worth (from $500 million to $300 million). This is TC and it is equal to the total expansion in imports from within the EC and *W*; hence the ratio of imports to apparent consumption has risen from 66.67 per cent to 80 per cent. The creation of the EC also leads to a $200 million worth decline in imports from *W* and this is TD; hence the ratio of extra-EC imports

Commodity group X (in $ million)

	Before EC formation	After EC formation
Imports (*M*) from *W*	700	500
Imports (*M*) from the EC	300	700
Domestic production (*P*)	500	300
Exports (*X*)	nil	nil
Apparent consumption ($P + M - X$)	1500	1500

Source: M. E. Kreinin (1972) 'Effects of the EEC on imports of manufacturers' *Economic Journal*, vol. 82, p. 901.

to apparent consumption has fallen from 46.67 per cent to 33.33 per cent. Note that the expansion of imports from within the EC by $400 million is the sum total of both effects. Hence Kreinin's method measures TC by the change in the ratio of

total imports / apparent consumption

and TD by the change in the ratio of

imports from *W* / apparent consumption.

Kreinin recognised that a host of important factors, other than economic integration, also affected the ratio of imports to consumption, such as income and price changes, which were (at least in theory) measurable, and changes in preferences in favour of or against foreign commodities, which were not. He suggested that

there were two possible ways, apart from the projection of pre-EC trends which he did not deem to be a satisfactory method, for tackling this problem. The first was to employ the changes in the ratio of imports to consumption in other countries over the same period of time and use these countries as a 'control group' or normaliser for the EC changes. The second was to adjust the changes in the ratios for the EC themselves for the quantifiable biases contained in them. The first approach was subject to the limitation of the need to presume that the influences over the ratio of imports to consumption not only changed, over the period under consideration, in precisely the same fashion in the EC as in the control group but also that the markets in the two areas reacted to them in the same way. The second approach had the limitations of not being capable of taking into consideration the 'non-measurable' elements and the lack of convincing ways for estimating the measurable factors.

Kreinin argued that, in the case of a control group, only industrial nations which produce domestic substitutes for the majority of their imports of manufactures could be used to depict the changes in the ratio of imports to consumption in the EC in the absence of economic integration. He felt that three possible candidates could be entertained: Japan, the UK and the USA. However, Japan was considered to be very inappropriate since, in the 1960s, its imports were subject to quantitative controls and were, therefore, not allowed to vary with consumption. The UK was also considered unsuitable because its income and price changes were much different from those in the EC during the 1960s and because the UK, as a member of EFTA, was itself undergoing an economic integration process; membership of EFTA may have artificially raised UK imports and biased the EC effects. The third candidate, the USA, although it was not subject to these limitations, had the major shortcoming of being more self-sufficient than the EC: in 1959/60, the ratio of imports to consumption for the USA was nearly half the ratio of external imports to consumption and a quarter of the ratio of total imports to consumption in the EC. Thus, having judged all three possible candidates as unsuitable, Kreinin settled for the USA as his control group on the grounds that it was the least inappropriate, but without offering a justification for this decision.

Having adopted the USA, as the best of the worst, for his control group, Kreinin had to compromise even further. The ideal procedure was to use the proportional, not the absolute, changes in the ratios for the USA in order to account for the EC growth effects on the

ratios of imports to consumption. However, the base period ratios in all the US industries were rather small, with the result that even minor changes in US imports due to shifts in buyers' preferences would have resulted in substantial changes in the US ratios. Therefore, Kreinin had to settle on absolute differences. This had the implication that when the proportional changes for the USA exceeded its absolute changes by more than the comparable difference in the EC, the estimates calculated on the absolute changes would have exaggerated TC and deflated TD in the EC.

Kreinin then turned to the question of how to use the percentage point changes in the ratios of imports to consumption. Recalling that the ratios for the USA were closer in size to the ratios of external imports to consumption than to total imports to consumption in the EC, he resorted to the assumption that if the EC had not been formed, the ratio of imports to consumption in the EC in every commodity group would have changed by the same amount as the relevant ratio of imports to consumption in the USA. This implied that, over the period under consideration, the increase in percentage points in the USA imports/consumption ratio *minus* the increase in the EC external imports/consumption ratio yielded an estimate of TD (Kreinin, 1972, p. 903). Also, to estimate the hypothetical change in total (both external and internal) EC imports, Kreinin assumed that the ratio of external to total imports would have remained at its base year (1959/60) magnitude had economic integration not occurred. Therefore, the percentage point change in the ratio of imports to consumption in each industry in the USA was adjusted upwards by the 1959/60 ratio of total to external imports for the EC. This was interpreted by Kreinin to mean that the actual change (in percentage points) in the EC ratio of total imports to consumption (for each industry) *minus* the adjusted change in the US import/consumption ratio yielded an estimate of TC (Kreinin, 1972, p. 903).

Since Kreinin sought to adjust for income and price changes (as well as for other factors), for comparison purposes, he wanted a sequence of years during which these changes were identical for the EC and the USA. But the selection of such years was also subject to other constraints: the need to cover the economic integration period and the availability of data on consumption. The latter were compiled for 1959, 1960 and all the years between 1967 and 1970. With regard to the former, he found that the changes in incomes and prices were rather similar between 1960 and 1967 and between 1960 and 1968, but because the ratios of imports to consumption for pairs of

years were near to those of corresponding individual years (for example, the 1960 ratio was close to the average ratio for 1959/60), he opted for a comparison of an average of pairs of years; this had the advantage of enhancing stability in the estimates since it reduced the relative strength of any special circumstances which may have had an influence on any particular year. He, therefore, made his estimates of the effects of the EC on the basis of comparisons between the average for 1959/60 and the average for 1967/68, and between the average for 1959/60 and the average for 1969/70. He noted that during the eight-year period, income and price movements in the USA were similar to those in the EC, but during the ten-year period the growth of income in the EC was in excess of that in the USA (he later adjusted for these).

He expounded on this in the following way. The first round of EC tariff reductions which were introduced in 1959 were extended to all members of GATT; hence the EC did not discriminate against the outside world until the middle of the 1960s. Therefore, the observations for 1959/60 could be taken to represent the period immediately before economic integration. He added, however, that this may have imparted a downward bias on the effects of the EC inasmuch as the transactions in 1960 had already been affected by an 'anticipation of tariff discrimination'. Note that the eight-year period took one to the end of the transitional period in manufacturing in the EC, while the ten-year period took one a year beyond the end of this transition as well as towards the transitional period for most agricultural products.

Kreinin realised that some sectors of the USA could not serve as reasonable normalisers. First, agricultural imports were subjected to quantitative controls, and the nature of these was changing over the period of the analysis. Second, due to the fact that imports of cotton textiles by the USA were restricted first by 'voluntary export restraints' (VERs) in the Far East and then by the *Long-term Agreement on Cotton Textiles*, Kreinin believed that the normalised estimates for this sub-sector were probably biased. Third, because US car imports from Canada were mainly affected by the preferential *US–Canada Automobile Agreement*, Kreinin had to net these imports out of the US imports for all the years under consideration. Fourth, due to the differing resource bases for the USA and the EC, a substantial part of any increase in the supply of inputs could have been secured from domestic resources in the USA but via an expansion in imports in the EC; this suggested that a comparison of primary products would have been out of the question. However,

because imports of raw materials were subject to either zero or very low tariffs in most advanced nations, Kreinin believed that no EC effect was to be expected here; hence no estimates were attempted for the mining sector. However, of the sectors covered in the Kreinin study, basic metals was the one most affected by the resource base differential between the USA and the EC. This sector included iron and steel and non-ferrous metals, and the consumption data available to Kreinin did not permit a separation of non-ferrous metals from iron and steel. Hence he opted for a presentation of the results both with and without basic metals. Also, processed foods had to be tackled in the same vein. Fifth, because petroleum products were affected by the construction of refineries in the EC whose products were replacing imports from the rest of the EC, Kreinin did not include this sector in his estimates. Sixth, Kreinin ignored the impact of the Dillon and the first stage of the Kennedy Rounds of tariff reductions on the understanding that their multilateral nature should not bias aggregate results, but he conceded that they may bias sectoral results. Finally, Kreinin could not perceive a way of handling the impact of the Japanese 'export penetration' on the imports of the USA, so he left this dimension out of his estimates.

Kreinin concluded his reservations by stating that there may have been other factors which needed adjustment in the comparison of the EC and USA in terms of individual commodities; thus the US

> experience can at best provide some guidance to what would have happened in the [EC], but it also contributes random errors. Hence, while the computations will be carried out for individual industries, the main significance attaches to the aggregative results. For it is only when the results are aggregated over all industries that the random errors may be expected to cancel out (Kreinin, 1972, p. 906).

Before presenting the results, it may be in order to explain the nature of the data input in this study. The trade data were obtained from the publications of the United Nations. Output data for Japan, West Germany and the USA were collected from national sources, but for the remaining countries it was obtained by 'blowing up' value-added data employing their input–output tables which were made available by the Economic Commission for Europe; hence, the sectoral breakdown was decided by the availability of input–output data.

Table 10.10 gives the results of the estimates obtained using the percentage point changes as explained in the section on methodol-

Table 10.10 Estimated trade creation and diversion by the EC in manufacturing

Industry	*Estimates for 1967/68 (average)*					*Estimates for 1969/70 (average)*				
	EC apparent consumption 1967/68 ($ millions)	*Trade creation*		*Trade diversion*		*EC apparent consumption 1969/70 ($ millions)*	*Trade creation*		*Trade diversion*	
		$ millions	*% of EC total imports 1967/68*	*$ millions*	*% of EC external imports 1967/68*		*$ millions*	*% of EC total imports 1969/70*	*$ millions*	*% of EC external imports 1969/70*
Processed foods	48 007	132	3.2	413	19.5	57 869	511	9.3	700	28.1
Textiles and clothing	22 938	526	12.5	391	33.5	26 860	186	2.9	531	31.1
Wood, paper	16 542	399	8.7	139	6.8	21 591	763	16.6	148	5.2
Rubber products	3 277	111	31.9	–2	–1.9	4 394	161	30.2	1	0.6
Chemicals	16 899	768	15.7	458	21.7	20 760	1 876	26.4	343	11.7
Non-metallic mineral products	8 734	98	11.7	18	8.5	11 092	84	6.9	45	14.7
Basic metals	16 292	209	3.2	32	1.1	24 953	1 006	10.0	–313	–6.3
Transport equipment	18 969	709	21.2	137	13.9	24 567	1 428	25.8	327	22.9
Engineering products	47 761	1 673	15.0	–117	–2.5	64 480	2 528	15.0	–61	–8.9
All manufactures[a]	199 369	4 625	12.0	1 469	9.0	256 566	8 543	14.8	1 721	7.3
Manufactures excluding basic metals	183 077	4 416	13.8	1 437	10.8	231 613	7 537	15.8	2 034	10.9
Manufactures excluding basic metals and processed foods	135 070	4 284	15.3	1 024	9.1	173 744	7 026	16.7	1 334	8.2

Note: (*a*) Petroleum products excluded from all columns.

Source: M. E. Kreinin (1972) 'Effects of the EEC on imports of manufactures', *Economic Journal*, vol. 82, p. 907.

ogy. TC in the manufacturing sector in 1969/70 was about $8.5 billion which was approximately 15 per cent of total EC imports of manufactures. TD was approximately $1.7 billion, or 7.3 per cent of the imports of the EC from *W*. Both estimates were smaller in 1967/68. Note that these estimates were annual ones, so that the smaller figures for 1967/68 were not necessarily due to a shorter historical span.

The two bottom rows of the table give the estimates for all manufacturing excluding basic metals and basic metals and processed foods respectively. Kreinin drew attention to the fact using USA as a control group for agriculture (see above for reservations regarding this sector), resulted in TD of $0.75 billion and $1.3 billion in 1967/68 and 1969/70 respectively. TC was found to be, at the very best, equal to zero.

With respect to the sectoral composition of the effects of the EC, chemicals, textiles and clothing, processed foods and, in 1969/70, transport equipment had the largest amount of TD. Five sectors experienced fairly substantial TC: engineering products, chemicals, transport equipment, textiles and clothing and wood and paper. Basic metals also experienced substantial TC in 1969/70. Note also that both engineering products and basic metals (in 1969/70) experienced *negative* TD, i.e. ETC, but Kreinin had reservations here since the increased imports from *W* could have been to satisfy the inputs needed in the growing sectors experiencing TC, or simply due to a statistical bias created by using the USA as a normaliser.

Recall that these estimates were carried out on the assumption that movements in incomes and prices were identical in the EC and USA. Also recall that with regard to the ten-year period this assumption was far from realistic; therefore, the changes in the import consumption ratio for the USA did not explain fully what the changes in the EC would have been had the EC not been created. Hence, Kreinin tried to adjust the estimates separately for income and price differentials. These were done on an aggregate basis involving 'crude calculations, which at best indicate approximate orders of magnitude' (Kreinin, 1972, p. 909). It is therefore pointless to waste valuable space on the details of these adjustments. However, the outcome of these crude manipulations, in the case of adjustments for income, was to reduce the size of TC and increase that of TD. In the case of price adjustments, the estimates were affected in a contrary way, but these were not obtained in an aggregate manner since a large part of the adjustment was made in terms of three sectors: chemicals, engineering products and transport equipment. When adjusting for *both* income and price changes, the outcome was that both TC and TD increased

Table 10.11 Summary of EC effects of manufacturing ($ million)

Estimate	*1967/68*		*1969/70*	
	TC	*TD*	*TC*	*TD*
(1) US normalised (adjusted)	4.3	1.2	6.7	1.7
(2) UK normalised	3.9	1.1	9.3	0.4
(3) Non-normalised (adjusted)	3.5	1.8	9.2	1.2
(4) Unweighted average of (1)–(3)	3.9	1.3	8.4	1.1
(5) Unweighted average of (1) and (3), including processed foods	4.3	1.8	8.9	1.9

Source: M. E. Kreinin (1972) 'Effects of the EEC on imports of manufactures', *Economic Journal*, vol. 82, p. 917.

from 1967/68 to 1969/70, suggesting that trade flows were continuously adjusting to the creation of the EC.

The final part of Kreinin's study was devoted to entertaining the use of the UK as a normaliser, and to doing without any normaliser. The procedures adopted left a lot to be desired and the comments on them were 'highly speculative' in Kreinin's own words. Hence, the interested reader is advised to refer to the paper itself for further details; the general summary of these results is given below.

Now consider a summary of Kreinin's overall results. Even though each method is fraught with biases and difficulties, the results indicate that TC far exceeded TD in all the estimates. Moreover, there were also similarities in the sectoral distribution (not the absolute magnitudes) of these estimates: TD was largest in chemicals, while TC was more widely spread with engineering products, transport equipment, basic metals and chemicals having the largest estimates.

Table 10.11 gives a summary of the results obtained from the three estimates as well as their unweighted average, with and without processed foods.

Considering the unweighted average given in row (4), it is clear that in 1967/68 TC was three times TD and in 1969/70 TC became about eight times TD. Moreover, the results obtained by the different methods do not seem to diverge by much from this. Hence, Kreinin's conclusion was that the impact of the EC, on static grounds alone, was 'highly favourable to world-wide allocation efficiency'.

Conclusion

It should be apparent that Kreinin's method is fairly similar to that adopted by the EFTA Secretariat and is therefore subject to the same

limitations stated there. Moreover, most of the adjustments carried out by Kreinin are consistent with the expectations of customs union theory, but since the object of the exercise is to calculate the effects of economic integration, such adjustments make the estimates rather useless. Other criticisms will become apparent when recent contributions are examined, particularly the contribution by Winters (1984a) – see the following chapter.

AITKEN'S STUDY

Aitken (1973) used a cross-sectional trade flow model akin to those of Tinbergen (1962) and Linnemann (1966) with the aim of empirically isolating the principal influences which shaped European trade relations between 1951 and 1967. Utilising dummy variables, he first estimated the effect of the formation of the EC and EFTA on the trade of member nations. For each year of the post-integration period (1959–67), he estimated a cross-sectional equation and used it to test for the existence and approximate size of the respective integration effects. Also, he estimated a similar equation for the eight years prior to the formation of the EC to enable him to have a clear picture of the forces at work before economic integration. He then utilised a base year equation to calculate the TC and TD effects of these two regional groupings.

Aitken used the definitions of GTC, TD and ETC employed by Balassa (1967b). He tried to tackle the problems associated with 'residual' models by using a least squares regression method to estimate a variant of the Linnemann (1966) trade flow model for each of the years between 1951 and 1967. This variant of the Linnemann method can be expresed as:

$$\begin{aligned}\log X_{ij} = {} & \log b_0 + b_1 \log D_{ij} + b_2 \log Y_i + b_3 \log Y_j + b_4 \log N_i \\ & + b_5 \log N_j + b_6 \log A_{ij} + b_7 \log P^{EC}{}_{ij} + b_8 \log P^{EFTA}{}_{ij} \\ & + \log e_{ij} \end{aligned} \tag{15}$$

where X_{ij} is the dollar value of country i's exports to country j measured in accordance with country j's import data, Y is the nominal dollar value of GNP, N is population, D_{ij} is the geographical distance between the commercial centres in the two countries, A_{ij} is a dummy variable for adjacent countries, P is a dummy variable for trade between the partner countries and log refers to common logarithms.

It is assumed that Y_i and N_i together determine country i's poten-

tial export supply such that Y_i determines economic capacity and N_i the country's production ratio of the domestic/foreign markets. Generally, but more precisely, N is assumed to determine the size of market and, given the existence of economies of scale, it is presumed that the larger N, the more lines of production a country will be able to have to satisfy the minimum market size for efficient production (Linnemann, 1966, pp. 11–14). Therefore, the larger N the larger the ratio of the domestic to the foreign market and the smaller the export supply of the country in question. Using the same argument, it follows that Y_j and N_j together determine country j's potential import demand. D_{ij} is a proxy variable for 'natural trade resistance' which is defined as a composite of transport costs and time plus the 'economic horizon' (Aitken, 1973, p. 882). As a result, D_{ij}, together with N_i and N_j is hypothesised to have a negative impact on X_{ij}.

Aitken presumed that adjacent countries had an extra stimulus to trade due to taste similarities and an awareness of common interests. However, what Aitken wanted to emphasise was that, particularly where border areas were densely populated, neighbouring nations were likely to experience significant extra international trade in what were essentially locally traded goods.

Aitken was of the opinion that this model allowed one to incorporate into the analysis, as independent variables, the effects of economic integration by the use of dummy variables which represented, approximately, aspects which were difficult to calculate. He was quick to point out that the approximate nature of the economic integration variables necessarily meant that the estimates of the impact on trade flows must also be approximate. However, he claimed that there were distinct advantages in using a cross-sectional model. Firstly, by estimating the impact of economic integration as an independent variable, he was able to keep unchanged other important variables influencing trade, including potential demand and supply and, to a certain extent, the effects of general changes in trade liberalisation as well as transport costs – over time, the latter would be picked up by the proxy variables D_{ij} and A_{ij} (which do not change over time, but changes in the real variables would be expected to show up as annual changes in their estimated coefficients). As a specific example of this, Aitken pointed out that since the size of the trade-stimulating effect of European trade liberalisation may be expected to vary inversely with distance ('natural trade resistance'), the impact of trade liberalisation may show up as a change over time in the D_{ij} or A_{ij} coefficients or both. Secondly, Aitken claimed that

this model permitted the estimation of trade preference coefficients for each of the economic integration years, 'hence a series of parameter estimates can be obtained which can then be considered as a whole in terms of whether their pattern indicates the expected cumulative growth in the preference effects' (Aitken, 1973, p. 883). Thirdly, the preference parameters themselves could be used to calculate the dollar value of GTC for each of the EC and EFTA schemes: since the estimates for each year were obtained from the cross-sectional equation for the same year, it followed that each estimate was independent of the others and the estimation procedure necessitated the use of a base year; actually, the outcomes of the calculations would give information which 'may be useful in determining when the first integration effects on trade occurred' (Aitken, 1973, p. 883). Finally, one is reminded that employing the trade preference coefficients to calculate the trade stimulating effect of economic integration in any post-integration year forced one to assume that the size of the coefficient was being determined entirely by the effect of trade preference; hence, it was not partly reflecting some other special trade relationship which had existed in the pre-integration era. As a consequence, it was necessary to test the preference coefficients for 'non-significance' in the pre-integration period as well as for 'significance' in the post-integration era. By calculating the equation for the eight years preceding the first tariff reductions of the EC, Aitken claimed that he was able to test for the existence of pre-integration preference effects (Aitken, 1973, p. 883).

The sample from which Aitken calculated his equations consisted of the seven original members of EFTA (Austria, Denmark, Norway, Portugal, Sweden, Switzerland and the UK – Finland was left out due to its late entry) and the original founders of the EC, with Belgium and Luxembourg counted as one trading country. Hence, the sample contained 20 trade flows between members of the EC, 42 trade flows between the nations of EFTA and 70 trade flows between the members of both EC and EFTA. Therefore, 132 annual observations were needed.

The 70 trade flows between the EC and EFTA were presumed to be indicative of 'normal' European trade, and were, therefore, used as the norm to test for the preferential effects of the formation of the two blocs. Of course, this presumption had no validity for any year in which trade flows between the two blocs had, on average, experienced significant amounts of TD, since TD would have led to an inflated estimate of GTC because the value of the trade preference

coefficients would have tended to increase by an integration-caused reduction in the average trade flow between the two blocs as well as by an integration-caused increase in the average trade flow among members (Aitken, 1973, p. 884). Note, however, that although TD could have resulted in an inflated estimate of GTC, it could not detect a GTC effect where none had existed: by definition, TD could not occur in the absence of GTC.

Rather than rely on previous studies for the estimation of TD between the EC and EFTA, Aitken used his own procedure. The cross-sectional regression estimates were analysed to find an appropriate year not affected by economic integration. He then utilised the equation for the base year to calculate the value of trade that would have occurred in subsequent years in the absence of the EC and EFTA. He maintained that a comparison of the projected estimates and actual trade gave an estimate of the degree to which trade between the two blocs had been reduced due to TD.

This method of projection was also used to calculate GTC within the EC and EFTA in order to enable a further check on the dummy variable estimates. As a result, the second part of Aitken's statistical analysis comprised residual estimates of the dollar value of GTC and TD, but he emphasised that these were residual estimates based on the information provided by the regression analysis with regard to the timing of the first EC effect on European trade. He also emphasised that the assumption that the trade between the EC and EFTA was normal should be regarded as only an initial working hypothesis to be tested against the projected estimates before any conclusions were reached about the general size of GTC within the EC and EFTA.

Aitken's estimated values for the parameters for the trade flow equations for 1951–67 are given in Table 10.12. He observed that the trade preference coefficients fitted the expected theoretical pattern. This was because in all the pre-integration years (1951–8), the P^{EC} coefficient was not significantly different from zero and had even a negative sign. Moreover, in 1959 there was a sharp increase (relative to earlier years) in the value of the coefficient, making it positive for the first time, a trend which continued in later years, reaching a significance level of 0.1 in 1960 and becoming statistically significant at the 0.05 level in 1961. This amounted to stating that the change in the sign and the large change in the value of the P^{EC} coefficient (relative to earlier years) from 1958 to 1959 was consistent with the hypothesis that the first EC effect on member trade occurred in 1959, but the hypothesis of no EC effect could not be rejected at the

standard 0.05 confidence level until 1961. However, Aitken pointed out that in selecting the base year for projections, the appropriate methodological question was not whether the null hypothesis of no EC effect could be rejected at the 0.05 level, but rather whether or not the hypothesis of no EC effect could be accepted. He concluded that to make the latter decision, the hypothesis to be tested for acceptance (i.e. no EC effect) became the alternative hypothesis and the hypothesis that the EC had had a positive effect on trade became the equivalent of the null hypothesis (i.e. the hypothesis to be tested for rejection). Clearly, the positive P^{EC} coefficient for 1959 and 1960 together with the change in sign and large increase in value from 1958 to 1959 did not permit the rejection of the hypothesis of a positive EC effect and hence the hypothesis of no EC effect could not have been accepted for those years. The year 1958, therefore, constituted the last date for which the regression results allowed Aitken to assume that there had been no EC effect on member trade (Aitken, 1973, p. 886).

The preference area coefficient for EFTA (P^{EFTA}) seemed to follow the same pattern as that for the EC. From 1951 to 1959, the pre-integration period, the coefficient was insignificant, and in all years except 1951 it had a negative sign. It continued to have a negative sign in 1960, the first year after the formation of EFTA, but Aitken attributed this to the fact that the EFTA tariff reductions were introduced only in July of that year and, therefore, could not have influenced trade flows in 1960. In 1961, the preference coefficient became positive but small and began to increase slowly through 1963, becoming statistically significant at the 0.05 level in 1964. Aitken concluded that the EFTA preference area coefficient was therefore consistent with the hypothesis that the first EFTA effect on trade flows had occurred in 1961, but the null hypothesis of no EFTA effect could not have been rejected at the 0.05 confidence level until 1964. Also, all the remaining estimated parameters in the equations had the correct sign and were significant to at least the 0.05 confidence level in each and every year.

As pointed out above, the trade preference coefficients gave an indication of the extent to which normal trade amongst member nations had been enhanced due to the formation of the EC and EFTA. Hence, estimates of GTC for each bloc could be obtained from the coefficients for each year of the respective integration periods. Note that the regression results indicated that 1958 was the last year for which it could safely be presumed that there had been no

Table 10.12 Regression equations for European trade flows

		Coefficients of independent variables[a]									
Year	*Constant*	D_{ij}	Y_i	Y_j	N_i	N_j	A_{ij}	P_{ij}^{EC}	P_{ij}^{EFTA}	$\bar{R}^2$	*S.F.*
1951	1.958	–0.427	1.137	1.000	–0.493	–0.476	0.480	–0.141	0.53	0.766	0.277
		2.53	*8.81*	*7.76*	*3.60*	*3.48*	*1.85*	*0.46*	*0.23*		
1952	2.130	–0.499	1.163	0.876	–0.567	–0.350	0.490	–0.213	–0.078	0.760	0.292
		2.84	*8.92*	*6.72*	*3.99*	*2.46*	*1.80*	*0.66*	*0.32*		
1953	2.155	–0.509	1.200	0.839	–0.599	–0.350	0.515	–0.130	–0.068	0.769	0.292
		2.89	*9.28*	*6.49*	*4.17*	*2.44*	*1.89*	*0.40*	*0.28*		
1954	2.052	–0.484	1.110	0.816	–0.482	–0.354	0.686	–0.146	–0.111	0.755	0.306
		2.63	*8.27*	*6.08*	*3.23*	*2.37*	*2.40*	*0.43*	*0.44*		
1955	1.915	–0.452	1.081	0.810	–0.463	–0.312	0.759	–0.091	–0.098	0.777	0.291
		2.58	*8.35*	*6.26*	*3.20*	*2.16*	*2.80*	*0.28*	*0.41*		
1956	2.000	–0.476	1.075	0.773	–0.482	–0.276	0.742	–0.098	–0.107	0.782	0.284
		2.80	*8.54*	*6.14*	*3.41*	*1.96*	*2.80*	*0.31*	*0.46*		
1957	1.900	–0.448	1.118	0.776	–0.505	–0.304	0.788	–0.019	–0.136	0.779	0.292
		2.57	*8.64*	*5.99*	*3.48*	*2.09*	*2.89*	*0.06*	*0.56*		
1958	1.901	–0.444	1.069	0.740	–0.481	–0.281	0.766	–0.008	–0.159	0.770	0.291
		2.55	*8.18*	*5.66*	*3.25*	*1.90*	*2.82*	*0.02*	*0.66*		

1959	1.848	–0.449	1.123	0.849	–0.484	–0.396	0.758	0.204	–0.109	0.802	0.276
		2.71	*8.91*	*6.74*	*3.44*	*2.81*	*2.94*	*0.68*	*0.47*		
1960	1.617	–0.383	1.215	0.903	–0.578	–0.429	0.782	0.402	–0.103	0.815	0.273
		2.34	*9.65*	*7.17*	*4.09*	*3.04*	*3.07*	*1.33*	*0.45*		
1961	1.617	–0.398	1.209	0.826	–0.551	–0.375	0.798	0.475	0.045	0.831	0.257
		2.59	*10.30*	*7.03*	*4.17*	*2.84*	*3.33*	*1.68*	*0.21*		
1962	1.562	–0.410	1.150	0.925	–0.474	–0.456	0.806	0.527	0.076	0.846	0.251
		2.75	*10.18*	*8.18*	*3.72*	*3.58*	*3.45*	*1.91*	*0.36*		
1963	1.589	–0.440	1.106	0.891	–0.441	–0.376	0.789	0.580	0.172	0.854	0.244
		3.06	*10.03*	*8.08*	*3.55*	*3.02*	*3.47*	*2.17*	*0.85*		
1964	1.520	–0.444	1.120	0.959	–0.439	–0.442	0.747	0.630	0.326	0.870	0.229
		3.28	*10.88*	*9.31*	*3.80*	*3.83*	*3.51*	*2.52*	*1.73*		
1965	1.349	–0.392	1.108	0.899	–0.421	–0.396	0.828	0.743	0.345	0.863	0.232
		2.87	*10.62*	*8.62*	*3.64*	*3.42*	*3.84*	*2.94*	*1.81*		
1966	1.252	–0.389	1.111	0.880	–0.398	–0.354	0.825	0.802	0.435	0.871	0.225
		2.93	*10.88*	*8.62*	*3.54*	*3.15*	*3.94*	*3.26*	*2.35*		
1967	1.067	–0.349	1.052	0.911	–0.331	–0.369	0.892	0.887	0.572	0.874	0.217
		2.74	*10.39*	*9.00*	*3.03*	*3.38*	*4.41*	*3.75*	*3.21*		

Notes: [a] X_{ij} is the dependent variable; all variables are expressed in *logs*; *t*-values shown in italics, where 1.66 and 2.36 are significant at the 0.05 and 0.01 level, respectively.

Source: N. D. Aitken (1973) 'The effects of the EEC and EFTA on European trade: a temporal cross-section analysis', *American Economic Review*, vol. 63, p. 885.

EC effect on European trade. Therefore, Aitken chose 1958 to be the base year to project estimates of what trade flows would have been in the absence of economic integration. To carry out these projections, the 1958 equation was recalculated without P^{EC} and P^{EFTA}. This procedure led to the following results:

$$\begin{aligned}\log X_{ij} = {} & 1.978 - 0.487 \log D_{ij} + 1.062 \log Y_i + 0.733 \log Y_j \\ & \quad (3.76) \qquad\quad (8.33) \qquad\quad (5.75) \\ & - 0.459 \log N_i - 0.259 \log N_j + 0.718 \log A_{ij} + \log e_{ij} \\ & \quad (3.36) \qquad\quad (1.90) \qquad\quad (2.84)\end{aligned} \tag{16}$$

$R^2 = 0.776$; S.E. = 0.289; and the t-values all sigficant above the 0.05 level.

Aitken drew attention to the fact that equation (16) took into consideration neither the impact of changes in competitiveness amongst the member nations of the EC and EFTA nor any general trade liberalisation measures introduced after 1958. Therefore, his projections were based on the understanding that these two factors had insignificant effects in relation to the impact of economic integration. He believed that this assumption was vindicated by his regression results since 'the pronounced increase in the trade preference coefficients indicates that economic integration provided the major impetus for additional trade (with the effect of income held constant) among the respective members of the two blocs' (Aitken, 1973, p. 887). However, he did point out too that this model could not give information on trade between the EC and EFTA, i.e. it was incapable of providing information on the size of TD and ETC.

Aitken then used the exponential form of equation (16) to estimate inter- and intra-EC and EFTA trade. These were then deducted from actual trade to get the residual estimates of the trade effects of the two blocs. Because equation (16) estimated the dollar value of trade in 1958 prices, Aitken estimated trade by country i's export price index (dollar prices, 1958 base) so that his estimates could be recorded in current prices: this should have enabled a direct comparison with the dummy variable (DV) estimates which reflected the prices of the given year for which the regression was calculated. Table 10.13 gives the projection estimates for each of the four sub-groupings of the sample together with the DV estimates of GTC.

Commenting on the results in Table 10.13, Aitken pointed out that both the DV and projection estimates of the respective bloc's impact on member trade were consistent with the expectation that the

Table 10.13 Net effects of integration on EC and EFTA trade – dummy variable and projection estimates ($ million at current prices)

	Net EC effect on:			*Net EFTA effect on:*		
	EC exports[a]		*EFTA exports*[b]	*EFTA exports*[a]		*EC exports*[c]
Year	*Dummy variable estimate*[d]	*Projection estimate*[e]	*Projection estimate*[e]	*Dummy variable estimate*[d]	*Projection estimate*[e]	*Projection estimate*[e]
1959	1 067	925	50	0[f]	–8	66
1960	2 468	1 639	31	0[f]	140	48
1961	3 284	2 254	67	126	149	–102
1962	4 114	3 213	393	222	243	–201
1963	5 203	4 731	541	545	389	–262
1964	6 388	5 695	202	1 151	573	–289
1965	8 228	6 941	–41	1 326	690	–259
1966	9 784	8 612	–157	1 773	919	–205
1967	11 127	9 189	–629	2 425	1 264	–202

Notes: (i) *a* Estimates of Gross Trade Creation (GTC).
(ii) *b* Estimates of the net external trade creation (ETC) or trade diversion (TD) effect of the EC on the exports of EFTA countries.
(iii) *c* Estimates of the net TD effect of EFTA on the exports of EC countries.
(iv) *d* Dummy variable estimates of GTC derived from the P^{EEC} and P^{EFTA} coefficients reported in Table 10.12.
(v) *e* Actual trade in current prices minus trade estimated by equation (16) converted to current prices.
(vi) Zero values are given for 1959 and 1960 since the P^{EFTA} coefficient is negative for those years.

Source: N. D. Aitken (1973) 'The effects of the EEC and EFTA on European trade: a temporal cross-section analysis', *American Economic Review*, vol. 63, p. 888.

removal of inter-bloc tariffs in stages (economic integration being a cumulative process in both the EC and EFTA), would cause the estimates of GTC to increase from year to year without any reversals. In the case of the EC, the projection estimates were consistently below the DV's, with the gap widening as one approached 1967. Be that as it may, both estimates indicated a substantial EC effect in 1959 and a powerful cumulative growth in the annual values of GTC. The estimates for EFTA indicated a cumulative growth in GTC, but until 1962 the DV estimates were below but fairly close to the projection estimates and in 1963 and thereafter the DV estimates exceeded the projection estimates with the gap widening towards the end of the period. Aitken concluded that, even allowing for a large margin of error, the results clearly showed that the GTC had been much larger for the EC than for EFTA: it accounted for 38 per cent of actual intra-EC trade (import data) and 16 per cent of total EC exports in 1967 while the percentages for EFTA were 16 and 4 respectively.

Aitken then turned to the results regarding the impact of each bloc on the other. Since EFTA was a free trade area, its formation did not lead to a reduction in its external tariff rates. Hence, Aitken's expectation was that EFTA would have been detrimental to EC exports. Moreover, due to the progressive reduction in tariffs within EFTA, it was expected that TD would have increased progressively throughout the integration period. As the table shows, the estimated effect on EC exports due to the formation of EFTA was only partially consistent with this expectation: the estimated effect becoming negative in 1961 (first full year of economic integration) and increasing thereafter until 1964 was consistent with TD while the reduction in the magnitude of TD during the last three years was not. However, when Aitken disaggregated the EFTA effect by individual EFTA importing country, he found that the decline in the TD effect over the period under consideration was almost entirely due to the UK: the net effect on EC exports increased from *minus* $38 million in 1963 to $530 million in 1967. His explanation for the UK effect was that the period 1964–7 was one of a general decline in the UK's trade balance leading to the 1967 devaluation of Sterling; hence, the divergence of the UK effect was accounted for by a substantial decline in the competitive position of the UK. When the UK divergence was allowed for, the results for the rest of EFTA were consistent with expectations: net TD increasing at a progressive rate from minus $223 million in 1963 to minus $731 million in 1967.

With regard to the estimates of the net EC effect on EFTA,

Aitken's expectations were that the reductions in the external tariff rates (CETs) of those members with very high tariffs (France and Italy) would have meant that both ETC and TD were possible, but that TD would have eventually dominated when the internal EC tariffs were completely removed. The estimates indicated a general rise in net ETC until 1963 and the emergence of a rising net TD effect during the period from 1965–7.

Aitken's final conclusion from this table related to the fact that the predominance of TD over trade between the EC and EFTA over the later years of the period under consideration explained the growing gap between the DV and projection estimates for these years. Hence, he concluded that the DV estimates were certainly inflated for the period 1965–7 and, possibly, for earlier years as well. Therefore, for at least the last three years, he rejected the DV estimates, preferring the projected estimates.

In the final part of his paper, Aitken asked the question: did the expected results hold for each country under consideration in 1967? He felt that this was an important question since it was tantamount to asking for a more severe test of the GTC and TD hypotheses: mistakes due to competitive effects cancelling out in the estimates were less likely to occur in the case of individual countries as opposed to the bloc as a whole. These results are provided in Table 10.14 for 1967. Note that, with the exception of the UK (negative minor value), the estimated effects of each bloc on the trade of its respective member nations were all positive; hence they were consistent with the expected GTC effect. The estimated net EC effect on the individual member nations of EFTA showed that, with the exception of the UK, they were all experiencing net TD in 1967.

When the 1967 EFTA nation estimates were disaggregated by the EC countries which initially had high and low tariffs, the results indicated that the high tariff nations were responsible for $238 million of the total EC effect on the UK. Aitken interpreted this to mean that the positive effect for the UK could be explained by ETC. Also, Sweden ($82 million) and Switzerland ($7 million) indicated evidence of an ETC effect by the high tariff EC nations, but this was more than counteracted by a more substantial TD effect from the low tariff countries. In this respect, Aitken concluded that the results showed that although TD was the most substantial effect of the EC in relation to EFTA in 1967, the three predominantly industrial nations of EFTA carried on benefiting from ETC in the markets of France and Italy.

Table 10.14 Net effect of EC and EFTA on 1967 trade of individual coutries – projection estimates ($ million at current prices)

Exporting country	*Net EC effect*	*Net EFTA effect*
Belgium-Lux.	1 649	–39
France	2 170	379
Germany	2 473	–390
Italy	1 958	260
Netherlands	939	–412
Total EC	9 189	–202
Austria	–123	234
Denmark	–350	144
Norway	–30	211
Portugal	–42	107
Sweden	–100	397
Switzerland	–229	173
United Kingdom	245	–2
Total EFTA	–629	1 264

Source: N. D. Aitken (1973) 'The effects of the EEC and EFTA on European trade: a temporal cross-section analysis', *American Economic Review*, vol. 63, p. 890.

However, the estimated EFTA effect on the member nations of the EC was surprising: they indicated positive values for both France and Italy which was in contradiction to expectations, given anticipation of only a TD effect. Aitken pointed out that while it was feasible that these two nations experienced only minimal TD by EFTA, one was not in a position to eliminate the possibility that the estimates may have been substantially affected by changes in relative competitiveness. He, therefore, concluded that although the net effect of EFTA on the EC was largely consistent with the TD hypothesis, 'there are sufficient discrepancies among the individual country estimates to temper this conclusion with reservation' (Aitken, 1973, p. 891).

Conclusion

Aitken's methodology stands out with regard to its ability to detect the year when the effects of economic integration began to be felt. This certainly disposes of the problem of arbitrarily determining the most suitable year to divide integration from non-integration. However, the way the results are interpreted leaves a lot to be desired: one cannot assume that one's equations can determine the pattern of

trade prior to integration and use them to project in the future and then try to justify puzzling results by resorting to changes in relative competitiveness! This is precisely what Aitken did in order to make sense of his GTC and TD estimates. Other criticisms will become apparent as we discuss some of the later contributions in the following chapter.

CONCLUSION

Maybe the best way to conclude this chapter is to provide an integrated summary of the studies of the impact of economic integration to this point. In doing so, it is vital to distinguish between short-term static effects, whereby changes in the impediments to trade lead to once-and-for-all changes in the composition and pattern of trade, and longer-run dynamic effects, whereby economic integration over time leads to permanent changes in the rate of change of economic parameters. With this distinction in mind, one can classify the studies into *static* and *dynamic* along the lines suggested by Mayes (1978) in his excellent survey which forms the basis of this section.

The static studies can be put together into two major groups under the headings of *residual* and *analytic* models.

Residual Models

These depend largely on their ability to quantify the situation in the absence of economic integration, i.e. on the construction of the *anti-monde*. It should be clear from the contributions discussed that the construction of a satisfactory *anti-monde* will depend on a thorough accounting for the omissions mentioned in the previous section. These models are set out here in order of increasing complexity.

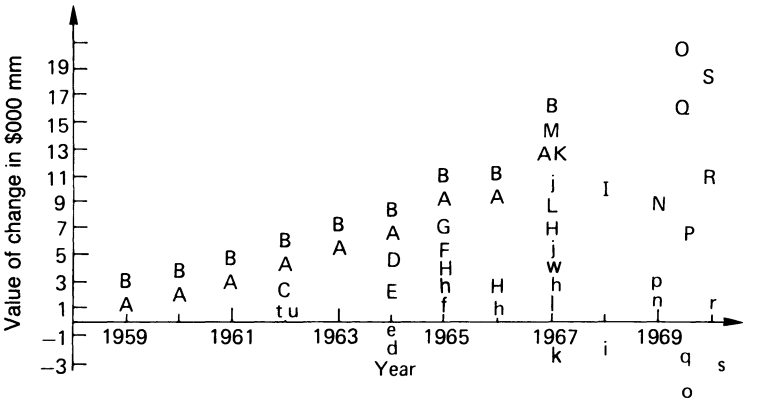
Import models

The general tendency here is to emphasise variables drawn from only the importing country. This has the advantage of easy data collection, but one must ask the question of whether or not this adequately compensates for the inaccuracy of the estimates? To answer this question meaningfully, we need to follow Mayes's (1978) classification of this category of studies.

(i) The demand for imports. These studies are based on the assumption that in the absence of economic integration imports would have

grown over time as they did in the past. They have the obvious limitation that the extrapolation of trends has cryptic drawbacks for a cyclical activity such as international trade. Hence, many of the contributors assumed that imports would continue to be subject to the same linear relation to total expenditure, GDP and GNP respectively, in the *anti-monde* as they had been prior to the integration era – see, for example, Wemelsfelder (1960), Clavaux (1969) and Walter (1967). As indicated in Chapter 10, these contributions were built on the untenable premise that the marginal propensity to import remained constant throughout; evidence suggests that this parameter rises as income grows. Moreover, the estimation of the actual marginal propensity to import over the pre-integration periods would always be obscured by other changes in the international trading arrangements which had occurred then, and would not represent an *anti-monde* where no change had taken place.

The relative significance of changes in assumptions in terms of their quantitative impact is depicted in Figure 10.3 where the results of



Capital letters denote trade creation and small letters trade diversion

A Aitken (1973) (projection)
B Aitken (1973) (dummy variable)
C Waelbroeck (1964) (method 1)
D Truman (1960) disaggregated 1958 base
E as D 1960 base
F Balassa (1967c)
G Clavaux (1969)
H EFTA (1972)
I Major and Hays (1970) 1958 base
J Resnick and Truman (1974)
K Truman (1972)
L K (adjusted)
M Verdoorn-Schwartz (1972)
N Williamson-Bottrill (1971)
O Kreinin (1972) not normalised
P O US normalised and adjusted
Q O UK normalised

R Balassa (1964)
S Prewo (1974)
t Lamfalussy (1963)
u C method 2

Values denoted:

(i) Trade creation						(ii) Trade diversion		
Year	*Estimate*	*Value in $000 million*	*Year*	*Estimate*	*Value in $000 million*	*Year*	*Estimate*	*Value in $000 million*
1959	A	0.9	1965	H	1.7	1962	t	0.5
	B	1.1	1966	A	8.6		u	0.5
1960	A	1.6		B	9.8	1964	d	–1.6
	B	2.5		H	2.2		e	–0.3
1961	A	2.3	1967	A	9.2	1965	f	0.1
	B	3.3		B	11.1		h	0.6
1962	A	3.2		H	2.3	1966	h	0.7
	B	4.1		J	1.8	1967	h	0.9
	C	1.0		K	9.2		j	3.0
1963	A	4.7		L	2.5		k	–1.0
	B	5.2		M	10.1		l	0.5
1964	A	5.7	1968	I	10.8		n	1.1
	B	6.4	1969	N	9.6	1968	i	–2.9
	D	4.5	1969/70	O	20.8	1969	n	0.0
	E	2.6		P	7.2	1969/70	o	–4.0
1965	A	6.9		Q	16.0		p	2.4
	B	8.2	1970	R	11.4		q	–2.8
	F	1.9		S	18.0	1970	r	0.1
	G	5.0					s	–3.1

Figure 10.3 Predictions of trade creation and trade diversion in the EC

Source: D. G. Mayes (1978) 'The effects of economic integration on trade', *Journal of Common Market Studies*, vol. 17, p. 6.

various estimates for the economic impact of the formation of the EC on trade are portrayed. Clearly, ideal comparison would require one to use each of the models with the *same* set of data, and where the quantity of recomputation was minimal, Mayes (1978) carried it out and included it in the figure. However, the data used in the various models were very different, so Mayes opted for the original results; these are also included in the figure with a time axis denoting the year for which they are estimates. The conclusion one reaches from a portrayal of the estimates is that the use of more observations tends to improve the results.

(ii) Shares in apparent consumption. Estimation can also be carried out by examining the relative share performance in total consump-

Table 10.15 Alternative estimates of aggregate effects of EFTA, 1965 ($ million)

Country	*Trade creation*		*Trade diversion*	
	Hypothesis		*Hypothesis*	
	(1)	*(2)*	*(1)*	*(2)*
Austria	–121.5	163	178.3	79
Denmark	–180.6	–122	322.1	–166
Finland	–104.9	–59	149.0	–136
Norway	–32.7	63	261.6	–73
Portugal	63.8	62	–15.1	43
Sweden	364.4	276	96.5	–110
Switzerland	–357.8	218	288.3	117
United Kingdom	831	–343	–619.1	–594
Total	361.7	258	661.6	–840

Source: D. G. Mayes (1978) 'The effects of economic integration on trade', *Journal of Common Market Studies*, vol. 17, p. 8.

tion, as against the absolute value of imports, of different suppliers. Truman (1969) adopted the simplest solution by assuming that the relative share of each supplier would remain constant over time, but, as already indicated, it would be desirable to allow for changes in these ratios over time on the basis of historical experience. The studies by the EFTA Secretariat (1969; 1972) tackle this by assuming that the linear trend in relative shares during 1954–9 would have been maintained by the participating nations in the absence of economic integration. There are two objections to this premise: firstly, 1954 and 1959 may not lie on the actual trend, and secondly, the form of the trend itself is too simple. Estimation, by for example regression analysis, to improve on the results is not really worth while, given the naivety of the original assumption.

Table 10.15 gives two alternative estimates of the impact on the aggregate trade flows for EFTA depending on whether or not one assumed a linear trend or no change in the *anti-monde*. One should note not only the differing results but also the almost random distribution of the negative and positive signs.

(iii) Changes in the income elasticity of demand for imports. This method tries to tackle the problem of changes in the relative shares from the opposite direction by discerning what the actual changes imply for the elasticity of demand for different types of imports with respect to income. As we observed in Chapter 10, Balassa (1967b;

1974) estimates the income elasticities of demand for imports from member countries separately from those from non-participating nations. Recall that he advanced the proposition that an increase in the elasticity of demand for imports from all sources indicated TC, and that a decline in the elasticity of demand for imports from non-participants, given an increase in the elasticity for imports from the partners, indicated TD. These results are given in Figure 10.3. Also recall that the *anti-monde* here was that these elasticities would not have changed in the absence of economic integration. To reiterate the criticism advanced in Chapter 10, Mayes (1978, pp. 8–9) argues that since the estimated elasticties 'are not unitary and not equal for imports from member and non-member countries, this means that changes in the shares of total imports in apparent consumption and imports from non-member countries (and hence member countries) in total imports can and do take place' in the *anti-monde*. Although Balassa made allowances for changes in prices, his estimates were similar to those of the general trend in Figure 10.3, but both positive and negative results were observed.

Both the Balassa (1967b) and EFTA Secretariat (1969) methods leave unanswered the question as to why the substantial liberalisation in world trade prior to economic integration left unaffected the estimation of trade relationships during that period. Indeed, Clavaux (1969) showed that if this factor were taken into consideration, i.e. trade liberalisation were excluded from the *anti-monde*, Balassa's calculations for TC by 1966 would have more than doubled. However, as Mayes (1978, p. 9) clearly argues, the most important aspect of this criticism is that price elasticities imply a level of sophistication not reflected in the methods employed: without equations depicting supply conditions, there would arise identification problems which would bias estimates of price elasticities towards zero; the neglect of supply conditions implied that the price elasticities of supply would be infinite. Note that Balassa's (1974) calculation of *ex post* income elasticities incorporated supply constraints, but for the pre-integration situation as well. Moreover, Sellekaerts (1973) demonstrated that income elasticities varied widely over both the pre- and post-integration eras. Hence, the selection of appropriate periods for comparison purposes is of the utmost importance.

Inclusion of supply parameters

The explicit incorporation of supply conditions would improve the specification of models since trade between any two countries is

determined by parameters within *both* of them. The simplest method dealing with this was built on the premise that, under ' normal' circumstances, trade between any two countries would be purely a function of the total trade of each of the two countries. Most particularly, the trade between any two countries would vary proportionately with the total exports of the exporting country and the total imports of the importing country in the *anti-monde*. The *RAS*, advanced by Stone and Brown (1963), was the earliest input–output model to be adapted by Kouevi (1965) and Waelbroeck (1964b) for this purpose. The major deficiency of this model is that total imports and exports were constrained to their actual values; hence, it was not possible to estimate TC.

An advance on this simple approach was the 'gravitational' method pioneered by Tinbergen and developed by Pulliainen (1963b), Poyhonen (1963) and Linnemann (1966). The model presumed that the trade flow between any two countries would be a function of their respective national incomes, populations and the distance between them. The model was estimated by cross-section data and the economic impact of any integration scheme was calculated by the unexplained residual in the regression, or by the inclusion of dummy variables (DVs) for trade between participating nations as was the case in the estimates by Aitken (1973; equation 15 in this chapter) and Aitken and Lowry (1973). These two methods gave very different results due to substantial variability over time in the parameters. Recall that the estimates by Aitken (1973) gave a figure of $1264 million for TC by EFTA in 1967, employing the 1958 variables (this is labelled 'projection' in Figure 10.3), while the use of the 1967 values themselves together with the DVs made the results increase by 92 per cent. Note that Aitken's results were the only ones to be estimated over a sequence of years, hence their great influence on the overall pattern of Figure 10.3. Even though these estimates are fairly consistent with the others, they tend to form an upper bound in some instances; for example, in 1965 they were three to four times as large as the lower bound. But one should hasten to add that the absolute magnitude of all the estimates was small. The main reason for these differences was the variability in the estimated parameters from year to year indicating that to project with fixed parameters, one needed to take great care; this was confirmed in a disaggregated study by Bluet and Systermanns (1968). Mayes (1978, pp. 11–12) argued that much of the 'variability in the estimators occurs because a cross-section cannot represent a relationship which responds to cycles in

Table 10.16 Resnick and Truman's (1974) estimates of trade creation and trade diversion in the EC and EFTA compared with those of Verdoorn and Schwartz (1972) ($ million)

Country	*Trade creation*		*Trade diversion*	
	R & T 1968	*V & S 1969*	*R & T 1968*	*V & S 1969*
EC				
BLEU	152	913	281	183
Netherlands	93	868	190	216
W. Germany	– 659	3 874	1 732	267
Italy	1 022	1 336	62	154
France	582	3 073	737	248
Total	1 190	10 064	3 002	1 068
EFTA				
UK	81	204	394	249
Other EFTA	131	161	231	547
Total	212	365	625	796
EC + EFTA	1 402	10 429	3 627	1 864

Source: D. G. Mayes (1978) 'The effects of economic integration on trade', *Journal of Common Market Studies*, vol. 17, p. 12.

economic activity and the very process of trade liberalisation in general. Pooling data helps to some extent but the model's main disadvantage is the omission of relative prices'.

Verdoorn and Schwartz (1972) tried to tackle this drawback in their second model where they combined the advantages of the gravitational method with the effects of prices both on the overall demand for imports and the substitution between imports from different sources. While the results were mainly calculated on a residual basis, two DVs were used to explain some of the residual, but the explanation was statistical, not economic. The results are given in Table 10.16, and as can be observed from Figure 10.3, they generally conform with the broad results, thus indicating that more sophisticated models do not leave us much the wiser.

Incorporating information from third countries

Estimation using the share approach, without incorporating supply factors, could include third country behaviour. Lamfalussy (1963) showed that if one took into consideration the change in the shares of

Table 10.17 A comparison of the effects of different *anti-mondes* on the imports of the EC and EFTA in 1969 ($ million)

		Importer	
Anti-monde	*Exporter*	*EC*	*EFTA*
(1)		5 091	–1 042
(2)	EC	1 018	–3 610
(1)/(2)		5.00	0.29
(1)		–2 258	2 542
(2)	EFTA	–1 594	2 644
(1)/(2)		1.42	0.96
(1)	*W*	–2 833	–1 500
(2)		576	966

Notes: (i) Share of exporter *i* in the market of importer *j* would change betwee 1959 and 1969 at the same linear rate as the share of *i*'s exports in the imports of Rest of World (*W*) changed during the same period (shares constrained to sum to unity).
(ii) Share of exporter *i* in the market of importer *j* would change between 1959 and 1969 at the same linear rate that it did between 1954 and 1959.

Source: D. G. Mayes (1978) 'The effects of economic integration on trade', *Journal of Common Market Studies*, vol. 17, p. 13.

trade of non-participating countries and member nations of the EC in other markets, where neither was affected by economic integration, as the basis of one's expectations of how shares in the participating nations' markets would have changed in the absence of integration, one would get a different set of answers relative to those from trend extrapolation in the markets of the member countries alone. This is shown in Table 10.17, where the differences depict a fairly clear pattern: the share of EC exports in both EC and EFTA imports is much greater under the first hypothesis and the share of *W* in both markets falls under the first hypothesis but rises under the second. EFTA shares in both markets are greater under the second hypothesis but only very marginally so for intra-EFTA trade. As we observed earlier, it is also apparent that Lamfalussy's pessimistic conclusions were largely due to a limited period of observation: the first three years in the life of the EC. This was demonstrated by Williamson and Bottrill (1971) by using more observations and sophisticated extrapolation methods of the *anti-monde* shares. Recall, however, that their approach does not allow one to estimate TC and TD without introducing further assumptions concerning their relative sizes.

Third countries can be used as a 'control' group or a 'normaliser' for estimating what the *anti-monde* would have been by incorporating them explicitly in the model. Kreinin (1972) does so by adapting the technique of projecting the *anti-monde* on the basis of predicted import/consumption ratios. The advantage of this method is that it allows one to observe more clearly how the normalisation procedure works, and, therefore, should enable one to evaluate the tenability or otherwise of the assumptions on which it is built. However, it is an illusion to believe that a control group can be found, particularly for such schemes of integration as the EC and EFTA, since the control variables themselves are affected by the very experiment one is seeking to isolate.

Estimation of the anti-monde

We have observed that the number and range of estimates of the impact of economic integration by imputation of the unaccounted for residual are large, and it should be apparent that the more the relevant parameters are incorporated into the estimation of the *anti-monde* the more acceptable are the results. Also, the incorporation of such refinements as disaggregation and intermediate products should lead to even more satisfactory results. However, the results of the study by Prewo (1974) depicted in Figure 10.3 give a very different pattern of estimates relative to other models, but this may be attributable to the simplicity of some of his other assumptions. Yet, as Mayes has argued, the problem of establishing a hypothetical *anti-monde* is in itself not an attractive proposition. 'While it is possible to point out the existence of biases it is not possible to know whether an unbiased estimate has been achieved, one can merely judge on the grounds of plausibility' (Mayes, 1978, p. 15). Plausibility is determined by the incorporated parameters not just in the importing and exporting countries, but also in the way they influence the trade cycle and changes in world prices. Hence, it is necessary to develop *analytic* models which are capable of explaining actual trade flows and their changes, as opposed to the estimation of *anti-mondes* and the imputation of residual differences to determine the impact of economic integration.

Analytic Models

By *analytic* models one means methods which provide an economic rationale for the actual situation after integration has taken place.

Such approaches are vital for all *ex ante* methods since the future values of trade flows are not known. Due to the inherent complexity of prediction, such models are usually very simple and rely mainly on economic behaviour in the importing country. As we have seen, they assume that imports are determined by a measure of income or economic activity and the level of prices of imported and domestic products. Therefore, on the premise of a relationship between tariffs and prices, TC can be predicted from the change in the level of tariffs. Also, if one has knowledge about the elasticity with regard to changes in prices between member countries and the non-participants, one can estimate TD.

As was suggested in Chapter 8, this simple method will not provide acceptable estimates even if more sophisticated import demand functions are incorporated unless the effect of price changes on the level of prices can be explained. The EFTA Secretariat (1968) expected prices to fall by the full amount of tariff changes, but it turned out that only part of the tariff changes seemed to be passed on. There is also a fair amount of evidence, at the microeconomic level, to suggest that the pricing of imports of many commodities depends mainly on the prices of existing competing domestic products. It is even suggested that the situation is far worse since importers tend to anticipate tariff changes, indicating that the growth of trade will anticipate the 'determining' tariff changes – see Walter (1967). Moreover, the attempts by Krause (1962) and Kreinin (1961) to calculate the tariff elasticities directly have not been successful; Mayes (1971; 1974) demonstrates that the estimates from this method do not correspond closely with those from the residual models.

Since different goods/nations are unlikely to behave in an identical fashion, one should expect that the greater the extent of disaggregation the more reasonable the estimates will be. Mayes (1971) uses a 97 commodity breakdown of manufactures and allows for a complete system of demand equations with the volume and price of imports from each country being distinguished to give a whole matrix of direct substitution elasticities (along those of Barten, 1970) to reach estimates for a projected *Atlantic Free Trade Area* comprising Canada, EFTA, Japan and the USA. These results are given in Table 10.18. They display an expected pattern of signs for overall TC and TD, and are also robust to quite significant changes in the variables. Other estimates utilise more global values based either on simple assumptions or crude extrapolation from calculations for the USA; the different set of assumptions employed by Balassa (1967b), Krei-

Table 10.18 A comparison of *ex-ante* predictions of the effects of economic integration on trade
An Atlantic free trade area[a] (effects on total exports) ($ million) 1972 (estimated)

Country	*(1)*	*(2)*	*(3)*	*(4)*
US	2 454	2 318	2 509	2 645
Canada	2 141	2 610	2 547	2 650
Belgium-Luxembourg	–88	–124	–93	–117
France	–127	–146	–159	–199
Germany	–444	–538	–538	–673
Italy	–131	–144	–163	–204
Netherlands	–48	–56	–64	–80
Total EC	–838	–1 008	–1 017	–1 273
Denmark	22	30	24	24
Norway	15	23	18	18
Sweden	128	156	144	148
UK	607	821	726	756
Rest of EFTA	241	263	225	265
Total EFTA	1 013	1 293	1 167	1 215
Japan	1 879	2 380	2 301	2 448
Rest of the world	–646	–806	–719	–898
Total	6 002	6 786	6 786	6 786

Notes: (i) (a) Defined here 7s an area comprising US, Canada, EFTA and Japan – this corresponds closely to the definitions used by Balassa (1967b).
(ii) (b) Commodity categories are different so these results do not represent an exact up-dating of the original results.
(iii) (1) Mayes (1971).
(2) Using elasticities used by Balassa (1967b).[b]
(3) Using same import elasticity as Balassa but assuming elasticity of substitutuion is –2.5 as does Kreinin (1967).
(4) As (3) but assuming elasticity of substitution is –2 as does Krause (1968).

Source: D. G. Mayes (1978) 'The effects of economic integration on trade', *Journal of Common Market Studies*, vol. 17, p. 18.

nin (1967) and Krause (1968) lead to estimates given respectively in columns (2), (3) and (4) of the table, as recalculated by Mayes (1978). The results are somewhat similar, but this is attributable to offsetting changes: greater TC being matched by greater TD. However, the striking feature of these results is that they are small relative

to those given by residual models; for example, Kreinin (1969) found the effect of the formation of the EC for the period 1962–5 to be less than $100 million.

More elaborate models (Armington, 1970; Resnick and Truman, 1973) allow for the determination of imports by a series of allocative decisions while the studies by Balassa (1967b) and Kreinin (1967) use simple assumptions for supply constraints, but, as can be seen from Figure 10.3 and Table 10.16, the estimates of these models do not fit happily with those from the residual models. For example, the estimates of TD from the Resnick and Truman model are only one-eighth of those from the Verdoorn and Schwartz (1972) model. Also, because the establishment of the CETs meant that West Germany had to raise its tariff levels, TC is negative in the analytic case but is the largest positive estimate in the residual model. This indicates that factors other than tariff changes had a very substantial and positive effect on West Germany's post-EC trade. There is, therefore, 'much more to be explained which *is not* covered by the analytic models and *cannot* be covered by the residual ones' (Mayes, 1978, p. 18).

However, the main attraction of the analytic models is that they can be tested after the event and can be used for forcasting as well as for *ex post* estimation. In this respect, the models used by Grinols (1984) and Winters (1987) – discussed in Chapter 11 – represent a way forward.

Dynamic Studies

The static models are predominantly concerned with the impact of price changes alone on the level, composition and pattern of trade. However, it could be argued that the static models leave out the most dominant effects of economic integration. This is due to the fact that the feed-back on to incomes and the rate of economic growth or the necessity for the use of expenditure switching policies for balance-of-payments equilibrating purposes may be considerable and either positive or negative. For example, Kaldor (1971a; 1971b) not only argues that membership of the EC will inflict costs on the UK, but that the costs will be reinforced by adverse dynamic effects. However, there are very few estimates of the dynamic effects, with Krause (1968) being the exception. Krause tries to explain changes in the rate of real economic growth in the EC and EFTA by increasing business investment and efficiency. The expectation is that an in-

crease in the ratio of investment to GDP will increase capital accumulation, and if the marginal capital/output ratios are constant, both output and the rate of growth must increase. But the fixity of the capital/output ratios automatically excludes economies of scale which lie at the very heart of the dynamic effects. The increase in efficiency is due to a decrease in input costs from imports; hence the increase in the ratio of imports to output is estimated and multiplied by the average tariff rate to calculate the income effect of the cost reduction, and this can be expressed as an annual rate.

Clearly, this method suffers from the same limitations as the static models: equating tariff changes and consequent price changes, and attributing all changes to economic integration.

11 Estimating the Impact of Integration on Manufactures: the Latest Contributions

This chapter is devoted to the two most recent studies in the field of international economic integration. However, this is not the only reason why they are put together in one chapter; both happen to deal with the specific question of whether or not membership of the European Community (EC) has been beneficial for the UK. The reader may wonder why the studies are confined to the UK alone. The reason is simple: the British Labour Party's *Manifesto* for the *1983 General Election* stated, as one of its four major objectives, its commitment to the withdrawal of the UK from the EC in the belief that membership of the EC had been an 'unmitigated disaster' for Britain. Moreover, by 1983, ten years had elapsed since the UK joined the EC; hence, ten observations were deemed sufficient to warrant econometric calculation.

These are not the only studies dealing with this particular question. Mayes (1983a; 1983b) and El-Agraa (1984b) also cover this area. However, the study by Mayes does not throw any light on the distinction between trade creation (TC) and trade diversion (TD), and my own study is not intended to do so, but rather to suggest that the whole exercise is fraught with too many insurmountable difficulties to warrant the exercise in the first place; if these two points have not become very clear by now, they will, hopefully, become so in due course.

THE STUDY BY WINTERS

Winters (1984a) objective was to assess the changes in UK imports of manufactures brought about by membership of the EC. His method took account of the substitutability of imports for domestic production with a consistent modelling of price effects. He applied Deaton and Muellbauer's (1980a) 'Almost Ideal Demand System' (AIDS) to

annual data on domestic UK sales and imports from ten supply sources, five of which were members of the EC (Belgium/ Luxembourg, France, Italy, Netherlands and West Germany), the others being Canada, Japan, USA, Sweden and Switzerland.

Winters found AIDS to be a very broad yet tractable demand system, which satisfied various *a priori* restrictions arising from the theory of demand (Winters, 1984a, p. 108). Assuming away problems of aggregation, simultaneity and lagged responses, he postulated that the allocation of demand over supply sources was governed by:

$$w_{it} = \alpha_i + \sum_j \gamma_{ij} \log p_{jt} - \beta_i \log (E_t/P_t^*) + u_{it} \qquad i = 1, \ldots N \quad (1)$$

where w was country i's share of E_t, E_t was total expenditure when domestic sales were included, t was a time trend, p_{jt} was the price of manufactures from country j, P_t^* was calculated over the group of countries included, and α_i, β_i and γ_{ij} were parameters.

In order to add up, it was necessary that

$$\sum_i \alpha_i = 1 \quad \text{and} \quad \sum_i \gamma_{ij} = \sum_i \beta_i = 0 \qquad (2)$$

which was satisfied automatically by any set of w_i which added up to unity. Homogeneity required that

$$\sum_j \gamma_{ij} = 0 \qquad (3)$$

and symmetry that

$$\gamma_{ij} = \gamma_{ji}. \qquad (4)$$

Winters was certain that these could easily be imposed, although (4) did mean that all equations had to be estimated simultaneously with cross-section constraints. This adding-up constraint also meant that $\Sigma_i u_{it} = 0$, where the u_{it} were the errors in equation (1). This created some problems in estimating equation (1) as a system, since the variance-covariance matrix $\Omega \equiv E(uu')$ was singular. Indeed, Winters conceded that the estimation of Ω was very difficult, due to the fact that the deterministic part of equation (1) alone contained 75 parameters when $N=11$, and the estimation of would have added a further 55. Winters therefore decided to constrain it *a priori*. For the full model, he found evidence to suggest that random changes in the share of any imports were largely reflected by compensating changes in the UK share; hence he specified, where the UK was the last supplier:

$$\Omega = \begin{bmatrix} \sigma_{11}^2 & & & -\sigma_1^2 \\ & \sigma_{22}^2 & 0 & -\sigma_{22}^2 \\ & & \cdot & \cdot \\ & & \cdot & \cdot \\ & & \cdot & \cdot \\ & 0 & \sigma_{1010}^2 & -\sigma_{1010}^2 \\ -\sigma_{11}^2 & -\sigma_{22}^2 & \ldots -\sigma_{1010}^2 & \eta \end{bmatrix}$$

where $\eta = \sum_{i=1}^{10} \sigma_{ii}^2$.

Winters allowed for the non-singularity in this case by suppressing the equation for the UK, estimating its parameters from the adding-up constraints – see Winters (1983) for full details of the estimations.

Winters then applied the AIDS models to UK imports. The full model consisted of 55 price parameters . Since over the pre-EC membership period 1952–71 none of the countries in this sample experienced great inflation and there were very few exchange-rate adjustments, he concluded that there would be very little variation in the independent data to allow a reasonable estimation of the AIDS model; indeed, he found huge standard errors, implausible estimates and a lack of convergence (Winters, 1984a, p. 109). Therefore, he estimated the model over the whole data period, adding dummy variables (DVs) to account for the EC effect. This was done in two experiments: (i) where he added $\delta_i D$ to equation (1) for each country, where D was zero until 1972 and unity after 1973 which implied that EC membership was both immediate and complete – a most unlikely event; (ii) where he replaced D by D' with a value of zero for the period 1952–71, unity for 1972, 3 for 1973 and increased the value by one unit per year thereafter, i.e. D' was 9 in 1979.

Winters noted that the procedure of using DVs shifted his model from that of the 'residual imputation' to the 'analytic' class, i.e. the use of DVs attributed all structural shifts and random variations only to the factor specifically under consideration.

He then added two further DVs to allow for Swiss diamond trade which strongly influenced the results for his 'imports only' model. These DVs were assigned a value of zero for all years except that it was unity for 1972–9 and 1978–9. These values raised the share of Switzerland, so he had to decide which country was to be held responsible for this. He opted for the UK due to its predominant share of its own market (he found it impossible to estimate at which

country's expense since that would have required an extra 18 independent parameters).

The results are given in Table 11.1 for the complete AIDS model under experiment (ii). Note that the Swiss dummies were significantly positive, for example they had *t*-statistics of 3.74 (1972–9 dummy) and 6.28 (1978–9 dummy); these reduced the Swiss external trade creation (ETC; and consequent loss of domestic sales) from £2195 million to £542 million.

Winters then drew the reader's attention to the fact that the ten EC-membership effects were jointly significantly different from zero. Also, that the main effect was 'internal' trade creation (TC) – the effects on the five members of the EC were significant jointly (and nearly so individually) and involved a substantial amount of trade. Moreover, the effects on the five non-partners were insignificant and relatively small. He concluded that, at face value, these results suggested that accession to the EC, by 1979, had led to internal TC of £10 billion, ETC of £2 billion and a consequent loss of domestic sales of £12 billion. In proportion to the 1979 magnitudes, these figures amounted to 70, 22 and 17 per cent respectively.

Finally, Winters was quick to caution the reader that his results may have been an over-estimation due to: the ETC figures may have captured other non-integration effects; the second oil price shock may have affected the competitiveness of the EC and non-EC members differently (note that the oil problem was largely dismissed in his 1985 paper); and his model implied that the consumption of manufactures and all (tax-exclusive) prices would have been the same irrespective of economic integration. He suggested that if these considerations had been taken into account, by 1979, TC may have amounted to £6 billion or more.

Conclusion

Winter's approach no doubt represents a great improvement on most of the previous estimates since, by including the effects of economic integration on the level of home sales, his model comes nearest to incorporating production effects; most other models deal with only trade data – for more on this, see the concluding chapter. However, his results should be examined with a great deal of caution. Firstly, there are limitations which he himself explicitly stated: the model treats manufactures as if they were a single homogeneous product; there are no dynamics in the price effects because of 'tractability – it

Table 11.1 Integration effects in an AIDS model of trade[a]

	Actual sales in the UK 1979[b] *(£m)*	*Imports only* *Share*[c]	*Value 1979 (£m)*	*Complete model* *Share*[c]	*value 1979 (£m)*	*t-statics*[d]
France	3 100	0.0060*	1 292	0.00225*	1 934	2.25
Belgium/ Luxembourg	1 967	0.0024	517	0.00203*	1 745	2.03
Netherlands	1 883	0.0015	323	0.00153	1 315	1.53
Germany	5 419	0.0080*	1 723	0.00436*	3 748	4.36
Italy	2 012	0.0059*	1 270	0.00155	1 332	1.55
Sweden	1 301	–0.0067	–1 443	–0.00014	–120	–0.14
Switzerland	2 559	–0.0034	–732	0.00063	542	0.64
Japan	1 471	–0.0005	–108	0.00084	722	0.84
Canada	529	–0.0019	–409	–0.00027	–232	–0.27
USA	3 684	–0.0112*	–2 412	0.00138	1 186	1.38
UK	71 581	—	—	–0.01416*	–12 171	4.54

Notes: [a] Experiments B: AIDS plus dummy D' and two Swiss dummies.
[b] Adjusted for tariffs.
[c] The effect on the share in any year is this coefficient times the value for the year (1973–9).
[d] t-statistics of coefficients on D'. Wald-statistics on the joint significance of the integration effects in this model are:
(i) on all ten indenpendent effects 36.9 (critical value $x^2_{10} = 18.3$),
(ii) on five EC partner effects 33.5 (critical value $x^2_5 = 11.1$),
(iii) on five non-partner effects 3.1 (critical value $x^2_5 = 11.1$).
* t-statictic exceeding 1.96.

Source: L. A. Winters (1984) 'British imports of manufactures and the Common Market', *Oxford Economic Papers*, vol. 36, p. 112.

is not clear how to incorporate sensible dynamics into allocation models like the AIDS'; simultaneity problems are ignored; there is the serious problem of the ' causation running from the UK share of [its] own market in manufactures to the UK price index and aggregate level of spending on manufactures' (Winters, 1984a, p. 111); and the data are not perfect. Secondly, and equally seriously, is the neglect of the basic reality that before joining the EC in 1973, the UK was a founder member of EFTA, a bloc which came into existence just a year after the formation of the EC. This might not have been a problem had it not been for the fact that two of Winters's non-partners are themselves members of EFTA, namely Sweden and Switzerland. However, Winters draws my attention to the fact that DVs can account for both 'preference' and 'loss of preference', leading to minor estimation problems. Thirdly, as part of the accession negotiations, the EC and EFTA established several agreements which made virtually the whole of Western Europe into a FTA in manufactures. Finally, although the UK formally joined the EC in 1973, it was subject to a transitional period of four years before its tariffs against other members were fully dismantled. Of course, it could be argued that DVs allow for this, but I remain sceptical. Is it not conceivable that the inclusion of any or all of these considerations would have drastically affected Winters's estimates?

THE CONTRIBUTION BY GRINOLS

Grinols (1984) asked two questions: how much should a country pay in order to enjoy free trade with an economically integrated group of nations? and how would that country fare after joining such a group? Grinols asked these questions with regard to the UK and its membership of the EC.

The answer to the first question was reached by estimating the sum of money an individual would have to receive at a new set of prices that would leave her/him no worse off than before, using revealed preference to represent the demand system. 'Summing to the national level and subtracting the aggregate income needed from the country's available income (assuming initial production quantities at the new set of prices) determines the payment, whether positive or negative. By construction, the income remaining to the nation after payment is great enough to ensure that no one is made worse off' (Grinols 1984, p. 272). Grinols argued that the payment can be shown to be equal to the value of the UK's pre-EC membership trade

bundle at post-EC membership prices. More income due to more profitable production at the new set of prices (producers surplus) could be used to make everyone strictly better off. Similarly, adjustments in consumption create savings (consumers surplus) which also accrue to the country.

With regard to the welfare of the UK, Grinols adjusted the UK payments for the actual transfers. He assumed that the financing of transfers was equivalent to the cost of membership of the EC, and showed that in a general equilibrium model the aggregate payments could be financed from the revenue collected from a properly chosen common external tariff (CET) for the EC.

The model used to answer these questions is that depicted in Figure 11.1, where *HH* is the country's production possibility fontier (PPF) for the two commodities *X* and *Y*. The initial production bundle is indicated by *A*, and consumption by *B* which lies on the Scitovsky frontier *SS*. The gap between *A* and *B* indicates international trade with the rest of the world (*W*). Grinols then assumed that when this country joined a customs union (CU), t_1 and t_4 ($t_1 \ldots t_4$ are parallel to each other) would represent the prices facing it in the CU.

He then considered the assignment of income to each household. If each household was given income equal to the value of its pre-CU consumption at post-CU prices, then the incomes for the totality of households would be in excess of the value of domestic production (at *A*) by the discrepancy between *A* and *B*. Hence, an aggregate transfer equal to the value of pre-existing trade at post-CU prices would ensure that every consumer could be given an income large enough to be no worse off than (s)he was at the pre-CU level. Grinols claimed that this would answer the first question.

To answer the second question regarding whether the CU could afford to make these paymens to each member, Grinols stated that if the CU were not self-financing, i.e. was able to generate enough income from its own sources to pay its member nations, these transfers would not be feasible. Obviously, there were difficulties in answering this question since the CU's choice of CETs and transfers would affect equilibrium prices. Therefore, financing should be determined in a general equilibrium context. Grinols pointed out that proof of existence was needed to show the simultaneous existence of a properly chosen CET, transfers and equilibrium prices which satisfy the budget balance for the CU and market clearing for world trade (Grinols, 1984, p. 274). Grinols claimed that the answer was in the affirmative.

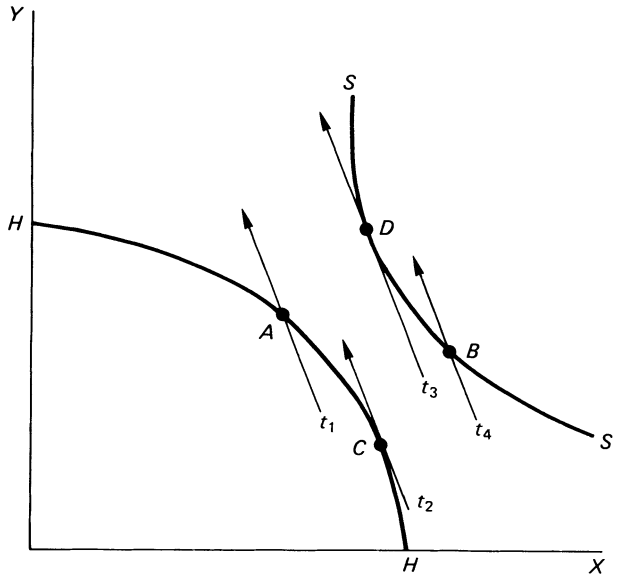


Figure 11.1 *Compensation in the two-good case*

However, in the case of the UK and the EC, transfers and tariffs were far removed from this procedure – see El-Agraa (1980; 1985b) for full details. Hence, in order to determine whether or not the UK's welfare had risen or fallen as a result of membership of the EC, Grinols suggested that one should be interested in the quantity

$$(T - p_1 z_0) + S_1$$

where T was the actual net transfer from the UK to the EC valued in £s, $p_1 z_0$ was the value of pre-EC membership trade (z_0) at post-EC membership prices (p_1), i.e. the difference between A and B in Figure 11.1, and S_1 was the increase in profits from domestic production at prices p_1 relative to pre-EC membership production, plus savings at prices p_1 from substitutability in consumption. If the term in brackets were negative, UK transfers would have fallen short of those based on revealed preference. If the entire term were negative, UK income would have been insufficient to maintain welfare at the pre-EC membership level. This could be demonstrated by reference to Figure 11.1. Since production at C is more profitable than at A, given the prices indicated by t_2, and the consumption of the less expensive

bundle at D could give the same welfare as B, this country would have enough income to preserve welfare gains even though it received a transfer less than the difference between A and B. This is due to the fact that the difference between t_1 and t_2 (increased profits) and t_3 and t_4 (substitutability in consumption) represents the savings (S_1) against the transfer needed to consume somewhere along SS.

Grinols then used a mathematical formulation to demonstrate that his model could be extended to a finite number of trading nations with nation-by-nation distribution of the tariff revenues. He applied his model to the case of the UK using British data.

Grinols reminded the reader that an estimate of the welfare changes in the UK due to accession to the EC must take into consideration the financial arrangements that had been established to transfer funds between the UK and the rest of the EC as well as the changes in the prices of foodstuffs and finished manufactures (the UK tended to export finished manufactures and semi-manufactures import food, beverages and basic materials) 'coinciding with Britain's diversion of trade from its former trading partners' to the EC (Grinols, 1984, p. 280). He claimed that explicit payments by the UK to the EC in 1979 and 1980 (these were part of T) amounted to about 1 per cent of GDP.

He used 1972 as the base year for comparison since it was not only the year before the UK formally joined the EC, but it was also a normal year without recession or depression. Hence, his estimates of the transfer income amounted to ensuring that the UK's welfare was greater than or equal to its 1972 level, and that the transfer sum was equal to the revenues from the EC CET when the CET was chosen to maintain the EC's terms of trade at the 1972 level.

To enable calculations to be made, UK trade was divided into 23 commodity categories corresponding to six groups of exports and an equal number of imports using *Standard International Trade Classification* (SITC) data published by the UK Department of Trade, and six categories of exports and five categories of imports of services published by the UK Central Statistical Office in the balance-of-payments accounts. The Sterling value of each series was divided by its corresponding volume to generate prices for each commodity group. In order to eliminate the oil price shocks, Grinols replaced the prices of exports and imports of fuels (which included oil) by prices which grew according to the trade-weighted average of the respective prices of other exports and imports. For each year of the period 1973–80, the increase in the cost of acquiring the UK's 1972 trade

quantities at the current year's prices (value of imports minus value of exports) was then computed to give the figures in row (1) of Table 11.2.

For example, the computations revealed that in 1973 the UK paid £2436.5 million more to trade at the 1972 volume. In each year given in the table, UK commodity prices were worse than they had been in 1972, with the deterioration becoming less after 1978. However, Grinols warned that the figures underestimated the cost to the consumer: import values were registered on a c.i.f. basis while consumers were charged the tariffs and levies which were added to these prices. Hence, row (2) of the table gives the amount of customs duties and agricultural levies collected for the years 1973–80. Row (3) is the sum of the first two rows.

Repeating the exercise for services gave the calculations in row (4); note that services were not subject to tariffs. Grinols pointed out that, as one would have expected, this sector typically showed terms of trade effects much less than in the case of commodities, here averaging to less than 50 per cent of those in the goods sector.

The total effect of both the goods and services sectors was a terms of trade loss to the UK of about four billion pounds per annum for the period under consideration. In terms of UK GDP, these losses varied from 0.35 per cent of GDP in 1980 to 4.61 per cent in 1974; the average for the whole period was 2.3 per cent (1.7 per cent when tariffs and levies were ignored, and 2.6 per cent relative to the 1972 GDP inflated by the General Index of Retail Prices for each year). Grinols interpreted this to suggest that the UK should have received from the EC transfers of equal magnitude in order to maintain welfare at the 1972 level in GDP without changes in either consumption or production.

Table 11.3 gives a summary of the actual transactions of the UK with the EC for the period 1973–9. Section A of the table simply repeats the total implied payment given in Table 11.2, row (5). The figures in sections B and C give the payments that the UK actually made.

The transfers of the UK to the EC are listed by category of payment. Row (9) gives the amount of duties and levies collected [this is a repeat of row (2) of Table 11.2], since these are EC 'own resources', i.e. items so collected are the property of the EC – see El-Agraa (1985b and Chapter 12) for a full explanation. During the transition period for the UK, 1973–8, this principle was not operative; it became effective in 1980. Grinols assumed that this was

Table 11.2 Implied compensation payments (receipts) for Britain: 1973–80 ($p_1 \cdot z_0$ *in £ millions)*

	1973	*1974*	*1975*	*1976*	*1977*	*1978*	*1979*	*1980*	
(1) Visible trade (omitting oil price change)[a]	(2 436.5)[b]	(3 717.4)	(2 829.4)	(3 470.7)	(4 077.9)	(2 763.0)	(1 975.9)	(922.5)	
(2) Customs duties and agricultural levies	(462.5)	(525.7)	(558.0)	(727.7)	(860.2)	(968.1)	(1 173.8)	(1 120.9)	
(3) Visible trade plus duties and levies	(2 899.0)	(4 243.1)	(3 387.5)	(4 198.4)	(4 938.1)	(3 731.1)	(3 149.7)	(2 043.4)	
(4) Services	861.1	809.5	984.5	1 035.7	1 015.7	1 367.3	2 342.6	2 704.9	
(5) Total	(2 037.9)	(3 433.6)	(2 403.0)	(3 162.6)	(3 922.4)	(2 363.8)	(807.1)	(661.6)	
(6) GDP[c]	64 258	74 414	93 954	111 245	126 111	144 442	163 647	191 035	
(7) Payments as percent of GDP	(3.17)	(4.61)	(2.56)	(2.84)	(3.11)	(1.64)	(0.49)	0.35	Average (2.3)

Notes: (*a*) To correct the change in the price of oil over the period from 1972 to 1980, price indexes for exports and imports of fuel (SITC Division 3 which includes oil) were replaced by indexes growing as the trade-weighted average of all other exports and imports respectively.
(*b*) Figures in parentheses represent the amount by which the terms of trade worsened.
(*c*) Gross Domestic Product on an expenditure basis.

Source: E. L. Grinols (1984) 'A thorn in the lion's paw: has Britain paid too much for Common Market membership?', *Journal of International Economic*, vol. 16, p. 282.

Table 11.3 Implied transfer payments (receipts) for Britain including historical transactions with institutions of the EC($T - p_1 \cdot z_0$ *in £ millions*).

	1973	*1974*	*1975*	*1976*	*1977*	*1978*	*1979*	
A. (1) Payment	(2 037.9)[a]	(3 433.6)	(2 403.0)	(3 162.6)	(3 922.4)	(2 363.8)	(807.1)	
B. (Transfers) to Common Market:								
(2) Customs duties	(170.5)	(168.1)	(310.5)	(425.8)	(593.4)	(714.3)	(868.1)	
(3) Agricultural levies	(9.7)	(9.3)	(29.3)	(33.2)	(135.4)	(227.2)	(229.5)	
(4) Sugar/isoglucose levies	(0.8)	(1.4)	(1.6)	(3.5)	(7.8)	(14.8)	(16.9)	
(5) GNP financial contribution	—	—	—	—	—	(596.3)	—	
(6) VAT own resources	—	—	—	—	—	—	(843.7)	
(7) Adjustment for full own resources payments	—	—	—	—	—	204.3	352.1	
(8) European Coal and Steel Community contributions	(6.0)	(14.7)	(24.1)	(11.0)	(12.3)	(17.5)	(16.3)	
(9) Duties and levies collected	462.5	525.7	558.0	727.7	860.2	968.1	1 173.8	
Total transfers	275.5	332.2	192.5	254.2	111.3	(397.7)	(448.6)	
Receipts from Common Market:								
European Community Budget								
(10) Social Fund	—	16	19	11	48	63	87	
(11) Regional Development Fund	—	—	—	29	60	35	71	
(12) Other	—	—	—	2	2	6	14	
(13) European Coal and Steel Community	4	4	4	4	8	7	7	
(14) Agricultural Guidance and Guarantee Funds	63	112	342	207	181	329	371	
Total receipts	67	132	336	253	298	439	550	
C. Net payments, transfers and receipts								
(15) Total	(1 695.4)	(2 969.4)	(1 844.5)	(2 655.4)	(3 513.1)	(2 322.5)	(705.7)	Average percent
(16) As percent of GDP	2.64	3.99)	1.96)	2.39)	2.79	1.61	0.43	(2.26)

Note: (*a*) Numbers in parentheses indicate that payments flow from the Common Market to Britain.

Source: E. L. Grinols (1984) 'A thorn in the lion's paw: has Britain paid too much for Common Market membership?', *Journal of International Economics*, vol. 16, pp. 284–5.

tantamount to transfers from the EC to the UK. Hence, the total transfers are given in the row below (9) which incorporates this assumption.

Rows (10) – (14) give the amounts of EC expenditure in the UK as calculated by the UK's Central Statistical Office. Hence, these are regarded as explicit receipts of transfers from the EC by the UK.

The transfers between the EC and the UK which are necessary to maintain the income needed to keep the UK's welfare intact are given in row (15). They are all negative, implying a net transfer is needed from the EC to the UK. These range, as a percentage of UK GDP, from 0.4 per cent in 1979 to 4 per cent in 1974, with an average for the whole period of 2.3 per cent. Grinols concluded from this that if industry in the UK had continued to produce at the 1972 level, with no substitutability in consumption, UK incomes would have been, *on average*, about 2.3 per cent lower than was necessary to maintain British welfare at the pre-EC level. He pointed out that these figures were smaller than the transfers given in Table 11.2 because the UK had actually received implicit transfers from the EC in the form of retained tariff collections in all but the last two years from 1973 to 1979.

Grinols pointed out that if the finances of the EC had been determined by the transfer policy specified above, the transfers given in Table 11.3 would have been final compensations. Hence, the UK would have received average transfers of 2.3 per cent of GDP per annum from 1973 to 1979 inclusive. Thus UK gains in welfare attributable to substitution in production and consumption in the enlarged EC would have been regarded as a 'dividend' for EC membership. Of course, similar gains would have been achieved by the rest of the EC.

The dividend in production could be calculated as the profits of the UK after joining the EC minus the profits which would have accrued for 1972 production levels at post-membership prices. The dividend in consumption would have been the cost of 1972 consumption prior to EC membership, valued at post-membership prices, minus 'the minimum cost of purchasing an equally desirable bundle' at post-EC membership prices. The sum of both these dividends, which were essentially non-negative, was denoted by S_1. When S_1 was added to the sums in Table 11.3, Grinols obtained the surplus/deficit with regard to the income required to maintain UK welfare at the 1972 pre-EC membership level. Grinols interpreted these amounts in the following way: when S_1 was in excess of the amount of unpaid

Table 11.4 Contribution of production to welfare gains (surplus or (deficit) relative to income needed to preserve 1972 welfare level) ($(T - p_1 \cdot z_0) + S_1$ in production in £ millions).

	1973	*1974*	*1975*	*1976*	*1977*	*1978*	*1979*	
A. Production contribution								
(1) total[a]	1 993	929	0	1 077	3 143	4 701	5 266	Average percent
As percent of GDP	3.10	1.25	0	0.97	2.49	3.25	3.22	2.0
(2) Total[b]	948	0	0	0	0	876	956	Average percent
As percent of GDP	1.48	—	—	—	—	0.61	0.58	0.4
B. Net payments, transfers and receipts								
(3) Total	(1 695.4)	(2 969.4)	(1 844.5)	(2 655.4)	(3 513.1)	(2 322.5)	(705.7)	Average percent
(4) As percent of GDP	(2.64)	(3.99)	(1.96)	(2.39)	(2.79)	(1.61)	(0.43)	(2.3)
C. Net surplus (deficit)								
(5) Total[a]	297.6	(2 040.4)	(1 844.5)	(1 578.4)	(370.1)	2 378.5	4 560.3	Average percent
As percent of GDP	0.46	(2.74)	(1.96)	(1.42)	(0.30)	1.64	2.79	(0.2)
(6) Total[b]	(747.4)	(2 969.4)	(1 844.5)	(2 655.4)	(3 513.1)	(1 446.5)	250.3	Average percent
As percent of GDP	(1.16)	(3.99)	(1.96)	(2.39)	(2.79)	(1.00)	0.15	(1.9)

Notes: (*a*) Most favourable scenario to Britain.
(*b*) Preferred scenario.

Source: E. L. Grinols (1984) 'A thorn in the lion's paw: has Britain paid too much for Common Market membership?', *Journal of International Economics*, vol. 16, p. 288.

transfers, membership of the EC would have improved UK welfare, implying the contrary in the case when S_1 was less than the amount of unpaid transfers and no change in UK welfare when the two were equal.

Grinols next considered the estimation of the production element of S_1 for the UK. Table 11.4 gives the production dividend for each of the years during the period 1973–9. In order to recover profits, UK domestic production was divided into eight categories corresponding to the UK Standard Industrial Classification (SIC). Using published indices, a price series was calculated for each component. The prices for each year of the period 1973–9 were then applied to production volumes for the respective year minus the 1972 volume.

Grinols carried out two corrections. The first sought to eliminate the impact on UK welfare of North Sea oil production in the late 1970s by subtracting North Sea oil production from the sector which would have incorporated it: 'mining and quarrying'. The second had the aim of eliminating the effect of technical change and economic growth from the data; recall that Grinols's method was confined to a static PPF – all eight sectors achieved output growth between 1972 and 1973 ranging from 2.3 per cent to 10 per cent, averaging around 5.8 per cent, and the value of the 1978 and 1979 volume of production at 1973 prices exceeded the value of the 1973 volume at those prices.

Economic growth was catered for by entertaining two alternatives which were presented in Table 11.4. The first alternative assumed that no economic growth took place in the UK between 1972 and 1979 except for that needed to satisfy the two points mentioned in the previous paragraph; these estimates are given in line (1). This amounted to assuming, for the sectors under consideration, that: the 1972 to 1973 growth rate was 2.3 per cent; the growth rate for the period 1973–8 was 1.92 per cent; and the 1978 to 1979 rate was at 1.38 per cent. For the whole period, the growth rate was assumed to be a cumulative 5.7 per cent. Grinols was of the opinion that this was an underestimate 'since the official reported real index of output at constant factor cost (excluding North Sea oil production) rises from 98 in 1972 to 107 in 1979, an increase of 9.2' per cent (Grinols, 1984, p. 287). To Grinols, the figures in line (1), therefore, indicated that economic growth in the UK would have been counted as gains from EC membership. The second alternative, given in line (2), assumed that the rate of growth was 0.6 per cent per annum for the period 1972–9, except for 1972–3 and 1978–9 when it was respectively 4.0

and 1.38 per cent. This gave a cumulative growth rate for the entire period of 8.6 per cent. Grinols was certain that this alternative was also an underestimate, but that it had the advantage of uniformity of economic growth over the period in question.

Note, however, that in years when UK production fell because of recession, as in 1974, the figures in lines (1) and (2) were replaced by zeros. Grinols justified this on the understanding that the UK economy was not operating on the PPF; hence, the value of the 1974 volume relative to the 1972 volume was negative at 1974 prices and did not contribute to gains in welfare.

These two alternatives amounted to assuming that the figures given in Table 11.4 were biased towards gains in welfare due to UK membership of the EC, 'since years of welfare loss from recession are not counted towards the losses of membership although some of the gains from growth are' (Grinols, 1984, p. 289).

From line (2), it can be seen that production gains varied from 1.48 per cent to zero per cent of GDP for respectively 1973 and 1974–7, giving an average gain of 0.38 per cent. Subtracting these figures from the totals in Table 11.3, line (3) shows deficits ranging from 4 per cent in 1974 to 1 per cent in 1973, with a small surplus of 0.15 per cent in 1979, and an average loss for the whole period of 1.9 per cent. However, Grinols added that, given his assumptions about economic growth, the more favourable figures towards the end of the decade probably exaggerated the benefits.

> It is probable, in spite of the figures for 1979, that Britain had welfare losses in each year since it joined the [EC], and that these losses exceeded 1.9 [per cent of GDP] for the period as a whole. The only remaining unknown is whether substitutability in consumption could have made up for the losses which were sustained' (Grinols, 1984, p. 289).

He reckoned that this was unlikely given the large discrepancies he reported.

Grinols used a Cobb–Douglas utility function with income shares equal to the 1972 production shares in GDP, adjusted for trade flows, to estimate the impact of substitution in consumption. He then used the expenditure function to calculate the minimum income required to maintain the utility of the base year. Table 11.5 gives the savings that would have been achieved by buying the base year consumption

Table 11.5 Gains from trade in consumption:

$$\frac{\sum_{i=1}^{s} P_{i,t=F} \frac{\alpha_i \text{GDP}_{t=B}}{P_{i,t=B}} - e(P_{t=F}, u_{t=B})}{GDP_{t=F} \times 10^{-2}}$$

	Final year t = F						
	1973	*1974*	*1975*	*1976*	*1977*	*1978*	*1979*
Base year t = B							
1973	0	0.27	0.20	0.31	0.43	0.48	0.79
1974	0.24	0	0.07	0.12	0.17	0.27	0.37
1975	0.16	0.07	0	0.14	0.16	0.21	0.40
1976	0.26	0.11	0.13	0	0.11	0.25	0.34
1977	0.36	0.18	0.15	0.12	0	0.04	0.11
1978	0.47	0.30	0.23	0.30	0.05	0	0.09
1979	0.73	0.39	0.42	0.41	0.12	0.09	0

Notes: $e(P,u)$ = expenditure function based on Cobb–Douglas utility, $u_i = \sum_{i=1}^{s} \alpha_i \ln \frac{\alpha^i \text{GDP}_t}{P_{i,t}}$ with sectoral shares:

Agricultural, forestry and fishing	$\alpha_1 = 0.045$	Gas, electricity and water	$\alpha = 0.030$
Mining and quarrying	$\alpha_2 = 0.035$	Transport and communication	$\alpha = 0.085$
Manufacturing	$\alpha_3 = 0.310$	Distributive trades	$\alpha = 0.105$
Construction	$\alpha_4 = 0.065$	Other services	$\alpha = 0.325$
		Total	1.000

basket. These varied from 0.05 per cent of GDP to 0.8 per cent, with the larger values going with price changes between years further apart.

When Grinols applied the average value of savings in consumption of 0.37 per cent of GDP to the figures in Table 11.4, the average deficit in income for the period under consideration fell from 1.9 per cent to 1.53 per cent of GDP. Moreover, using the maximum figure of 0.79 per cent savings uniformly gave an average deficit in excess of 1.1 per cent of GDP for the sample period. Grinols believed that these results suggested that the actual losses to the UK in 1974 were 3–4 per cent of GDP and in excess of 2 per cent in 1977 and 1978. Grinols was careful to add that, although the utility function he employed had no 'particular claim to relevance', it assumed an elasticity of substitution between different commodities equal to unity, hence, probably, overstating the case for substitution. On the other hand, it did not have a functional form based on detailed

econometric studies of UK consumption. Irrespective of this, he claimed that the conclusions that '(1) average losses to Britain from membership [of the EC] are in the range of 1–2 [per cent of GDP] with individual years going several [per cent] higher, and (2) compensation figures are 2–3 [per cent of GDP] seem fairly robust given the assumptions used' (Grinols, 1984, p. 290).

Conclusion

I have no major quarrels with the *methodology* employed by Grinols since I believe it represents a great improvement on the methodologies used in the previous studies. However, the jump from methodology to *empirical calculation* leaves a lot to be desired. Why should the production of North Sea oil be left out of the calculations? Such an assumption implies that oil production is costless – natural resources require a cost to utilise, and one could argue that production of North Sea oil would not have been economically viable without the boost to oil prices from the two oil shocks of 1973 and 1979. Moreover, importantly, there is the question of what is left out in terms of 'budgetary compensation' received by the UK from the EC in 1979 and 1980 in settlement of the budgetary quarrels between the two – see El-Agraa (1987b) for full details of the compensation figures. Finally, and most importantly, the UK did not become a full member of the EC until 1977; hence, for example, the assumption that *full* membership was automatically achieved ignores the fact that tariffs on intra-EC trade and on the CET were not achieved until towards the end of 1977. Therefore, I feel confident that if the exercise were carried out with these reservations built into the estimates, a completely different set of results would be produced for not only the period studied by Grinols but also for the subsequent period to date.

CONCLUSION

The two studies presented and discussed in this chapter are completely different from each other; hence, it would be futile to try for a common conclusion, particularly when each review finished with an evaluation of its own. However, one should hasten to add that both studies present refreshing new methodologies which may lead to improved estimates in the future, but some reservations still remain with regard to the *overall* nature of the field of the estimation of integration effects – these are dealt with in the final chapter.

12 The Costs of the Common Agricultural Policy of the European Community

INTRODUCTION

The previous three chapters were devoted to the estimation of the effects of economic integration on manufactures. The concern of this chapter is with the calculation of the costs of economic integration on agriculture. However, the only scheme of economic integration that has a policy specifically directed towards agricultural products is the European Community (EC), a policy generally referred to as the 'common agricultural policy' (CAP). Hence the chapter is devoted entirely to the estimation of the costs of the CAP.

No single topic has raised more interest and discussion in relation to the various facets of the EC than the CAP. More specifically, the *true* (see below for the reason why) cost of the CAP particularly for Britain has been a subject of great concern for the average UK citizen, for farming and consumer organisations within Britain and for nations both inside and outside the EC. Hence the aim of this chapter is to explain and discuss the estimates that have been made regarding the cost of the CAP, with particular reference to the UK. However, it should be quite obvious that such a discussion will not make any sense without a thorough understanding of the aims, mechanisms and financing of the CAP, hence the first section of this chapter is devoted to a brief discussion of these matters – readers interested in a detailed analysis within a global context should consult El-Agraa (1980, ch. 7; 1985b ch. 8).

OBJECTIVES OF THE CAP

The various schemes for protecting the agricultural sector that were operated by the potential member nations at the time of the formation of the EC made it necessary to subject agriculture to equal

treatment in all member states. This was due to the fact that agriculture was a major employer of people with relatively low incomes when compared with the national average and also because agriculture formed the basis of industrial costs. Equal treatment of coal and steel (which are necessary inputs for industry, hence of the same significance as agriculture) was already under way through the European Coal and Steel Community (ECSC).

Before stating the objectives of the CAP, one should point out that the Treaty of Rome defines agriculture as 'the products of the soil, of stock-farming and of fisheries and products of first-stage processing directly related' to the foregoing (Article 38). However, in 1966 the EC introduced its 'common fisheries policy', thus redefining agriculture to exclude fisheries.

The objectves of the CAP are clearly defined in Article 39 of the Treaty. They are:

(1) to increase agricultural production and the optimum utilisation of all factors of production, in particular labour;
(2) to ensure thereby a fair standard of living for the agricultural community, in particular by increasing the individual earnings of persons engaged in agriculture;
(3) to stabilise markets;
(4) to provide certainty of supplies;
(5) to ensure supplies to consumers at reasonable prices.

The Treaty also specifies that in working out the CAP, and any special methods which this may involve, account shall be taken of:

(1) the particular nature of agricultural activity, which results from agriculture's social structure and from structural and natural disparities between the various agricultural regions;
(2) the need to effect the appropriate adjustments by degrees;
(3) the fact that, in the member states, agriculture constitutes a sector closely linked with the economy as a whole.

The Treaty further specifies that in order to attain the objectives set out above a common organisation of agricultural markets shall be formed. This organisation is to take one of the following forms depending on the product concerned:

(1) common rules as regards competition;
(2) compulsory coordination of the various national marketing organisations; or

(3) a European organisation of the market.

Moreover, the common organisation so established:

> may include all measures required to achieve the objectives set out . . ., in particular price controls, subsidies for the production and distribution of the various products, stock-piling and carry-over systems and common arrangements for stabilisation of imports and exports.
> The common organisation shall confine itself to pursuing the objectives set out . . . and shall exclude any discrimination between producers and consumers within the Community.
> Any common policy shall be based on common criteria and uniform methods of calculation.

Finally, in order to enable the common organisation to achieve its objectives, 'one or more agricultural orientation and guarantee funds may be set up'.

The remaining Articles (41–47) deal with some detailed considerations relating to the objectives and the common organisation.

The social issues were discussed and stated in more detail in 1960 after a lengthy discussion of the structural and social aspects of the CAP (see Fennell, 1979, p. 13):

(1) to ensure social protection for agricultural wage earners and their dependants equivalent to that enjoyed by other categories of workers;
(2) to encourage the adaptation of contractual relations within agriculture to accord more with modern conditions;
(3) to narrow the gap between agricultural wage earners and those in comparable branches of activity with regard to remuneration, social security and working conditions;
(4) to ensure that rural children have the same opportunities for general and vocational education as those elsewhere;
(5) to aid young country dwellers wishing to set up as independent farmers or who wish to change to other types of farm work;
(6) to ensure that the best conditions for success are available to those leaving agriculture for other employment;
(7) to facilitate the retirement on pension of farmers and farm workers at the normal retirement age;
(8) to improve rural housing;
(9) to improve the social and cultural infrastructure of rural areas.

It can be seen, therefore, that the CAP was not preoccupied simply

with the implementation of common prices and market supports; it also included a commitment to encourage the structural improvement of farming, particularly when the former measures did not show much success. Regarding the latter point, the main driving force was the *Mansholt Plan* of 1968 (see Fennell, 1979, for later developments). However, the EC budgetary expenditure on the structural aspects now amounts to only 3–4 per cent of total CAP expenditure.

The CAP Price Support Mechanism

Although the CAP machinery varies from one product to another, the basic features for most of the products are more or less similar – for a detailed specification of the differences see Fennell (1979). The farmers' income support is guaranteed by regulating the market so as to reach a price high enough to achieve the objectives stated earlier. The domestic price is partly maintained by various protective devices. These prevent cheaper world imports from influencing the EC domestic price level. But in addition, certain steps are taken for official support buying within the EC, so as to eliminate from the market any actual excess supply that might be stimulated by the guaranteed price level. These surpluses may be disposed of in various ways, e.g. they can be destroyed, stored (to be released at times of shortage), exported, donated to low income countries (Food Aid Programme) or needy groups within the EC, or converted into another product which does not compete directly with the original one (e.g. the 'breaking' of eggs for use as egg powder).

More specifically, the basic features of the system can be represented by that originally devised for cereals, the first agricultural product for which a common policy was established.

A *target price* is set on an annual basis and is maintained at a level which the product is expected to achieve on the market in the area where cereals are in shortest supply – Duisburg in the Ruhr Valley. The target price is not a producer price since it includes the costs of transport to dealers and storers. The target price is variable, in that it is allowed to increase on a monthly basis from August to July in order to allow for storage costs throughout the year.

The *threshold price* is calculated in such a way that when transport costs incurred within the EC are added, cereals collected at Rotterdam should sell at Duisburg at a price equal to or slightly higher than the target price. An import levy is imposed to prevent import prices falling short of the threshold price. The import levy is calculated on a

daily basis and is equal to the margin between the lowest representative offer price entering the EC on the day – allowing for transport costs to one major port (Rotterdam) – and the threshold price. This levy is then charged on all imports allowed into the EC on that day.

It is quite obvious that as long as the EC is experiencing excess demand for this product, the market price is held above the target price by the imposition of import levies. Moreover, import levies would be unnecessary if world prices happened to be above the threshold price since in this case the market price might exceed the target price.

If target prices result in an excess supply of the product in the EC, the threshold price becomes ineffective in terms of the objective of a constant annual target price and support buying becomes necessary. A *basic intervention price* is then introduced for this purpose. This is fixed for Duisburg at about 7 or 8 per cent below the target price. Similar prices are then calculated for several locations within the EC on the basis of costs of transport to Duisburg. National intervention agencies are then compelled to buy whatever is offered to them (provided it conforms to standard) of the 'proper' product at the relevant intervention price. The intervention price is therefore a minimum guaranteed price.

Moreover, an export subsidy or *restitution* is paid to EC exporters. This is determined by the officials and is influenced by several factors (world prices, amount of excess supply, expected trends) and is generally calculated as the difference between the EC internal market price and the average world price.

The Green Money

The various agricultural support prices were previously fixed by the *EC Council* in *European Units of Account* (EUA) and now in terms of the *European Currency Unit* (ECU) which has the same value as the original EUA. For each member country there is a *Green Rate* at which the support prices are translated into national prices. The EUA had orginally a gold content equal to a US dollar, but in 1973 was linked to the 'joint float' and to the *European Monetary System* (EMS) in 1980. This implies that if a member country devalues (revalues) its currency, its farm prices expressed in terms of the national currency rise (fall). It should also be noted that the scope for changing Green currency rates gives the member countries scope for altering internal farm prices *independently* (but only with the consent

of other members and only within certain limits) of price changes determined at the annual reviews for the EC as a whole. In August 1969 the French franc was devalued by 11.11 per cent which obviously disturbed the common farm price arrangements in favour of the French farmers, and the rise in their price level would obviously have stimulated their farm production and aggravated the excess supply problem. Moreover, the devaluation of the EUA would not have improved matters in such a situation, since it would have depressed the price level for the farmer in the rest of the EC, even though it would have nullified the effects of the devaluation of the French franc. Therefore, a more complicated policy was adopted; the French intervention price was reduced by the full amount of the devaluation so as to eliminate the unfair benefit to the French farmer; French imports from and exports to the rest of the EC were to be restored by asking France to give import subsidies and levy duties on her exports to compensate for the effects of the devaluation. The term *Monetary Compensatory Amounts* (MCAs) was coined to describe this system of border taxes and subsidies. Since then, the MCA system has become general in application and more complicated with the changes in the rates of exchange of the currencies of other EC members. Even though the EC has recently announced its intention to discontinue the MCA system, it seems that it will be with us for some time yet (see Fennell, 1979, p. 98 for reasons why). It should be added, however, that the currency divergencies are now much smaller than in the heyday of MCAs.

The reader who is particularly interested in this area of the CAP is advised to read Irving and Fearn (1975), Josling and Harris (1976), Mackel (1978), Hu (1979), and MacLaren (1981). Hu demonstrates that Germany has recently been the main beneficiary of this sytem.

Financing the CAP

Intervention, export restitution, storage and the MCA system need to be financed. The finance is supplied by the EC central fund called FEOGA (Fonds Européen d'Orientation et de Garantie Agricole), the European Agricultural Guidance and Guarantee Fund (EAGGF). At the *time of inception* of the CAP it was expected that the revenues collected from the imposition of extra-area import levies would be sufficient to finance FEOGA but when agreement regarding the financing of the CAP was finally reached, the position was completely different – see Regulation 25/62. FEOGA used to take about 70 per

cent of the EC Budget but now takes about 60 per cent. The EC Budget is financed by contributions from national governments based on a maximum of 1 per cent (rising to 1.4 per cent in 1986 and 1.6 per cent in 1988) of the VAT base plus all tariff revenues collected from extra-EC industrial trade and agricultural levies; they are referred to as *own resources*.

COMMON MISCONCEPTIONS ABOUT THE CAP

Before considering the true cost of the CAP one needs to mention three common fallacies generally attributed to the CAP. Firstly, it is not true *all* agricultural products are price-supported; some are subject to production subsidies (cereals, butter, olive oil and other minor products) and sugar producers are charged a production levy on excess output. Secondly, the actual size of the so-called butter mountains and wine lakes did not, until recently, amount to a large percentage of total EC supply. Finally, the aim of 'security of supplies' is not unimportant; the EC has managed to be self-sufficient at times when there was a global shortage of food supplies.

THE TRUE COST OF THE CAP

A number of studies attempting a calculation of the true cost of the CAP have been published over the past twenty years or so. Space limitations do not allow an adequate consideration of all of them, hence in this section I intend to concentrate on those of: Koester (1977), Blancus (1978), Bacon, Godley and McFarquhar (1978), Rollo and Warwick (1979), Morris (1980a), Buckwell *et al.* (1982) and Breckling, Thorpe and Stoeckel (1987). These are selected not only because they are the most recent studies but also because they are the most serious and most competently carried out of all the available studies.

The theoretical framework for these studies can be explained by using a simple partial-equilibrium diagram. In Figure 12.1, SS and DD are respectively the supply and demand curves for an agricultural product for a member nation of the EC. P_W is the world (W) price with $P_W S_W$ the world supply curve, assumed to be perfectly elastic with the rest of the world being more efficient than the country under consideration. t and t' are two different levels of import levies (tariffs)

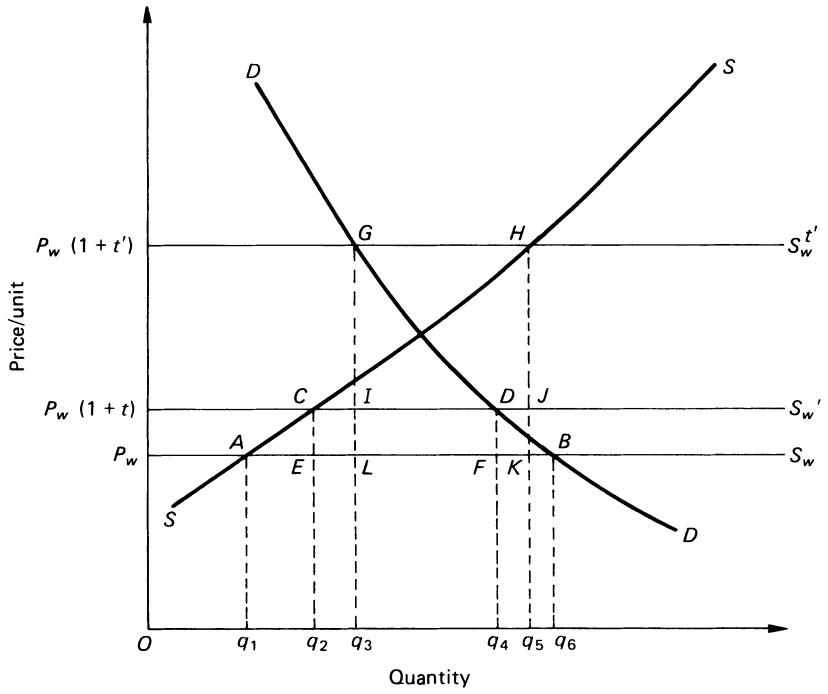


Figure 12.1 *Economic Effects of the CAP*

resulting in two different levels of EC prices for this product – these prices are determined in the manner discussed earlier.

If the import levy happens to be t, this country will produce Oq_2 domestically, consume Oq_4 and import the difference (q_2q_4). The welfare dead-weight loss of such a tariff consists of the triangles ACE and BDF [consumers lose $P_wP_w(1+t)DB$, producers gain $P_wP_w(1+t)CA$ and there is a net levy collection of $CDFE$ which is an EC own resource – see El-Agraa (1987b) for a description of the EC Budget]. If the import levy happens to be t' resulting in an EC price of $P_w(1+t')$, there will result an excess supply of q_3q_5 with the welfare dead-weight loss now equal to the sum of the triangles LGB and KHA.

These triangular dead-weight losses include not only the usual net costs to consumers and producers but also the costs of restitution since, as already indicated, not only is any tariff collection an own resource of the EC (if the product is imported from outside the EC) but also the EC has either to buy the excess supply into intervention

and therefore incur expenditure in storing it or pay restitutions of *LGHK* to sell it at the world price outside the EC. Of course, if the excess supply has to be disposed of in the fashion discussed earlier then that also means expenditure by the EC.

This simple analysis forms the theoretical basis of most of the studies. Before discussing them, however, one should point out that the analysis makes clear the elements involved in the calculation of the costs and benefits:

(i) tariff levies or restitution payments;
(ii) storage costs;
(iii) MCAs (implicitly in that changes in the official exchange rates or the Green rates will imply that these prices are not uniform throughout the EC); and
(iv) the welfare triangular dead-weight losses.

These elements need stressing particularly since most previous calculations seemed to miss the point that the net budgetary contributions do not take (iv) into consideration – see below.

Budgetary Costs of the CAP

In 1986 expenditure from FEOGA totalled 18.8 billion ECU, which was about 59 per cent of the overall EC budgetary expenditure in that year.

Functionally, the funds are spent on subsidising exports (about 47 per cent), subsidising domestic producers and consumers (about 37 per cent) and on withdrawal and storage of market surpluses (about 17 per cent). By commodity group, the dairy and cereals sectors account for about half of total expenditure, and the other half is shared by meat and eggs (about 14 per cent), fats and oils, and sugar (about 9 per cent each), fruits and vegetables (about 7 per cent) and wine (about 3 per cent). Variable levies, sugar levies and co-responsibility levies are all means of raising funds under the CAP, amounting to 2.2 billion ECU in 1985. Thus, the net FEOGA expenditure in 1986 represented a little over half of the total budget for that year. It so happens that this was the lowest such proportion for about fifteen years.

The share of net agricultural spending in the total budget has not been falling regularly, however. In 1977, 1980 and 1985 the share rose. Some of the factors which determine changes in FEOGA expenditure are controlled by the EC *Council*, in particular the change in

support prices agreed at the spring price fixing and changes in Green currencies used to translate these common prices into member currencies. In the short run, commodity management committees have the ability to change expenditure by encouraging or discouraging exports through the manipulation of the export refunds offered. However, factors beyond EC political or administrative control have a substantial impact on the total cost of agricultural support. Chief amongst these is the level of prices outside the EC which determines the refunds necessary to make EC exports competitive.

The magnitude of the variability in farm support spending from one year to the next is, no doubt, an uncomfortable feature for those managing EC finances. For example, over the four years 1979 to 1982, FEOGA guarantee expenditure in sequence rose by 10 per cent, fell by 3 per cent, and then rose by 22 per cent. What makes the situation worse to contemplate is the fact that the average growth in FEOGA expenditure is regularly in excess of the growth in resources available to the EC.

Thomson (1982) calculated that FEOGA expenditure net of levies had grown by an annual average of 16.3 per cent since 1975. Since the current system of own resources became fully operational in 1979, the available total budgetary resources had been growing annually at 10.8 per cent on average. Because total EC expenditure was well within the maximum resources available, it was possible to accommodate both the increasing agricultural expenditure and the rise in non-agricultural expenditure, at the even faster rate on average of 20 per cent per annum. However, the 1982 'take' of VAT was 0.92 of the maximum 1 per cent and the 1986 take was 1.35 per cent (out of a maximum of 1.4 per cent), so continuation of these past rates of growth of expenditure will not be possible for long. In his projections for the period 1983 to 1988, Thomson shows net FEOGA expenditure rising to almost 20 billion ECU, at constant 1982 ECU. The projection is based on the assumption that there is no change in the real prices of agricultural products from the 1982 levels. It shows the budgetary impact of a continuation of past technological progress in agriculture coupled with continued slow demand growth. This 75 per cent rise in spending over 1982 levels cannot be accommodated within the remaining slack in own resources: it would require a cut of about one half of the current level of non-agricultural spending. If such a course of action is unacceptable, the alternatives are to achieve significant savings in agricultural spending or to find additional budgetary income.

In the absence of the distributional problem of the budget and further restructuring of the EC budget itself, and without the disquiet about the wisdom of spending such large sums on surplus agricultural production, there is little doubt that the EC Budget problem would be solved by further raising the VAT limit. However, the inequitable distribution of principally agricultural expenditures from the budget has, to date, prevented this option being chosen, but the EC *Commission* is now pursuing an even more ambitious target.

This inequity arises because agricultural funds are spent disproportionately in agricultural exporting countries and, correspondingly, agricultural import levies are raised mostly in agricultural importing countries. Note also that the existence of substantial entrepôt trade makes the budgetary distribution of net FEOGA payments even less meaningful. Thus the main agricultural importers in the EC – Italy, the UK and West Germany – find that they contribute more and receive less from FEOGA than the other, more agricultural, export-orientated members. This basic pattern of net expenditures is complicated by the other support measures under the CAP. The extent of more direct producer and consumer subsidisation varies enormously between the specific commodity programmes (which cover, *inter alia*, beef, butter, fruit and vegetables, olive oil, sheep and wine) and of course member countries have widely different interests in these commodities. Also, guidance expenditures are distributed unevenly. The resulting overall pattern of FEOGA expenditures is shown in Table 12.1. As Buckwell (1985) has suggested, the country distribution of FEOGA expenditures does not fully illustrate another regional imbalance of the CAP which is likely to grow in importance, namely the north–south disparity. The CAP provides a much higher degree of protection to the northern products – beef, cereals, dairy products and sugar – and lower support to the southern products – fruit and vegetables, olive oil and wine. The second enlargement of the EC will accentuate this problem and, to the extent that support for the Mediterranean products is increased, it will exacerbate the EC budget problem. However, Buckwell (1985) argues that this is only part of the budgetary transfers arising out of the CAP. For the EC as a whole, the CAP involves a net expenditure which is financed by customs duties and VAT-based contributions. Each country's share of this net FEOGA expenditure can be calculated in proportion to its VAT contributions. The sum of each country's net FEOGA expenditure and its VAT-based contribution may be termed its FEOGA balance. Buckwell (1985) carried out these calculations for

Table 12.1 Budgetary transfers arising out of the CAP by country, 1982

	Gross FEOGA expenditure	*All levies*	*Net FEOGA expenditure*	*VAT share*	*VAT-based contribution to FEOGA*	*FEOGA balance*
		(ECU billions)		*(%)*	*(ECU billions)*	
West Germany	2.75	0.44	2.13	27.4	3.06	–0.93
France	3.37	0.35	3.02	23.9	2.67	0.35
Italy	2.41	0.35	2.08	13.1	1.46	0.62
Netherlands	1.43	0.26	1.18	5.2	0.58	0.60
Belgium/Luxembourg	0.61	0.21	0.40	4.1	0.46	–0.06
United Kingdom	1.14	0.67	0.47	22.0	2.46	–1.99
Ireland	0.46	0.03	0.43	0.8	0.08	0.35
Denmark	1.08	0.07	1.01	2.0	0.22	0.79
Greece	0.62	0.18	0.44	1.6	0.18	0.26
EC–10	13.72	2.54	11.16	100.0	11.17	0.00

Source: A. E. Buckwell (1985) 'The costs of the Common Agricultural Policy', in A. M. El-Agraa (ed.), *The Economics of the European Community* (Oxford: Philip Allan), p. 187.

1982; these are shown in the last column of Table 12.1. They indicate that the net contributors are Belgium/Luxembourg, the UK and West Germany, and the other members are net beneficiaries. These flows formed the basis of the intense debate about the 'fairness' of the budget in the late 1970s and early 1980s.

The remainder of this chapter reviews the attempts which have been made to widen these rather simplistic budgetary measures of the costs of the CAP to include:

(i) the inter-country transfers caused by food trade at high EC prices;
(ii) the balance of agricultural trade resulting from a given constellation of prices under the CAP;
(iii) the impact of the policy on producer and user welfare; and
(iv) an attempt to aggregate these various effects into an overall welfare measure.

Whilst the budgetary transfers and the 'costs' under (i) and (ii) above can be calculated for the existing CAP, the measures under (iii) and (iv) require careful specification of alternative policies.

Budget and Trade Effects of the CAP

Koester (1977) was one of the first to explain the misleading nature of calculating the cost of the CAP in budgetary terms only. He pointed out that the incidence of payments to and receipts from the EC budget by member countries through the mechanism of import levies and export refunds often had no relationship to the burden of the CAP on them. For each member country, he calculated a concept of national cost which compared the actual net budgetary contribution to FEOGA with the cost to that country of nationally financing its current support level. This choice of alternative policy was recognised to be arbitrary; it was however of great analytical convenience because it meant that domestic production and consumption did not change and so there was no need for controversial estimates of production, consumption and trade responses to changes in prices. The calculations were carried out for six commodities (barley, beef and veal, butter, skim milk powder, soft wheat and white sugar) for each of the years from 1971 to 1975 and for five member countries: France, Italy, the Netherlands, the UK and West Germany.

The results of Koester's calculations are shown in Table 12.2. The sign convention in this analysis is a little confusing: for each country,

Table 12.2 National net transfer payments due to common organisation of agricultural markets, 1971–5 (in EUA)

	1971	*1972*	*1973*	*1974*	*1975*
West Germany	–247	–182	–182	–174	–30
France	357	517	484	–454	–411
Italy	–265	35	–212	69	–203
Netherlands	–165	105	2	127	119
United Kingdom	n.a.	n.a.	–896	–55	188

Note: n.a. = not available.

Source: U. Koester (1977) 'The redistributional effects of the common agricultural financial system', *European Review of Agricultural Economics*, vol. 4, p. 30.

the calculations compare its contribution towards the overall FEOGA net deficit with the domestic cost of maintaining its existing agricultural support nationally, rather than supra-nationally. A positive result thus indicates a country penalised by the common organisation of the market, and a negative result a country benefiting under the present system. Interpretation is made more difficult by the fact that in 1974 and 1975 world prices for some commodities (sugar and wheat) rose above the EC prices. Koester's own interpretation of these figures pointed to the benefits enjoyed by France, except for 1975, and to the high costs suffered by the UK as a result of the common organisation of the market.

Whilst Koester's numerical results presented some puzzles, he undoubtedly pointed in the right direction as far as the debate surrounding the costs of the CAP was concerned. He showed that it was necessary to focus on more than the simple incidence of budgetary receipts and payments and that it was necessary to specify an alternative policy in order to estimate costs. The Cambridge Economic Policy Group (CEPG) – see McFarquhar, Godley and Silvey (1977), Bacon *et al.* (1978) and CEPG (1979) – pursued these ideas further in a series of calculations which, although focusing on the cost of the CAP to the UK, reported results for all member countries of the EC. Their contribution was to point out two components of cost: 'net budget receipts' and 'net trade receipts'. Participation in the CAP involves acceptance not just of financial solidarity but also of common prices and EC preference. It means that EC members agree to trade agricultural commodities internally at the (usually high) EC

Table 12.3 Net cash receipts and payments between EC members (in £ million): CEPG and blancus

Country	*Net budget receipts 1979*	*Net trade receipts CEPG 1979*	*Net trade receipts Blancus 1976*	*Total net cash receipt 1979*
United Kingdom	−806	−317	(−593)	−1123
West Germany	−570	−101	(−122)	−671
Italy	−114	−532	(−736)	−646
Belgium/Luxembourg	+312	−156	(−129)	+156
Ireland	+254	+221	n.a.	+475
Holland	+190	+441	(+91)	+631
Denmark	+329	+289	(−14)	+618
France	+114	+620	(−272)	+734

Source: Cambridge Economic Policy Group (1979) 'Policies of the EEC', *Cambridge Economic Policy Review*, vol. 5, pp. 25–26; and U. Blancus (1978) 'The common agricultural policy and the balance of payments of the EEC member countries', *Banca Nazionale del Lavoro Quarterly Review*, vol. 5, no. 127, p. 369.

support price levels and not at world market price levels. A full assessment of the national cost of the CAP should thus include both the budgetary flows and thus the intra-EC food trade effect; the result may be called budget and trade effects. The CEPG calculations of these two effects made the same choice of comparator policy as Koester, that is, each country continued the same level of price support as under the CAP, but funded the support nationally. Also, in common with Koester, the CEPG focused their attention solely on the balance-of-payments cost of the CAP. They made no attempt to assess the impact of the CAP on producers or consumers.

The budget and trade calculations produced by the CEPG covered seven commodities (barley, beef, butter, cheese, maize, sugar and wheat) for the year 1979, and the results are shown in Table 12.3. The results show the large net costs of the CAP to Italy, the UK and West Germany, and the benefits being enjoyed by all the other members, particularly France. The fact that two of the net paymasters of the CAP, Italy and the UK, were amongst the poorest three countries in the EC enhanced the political significance of these results. Two qualifications should be made in interpreting these figures. First, in their allocation of budgetary costs amongst members, the CEPG appear to have included all budgetary expenditure, not just agricultural expenditure. The figures are thus inflated measures of the cost of the CAP. Secondly, MCAs appear to have been double-counted by being included in both the budget and the trade

effects; again, the result is to enlarge the magnitude of the sum of these two effects.

Blancus (1978) also drew attention to the trade effects of the CAP. His estimates covered all the CAP commodities for seven EC members (he did not include Ireland or Luxembourg) for each year from 1970 to 1976. For comparison with the CEPG work, his 1976 figures are shown in parentheses in Table 12.3. Bearing in mind the different year, the wider commodity coverage in Blancus's figures and the qualifications to the CEPG analysis, the results are comparable at least in so far as pinpointing the gainers and losers is concerned.

Given the political importance attached to the budget and trade costs of the CAP in the UK, it was not surprising to find the calculations being replicated in Whitehall. Rollo and Warwick, officials at the Ministry of Agriculture, published their estimates of the budget and trade effects in 1979. Their analysis closely mirrored that of the CEPG, but avoided the double counting of MCAs and restricted the budgetary figures to items relevant to the CAP; they also included more commodity detail (they added eggs, pigmeat, poultry meat and rice to their calculations and disaggregated wheat into common and durum wheat). Rollo and Warwick provided interval estimates of the costs of the CAP to each member by calculating the trade effect under two assumptions about world prices, using import levies and then export restitutions to measure the difference between EC and world prices. The logic of this choice was that using import levies would provide a low estimate of world prices as importers would seek the lowest price sources, and export refunds would indicate the upper limit to world prices as EC officials (and exporters) would seek the highest prices available in world markets to minimise the cost of subsidising exports (and hence maximise profits).

The results, as seen in Table 12.4, show that the net effect on the balance of payments measured using export refunds is smaller than that based on variable levies for all countries except the UK. Also, the ranking of gainers and losers is the same using either measure, except that the UK is the largest loser when using export refunds. It might be expected that for the UK, the EC's largest net importer, levies are a better guide to the relevant world price than export refunds. Comparing the Rollo and Warwick results with those of the CEPG shows that the pattern of losers and gainers is almost the same. The exception is Belgium/Luxembourg, shown to benefit from the CAP in the CEPG calculations and to lose on the Rollo and Warwick estimates. However, the ranking and absoute magnitude of

Table 12.4 Effects of the CAP on balance of payments of member states, 1978, (in £ million): Rollo and Warwick

Country	*Net receipts from (+) or contributions to (–) FEOGA*	*Net effect on trade account measured by*		*Net effect on the balance of payments*	
		Variable levies	*Export refunds*	*Variable levies*	*Export refunds*
Italy	–344	–588	–442	–932	–786
United Kingdom	–673	–110	–145	–783	–818
West Germany	–122	–434	–282	–556	–404
Belgium/Luxembourg	+33	–54	–95	–21	–62
Ireland	+343	+184	+163	+527	+506
France	+41	+575	+480	+616	+521
Denmark	+408	+275	+213	+683	+621
Netherlands	+241	+605	+387	+846	+628

Source: J.M.C. Rollo and K.S. Warwick (1979) 'The CAP and resource flows among EEC member states', *Government Economic Policy Working Paper*, no. 27, p. 28.

each country's position is at variance in these studies. It is impossible to define the differences because of different commodity coverage, year of analysis and the precise data used.

The four studies reviewed in this section permit no very detailed conclusions about the magnitude of the budget and the trade costs of the CAP. It is clear that the size of this measure of cost is quite sensitive to the assumptions made, particularly the level of world prices, to the commodity coverage of the analysis and to the year chosen for analysis.

Welfare Effects of the CAP

Although there is little doubt that estimates of the budget and trade effects of the CAP are considered of great political importance, there has been dissatisfaction with this measure of the costs of the CAP on two grounds. First, the alternative policy on which it is based, namely independent nationally-financed agricultural policies at existing price levels, is neither realistic nor desirable. Second, appraisal of the complex system of transfers which the CAP represents, by focusing only on the budget and trade effects, seems narrow. As the policy is designed to transfer income to producers, an appraisal of its effectiveness might be expected to focus at least some attention on producer benefits and on the corresponding consumer burdens.

Morris (1980a), tried to accommodate these criticisms. He measured the 'effect on resources' of the CAP for each member country for the year 1978. His study used the concept of economic surplus to represent the loss felt by consumers and the gain experienced by producers when prices were supported at a high level compared to some lower level. There is some doubt in Morris's study as to the precise specification of the comparator policy and its implied prices. Whilst it appears that he made specific assumptions about the price levels each member country would apply if it no longer participated in the CAP, the numerical results appear to have been made on the assumption that the member states would adopt world prices (adjusted) upon abandoning the CAP.

The essence of Morris's calculations is that the effect on resouces for each country is defined as the sum of the consumer loss, producer gain and budgetary contribution arising out of the CAP as compared with a free market in agricultural products. Such calculations require assumptions about two potentially controversial factors: the appropriate level of world prices and the response of producers and

consumers to changes in prices. The first of these was also required in calculations of budget and trade effects. However, as Buckwell (1985) argues, world prices are more problematic in cases where the EC net trade position is assumed to change. In such cases it is necessary to determine not just the existing appropriate level of world prices, but also how much these prices will be affected by changes in EC net exports. Measuring the responsiveness of producers and consumers to imaginary large changes in each of the principal agricultural commodities of each of the member states and the rest of the world (treated as a single block) is no simple task. Considerable argument surrounds agricultural supply elasticities although there is less dispute about demand elasticities. Compounding the problem further is the fact that the situation to be analysed involves simultaneous (but not equal) changes in all commodity prices. In principle this requires the use of complete matrices of own-price and cross-price effects, otherwise the simple, partial, own-price effects will grossly overstate the result of a change in prices. Morris assembled elasticities from whatever sources he could find, and in about half of the cases where he could find no information on elasticities he assumed the value of ± 0.3. To circumvent the problem of general price change, he simply halved the raw estimates of producer and consumer effects where he suspected there were significant cross-price elasticities.

Conceptually, measures of the overall welfare cost of the CAP incorporate the budgetary costs and the food-trade effect of intra-EC trade in agricultural products. However, by focusing on the internal transfers between producers, consumers and taxpayers, the total impact on the balance of payments is masked.

Morris's results covered eight member countries (Luxembourg was excluded) and seventeen commodities for the year 1978. The results are summarised in Table 12.5. For the agricultural exporter, it is expected that the producer gain of high CAP prices would outweigh the consumer losses. The opposite is true for net imports. The results bear this out, except in the case of Belgium. Comparing countries, the magnitudes of consumer losses and producer gains are of the order of between three and ten times as great as the overall effect on resources. The budgetary effects are all shown to be positive in Morris's study. This is because the figures shown are the contributions each country makes to the overall deficit on the FEOGA account. This is, of course, different from the net FEOGA expendi-

Table 12.5 Costs of the CAP: Institute for Fiscal Studies, 1978 (in £ million)

Country	*Consumer loss*[a]	*Producer gain*[b]	*Budgetary contribution*	*Effect on resources*
West Germany	4 598	4 035	1 177	−1 740
Italy	3 413	2 257	386	−1 541
United Kingdom	1 787	1 148	731	−1 370
France	3 167	3 642	761	− 286
Belgium	725	680	226	− 271
Ireland	175	408	32	+ 201
Netherlands	892	1 403	305	+ 206
Denmark	291	713	117	+ 324
EC Total	15 041	14 286	3 357	−4 112

Notes: [a] After allowing for subsidies.
[b] Includes guidance section payments.

Source: C. N. Morris (1980) 'The Common Agricultural Policy', *Fiscal Studies*, vol. 1, p. 28.

tures used by the CEPG and by Rollo and Warwick. Table 12.5 is arranged in descending order of magnitude of the cost of the CAP. Thus, Germany, Italy and the UK are in the top three rows showing large, and not very different, net costs which result from the sum of consumer losses exceeding gains to producers and the budgetary contributions. France and Belgium are losers by much smaller, and again rather similar, amounts. The cost in the case of Belgium arises in the same way as for the three large losers. For France, however, producer gains outweigh consumer losses, but the net gain to producers is outweighed by the budgetary contribution causing an overall net loss. In the other small agricultural exporting countries, farmers gain more from the CAP than consumers lose, and they all make relatively small budgetary contributions. These countries therefore benefit from the CAP. The last row of the table indicates the magnitude of the overall loss to the EC caused by its agricultural policy, and the very large and mostly offsetting flows between consumers and producers which are induced by the high-price regime.

The Morris study has been widely quoted as the definitive work on the costs of the CAP, despite its rather crude estimation of price response and its definition of free trade as the alternative policy to CAP. Buckwell *et al.* (1982) have sought to rectify these shortcomings. Before

discussing their results, it may be helpful to clarify the various categories of budgetary and economic costs of the CAP which have been identified.

There are four categories of budgetary flows: export refunds; import levies; MCA subsidies; and taxes and all other producer and consumer subsidies and taxes. For each country these items may be summed netting receipts from FEOGA against payments to FEOGA to arrive at the *net FEOGA expenditure*. Buckwell *et al.* argue that this item is likely to be positive if a country is a net exporter and negative if a net importer. If these net expenditures are summed over all member countries, the result is the EC total net FEOGA expenditure which has to be financed from non-agricultural customs duties and VAT-based contributions. Applying each country's share of such contributions to the total net FEOGA expenditure yields each country's *agricultural budget contribution*. This item will be positive for each country. Summing the net FEOGA expenditure and the agricultural budget contribution yields the *balance of FEOGA payments*.

To find the complete balance of *agricultural payments impact* of the CAP, the balance of trade in CAP commodities is added to the balance of FEOGA payments. In calculating the balance of agricultural trade, extra-EC trade is valued at world, or threshold, prices and intra-EC trade at the common EC price level. This is important in order to avoid double counting of import levies, export subsidies and MCAs. An alternative summary of the payments position is to add the preferential trade effect (or food trade effect, as it was called by the CEPG) to the balance of FEOGA payments to find the *budget and trade effects*.

The other way of accounting for the flows arising out of the CAP is to calculate the producer surplus effects, consumer surplus effects and the agricultural budget contribution which, in this context, could be called the taxpayer effect. Buckwell *et al.* claim that summing these three allows a measure of overall welfare. The relationship between these various items is shown schematically in Figure 12.2 The items (1) to (14) can all be calculated either for a single policy situation or for a change in policy by comparing the item before and after the change. The welfare items (15), (16) and (18) can only be calculated by comparing pairs of policy situations.

Buckwell *et al.* (1982) chose four policy alternatives to illustrate a range of costs of the CAP as it existed in 1980. These ranged from the marginal change in policy exemplified by the package of price and agrimonetary changes agreed at the spring price review of 1980 to the

A. *Budgetary transfers for each country*
   (1) Export refunds
   (2) Import levies
   (3) MCA taxes and subsidies
   (4) Other producer and consumer subsidies and taxes
   (5) Sum (1 to 4): Net FEOGA expenditure
   (6) Sum (5) over all countries: EC total net FEOGA expenditure
   (7) $\alpha(6)^a$: each country's agricultural budget contribution

B. *Agricultural trade flows for each country*
   (8) Export receipts
   (9) Import payments
   (10) Sum (8 and 9): balance of agricultural trade

C. *Frontier balances of interest to each country*
   (11) Sum (7 and 5): balance of FEOGA payments
   (12) Sum (10 and 11): balance of agricultural payments
   (13) Preferential trade effect
   (14) Sum (11 and 13): budget and trade effect

D. *Welfare effects*
   (15) Producer surplus
   (16) Consumer surplus
   (17) = (7) Taxpayer effect
   (18) Sum (15 to 17): overall welfare effect

Figure 12.2 *Transfers arising out of the CAP*

Note: * a denotes an individual country's share of total VAT in the EC budget, representing the marginal component of the EC budget.

Source: A. E. Buckwell (1985) 'The costs of the Common Agricultural Policy', in A. M. El-Agraa (ed.), *The Economics of the European Community* (Oxford: Philip Allan), p. 195.

drastic switch to free trade with the rest of the world. This latter policy was justified as it is often used as the economists' benchmark and also to provide comparison with earlier work (the study by Morris). Intermediate policies examined were: the elimination of MCAs by the alignment of Green currencies and hence the harmonisation of support prices throughout the EC; and the incorporation of price changes sufficient to bring about EC self-sufficiency in CAP products.

The analysis of these four policies was conducted using a sixteen-commodity (barley, beef, butter, eggs, cheese, common wheat, cream and condensed milk, durum wheat, maize, oats, pig meat, poultry meat, rye and maslin, skim milk powder, sugar beet and veal), eight-country (the EC of nine as in 1980 but with Belgium and Luxembourg aggregated together) model for the 1980–81 crop year (the data base was in fact a projected data set using the most recent

information available at the time). The technique used was a conventional partial-equilibrium, comparative static analysis. Long-run production and utilisation (rather than consumption due to using farm gate production and prices) elasticities including significant cross-price effects were assembled from published work and, where there were gaps, assembled judgementally. Export demand and import supply schedules for the rest of the world were derived in a similar fashion. As with previous studies, it was assumed that surpluses were disposed of solely through subsidised exports, i.e. no provision was made in the calculations for intertemporal decisions involving storage. Some attempt was made to avoid the double counting of producer effects where supported products were themselves factors of production, e.g. for grain feed. The treatment of intra-EC trade was crude: changes in the net trade position of countries were distributed according to rules of thumb involving the concepts of nearest neighbours, traditional suppliers and proportional change.

Buckwell *et al* (1982) provide estimates of all eighteen aspects of costs (as summarised in Figure 12.2) analysed for the base (1980) period and the long-run effects of the four alternative policies. The costs were presented for the EC as a whole and analysed by country and by commodity. Table 12.6 summarises the welfare effects of the four policy changes for each of the member countries.

To help with the interpretation of the figures in Table 12.6, it may be useful to learn what implied average price changes were involved in each of the four alternative policies: the 1980 price package involved a real price cut of 4.3 per cent (slightly less for Belgium and the Netherlands and slightly more for Belgium and Denmark); price harmonisation at the then common price levels involved an average real price cut of 2.9 per cent, ranging from a rise of 1.3 per cent in Ireland to a cut of 9.8 per cent in West Germany; EC self-sufficiency involved a 13.5 per cent average real price cut; and free trade required, on average, a 31.9 per cent price cut.

The authors described their results as follows:

> The 1980 price package represented a fall in real support prices for most CAP commodities. However, in the inflationary conditions of that year, the absence of such an agreement, and the continuation of the previous year's price levels, would have resulted in an even steeper real price decline. The cost of this alternative against that of the CAP as it stood in 1980 is therefore measurable by the changes that would have taken place in the *absence* of the 1980

Table 12.6 The costs of the CAP, changes in economic welfare, by alternatives to CAP 1980 (EUA millions)

	EC9 Total	*Germany*	*France*	*Italy*	*Netherlands*	*Belgium/ Luxembourg*	*UK*	*Ireland*	*Denmark*
I *1980 Price package*									
Producers	–2 879	–750	–748	–370	–265	–159	–340	–89	–157
Consumers	2 573	817	573	461	125	109	413	27	47
Taxpayers	2 200	721	543	240	133	104	382	19	58
Net	1 894	789	367	331	–7	55	455	–43	–53
II *Price harmonisation*									
Producers	–2 102	–1 690	0	0	–116	–61	–267	31	0
Consumers	2 267	1 857	0	0	51	46	325	–13	0
Taxpayers	1 243	407	307	135	75	59	216	11	33
Net	1 407	575	307	135	11	44	273	29	33
III *Community self-sufficiency*									
Producers	–9 725	–2 546	–2 392	–768	–1 127	–543	–1 255	– 481	– 613
Consumers	7 231	2 450	1 488	879	324	339	1 540	96	115
Taxpayers	5 652	1 854	1 394	616	342	268	981	48	148
Net	3 158	1 757	491	727	–460	64	1 266	–337	–350
IV *Free market*									
Producers	–22 039	–6 496	–5 198	–2 542	–2 213	–1 166	–2 484	–693	–1 247
Consumers	24 836	9 017	5 374	3 863	1 147	1 034	3 716	230	456
Taxpayers	8 255	2 707	2 037	900	500	391	1 433	71	217
Net	11 051	5 228	2 213	2 220	–566	260	2 664	–392	–575

Source: A. E. Buckwell (1985) 'The costs of the Common Agricultural Policy', in A. M. El-Agraa (ed.), *The Economics of the European Community* (Oxford: Philip Allan), p. 197.

agreement. The results [in section I of Table 12.6] show a difference of nearly 3,000 million EUA in the welfare of producers and about 2,500 million EUA in that of consumers. Through increased contributions to the EC budget the agreement is estimated to have cost taxpayers an extra 2,200 million EUA. Adding together these three amounts, the overall effect of the 1980 price package is estimated at about 1,900 million EUA, two-fifths of which is experienced by Germany. Ireland and Denmark are the main exceptions to the general pattern, although the amounts involved are small compared to the effects on the larger countries, while the effect of the package on the Netherlands is almost neutral.

The effects of harmonising prices to the common production-weighted average price within the EC depend on the pattern of the green exchange rates and MCAs which such a move would eliminate. In the circumstances of mid-1980, the overall effect [as shown in Section II of Table 12.6] is a net loss to producers and a gain to consumers of 2,100–2,200 million EUA. A taxpayer gain of 1,200 million EUA results in a significant positive effect of 1,400 million EUA, mainly through adjustments in Germany and the UK. These results differ somewhat from earlier studies . . . of harmonisation proposals on account of the substantial alternations in exchange rates which took place during 1979 and 1980. However, one conclusion reached by earlier researchers is reinforced, namely, that movement to truly common prices is likely to earn neither political nor economic endorsement, without regard to the level of those common prices relative to existing national levels.

Whilst the target of exact EC self-sufficiency has little to commend it from a theoretical point of view . . . the effect of such a policy change, given the current surplus production in the EC, is at least of interest in terms of its potential effect on the budget. Self-sufficiency in products currently in surplus eliminates the disposal cost to the taxpayer, a cost which in 1980 amounted to a net 5,600 million EUA. Such a policy would therefore go a long way to easing, if not removing, the current crisis in the EC [as shown in section III of Table 12.6]. However, this is achieved only at the considerable cost of nearly 10,000 million EUA to producers. Consumers would gain by 7,200 million EUA if the policy objective were achieved by a cut in agricultural product prices, as is assumed here. If, however, the objective were to be pursued by producer co-responsibility levies (taxes), then consumers would be

> unaffected and, in essence, most of the gain shown here as accruing to consumers would, through the levy receipts, accrue to taxpayers instead. The loss suffered by producers would remain unchanged. The overall benefit to the EC of eliminating surpluses is estimated at over 3,000 million EUA.
>
> The 'academic' policy option of a free market shows a net gain of 11,000 million EUA to the EC as a whole and proportionate gains to all countries except the three 'specialist' exporters, the Netherlands, Ireland and Denmark. These net gains are, of course, achieved at substantial expense to farmers. It is this fact which, above all others, is the most obvious reason why a policy change which would involve substantial reductions in the transfers generated by the CAP is not politically acceptable, despite the direct and obvious savings to taxpayers of some 11,000 million EUA of scarce public funds. While these values are of theoretical interest, realistic discussion of policy change requires more restricted analysis. (Buckwell *et al.*, 1982, pp. 167–70)

With the single exception of the estimates of the 'cost' of a policy of price harmonisation by Buckwell *et al.* (1982), all the studies reviewed so far show that changes in the CAP improve the welfare of some member states whilst imposing burdens on other members. Even the move to free trade impoverishes Denmark, Ireland and the Netherlands (as shown by both the Morris and Buckwell *et al.* studies). This might be considered sufficient explanation of the difficulty of finding changes in the CAP which are acceptable to all member states. However, the conflicts of interest are seen even more clearly when the transfers between producers, consumers (or users) and taxpayers are examined on a per capita or per farm basis.

A GENERAL EQUILIBRIUM ESTIMATE

Stoeckel (1985) and Breckling *et al.* (1987) made estimates using a simplified general equilibrium approach. Since the Breckling *et al.* study was a more sophisticated version of the Stoeckel work, this section is devoted to this later attempt; Stoeckel himself was a joint author of the Breckling *et al.* study.

The study commenced by stressing the three major problems facing the EC:

(i) the excessive surpluses created by the CAP in most (?) agricultural products necessitating huge restitution costs to enable their disposal on the international market;
(ii) the high level of unemployment which in 1987 reached about 11 per cent of the total labour force; and
(iii) the declining competitiveness of the EC manufacturing sector – the share of the EC in OECD exports of equipment goods having declined by more than 25 per cent since 1964 and its imports share having risen by more than the same percentage; it is the traditional industries that have lagged behind while the new technology industries and products with high growth in demand are lacking.

The authors correctly believed that these problems were interrelated, hence their employment of a general equilibrium approach. They conceded that the causes were numerous and complex but they were certain that the CAP 'has contributed significantly to the EC's relative economic malaise' (Breckling *et al.* 1987, p. 2).

The model specified a general equilibrium structure for each of the largest four EC economies and estimated the effects of protecting the agricultural and food processing sectors on the rest of the economies in terms of exports, factor markets and total unemployment. The four economies accounted in 1982 for 86 per cent of the GDP of the EC; hence they were fairly representative of the EC as a whole. They were, in ranking order: West Germany (28 per cent), France (23 per cent), the UK (19 per cent) and Italy (16 per cent). The reason for concentrating on these four was simplicity.

Each of these countries had large *services* and *manufacturing* sectors, representing about 55 and 25 per cent of their respective GDPs. Agriculture accounted for a small percentage of GDP, ranging from 2 per cent in the UK and West Germany to 6 per cent in Italy. Also, the food processing sector (which was subject to CAP support) represented about 4–6 per cent of the GDP of these countries. About 26 per cent of the agricultural production of the EC came from France, about 21 per cent from Italy, 17 per cent from West Germany and about 12 per cent from the UK.

A basic feature of EC agriculture was the co-existence of small and large scale farm enterprises. Within the EC of ten, large scale farms represented about 10 per cent of the total number of farm enterprises but accounted for 40 per cent of total agricultural output. The large scale farms were mostly (in ranking order) in the UK, West Germany

and France – see El-Agraa (1985b). It was always recognised that, *on the whole*, the large scale farms tended to be more capital intensive relative to the small scale ones.

The authors believed that the least controversial explanation for the high level of unemployment in the EC and its sharp rate of increase in the UK between 1975 and 1982 was rigidity of real wages. This belief was based on the study by Klau and Mittelstädt (1986) which showed the UK, France and Italy to have the highest real wage rigidities of all the members of the OECD. The same study showed West Germany to have a low level of real wage rigidity despite narrow wage differentials reflecting minimum wage legislation and cost-of-living adjustments.

The formal model incorporated all these features. It was based on a linearised Samuelson–Heckscher–Ohlin general equilibrium framework first advanced by Woodland (1982) and adapted for the EC by Stoeckel (1985); the present study extended it to a multi-country representation of the EC.

As indicated before, the EC was represented by its four major producers. For each of these, four production sectors were distinguished, reflecting the authors' focus on the CAP: agriculture, being the supplier of the products and the main recipient of financial support; food processing, being an intensive user of agricultural inputs and the second major recipient of financial support; manufacturing, being representative of all other tradable goods; and services, being the labour intensive and mostly non-traded goods sector. Also, the agricultural sector was disaggregated into small and large scale farm enterprises. The main instruments used in the approach to reflect CAP support were production subsidies, export restitutions, variable levies and the VAT tranche forming an own resource of the EC budget.

The authors felt that agriculture warranted special treatment, given the study's focus on it. A common agricultural sector, encompassing the four EC countries, was specified, and the agricultural products of these countries were treated as a single homogeneous product, which was exported, in aggregate, to the outside world. However, non-agricultural commodities produced in the EC were assumed to be not only exported to the rest of the world but also to other members of the EC. Except for the composite agricultural product, all EC commodities were distinguished by both country of origin and destination. All four countries were assumed to import both agricultural and non-agricultural commodities from the outside

world. Also, each of the four countries was seen to be large enough to influence the world price of its traded goods.

Each industry was assumed to use domestic and imported intermediate imports as well as primary factors in the production process. The model incorporated four factors of production: capital, labour and land used in both the agricultural sub-sectors, and land specific to the large farms. All factors other than labour were assumed to be fully employed, while labour could be either so or unemployed. Both capital and labour were assumed to be mobile domestically but immobile within the EC, in spite of the *economic union/common market* nature of the EC.

All factor endowments were assumed to be determined exogenously, implying, for the capital stock, that sectoral investment could take place only through the reallocation of capital (other than large scale land) amongst the sectors, i.e. at the margin, capital was 'malleable and . . . usable' by all sectors. Another implication was that all commodities were used in current production and could not be reproduced.

The main behavioural assumptions were: producers minimise costs subject to technological constraints, with each sector producing a single product; there was a single consumer in each country maximising utility subject to a budget constraint; perfect competition ensured that all factors, except labour, received their marginal products and were fully employed; and *Walras' law* applied with results being independent of the choice of reference price – this being the consumer price index for each country, hence only 'real' changes took place with movements in real income acting as a welfare indicator.

The basic model was non-linear. The solution procedure involved first linearising it using logarithmic differentiation. The resulting elasticity version was then solved by matrix inversion. The linear approximation is valid for the estimation of small changes in the endogenous variables from exogenous stimuli, but due to the large exogenous changes in the export restitutions and import levies, the authors conceded that the linearisation errors were substantial, particularly in the case of trade parameters.

Given the Samuelson–Heckscher–Ohlin nature of the methodology employed, the authors' (Breckling *et al.*, 1987, p. 11) expectation with regard to the CAP (agricultural protectionism) was that it would have adverse effects on the other traded goods sectors and the economy as a whole by:

(i) distorting the pattern of trade through agricultural import taxes (export taxes on non-agricultural goods) and agricultural export subsidies (import subsidies on non-agricultural goods);
(ii) worsening the terms of trade for the EC, thus reducing EC welfare;
(iii) increasing unemployment in the relatively labour intensive industries, given the assumption of real wage rigidities; and
(iv) promoting research into and investment in relatively inefficient industries.

The aim of the study was to establish the magnitude of each of these expected effects. The results were obtained through simulation. 1979 was chosen as the base year for calculating the impact of CAP support, modelled as exogenous shocks, on member countries since it was the year when the own resources system for financing the EC budget was formally phased-in. The full absorption time for such shocks was thought to be typically a five-year period; thus the authors interpreted the results as changes covering the period 1979–83.

The data base was the *Standard Input-Output Tables of ECE Countries for Years around 1975* (UN, 1982) augmented by trade shares obtained from OECD trade tapes used in their *INTERLINK Model* (OECD, 1983). Unemployment figures were obtained from OECD country-specific statistics for 1979 (OECD, 1985). The ratio of unemployment benefit to employment wage was set at 0.5 in the four EC nations, and real wages were assumed to be fixed. The input–output shares of the agricultural sub-sector were derived from the *Farm Accountancy Data Network* (*Eurostat*, 1982) since their preliminary tables for 1986 suggested no change from their 1975 calculations.

Behavioural elasticities were taken from Whalley (1985), Stern, Francis and Schumacker (1976) and Deaton and Muellbauer (1980b); these are given in Table 12.7. The authors claimed that although the calculations may have varied considerably, 'a preliminary sensitivity analysis has indicated that, except on the trade side, the results are fairly robust and that the effect on the economy is negligible' (Breckling *et al.*, 1987, p. 22).

The CAP support was modelled by four exogenous shocks:

(i) a 12.32 per cent agricultural production subsidy;
(ii) 80 per cent subsidies on all agricultural and food processing products exported to the rest of the world;

Table 12.7 Behavioural elasticities

Description	*Elasticity*
Production and consumption substitution elasticities (CES)	
Between domestic and imported goods and primary factors for all countries	0.8
Between imported goods and domestic goods for all countries	2.0
Consumer income elasticities	
Agricultural products for all countries	0.2
Food processing products for all countries	0.4
Manufacturing products for all countries	0.8
Service sector products(a)	
– Germany, FR	1.18
– France	1.17
– United Kingdom	1.17
– Italy	1.23
Export price elasticities of demand by rest of world	
Agricultural and agrifood products for all countries	2.0
Manufacturing products for all countries	1.0
Service sector products for all countries	4.0
Import price elasticities of supply by rest of world	
Agricultural and agrifood products for all countries	2.0
Manufacturing products for all countries	4.0
Service sector products for all countries	5.0

Notes: (*a*) These settings ensure that the weighted sum of expenditure elasticities is unity in each country.

Leisure demand (unemployment supply) elasticity for all countries was set to 1.0.

Source: J. Breckling *et al.* (1987) *Effects of EC Agricultural Policies: a General Equilibrium Approach* (Canberra: Bureau of Agricultural Research), p. 23.

(iii) 40 per cent import levies on all agricultural and food processing products imported from the rest of the world; and
(iv) a 0.75 per cent VAT tax on all consumer goods in the EC countries.

The sizes of these shocks were chosen by reference to the FEOGA accounts. All storage costs were treated as implicit export subsidies and production aids were regarded as implicit production subsidies.

The precise value of the agricultural production subsidy was selected to guarantee that the EC budget constraint was met. Note that the measurement of these shocks assumed a distortion-free base in 1979, i.e. 1979 was the year of equilibrium.

On the expectation that CAP support may have promoted investment in agricultural research and development (by assumption, to the advantage of large, capital intensive farms), two shocks were used to capture this effect:

(i) a 5 per cent increase in total factor productivity on large farms; and
(ii) a 5 per cent decrease in total factor productivity on small farms.

Finally, the simulations were carried out on the assumptions that the MCAs and national government supports were held constant.

The simulation results, given in Table 12.8, indicated the following:

(i) The agricultural production subsidy and the VAT tax necessary to finance agricultural support were more important instruments than the border measures.
(ii) EC agricultural production increased by 18 per cent, mainly due to the production subsidy. Output grew fastest in the UK (about 54 per cent), and least in Italy (about 7 per cent) with West Germany's growing by about 20 per cent and France's by about 12 per cent. Since the average growth rate for the EC was just under 20 per cent, the British and West German agricultural enterprises increased their share of total EC production.
(iii) The increase in agricultural production was associated with price rises for the factors used most intensively in agriculture, especially land. These increased land costs favoured the countries least intensive in the use of land, i.e. the UK and West Germany.
(iv) Given the assumptions made about technology, it was not surprising to discover that the large farms were the main beneficiaries. Indeed, output growth on small farms actually declined by about 35 per cent in the UK and remained almost constant in the rest of the EC.
(v) The food processing sector expanded, on average, by about 10 per cent throughout the EC. Most of this growth was attributed to the 80 per cent export subsidy, since the export sector accounted for 10 per cent total demand. The differences in

Table 12.8 Country-specific simulation results (Percentage change in variable)

Variable	*Germany FR (%)*	*France (%)*	*United Kingdom (%)*	*Italy (%)*
Gross output				
Agriculture – small farms	–1.1	0.3	–35.4	–1.2
– large farms	51.2	27.0	98.5	29.3
– total	20.2	11.7	53.7	6.8
Food processing	8.0	13.7	15.9	5.1
Manufacturing	–1.4	–1.9	–2.5	–1.1
Services	–1.3	–0.6	–3.1	–0.7
Producer prices				
Agriculture	–2.6	–4.6	–3.8	–2.9
Food processing	0.2	–2.0	1.3	–0.9
Manufacturing	–0.5	–0.7	–0.4	–0.6
Services	–0.3	–0.2	0.3	–0.4
Domestic consumer demand				
Agriculture	11.1	6.0	7.8	3.2
Food processing	0.9	2.9	1.6	1.6
Manufacturing	–0.8	–0.2	–2.0	–0.1
Services	–0.6	0.4	–1.5	0.2
Primary factor returns				
Labour	0.0	0.0	0.0	0.0
Capital	–0.5	0.4	1.7	–0.3
General land	17.6	11.7	14.0	9.5
Large scale land	72.5	40.2	130.4	44.8
Labour movement				
Employment	–0.9	–0.4	–1.8	–0.6
Unemployment	7.8	3.4	16.0	5.2
Exports to rest of world				
Food processing	149.9	150.2	145.3	151.5
Manufacturing	–4.4	–6.2	–5.7	–4.6
Services	–18.3	–26.7	–25.4	–19.4
Imports from rest of world				
Agriculture	–32.1	–34.0	–26.8	–33.6
Food processing	–33.1	–32.4	–28.4	–33.3
Manufacturing	5.1	7.3	5.8	5.4
Services	6.2	9.0	0.0	6.0
Real income	–0.1	0.8	–0.6	0.4
Exchange rate	4.9	6.9	6.1	5.2
Terms of trade	–0.4	1.9	–0.5	0.2

Note: All price changes are relative to the consumer price index in each country.

Source: J. Breckling *et al.* (1987) *Effects of EC Agricultural Policies: a*

General Equilibrium Approach (Canberra: Bureau of Agricultural Research), p. 14.

growth rates in the EC countries were attributed to their different export shares.

(vi) The manufacturing and services sectors contracted by about 1 per cent in each country, except in France where manufacturing declined by about 2 per cent and the UK where manufacturing declined by 2.5 per cent and services by 3.1 per cent. However, except for the UK, manufacturing was more adversely affected relative to the services sector, a situation which was to be expected since in this model agricultural protection resulted in an appreciation of the real exchange rates, which depressed exports; this was not so in the case of services since they were, by assumption, non-traded, but this left unexplained the UK reverse position.

(vii) As expected, unemployment increased throughout the EC, given the assumption of rigid real wages and the fact that the declining non-agricultural sectors were relatively intensive employers of labour. Calculations showed that the unemployment rate would become higher than in the absence of the CAP by 1.8 per cent (450 000 fewer persons employed) in the UK, 0.9 per cent (220 000 fewer persons employed) in West Germany, 0.6 per cent (110 000 fewer persons employed) in Italy and 0.4 per cent (80 000 fewer persons employed) in France. The rationale for greater job losses in the UK and West Germany was attributed to the lower contraction rate in the non-agricultural sectors of France and Italy, implying that jobs in the UK and West Germany were being lost in favour of France and Italy, reflecting the fact that labour was assumed to be immobile between members of the EC. It should not come as a surprise to learn that the relative effect of the CAP on unemployment followed an almost identical pattern to that in the non-agricultural sectors.

(viii) The CAP was found to create substantial changes in the pattern of consumer expenditure. For instance, consumer demand for locally produced manufactured goods declined in all four countries in the sample, particularly so in the case of the UK. Also, the demand for services contracted in the UK (1.5 per cent) and West Germany (0.6 per cent), but marginally increased in France and Italy.

Table 12.9 Aggregate EC simulation results for agriculture (Percentage change in variable)

Variable	*Change (%)*
Gross output	+18.3
Producer price	–2.3
Exports to rest of world	+155.4

Source: J. Breckling *et al.* (1987) *Effects of EC Agricultural Policies: a General Equilibrium Approach* (Canberra: Bureau of Agricultural Research), p. 15.

(ix) Exports of both processed and unprocessed products by the EC to the rest of the world rose by about 150 per cent – see also Table 12.9. This largely reflected the size of the export subsidy, and the authors claimed that this result was consistent with 'the evidence of massive surplus production' (Breckling *et al.*, 1987, p. 15). On the whole, the EC exports of manufactures and services declined by about 5 per cent and 23 per cent respectively. On average, intra-EC trade in processed agricultural products increased by about 7 per cent. The terms of trade worsened for the UK and West Germany, were almost unchanged for Italy and improved for France by about 2 per cent.

(x) As Table 12.10 shows, the simulations suggested that France was the main beneficiary from EC budgetary transfers by 8 per cent of its gross export income. The loss by the UK and West Germany is attributed to their relatively small agricultural sectors.

Conclusion

This approach is to be applauded since economists should be interested in the total economy-wide effects of any protectionist policy. Moreover, the approach improves on the five areas identified by Stoeckel (1985) to require more attention: the need to incorporate an agricultural sector, to specify a multi-country framework, to model explicitly the transfers within and between countries, to model a heterogeneous agricultural sector where just over 10 per cent of farms produce almost half the total output and to specify labour market rigidities in an acceptable model of unemployment.

Table 12.10 Intra-EC transfers (Percentage change in total export value prior to exogenous shock)

Variable	*Germany FR (%)*	*France (%)*	*United Kingdom (%)*	*Italy (%)*
Value of exports	−1.9	−2.4	−0.4	−4.8
Value of imports	−1.0	+0.6	−0.8	−0.8
Consumption tax	3.3	4.1	3.2	3.8
Production subsidy	4.2	7.1	2.8	7.8
Import tariffs on agriculture	2.7	0.6	2.3	0.8
Import tariffs on food processing	2.3	2.0	4.3	2.6
Agricultural export subsidy	−1.0	4.2	0.0	0.3
Agrifood export subsidy	1.6	3.4	2.6	0.8
Net transfers	−3.5	8.0	−4.4	1.7

Source: J. Breckling *et al.* (1987) *Effects of EC Agricultural Policies: a General Equilibrium Approach* (Canberra: Bureau of Agricultural Research), p. 16.

However, both the model specification and some of the assumptions employed here leave a lot to be desired. Theoretically, the model is inappropriate for dealing with large changes, as is the case with the CAP. The authors concede this point and are presently working on an improvement of the solution procedure in order to remove the linearisation error, but until those errors are eliminated, one should not have much faith in their preliminary results.

This point is reinforced when one carefully examines the assumptions built into the model. First, factors of production are not allowed to move across the borders of the EC. Of course, factor mobility has not been enhanced to any substantial extent by the formation of the EC, but there is evidence to suggest that some labour mobility does take place, and substantial amounts of capital and technology do move about within the EC – see Mayes in El-Agraa (1985). Second, large farms are not only intensive in their use of capital but also have access to land not available to small farms, the implication being that *all* large farms are more efficient than small farms. There is much evidence to suggest that some small farms are more efficient than large farms, depending on the agricultural product under consideraton. This takes one to the third point: because all agricultural products are counted as one aggregate, no such disaggregation is possible, hence this reality is completely

ignored in the calculations. Related to this is another point: in the EC, surpluses have been confined to certain products only, mainly milk and wine, and occasionally other products, but because there is no room for disaggregation, the estimates of this model suggest surpluses all round – the authors, realising this result, began by claiming that there have been surpluses in most agricultural products; there are no statistics to support such a claim. Also, and more importantly, a model which incorporates such assumptions is bound to produce the sort of results obtained, i.e. the model has been specified in such a manner as to produce these results; therefore both the formulation of the model and its application leave one unmoved. However, this should not diminish the need for a general equlibrium approach.

13 Estimating the Effects of Integration on the Terms of Trade

Petith (1977), utilising an extended theoretical structure of Mundell's (1964) framework, attempted an empirical evaluation of the terms of trade (*t/t*) effects of European economic integration. He concluded that the *t/t* gains seemed likely to have been one of the major effects of the creation of BENELUX, the EC and EFTA.

THE THEORETICAL FRAMEWORK

Mundell's (1964) model comprised three countries and three commodities. Each nation was assumed to consume all three commodities but to produce only one of them and at a fixed level of output.

The formal framework consisted of the market clearing conditions for the three commodities. Denoting both countries and commodities by the numbers 1–3, it was assumed that each country produced the commodity bearing its number. P_i was assumed to be the world price of commodity i and D_i^k and S_i^k the respective demand for and supply of it in country k ($S_i^k = 0$ for $k \neq i$). Furthermore, t_i^k for $k \neq i$ was assumed to be country k's tariff on imports of commodity i, and t_i^k for $k = i$ to be unity plus the subsidy paid by country k. Assuming that countries 1 and 2 were partners in a customs union (CU), the market clearing equations were shown to be:

$$D_1^1(P_1, P_2, P_3, t_1^1, t_2^1, t_3^1) + D_1^2(P_1, P_2, P_3, t_1^2, t_2^2, t_3^2) + D_1^3(P_1, P_2, P_3) = S_1^1, \tag{1a}$$

$$D_2^1(P_1, P_2, P_3, t_1^1, t_2^1, t_3^1) + D_2^2(P_1, P_2, P_3, t_1^2, t_2^2, t_3^2) + D_2^3(P_1, P_2, P_3) = S_2^2, \tag{1b}$$

$$D_3^1(P_1, P_2, P_3, t_1^1, t_2^1, t_3^1) + D_3^2(P_1, P_2, P_3, t_1^2, t_2^2, t_3^2) + D_3^3(P_1, P_2, P_3) = S_3^3. \tag{1c}$$

These equations are zero homogenous in all prices as well as in all tariffs and subsidies. After differentiating the equations totally, one

can set the change in a given selected price equal to zero and then use any two of the differentiated equations to solve for the relative changes in the other prices. This was the method employed in a number of proofs in the Petith article.

Petith assumed that the demand functions exhibited the property of gross substitution with respect to both prices and tariffs, i.e.:

$$\partial D_i^k/\partial \mathrm{d}P_j \lesseqgtr 0 \quad \text{as } i \overset{\neq}{=} j \quad \text{and} \quad \partial D_i^k/\partial \mathrm{d}t_j^k \lesseqgtr 0 \qquad \text{as } i \overset{\neq}{=} j.$$

He pointed out that the two CU partners could be described as similar when the following conditions held:

$$\left.\begin{array}{l} D_i^1 \equiv D_{i'}^2 \\ \\ D_i^3 \equiv D_{i'}^3 \end{array}\right\} \quad \left.\begin{array}{r} \text{where} \quad i = 1 \Rightarrow i' = 2 \\ i = 2 \Rightarrow i' = 1 \\ i = 3 \Rightarrow i' = 1 \end{array}\right\} \quad \text{and} \quad S_1^1 = S_2^2$$

For example, the meaning of similarity was that the demand function for a partner country for the other partner's commodity was identical with the latter's demand for the former's product.

When the partner countries are similar in the sense just described and also have similar tariff structures such that $t_2^1 = t_1^2$ and $t_3^1 = t_3^2$, the solution to equations (1a)–(1c) takes a very simple form. Here, the order in which the arguments appear implies that the system made up of equations (1a) and (1c) is identical with that composed of equations (1b) and (1c), except that the arguments relating to commodity 1 have been interchanged with those regarding commodity 2. Hence, if $P_1 = a$, $P_2 = b$ is an outcome, it follows that $P_1 = b$, $P_2 = a$ must also be an outcome. Assuming uniqueness, this suggests that the solution has the property $P_1 = P_2$.

Now assume that countries 1 and 2 form a CU and that the tariffs in the two countries prior to the CU were identical. Then consider the following three cases:

(1) Assume that the demand functions have the property of gross substitution for both prices and tariffs. Given equal initial tariffs, it can be presumed that the prices of the commodities of both partners will rise to the same extent relative to the price for the rest of the world (3), i.e. $\partial P_1 = \partial P_2 > 0$, $\partial P_3 = 0$.

The proof of this presumption is simple. Assume that the CU partners are similar and that $\partial P_3 = 0$. The tariff changes, $\partial t_2^1 = \partial t_1^2 \equiv \partial t < 0$, indicate that the tariff structures are similar both before and after the changes. The CU partners' similarity

then implies that $\partial P_1 = \partial P_2 \equiv \partial P$. Differentiating equation (1c) gives

$$\left[\sum_{j=1}^{2}\sum_{k=1}^{3}\frac{\partial D_3^k}{\partial P_j}\right]\partial P = -\left[\frac{\partial D_3^1}{\partial t_2^1} + \frac{\partial_3^2}{\partial t_1^2}\right]\partial t,$$

which, by gross substitutes, implies that $\partial P > 0$ and vindicates the result.

The formation of the CU has implications for the tariff changes. The CU will result in the abolition (or gradual dismantling) of tariffs on goods traded between the partners. Moreover, when the partners' tariffs are initially unequal, they will have to be equalised after the formation of the CU in order to achieve a common external tariff (CET). Petith assumed that the CET will be halfway between the two initial tariffs (p. 264), i.e. a lowering of the higher tariff by an equal amount as the raising of the lower tariff. This leads to the following result:

(2) Assume that the demand functions have the property of gross substitution for prices, tariffs and subsidies. If the tariff of country 1 is initially the lower tariff, there is a presumption that the price of its commodity will rise relative to both of the other two goods. The proof of this is also simple.

Petith found it convenient to calculate the effects of the tariff changes in two steps. In the first step, the partners get their tariffs to the common level, i.e. $dt_2^1 = dt_3^1 = -dt_1^2 = -dt_3^2 \equiv dt > 0$. Given the zero homogeneity of the demand functions this is equivalent to minus $dt_1^1 = dt_2^2 \equiv dt$. To see the effect of this, one needs to differentiate equations (1a)–(1c) and hold $dP_3 = 0$ to get:

$$\sum_{j=1}^{2}\left[\sum_{k=1}^{3}\frac{\partial_i^k}{\partial P_j}\right]\partial P_j = \left[\frac{\partial D_i^1}{\partial D_1^1} - \frac{\partial D_i^2}{\partial t_2^2}\right]\partial t \qquad (i = 1,2,3).$$

Since gross substitutes apply to subsidies, the term in brackets on the right is negative for $i = 1$ and positive for $i = 2$. Similarity and the fact that it is being evaluated at $P_1 = P_2$ indicate that it is zero for $i = 3$. The equations $i = 1$ and $i = 3$ show that $\partial P_1 > 0$ while those for $i = 2$ and $i = 3$ indicate that $\partial P_2 < 0$. When each partner lowers its tariff on imports from its partner, (1) shows that the outcome is $\partial P_1 = \partial P_2 > 0$. Therefore, after the two steps, P_1 has

increased relative to P_2 and P_3. Hence, the presumption is vindicated.

In order to calculate the effect of a country's relative size on changes in the t/t, Petith found it necessary to make the following additional assumption:

$$\frac{\partial D_i^{k2}}{\partial P_j \partial P_h} \quad \text{and} \quad \frac{\partial D_i^{k2}}{\partial t_j^k \partial P_h} \tag{2}$$

can be taken to be arbitrarily small.

This implies that the price elasticities and cross elasticities are not sensitive to price changes. The reason for this rather awkward assumption will be discussed after result (3) has been proved.

(3) Assume that the demand functions exhibit the property of gross substitution for prices and tariffs and that assumption (2) holds. If both partners have the same initial tariffs but country 1 is smaller than its partner, there is a presumption that the prices of the other two commodities will fall relative to that of country 1's good.

The proof of this presumption commences with both countries having the same size and then considers the effect of the expansion of country 2 on the price changes caused by the formation of a CU. A size parameter, α^k, is injected into equations (1a)–(1c) to give

$$\sum_{k=1}^{3} \alpha^k D_i^k = \alpha^i S_i^i \qquad (i = 1,2,3),$$

which indicates that the initial prices are a function of α^k. The price changes caused by the CU, when both partners are of the same size, $\overline{dP_j}$, are obtained by differentiating this equation totally at the point where $\alpha^1 = \alpha^2$:

$$\sum_{j=1}^{3} \left[\sum_{k=1}^{3} \alpha^k \frac{\partial D_i^k}{\partial P_j} \right] \overline{dP_j} = - \sum_{j=1}^{3} \sum_{k=1}^{3} \alpha^k \frac{\partial D_i^k}{\partial t_j^k} dt_j^k \quad (i = 1,2,3).$$

The effect on these price changes of an increase in α^2 is obtained by differentiating these equations:

$$\sum_{j=1}^{3}\left[\sum_{k=1}^{3}\alpha^k\frac{\partial D_i^k}{\partial P_j}\right]d(d\overline{P_j}) =$$

$$-\sum_{k=1}^{3}\left[\frac{\partial D_i^2}{\partial P_j}d\overline{P_j}+\frac{\partial D_i^2}{\partial t_j^2}dt_j^2\right]d\alpha^2$$

$$-\sum_{h=1}^{3}\sum_{j=1}^{3}\sum_{k=1}^{3}\left[\alpha^k\frac{\partial D_i^{k2}}{\partial P_j\partial P_h}+\alpha^k\frac{\partial D_i^{k2}}{\partial t_j^k\partial P_h}\right]\frac{dP_h}{d\alpha^2}d\alpha^2.$$

Since $dP_h/d\alpha^2$ does not depend on $\partial D_j^{k2}/\partial P_j\partial P_h$ or $\partial D_1^{k2}/\partial t_j^k\partial P_h$, the last term can be made arbitrarily small by assumption (2) and then eliminated. The equations can be rewritten as:

$$\sum_{j=1}^{3}\left[\sum_{k=1}^{3}\alpha^k\frac{\partial D_i^k}{\partial P_j}\right]d(d\overline{P_j}) = -\overline{dD_i^2} \qquad (i = 1, 2, 3), \tag{3}$$

where $\overline{\partial D_i^2}$ is the change in demand of country 2 for good i caused by the tariff and price changes at $\alpha^1 = \alpha^2$.

It is necessary to sign the $\overline{dD_j^k}$. The $\overline{dP_j}$ may be taken as $\overline{dP_1} = \overline{dP_2} = 0$ and $\overline{dP_3} < 0$ since this is equivalent to result (1). This and the tariff changes, $dt_2^1 = dt_1^2 < 0$, indicate that $\overline{dD_2^2} < 0$, $\overline{dD_1^1} < 0$, $\overline{dD_2^3} < 0$ and $\overline{dD_3^3} > 0$. Furthermore, the assumption of fixed supply suggests that

$$\sum_{k=1}^{3}\overline{dD_i^k} = 0$$

and similarity indicates that $\overline{dD_3^1} = \overline{dD_3^2}$. Hence, $\overline{dD_1^2} = -\overline{dD_2^2}$ $-\overline{dD_3^2} > 0$, $\overline{dD_2^2} < 0$, and $\overline{dD_3^2} = \frac{1}{2}(\overline{dD_3^1} + \overline{dD_3^2}) = -\frac{1}{2}\overline{dD_3^2} < 0$. Selecting P_1 as numeraire so that $d(\overline{dP_1}) = 0$, the first two equations of (3) show that $d(\overline{dP_2}) < 0$ while the first and the third equations show that $d(\overline{dP_3}) < 0$. Since the price changes with $\alpha^2 > \alpha^1$ are given by $\overline{dP_i} + d(\overline{dP_i})$, this proves the result.

It is useful to investigate why this result might not hold if the

magnitudes of the price elasticities are sensitive to price changes. An increase in the size of country 2 will, in general, lower P_2. Assume that this makes the demand for good 2 more sensitive to changes in P_3 and the demand for good 1 less sensitive. When P_3 does fall in the process of CU formation, the demand for good 2 will rise by a greater amount and cause a relative improvement in the *t/t* of country 2, the larger partner. Petith concluded that there seemed to be no convincing theoretical grounds for ruling out these asymmetric changes in the price elasticities so that the need for (2) represented a genuine weakness in the result.

Petith summarised these three results in the following way. When a CU is formed, there is a presumption that the *t/t* of both partners will improve with the greatest gain accruing to the member that is either smaller or has the lower initial tariff.

THE DETERMINATION OF THE SIZE OF THE GAINS

Petith then attempted a calculation of the benefits brought about by economic integration in manufactures in the case of the three main European integration schemes. Before doing so, he simplified the model so as to emphasise the role of substitution in determining the size of the price changes. He then showed that the magnitude of the *t/t* gains depended on the value of one key parameter. Finally, using a new technique, he calculated the *t/t* gains that arose from the reduction of the tariffs on industrial goods for BENELUX, the EC and EFTA.

It was necessary to simplify the latter two of these projects in order to fit them into the format of a three country model. For EFTA, Austria, Denmark, Finland, Norway, Portugal, Sweden and Switzerland were grouped together as Great Britain's partner. For the EC, France and Germany were taken to be the two partners and the other members were eliminated. The biases that were caused by these groupings will be discussed at the end of this section.

Because substitution elasticities were essential for the methods employed to calculate the price changes, Petith found it necessary to make some simplifying assumptions and to reformulate the demand functions in a manner which stressed the substitution effects. He assumed that all tariffs were small and that, for each commodity, all countries had the same marginal propensity to consume.

The demand in country k for commodity i can be written as a function of prices and utility:

$$E_i^k[t_1^k P_1,\ t_2^k P_2,\ t_3^k P_3,\ U^k],$$

where the proportional effects of the price changes are the pure substitution elasticities. These functional relationships can be linked with the ordinary demand functions by the budget constraint which, on the assumption that all tariff revenues are given back to the consumer, can be written as:

$$\sum_{i=1}^{3} P_i[D_i^k - S_i^k] = 0$$

Substituting the functions for E_i^k into the budget constraint and differentiating with respect to prices and tariffs gives the impact of these variables on utility. These terms permit one to make two calculations. Firstly, $\mathrm{d}U^k$, the change in country k's utility, can be immediately set out and, due to the assumption of equal marginal propensities to consume, can be simplified to:

$$\mathrm{d}U^k = -\sum_{j=1}^{2} P_j[\mathrm{D}_j^k - \mathrm{S}_j^k]\hat{p}_j, \tag{4}$$

where the marginal utility of money,

$$\sum_{i=1}^{3} P_i \mathrm{d}E_i^k/\mathrm{d}U^k,$$

is equal to unity, $p_j = P_j/P_3$, $j = 1,2$ and $\hat{}$ over a variable indicates the percentage change in that variable. Secondly, substituting the functions E_i^k for D_i^k, the market clearing equations (1a)–(1c) can be totally differentiated in a manner that immediately separates the income and substitution effects. Given the assumptions of small tariffs and identical marginal propensities to consume, the income effects drop out and one is left with the following equations:

$$\left.\begin{aligned} b_{11}\hat{p}_1 + b_{12}\hat{p}_2 &= -a_{11}^2\hat{t}_1^2 - a_{12}^1\hat{t}_2^1 - a_{13}^1\hat{t}_3^1 - a_{13}^2\hat{t}_3^2, \\ b_{12}\hat{p}_1 + b_{22}\hat{p}_2 &= -a_{21}^2\hat{t}_1^2 - a_{22}^2\hat{t}_2^1 - a_{23}^1\hat{t}_3^1 - a_{23}^2\hat{t}_3^2, \end{aligned}\right\} \tag{5}$$

where $a_{ij}^k \equiv P_i E_i^k E_{ij}^k$ and $E_{ij}^k \equiv \mathrm{d}E_i^k/\mathrm{d}(t_j^k P_j) t_j^k P_j/E_i^k$, so that the a_{ij}^k are

the value weighted elasticities and

$$b_{ij} = \sum_{k=1}^{3} \alpha_{ij}^{k}$$

The assumption of small tariffs ensures that world real income does not change while it is transferred between countries by price changes and the assumption of the same marginal propensities to consume implies that the distribution of income does not affect world demand, so that the two taken together cancel out the income effects. These simplifications permit the calcultion of the effect of CU formation: given the tariff equations, (5a) and (5b) reveal the associated price changes which by equation (4) determine the effect on utility levels.

One way of finding out which parameters are important in determining the size of the price movements can be attempted by considering the case in which the partners are similar and have the same initial tariffs. In such a case, $b_{11} = b_{22}$, $b_{21} = b_{12}$, $a_{11}^{2} = a_{22}^{1}$, $a_{12}^{1} = a_{21}^{2}$, and minus $\hat{t}_1^2 = -\hat{t}_2^1 = \hat{t} > 0$. From equations (5), it follows that for $\hat{p}_1 = \hat{p}_2 \equiv \hat{p}$:

$$\hat{p} = \frac{(a_{11}^{2} + a_{21}^{2})(b_{11} - b_{21})}{(b_{11})^2 - (b_{21})^2}\,\hat{t} = \frac{a_{11}^{2} + a_{21}^{2}}{b_{11} + b_{21}}\,\hat{t}$$

$$= \frac{a_{31}^{2}}{a_{31}^{1} + a_{31}^{2} + a_{31}^{3}}\,\hat{t} > 0, \tag{6}$$

where $\sum_{i=1}^{3} a_{ij}^{k} = 0$ is used for the second equality.

It should be noted that a_{31}^{1} and a_{31}^{2} relate to the cross elasticities between a country's own commodity and a foreign one, while a_{31}^{2} $(= a_{32}^{1})$ relates to the cross elasticity in a CU partner between the two foreign commodities. It can be stated that a_{31}^{1} and a_{31}^{2} depend on the elasticity of substitution between home goods and imports in general, while a_{31}^{2} depends on the elasticity of substitution between the imports themselves. Given this interpretation, the implication of equation (6) is that if the elasticity of substitution between the imports themselves is allowed to increase towards infinity, then, for a given common tariff reduction, the joint improvement in the CU's *t/t* will increase and approach the size of the tariff reduction as a limit.

Apart from being of interest in itself, this result influences the way in which the model is used to calculate the effects of economic

integration. To carry out the calculations, it was necessary to have the values for the coefficients $a_{ij}^k = P_i E_i^k E_{ij}^k$ in equation (5). The value of the demands, $P_i E_i^k$, could easily be obtained but for the elasticities, which presented a much greater difficulty anyway, the method which is chosen should allow the effects of differences in the elasticities of substitution to emerge clearly.

Verdoorn and Schwartz (1972), in a modification of Armington's approach (1969), had suggested that this aspect of the elasticities may be accounted for by supposing that the basic utility function has the form:

$$[X_h^{-\varrho} + (X_p^{-\lambda} + X_w^{-\lambda})^{\varrho/\lambda}]^{-1/\varrho},$$

where X_h, X_p and X_w are the consumption of the home, the partner's and the rest of the world's commodity, ε, $\varepsilon = 1/(1 + \varrho)$, is the elasticity of substitution between home goods and imports, and E, $E = 1/(1 + \lambda)$, is the elasticity of substitution between the imports themselves. Some manipulation, clearly laid out by Verdoorn and Schwartz, shows that the elasticities have the following form:

$$\left.\begin{array}{ll} E_{ij}^k = -\varepsilon(1 - S) & i = j = k \\ E_{ij}^k = \varepsilon(1 - S)S_j & i = k \neq j \\ E_{ij}^k = \varepsilon S & i \neq k = j \\ E_{ij}^k = -E(1 - S_j) - \varepsilon S S_j & i = j \neq k \\ E_{ij}^k = (E - \varepsilon S)S_j & i \neq j, k \end{array}\right\} \quad (7)$$

where S is the share of the home good in total consumption and S_j is the share of the jth good in total imports. Since the shares can easily be calculated, this approach makes the elasticities depend on the choice of the values for the two crucial elasticities of substitution.

In reality, the linear homogeneity of both the elasticities in (7) and the equations of the model in equation (5) necessitate the choice of a value for only the ratio of these two elasticities. Verdoorn and Schwartz estimated a number of equations each of which yielded a different value for the ratio of the elasticities. The values ranged from 2.4 to 8.8 with a median of 2.8 and a mean of 3.6. Verdoorn and Schwartz themselves felt that the most likely value was between 2 and 3. Petith provided estimates for the median and the two extreme values.

The data for the calculations are given in Table 13.1. The results based on equations (4), (5) and (7) are given in Table 13.2.

In answer to the question as to how much confidence one should

Table 13.1 Data

Project	E_1^k	E_2^k	E_3^k	GNP^k	$\hat{t}_p^k$	$\hat{t}_3^k$
BENELUX (1962)						
(1) Belgium	2 544	300	1 502	9 894	–12	0
(2) Holland	577	2 104	1 763	8 579	–12	0
(3) World	2 022	1 435	410 308			
EFTA (1969)						
(1) UK	15 820	1 695	8 228	109 766	–19	0
(2) The Seven	2 107	18 987	11 152	97 835	–10.5	0
(3) World	12 509	9 987	571 960			
EC (1970)						
(1) Germany	49 345	5 589	11 814	152 944	–13.5	2.5
(2)France	3 763	38 718	8 199	139 934	–18.5	–2.5
(3) World	26 892	8 053	535 602			

Notes: (a) E_j^k is country k's consumption of the industrial output of country j. $\hat{t}_p^k$ and $\hat{t}_3^k$ are the change in country k's tariff against partner and rest of world industrial goods.
(b) The first four columns are in millions of dollars, the last two are percentage changes.

Source: H. Petith (1977) 'European integration and the terms of trade', *Economic Journal*, vol. 87, p. 269.

have in his calculations, Petith responded by arguing that the assumptions of constant returns to scale and low tariffs and the utilisation of a method of small changes would seem to cause inaccuracy rather than to impart a specific bias to the results. Also, the assumption of equal marginal propensities to consume would probably cause the results to be understated since the transfer of income is towards the countries which have the higher propensities to consume the CU commodities, i.e. the partners themselves. However, he did concede that the compression of the EC and EFTA into a three country format did distort the results: the gains for Germany and France would be underestimated since the true EC could be thought of as being formed by successively adding the other countries to the Franco-German union, which itself gained from each addition by (1). It also caused the gains of the Seven to be understated since the true EFTA could be formed from the one described above by the lowering of the internal barriers between the Seven, a step whereby they would all gain. However, the gains for the UK were overestimated

Table 13.2 Results

Project	$E/\varepsilon = 2.4$		$E/\varepsilon = 2.8$		$E/\varepsilon = 8.8$	
	$\hat{p}_i$	GNP_i	$\hat{p}_i$	GNP_i	$\hat{p}_i$	GNP_i
BENELUX						
(1) Belgium	2.8	0.68	3.2	0.76	6.6	1.5
(2) Holland	2.1	0.23	2.5	0.28	6.2	1.0
EFTA						
(1) UK	1.6	0.20	2.0	0.21	5.6	0.62
(2) The Seven	2.4	0.28	2.8	0.33	5.9	0.59
EC						
(1) Germany	2.6	0.39	3.1	0.47	7.4	1.2
(2) France	3.6	0.27	4.2	0.32	8.9	0.66

Source : H. Petith (1977) 'European integration and the terms of trade', *Economic Journal*, vol. 87, p. 270.

since the UK played the role of the rest of the world during this second step. Hence, his argument was that it seemed likely that, with the exception of the UK, all of the figures in Table 13.2 were underestimates.

SUMMARY OF PETITH'S FINDINGS

Petith summarised his findings in four points. First, the figures given in Table 13.2 were consistent with the proven presumptions. With regard to presumption (1), in every case the *t/t* of both the CU partners improved relative to those of the rest of the world. As for presumptions (2) and (3), differences in the height of tariffs and in country size appeared in various combinations; for the Seven (country 2), their considerably lower tariffs seemed to dominate their slightly greater size and this enabled them to gain relative to the UK (country 1) as shown below:

	$E/\varepsilon = 2.4$	$E/\varepsilon = 2.8$	$E/\varepsilon = 8.8$	
$\hat{p}_2 - \hat{p}_1$	0.8%	0.8%	0.3%	(8)

For France (country 2), its higher tariffs were outweighed by its small size which was the reason why Petith obtained the gains relative to Germany (country 1) shown below:

	$E/\varepsilon = 2.4$	$E/\varepsilon = 2.8$	$E/\varepsilon = 8.8$	
$\hat{p}_2 - \hat{p}_1$	1.0%	1.1%	1.5%	(9)

Petith claimed that these examples demonstrated how some significant CU-induced changes could be interpreted with the aid of the theoretical presumptions.

Second, the size of the *t/t* gain depended essentially on the parameter E/ε. The average improvement in the *t/t*, $\hat{p}_{av}$, increased by 250 per cent as E/ε moved from its lowest to its highest value.

	$E/\varepsilon = 2.4$	$E/\varepsilon = 2.8$	$E/\varepsilon = 8.8$	
$\hat{p}_{av}$	2.5%	3.0%	6.7%	(10)

However, Petith pointed out that in order to have more reliable results for the *t/t* effects, it would be necessary to have more accurate estimates of this crucial parameter.

Third, the effects of changes in the *t/t* on GNP were of sufficient magnitude to have made them an important policy consideration. As shown below

	$E/e = 2.4$	$E/e = 2.8$	$E/e = 8.8$	
GNP_{av}	0.34%	0.40%	0.93%	(11)

the estimates ranged from one-third of 1 per cent to nearly 1 per cent of GNP on average. Petith argued that while these gains would clearly have been inadequate to motivate integration in Europe, assuming that their approximate value was perceived, they were certainly large enough to have justified the protracted and sometimes heated negotiations which determined their division among the various participants.

Fourth, although Balassa (1975) calculated an EC trade creation (TC) effect of 0.15 per cent of GNP, Petith argued, from (11), that the gains from improvements in the *t/t* were from two to six times as large. Hence, of the measurable effects of CU formation, the effects arising from changes in the terms of trade were by far the greatest.

These conclusions suggest that the gains from changes in the *t/t* were perhaps the major economic effect of Western European integration. This result came as a surprise to Petith since he believed that, in all the official justifications for economic integration, it had never been acknowledged that the gains from changes in the *t/t* were one of the objectives; this is strange, given that the literature discussed in Part I clearly indicated that changes in the *t/t* are one of the major possible effects of economic integration! Be that as it may, Petith

thought that there were two possibly complementary explanations for this official silence. The first was that BENELUX, EFTA, and to a greater extent, the EC, were all forced into extremely defensive positions by accusations that their creation had harmed their trading partners. He contended that under such circumstances, it was hardly surprising that appeal was made to the unobjectionable phenomena of TC and increasing returns to scale rather than to the double-edged sword of *t/t* manipulation. The second explanation depended on the probability that the main participants were not fully aware of the ultimate consequences of their policies, i.e. they were ignorant of the conclusions of CU theory as then developed. Petith explained this by stating that during the long negotiations which charted the course of economic integration, the protagonists generally supported those proposals which were expected to increase the demand for their products and were antagonistic to those which were expected to reduce it. Although these were taken to be ultimate objectives, in a world of nearly full employment, supply could not be greatly expanded; hence the ultimate consequence of such actions could only have been to increase the prices of the products of the country under consideration. He concluded that, in this somewhat attenuated sense, it could therefore be said that the gains from changes in the *t/t*, apart from being the major economic effect, were also one of the principal objectives of Western European economic integration in trade in manufacturing products.

CONCLUSION

Clearly, Petith's contribution adds to both the empirical and the theoretical literature. Hence, it is reasonable to ask why his theoretical work was not tackled in Part I. The answer is simple: Petith's contribution in this regard forms an extension to Mundell's (1964) work which was discussed in Part I, but since Part I was devoted to discussion of the major contributions only, there was no place for it there; it is discussed in this chapter of Part II because the theoretical structure forms an integral part of the empirical calculations.

With regard to the empirical results, one needs to recall some of the assumptions adopted: each country consumes all three goods, but produces a fixed amount of only one of them; the demand function of one country for its partner's product is identical with the demand function of the partner for its own product; the initial tariffs are very

small; for each product, all countries have the same marginal propensity to consume; etc. The combination of fixed supplies and identical demand patterns, which are biased towards partner products, must inevitably lead to large gains from changes in the *t/t*. But are these assumptions justifiable in the case of Western European countries? Well, during the first decade or so after the formation of the EC, the member nations experienced exceptionally high rates of growth. Also, during the late 1950s intra-Western European trade was below 40 per cent of their total trade and the openness of the economies of these countries was far less than it is today. Furthermore, their level of economic development was far more divergent. Given the diversity of the nations involved during the period of the investigation, the answer must, therefore, be an emphatic no.

There is also another consideration. One is not clear what the rest of the world stands for in this analysis. For example, BENELUX is part of the European Community, but Petith deals with it separately from France and West Germany. One can only presume that in the case of BENELUX, France and West Germany must constitute part of the outside world. If that is so, how can one interpret the phenomena of gains from changes in the *t/t* for all three nations? If both France and West Germany gain within a group (the rest of the world) which registers an overall loss, the remainder of the rest of the world group, i.e. the USA at the time, must have registered unimaginable losses, which is most certainly not the case. Petith does not shed any light on this important consideration.

Finally, when economic integration is occurring simultaneously in many countries (the EC and EFTA were formed within one year of each other), how meaningful is it to consider each scheme in isolation from the others? As stated in Part I, one needs a global model which captures such a reality explicitly before one can seriously analyse and discuss any findings. Petith's contribution suffers from this cryptic drawback; therefore his calculations cannot be taken too seriously.

14 Estimates of the Effects of CMEA Integration

INTRODUCTION

As one would expect, there is a paucity of studies in English on the effects of the economic integration of the Council for Mutual Economic Assistance (CMEA – see Chapter 7). The reason is that economic integration between centrally planned economies is pursued through joint investment/project planning within the context of promoting industrialisation and bilateral international trade in a situation of acute shortage of foreign currencies rather than through a market mechanism that promotes freer trade between the partners. As is discussed in Chapter 7, this process may actually lead to a decrease in intra-bloc trade, rather than to an increase. This chapter deals with the two main studies, which represent different frameworks, in order to provide some notion of the work carried out in this area. The first study is by Pelzman (1977) and the second is by Drabek and Greenaway (1984). It should be pointed out, however, that Pelzman (1978) carried out similar estimates for the USSR using a similar methodology to Drabek and Greenaway's, but because the work of the latter is much wider, Pelzman's analysis is not discussed here, though his results are compared with theirs.

PELZMAN'S ESTIMATES

Pelzman (1977) starts from the premise that although economic integration for the USSR is for the purpose of increasing its dominance, both economic and political, over the rest of the CMEA, for the remaining developed member countries, it is seen as a natural development of their wish to industrialise and maximise the economic gains from trade and cooperation (Pelzman, 1977, p. 713). He then points out that the CMEA differs from customs unions (CUs) in free market economies in one important respect: it does not have a clearly defined common external tariff (CET). However, he is quick to add that a proxy to such a CET can be calculated from the yearly bilateral negotiations carried out between member countries of the

CMEA; hence, one should be in a position to estimate trade creation (TC) and trade diversion (TD).

The model used is a variant of the cross-sectional Linnemann (1966) trade flow model which is slightly different from that utilised by Aitken (1973) – see Chapter 10. The main difference is that the measurement of the effects of the CMEA on trade flows requires the use of a gravity trade flow model which is modified to allow for the fact that prices are not directly incorporated into the model. Hence, the trade flow equation becomes:

$$\log X_{ij} = g_0 + g_1 \log Y_j + g_2 \log Y_i + g_3 \log N_j + g_4 \log N_i + g_5 \log D_{ij} + g_6 \log P_{ij} + \log e_{ij} \quad (1)$$

where X_{ij} is the dollar value of country i's exports to country j, Y is the nominal dollar value of GNP, N is population, D_{ij} is the geographical distance between the commercial centres in the two countries, P_{ij} is a dummy preference variable reflecting CMEA membership, with the value 2 given to intra-CMEA trade while the value 1 is assigned to inter-CMEA trade flows, and log refers to natural logs.

This is obviously a reduced-form general equilibrium model. It specifies that (i) the mutual trade of countries i and j is determined by the relative size of their foreign trade sectors; (ii) country i's potential foreign supply depends on its national product (Y) and on the ratio between production for the domestic market and production for foreign markets, which is due to differences in population; (iii) given economies of scale, the larger N is, the larger is the ratio of the domestic market to the foreign market, and the smaller is the potential export supply of the country; (iv) the variables Y_j and N_j together determine the potential import demand for country j; (v) D_{ij} is a proxy for natural trade resistance, hence D_{ij} together with N_i and N_j is hypothesised to have a negative effect on X_{ij}; (vi) the dummy variable (DV) P_{ij} reflects membership of the CMEA; and (vii) the estimated coefficient on the dummy variable (DV) measures the extent to which intra-CMEA trade flows are augmented.

Pelzman used both aggregate and disaggregate trade flows. The aggregate trade flows consisted of 350 trade flows per annum for the 17-year period, 1954–70. The sample included seven CMEA countries (Bulgaria, Czechoslovakia, East Germany, Hungary, Poland, Romania and the USSR) and ten Western countries (Austria, Belgium-Luxembourg, Canada, Denmark, Finland, France, West Germany, Greece, Iceland and Ireland). The trade-flow matrix, therefore, consisted of 5950 observations on eight variables (one

dependent variable and seven independent ones including the constant term).

The matrix can be written as a system of 17 equations where the μth equation can be represented as:

$$\log X_{ij,\mu} = \log Y_{\mu} g_{\mu} + \log e_{\mu} \tag{2}$$

where $\log X_{ij,\mu}$ is a 350 × 1 vector of observations on the μth dependent variable, Y_{μ} is a 350 × 7 matrix of observations on seven independent variables, g_{μ} is a 7 × 1 vector of regression coefficients and $\log e_{\mu}$ is a 350 × 1 vector of lognormally distributed error terms, with $E(\log e_{\mu}) = 0$. The system of which (2) is an equation is:

$$\begin{bmatrix} \log X_{ij,1} \\ \cdot \\ \cdot \\ \cdot \\ \log X_{ij,T} \end{bmatrix} = \begin{bmatrix} \log Y_1 \ldots 0 \\ \cdot \quad\quad \cdot \\ \cdot \quad\quad \cdot \\ \cdot \quad\quad \cdot \\ 0 \ldots \log Y_T \end{bmatrix} \begin{bmatrix} g_1 \\ \cdot \\ \cdot \\ \cdot \\ g_T \end{bmatrix} + \begin{bmatrix} \log e^1 \\ \cdot \\ \cdot \\ \cdot \\ \log e_T \end{bmatrix} \tag{3}$$

where $T = 17$.

Pelzman ran a pooled regression over all time periods and all X_{ij}s to begin to test his hypothesis that the linear regression system obeys two separate regimes. He believed that a major break in the system would have occurred after the signing of the *Basic Principles* (the formal documents setting up the CMEA) in June 1962. Moreover, he was also of the opinion that there would have been another major break in 1958/59 after the adoption of joint-planning. He thought that the result of each of these breaks would have been structural changes leading to enhanced integration within the CMEA.

To test for the location of the breaking point, he used Quandt's (1958) maximum likelihood technique and likelihood ratio test: to find the best estimate of this break t^*, he chose the value of t for which $L(t)$ reached the highest maximum, i.e.

$$L(t) = -T \log \sqrt{2\pi} - t^* \log \hat{\sigma}_1 - (T - t^*) \log \hat{\sigma}_2 - T/2$$

where σ_1 and σ_2 are the standard errors of the estimates of the left- and right-hand regressions. When the existence of a structural break had been demonstrated, he proceeded to reestimate the trade-flow equation for a stable period prior to the break. To achieve proper projection, the equation was recalculated without the preference variable. These projection estimates were carried out on the assumption that the effect of changes in competitive position and trade

liberalisation on trade flows had been small relative to the impact of integration.

The difference between the actual intra-CMEA trade flows and the hypothetical intra-CMEA trade flows (determined by the CMEA's pre-integration structure) was considered as indicative of gross TC [GTC, which is the sum of both TC and TD in the Balassa (1967b) sense – see Chapter 10]. The difference between the actual and pre-integration inter-CMEA trade flows was taken to be indicative of TD. Hence, the difference between GTC and TD measured the TC effects.

The disaggregated trade-flow sample consisted of 37 commodity classifications for the period 1958–70. In this case, the total number of trade flows per annum and commodity was 330. Hence the trade-flow matrix consisted of 4290 observations on eight variables per commodity.

As in the case of aggregate trade flows, Pelzman expected each of the equations to meet the assumptions of the classical normal regression model. However, since he was tackling disaggregated commodities, he could not rule out the possibility that the regression disturbances in different equations were mutually correlated. More specifically, he contended that it was possible that there may exist some common factors affecting countries' trade decisions for a certain commodity for a particular period of time, e.g. oil price shocks or a bad harvest. Therefore, there may have existed a link between the mth and the pth equation which would be represented only in the covariance of the disturbances of the mth and the pth equation. As this link is so subtle, he referred to this system of T equations (3) as a system of 'seemingly unrelated' regression equations (Pelzman, 1977, p. 716).

Pelzman pointed out that his assumption of correlation between equations suggested that an efficient estimation of his model of reduced-form equations (where each endogenous variable is a function of a set of exogenous variables and the only link between the mth and pth equation is σ_{mp}) was Zellner's (1962, pp. 350–52) procedure. Very simply stated, this procedure considers (3) as a single equation regression model and applies Aitken's (1973) generalised least squares.

The procedure used to test for the location of the breaking point and reestimation of the trade-flow equation was identical to that used for the aggregated trade flows. Also, the projection estimates of

GTC, TD and TC were carried out on the basis of the assumptions made above.

For the aggregate trade flows, the estimated parameter values for the pooled regression for the period 1954–70 was:

$$\log X_{ij} = \underset{}{6.72} + \underset{(0.03)}{0.788 \log Y_j} + \underset{(0.03)}{0.954 \log Y_i} - \underset{(0.04)}{0.177 \log N_j} - \underset{(0.04)}{0.283 \log N_i} - \underset{(0.03)}{1.229 \log D_{ij}} + \underset{(0.10)}{2.788 \log P_{ij}} \quad (4)$$

$R^2 = 0.58$; standard errors are shown in parentheses. All coefficients are statistically significant at the 0.01 level.

These coefficients confirmed Pelzman's expectations and his regression results; in particular an R^2 of 0.58 showed that he had a respectable fit. He concluded that, based on Quandt's maximum likelihood technique and likelihood ratio test, two breaks had taken place: a maximum maximorum was reached in 1964 and another local maximum in 1958. He attributed the 1958 break to the attempts for joint planning following the breakaway from the Stalinist development programme after 1954. He considered this to be a structural change representing a period where the autarkic policy was replaced by one favouring international trade. However, he felt that this break could not be associated with integration, but the second break in 1964 was attributed to the commencement of integration.

Given these results, Pelzman decided to recalculate the trade-flow equation for the period 1960–64 to represent a stable period between the two breaks. The idea was that a recalculation of the equation without the DV for CMEA membership gave a stable preintegration structure. Using this recalculated equation, he could then estimate inter- and intra-CMEA trade for the period 1965–70.

The pooled equation for the period 1960–64 was:

$$\log X_{ij} = \underset{}{8.574} + \underset{(0.08)}{0.580 \log Y_j} + \underset{(0.08)}{0.910 \log Y_i} + \underset{(0.08)}{0.111 \log N_j} - \underset{(0.08)}{0.178 \log N_i} - \underset{(0.05)}{1.509 \log D_{ij}} \quad (5)$$

$R^2 = 0.52$; standard errors are shown in parentheses. All coefficients except for N_j were significant at the 0.01 level. The population elasticity for N_j was not significantly different from zero, which is consistent with most findings except for those of Linnemann (1966) and Leamer and Stern (1970).

Table 14.1 Net effect of CMEA integration on CMEA ($ million)

Year	*GTC*	*TD*	*TC*	*Total trade*[a]
1965	9 202.87	−769.41	9 972.28	16 496.98
1966	9 235.08	−856.85	10 091.93	17 292.62
1967	10 299.95	−904.39	11 204.34	18 986.17
1968	11 263.27	−813.18	12 076.41	20 607.39
1969	12 071.51	−429.95	12 501.46	22 481.53
1970	13 221.59	122.34	13 099.25	24 853.69

Note: (*a*) Total exports of the *CMEA* member countries to the countries in the sample.

Source: J. Pelzman (1977) 'Trade creation and trade diversion in the Council of Mutual Economic Assistance: 1954–70', *American Economic Review*, vol. 67, p. 718.

Table 14.1 gives the GTC, TD and TC effects of CMEA integration, together with the total trade figures for the CMEA. Pelzman observed that since economic integration was supposedly a cumulative process, one should expect estimates of TC to increase from year to year without reversals. He noted that his results for the CMEA as a whole confirmed his expectations. However, despite the increase in total trade and the existence of TC, his examination of the TD figures pointed out that, with the exception of 1970, the CMEA member countries continued to trade outside their bloc.

Pelzman's evaluation of the individual country results confirmed both his *a priori* expectations and the results given in Table 14.1. Also, the individual country results demonstrated that the only CMEA member nations which were effectively diverting trade from the outside world (W) to partner countries were Czechoslovakia and East Germany.

Pelzman's estimates of the disaggregated trade flows were set back by the lack of consistent reporting of disaggregate trade flows by the CMEA member countries. He found that Czechoslovakia and the USSR and, to a lesser extent, Poland were the only members of the CMEA which reported almost consistent sets of foreign trade statistics by both commodity composition and partner country.

Although 37 disaggregated commodity groups were tested, the estimates for 34 of these showed that only the preference variable was significantly different from zero. He advanced two reasons to account for this result: (i) the impact of USSR–CMEA member country bilateral trade flows on a large number of these 34 com-

modity groups was very strong – this was confirmed when the total USSR trade in each commodity group was used as an eighth independent variable, and was found to be significantly different from zero; and (ii) transactions with W in some commodity groups such as beverages and tobacco, lubricants and related materials and mineral fuels were so small relative to intra-CMEA flows that they were of no consequence.

However, the results for the remaining three commodity groups (basic chemicals, iron and steel and machinery other than electric machinery) were consistent with Pelzman's expectations as well as with the aggregate results. In the case of basic chemicals, the results indicated a structural break in 1964. The recalculated equation for 1964 was:

$$\begin{aligned}\log X_{ij} = &- 0.84 - \underset{(0.11)}{0.083 \log Y_j} - \underset{(0.11)}{0.01 \log Y_i} \\ &+ \underset{(0.12)}{0.239 \log N_j} + \underset{(0.12)}{0.15 \log N_i} - \underset{(0.07)}{0.323 \log D_{ij}}\end{aligned} \tag{6}$$

Standard errors are shown in parentheses.

He used equation (6) to estimate the GTC, TC and TD effects of CMEA integration on the trade flow of basic chemicals. These are given in Table 14.2, together with the total trade figures for this commodity group. Pelzman drew attention to the finding that the estimates of TC were increasing from year to year in spite of the existence of inter-CMEA trade in this commodity group. Morever, an assessment of the individual country estimates for this commodity group confirmed both the results given in Table 14.2 and the aggregated results. Thus, while the member countries of the CMEA did experience TC in this commodity group, inter-CMEA trade flows during the period 1965–70 were still in existence.

The estimates for iron and steel were also significant. Moreover, the estimates also supported the prediction of a structural break in 1964. The recalculated equation for 1964 was:

$$\begin{aligned}\log X_{ij} = &- 1.221 - \underset{(0.11)}{0.183 \log Y_j} + \underset{(0.11)}{0.013 \log Y_i} \\ &+ \underset{(0.12)}{0.418 \log N_j} + \underset{(0.12)}{0.311 \log N_i} - \underset{(0.08)}{0.373 \log D_{ij}}\end{aligned} \tag{7}$$

Standard errors are given in parentheses.

As with the aggregate case, the projected trade flows obtained from the recalculated equation, excluding the CMEA membership DV, were used to determine the estimates of the GTC, TC and TD

Table 14.2 Net effect of CMEA integration on CMEA in basic chemicals ($ million)

Year	*GTC*	*TD*	*TC*	*Total trade*[a]
1965	167.39	−118.50	285.89	306.02
1966	163.65	−147.71	311.36	325.42
1967	180.23	−155.79	336.02	354.73
1968	203.63	−159.68	363.31	421.79
1969	206.41	−185.03	391.44	409.92
1970	227.75	−223.16	450.91	469.29

Note: (*a*) See Table 14.1.

Source: J. Pelzman (1977) 'Trade creation and trade diversion in the Council of Mutual Economic Assistance: 1954–70', *American Economic Review*, vol. 67, p. 719.

Table 14.3 Net effect of CMEA integration on CMEA in iron and steel ($ million)

Year	*GTC*	*TD*	*TC*	*Total trade*[a]
1965	881.33	−287.96	1 169.29	1 190.35
1966	821.41	−339.49	1 160.22	1 182.00
1967	883.02	−315.67	1 198.69	1 219.98
1968	900.88	−339.23	1 240.11	1 260.80
1969	1 134.35	−410.35	1 545.22	1 565.77
1970	1 260.31	−495.36	1 755.67	1 776.33

Note: (*a*) See Table 14.1.

Source: J. Pelzman (1977) 'Trade creation and trade diversion in the Council of Mutual Economic Assistance: 1954–70', *American Economic Review*, vol. 67, p. 719.

effects of CMEA integration. The results are given in Table 14.3, together with the total trade flows for this commodity group. The results again confirmed Pelzman's expectation of positive TC, but, despite this, inter-CMEA trade flows continued to grow. Indeed, an examination of the individual member country estimates showed that both Hungary and East Germany's trade in iron and steel was larger for inter- than for intra-CMEA trade.

In the case of machinery other than electric machinery, the structural break was in 1962. Pelzman suggested that because this break came soon after the signing of the *Basic Principles*, this commodity

Table 14.4 Net effects of CMEA integration on CMEA in machinery other than electric ($ million)

Year	*GTC*	*TD*	*TC*	*Total trade*[a]
1963	1 680.88	−95.96	1 776.84	1 816.99
1964	1 817.37	−141.79	1 959.16	1 998.81
1965	1 898.19	−128.08	2 026.27	2 069.12
1966	1 889.08	−182.12	2 071.20	2 115.58
1967	2 039.18	−185.40	2 224.58	2 270.98
1968	2 231.23	−209.98	2 441.21	2 459.15
1969	2 283.12	−209.28	2 492.40	2 541.84
1970	2 626.70	−252.72	2 879.42	2 931.17

Note: (*a*) See Table 14.1.

Source: J. Pelzman (1977) 'Trade creation and trade diversion in the Council of Mutual Economic Assistance: 1954–70', *American Economic Review*, vol. 67, p. 720.

group may have been of greater importance for the industrialisation drive of member countries of the CMEA.

Pelzman recalculated the equation for 1962 as:

$$\log X_{ij} = \underset{}{-0.144} + \underset{(0.11)}{0.228 \log Y_j} + \underset{(0.11)}{0.2 \log Y_i} + \underset{(0.13)}{0.131 \log N_j} + \underset{(0.13)}{0.002 \log N_i} - \underset{(0.09)}{0.447 \log D_{ij}} \quad (8)$$

Standard errors are given in parentheses. He then used the recalculated equation for 1962 to estimate inter- and intra-CMEA trade for the period 1963–70. The projected results for GTC, TC and TD are given in Table 14.4. The results again confirmed his *a priori* expectation of TC increasing from year to year with no reversals. In fact, these results were found to be quite large relative to those obtained from the aggregate data. Finally, with the exception of Czechoslovakia and East Germany, the remaining member countries of the CMEA were found to have diverted trade in this commodity from *W* to partner nations.

THE CONTRIBUTION BY DRABEK AND GREENAWAY

Drabek and Greenaway (1984) attempted a calculation of the effects of economic integration on intra-industry trade (IIT) for both the European Community (EC) and the CMEA. Although this chapter is

confined to estimates of CMEA integration, this section will consider their estimates for both blocs for the simple reason that one needs to clarify what is meant by IIT and its relevance for economic integration, and I felt it wiser to do so in one section rather than split their estimates in two distant chapters.

Ever since the studies by Balassa (1966) and Grubel (1967), economists have realised that countries export and import the same range of products; for example the UK exports a wide range of cars and imports a variety of cars too. The traditional theory of CUs simply concentrated on inter-industry trade, which is understandable since perfect competition was at the very heart of trade theory. However, with the introduction of imperfect competition one has to cater for a variety of *differentiated* products, a development which became possible as a result of the works of Dixit and Stiglitz (1977) and Lancaster (1979) on preference diversity. However, although Grubel and Lloyd (1975) and Balassa (1979) demonstrated the relation between the growth of IIT and economic integration, there was little systematic analysis of the links between the two. Drabek and Greenaway suggested that the reason for this is very obvious: traditional CU theory, with its emphasis on models of three countries, two commodities and two factors of production, cannot accommodate cases of many products in an imperfectly competitive world with any tractability, hence resulting in the emphasis of CU theory on exploring the inter-industry adjustments which ensue from restricted trade liberalisation. They then drew intuitive propositions from their own framework to trace any links which can be expected to hold between economic integration and IIT, and went on to consider whether their links can be expected to affect differentially the EC and the CMEA.

Their first proposition was that tariff dismantling in a CU will give a greater stimulus to IIT than would be the case under multilateral tariff liberalisation if, in the pre-CU situation, the countries involved have similar structures of preference and produce similar commodities. This will be particularly so if these countries have similar factor endowments and levels of per capita income. Their second proposition was that an ordering of preferences which favours imports from *W* rather than domestically-produced goods will hinder IIT within a CU; under such conditions even countries with similar structures of production would find it necessary to import from *W* despite the tariffs (or similar restrictions on trade) levied on these commodities. Hence, for both propositions, similarity in preference ordering is a necessary but not a sufficient condition for IIT.

If CU formation results in eliminating non-tariff trade barriers (NTBs) such as the harmonisation of standards, this may reinforce the previous link. Drabek and Greenaway proposed that this would enhance trade expansion, *directly* through the elimination of NTBs and *indirectly* via the effects of this on uncertainty. Since liberalisation of NTBs is not universal, they expected that, given the stated taste preferences, trade expansion is more likely to be of an IIT type than an inter-industry type.

Noting that as far as manufacturing industry is concerned, one of the most crucial sources of decreasing costs is the lengthening of production runs (i.e. economies of scale are attributed to a more intensive use of existing plant rather than to changes in plant size), they hypothesised that, where tastes overlap, decreasing costs will encourage IIT.

Drabek and Greenaway then drew attention to two further considerations. The first is that there is evidence to indicate (e.g. Barker, 1977) that the demand for *variety* increases as the level of per capita income rises; hence, if CU formation leads to a faster rise in per capita income relative to that in the absence of economic integration, then, *ceteris paribus*, trade in differentiated goods should be expected to increase at a faster rate than otherwise. Secondly, since Agmon (1979) has demonstrated that factor movements and IIT may be complementary rather than substitutes, and, specifically, that IIT emerges as a product of foreign direct investment, with multinational corporations specialising in different varieties in different countries, it follows that liberalisation of capital flows can be a concomitant of economic integration.

These tendencies suggest that there *might* be a positive correlation between CU formation and IIT. However, Drabek and Greenaway emphasised that there are no definite relationships between the two; there is only the *possibility* that CU formation can establish the environment within which IIT might increase at a faster pace than in the absence of economic integration. But they were quick to point out that it could very well be the case that institutional arrangements introduced after the formation of the CU are specifically designed to raise the relative importance of inter- rather than intra-industry trade.

The methodology employed by Drabek and Greenaway is based on two indices of IIT. The first is the Grubel and Lloyd index which is defined as:

$$B_j = [1 - (X_j - M_j)/(X_j + M_j)] \cdot 100 \tag{9}$$

where $0 \leqslant B_j \leqslant 100$, X and M are, respectively, total exports and imports and j is the industry under consideration. This is normally associated with a particular digit (most frequently, the third digit) of the *Standard Industrial Trade Classification* (SITC) or its equivalent (SIC, BTN, etc.). The presumption is that the closer the index lies to its upper limit, the greater the relative importance of IIT.

Drabek and Greenaway acknowledged the various problems raised by this index, but they proceeded to use B_j as the basis for their analysis with calculations being carried out for the third digit of the SITC. Since they were interested in *levels* of IIT at the third digit, *unweighted* averages were reported as:

$$B_j = \frac{1}{n} \sum_{i=1}^{n} B_j \tag{10}$$

where i is a sub-group within each digit category.

Drabek and Greenaway also calculated IIT indices for intra-CMEA and intra-EC trade. The index for this purpose is:

$$B_j^c = [1 - (X_j^c - M_j^c)/(X_j^c + M_j^c)] \cdot 100 \tag{11}$$

where all the terms are those used in the index for total trade, but with the superscript c indicating an integrated area such as a CU. The justification for the calculation of this index was the authors' *a priori* expectation that:

$$B_j^c < B_j \text{ for CMEA countries and } B_j^c > B_j \text{ for EC countries.}$$

They justified this by the greater similarity of the structures of production in the EC countries prior to the formation of the EC relative to the case of the CMEA countries. Again, unweighted averages were calculated as:

$$B_j^c = \frac{1}{n} \sum_{i=1}^{n} B_j^c \tag{12}$$

They included seven EC countries (Belgium/Luxembourg, Denmark, France, West Germany, Italy, the Netherlands and the UK) and three CMEA countries (Czechoslovakia, Hungary and Poland). Their justification for the choice of only seven of the EC nations was that these countries were the largest and most important member nations of the EC. Of course, they could not advance this justification with regard to the CMEA (can one exclude the USSR and still speak

meaningfully of the CMEA?), but their reason was that comparable data was available for these three countries only.

Before considering their results, one should point out that Drabek and Greenaway adopted a certain definition for intra-bloc trade. For Czechoslovakia, intra-CMEA trade included trade with *all* the CMEA countries as well as trade with other socialist countries since they could not separate these two groups. However, they did state that the latter amounted to only 4.1 per cent of Czechoslovakia's total foreign trade in 1977. In the case of Hungary, the CMEA consisted of only its East European member countries, but this was justified in terms of their being Hungary's most important trade partners.

For the EC, intra-EC trade included trade with *all* member countries. They noted that although intra-EC trade amounted to a smaller percentage of total EC trade when compared with the equivalent percentage for the CMEA, it was still very substantial. This percentage varied from 38 per cent of exports and a similar percentage for imports in the case of the UK to about 70 per cent of total exports and imports in the case of Belgium/Luxembourg – see El-Agraa (1985b) for a full statistical coverage.

Finally, it should be noted that Drabek and Greenaway calculated the indices for only SITC 5–8 groups (i.e. semi-finished and finished manufactured products) due to their expectation of finding the greatest potential for IIT in these groups.

In order to make the calculations, Drabek and Greenaway had to translate their expectations into testable hyphotheses. For example, one could hypothesise that economic integration will increase the level of IIT. Also, one could state this in terms of the null hypothesis of their expectations (different integration blocs should lead to identical levels of IIT) which could be tested against the alternative hypothesis that IIT levels were different in both blocs, i.e.:

$$H_0^{\cdot}: B_{jEC} = B_{jCMEA} \tag{13}$$

against

$$H_1^{\cdot}: B_{jEC} \neq B_{jCMEA} \tag{14}$$

where H stands for hypothesis. Moreover, they expected economic integration to have a positive effect on IIT by increasing the level of IIT within the integrated bloc relative to W. Thus they hypothesised that:

$$H_0^{\cdot}: B_{ij}^{w} = B_{ij}^{c}; \tag{15}$$

$$H_1^{\cdot}: B_{ij}^{w} < B_{ij}^{c} \tag{16}$$

where subscript i stands for the country in the sample. The hypotheses formalised in (13)–(16) were the main subject of the estimations.

The results of their tests, based on the B_j indices, are given in Tables 14.5 to 14.10. Table 14.5 reports average values of the 3-digit IIT indices by SITC group, together with the overall unweighted average. The table shows that average recorded IIT in the EC increased over the period 1964–77, and the unweighted B_j indices increased in every country except Italy, a result which was confirmed by the disaggregated B_j indices which showed the Italian case to be heavily influenced by indices in SITC 8.

Table 14.6, which gives results for four European developed market economies which are not members of the EC, indicates that for each SITC category average recorded IIT was lower than for the EC average. Drabek and Greenaway suggested that if this group were taken to represent all developed European market economies, it followed that average IIT levels were higher within the EC than outside it, which is consistent with Grubel and Lloyd's 1975 results.

Returning to Table 14.5, one notices that the indices for Czechoslovakia and Hungary do not fully conform with those for the EC countries. In the case of Czechoslovakia, they increased very slightly and stayed below 60 per cent in spite of the relatively low level of 1966. These results were established for both the aggregate and disaggregate levels, except for SITC 7 where the average IIT indices for Czechoslovakia were higher than those of the UK and West Germany (1966) and France and the Netherlands (1977).

The case of Hungary may seem to conform with the EC since the average indices for SITC 5–8 increased substantially over time and by 1977 Hungary's IIT even increased beyond the level of a number of EC countries for several SITC categories. However, Drabek and Greenaway were quick to point out that the Hungarian indices were calculated at the 2nd digit level, hence they were most likely to be subject to an upward bias relative to both Czechoslovakia and the EC nations.

The finding that economic integration seemed to have hindered rather than encouraged IIT in some of the CMEA countries is made more apparent in Table 14.7 where the indices for total trade are contrasted with those for intra-bloc trade. Although the table shows that the indices for the trade of the individual member countries of

Table 14.5 Unweighted B_j-indices by SITC division for CMEA and EC countries: 1964–77

SITC group	*Bel./Lux.*		*France*		*Italy*		*Netherlands*		*UK*		*W. Germany*		*EC average*		*Czechoslovakia*		*Hungary*	
	1964	*1977*	*1964*	*1977*	*1964*	*1977*	*1964*	*1977*	*1964*	*1977*	*1964*	*1977*	*1964*	*1977*	*1964*	*1977*	*1964*	*1977*
5	66	70	73	75	63	65	63	64	62	70	51	60	63	67	58	52	42	56
6	60	69	70	73	52	53	68	71	58	67	60	72	61	68	51	50	63	66
7	72	73	75	79	69	69	74	78	55	70	41	52	64	70	64	72	73	87
8	69	65	75	78	54	45	63	64	79	80	61	70	67	67	51	61	39	77
5–8	67	69	73	76	60	58	67	69	64	72	53	64	64	68	55	56	51	70

Source: Z. Drabek and D. Greenaway (1984) 'Economic integration and intra-industry trade: the EEC and CMEA compared', *Kyklos*, vol. 37, p. 455.

Table 14.6 Unweighted B_j-indices by SITC division for some non-EC European developed market economies, 1965/66–1977

SITC	*Austria*		*Sweden*		*Norway*		*Switzerland*		*Average*	
	1966	*1977*	*1966*	*1977*	*1966*	*1977*	*1956*	*1977*	*1965/66*	*1977*
5	40	57	51	54	39	48	58	58	47	54
6	56	62	56	64	39	41	44	57	49	56
7	62	72	75	81	41	40	62	61	60	64
8	55	59	50	55	36	31	56	57	49	50
5–8	53	63	58	63	39	40	55	58	51	56

Source: Z. Drabek and D. Greenaway (1984) 'Economic integration and intra-industry trade: the EEC and CMEA compared', *Kyklos*, vol. 37, p. 456.

Table 14.7 Intra-customs union IIT by SITC section for selected EC and CMEA countries

SITC section	*Bel./Lux.*	*France*	*Italy*	*Netherlands*	*UK*	*West Germany*	*EC average*	*Czechoslovakia*	*Hungary*
	1977	*1977*	*1977*	*1977*	*1977*	*1977*	*1977*	*1977*	*1975*
5	74	72	60	68	80	73	71	42	63
6	64	73	58	68	70	78	69	47	57
7	74	82	80	67	76	65	74	66	76
8	60	72	38	64	73	72	52	63	74
5–8	68	75	59	67	75	72	66	55	70

Source: Z. Drabek and D. Greenaway (1984) 'Economic integration and intra-industry trade: the EEC and CMEA compared', *Kyklos*, vol. 37, p. 456.

Table 14.8 Intra-industry trade between Czechoslovakia and GDR; 1967–1977 (B_j-indices)

SITC group	*1967*	*1977*
5	35	14
6	26	39
7	55	74
8	16	41
5–8	34	44

Source: Z. Drabek and D. Greenaway (1984) 'Economic integration and intra-industry trade: the ECC and CMEA compared', *Kyklos*, vol. 37, p. 458.

the EC with each other were higher than for their total trade, the table also indicates that IIT constituted a small proportion of the total trade of Czechoslovakia with the CMEA. For Hungary, the indices for trade with the CMEA were slightly below the indices for its total trade.

Drabek and Greenaway then explored other ways of supplementing these findings. Firstly, on the understanding that the most industrialised nations within the CMEA should be expected to have higher levels of IIT between them than with the less industrialised members of the bloc, they computed B_j indices for IIT between Czechoslovakia and East Germany. However, as the results in Table 14.8 clearly demonstrate, there was no evidence to support this hypothesis. Secondly, they tried to tackle Poland, whose data is classified according to its own classification – *Polish Foreign Trade Classification* (PFTC) – which differs from both the SITC and the Soviet equivalent (SFTC). In spite of this, they used the USSR as a proxy for the CMEA: if this procedure is legitimate here, why was the USSR not included in the CMEA category in their basic exercise for Table 14.5? The calculations for Poland are given in Tables 14.9 and 14.10 with the results indicating that the indices for Polish IIT with the USSR were lower than for its total trade. Drabek and Greenaway attributed this result to the high degree of complementarity in Poland–USSR trade mentioned at the beginning of this section. The two tables also show that this low level did not change over the period under consideration. Furthermore, the unexpectedly low level of B_j indices suggested that IIT was insignificant as a form of exchange in Poland's foreign trade transactions, which was particularly the case with regard to Poland's trade with the USSR where the indices indicate that IIT was virtually non-existent in their mutual trade.

Table 14.9 Unweighted B_j-indices by PFTC[a] division for Polish total trade and trade with the Soviet Union: 1967

	PFTC	*Total trade*	*USSR*
1 Equipment for metal processing	(10)	37	10
2 Energy and electrode chemical equipment	(11)	33	9
3 Mining, metallurgy and drilling equipment	(12)	53	0
4 Transport equipment	(13)	27	7
5 Equipment for food processing and light industries	(14)	29	10
6 Equipment for chemical, wood processing, paper construction and other industries	(15)	0	0
7 Equipment for complete plants	(16)	21	2
8 Articles and instruments	(17)	42	28
9 Tractors and agricultural machinery	(18)	34	2
10 Transport means	(19)	22	7
11 Iron, steel and products of	(26)	25	5
12 Non-ferrous metals and products of	(27)	1	4
13 Cables	(29)	47	37
14 Chemicals	(30)	9	2
15 Paints, varnishes	(37)	15	3
16 Photographic materials	(33)	26	0
17 Pesticides	(34)	20	0
18 Rubber	(35)	19	0
19 Construction materials and other products of mineral industry	(40)	15	0
20 Paper	(50)	10	0
(21 Textiles)	(310–373)	(3)	0
22 Textiles	(90)	31	14
23 Clothing	(91)	36	2
24 Gloves, ties, etc.	(93)	16	0
25 Shoes	(93)	23	0
26 Household goods	(94)	44	93
27 Furniture	(95)	55	0
28 Cosmetics	(96)	32	6
29 Articles, instruments, films, books	(97)	31	9
30 Other industries	(98)	36	0
1–30		28	9
1–29 (exl. 21)		29	10

Note: (*a*) Polish foreign trade classification (PFTC) differs from SITC and SFTC. For details see Appendix to Drabek and Greenaway (1984.)

Source: Z. Drabek and D. Greenaway (1984) 'Economic integration and intra-industry trade: the EEC and CMEA compared', *Kyklos*, vol. 37, p. 459.

Table 14.10 Unweighted B_j-indices by PFTC[a] division for Polish total trade and trade with the Soviet Union: 1978

	PFTC	*Total trade*	*USSR*
1 Products of ferrous metallurgy	(04)	24	0
2 Products of non-ferrous metallurgy	(05)	19	0
3 Products of metal industry	(06)	56	29
4 Machinery and equipment	(07)	54	36
5 Products of electrotechnical industry	(08)	61	22
6 Products of precision industry	(09)	61	41
7 Transport means	(10)	51	10
8 Products of electrical industry	(11)	55	23
9 Chemical products	(12)	8	0
10 Chemical products	(13)	50	9
11 Construction materials	(14)	19	0
12 Glass products	(15)	29	0
13 China, ceramics	(16)	61	0
14 Wood products	(17)	33	0
15 Paper products	(18)	8	0
16 Textiles	(19)	37	0
17 Textiles	(20)	30	0
18 Clothing	(21)	33	0
19 Leather products	(22)	23	0
20 Other industry	(26)	0	0
21 Products of printing industry	(27)	38	34
22 Other industrial products	(28)	63	25
1–22		37	9

Note: (*a*) Polish foreign trade classification (PFTC) differs from SITC and SFTC.

Source: Z. Drabek and D. Greenaway (1984) 'Economic integration and intra-industry trade: the EEC and CMEA compared', *Kyklos*, vol. 37, p. 460.

Drabek and Greenaway then drew attention to the similarity of their results to those of Pelzman (1978) for the USSR, who concluded that the level of IIT was lower than in the EC countries and that the level for the USSR with CMEA partners was even lower relative to that for third countries. But, as Table 14.11 clearly shows, Pelzman's estimates were for a different period (1958–73) and were based essentially on SFTC data.

Table 14.11 Intra-industry trade as a percentage of total trade turnover 1958–73

Year	*USSR intra-industry trade with*															
	World		*COMECON*		*Bulgaria*		*Czechoslovakia*		*Germany*		*Hungary*		*Poland*		*Romania*	
	A[a]	*NA*[b]	*A*	*NA*	*A*	*NA*	*A*	*NA*	*A*	*NA*	*A*	*NA*	*A*	*NA*	*A*	*NA*
1958	41	38	26	23	5	5	8	8	5	4	11	8	17	16	13	13
1959	40	38	24	21	8	7	10	10	4	3	18	13	17	15	7	6
1960	40	35	26	23	15	14	11	10	6	4	15	11	17	16	9	8
1961	37	34	29	26	17	16	10	10	9	6	11	9	15	14	12	10
1962	35	33	26	24	7	16	11	10	7	5	10	9	14	13	14	13
1963	40	37	25	24	14	13	11	10	6	5	12	11	17	17	12	10
1964	39	34	25	25	13	12	15	14	6	5	11	9	18	18	13	12
1965	39	34	24	24	12	11	10	9	5	4	8	8	19	18	16	13
1966	36	33	27	26	15	14	11	11	7	5	15	14	13	12	15	14
1967	33	31	27	26	19	17	9	9	10	8	17	17	14	14	14	12
1968	34	32	26	26	20	19	12	12	10	9	15	15	21	19	21	18
1969	34	32	26	25	19	16	13	13	13	12	11	11	21	19	20	17
1970	37	35	27	27	18	17	10	10	13	13	13	13	24	23	17	15
1971	38	36	30	28	17	16	12	11	16	14	12	12	26	23	21	19
1972	37	34	31	27	17	17	13	12	15	12	14	14	26	22	21	19
1973	34	32	29	27	16	16	13	13	15	14	14	13	25	22	20	18

Note: (*a*) adjusted
(*b*) not adjusted

Source: J. Pelzman (1978) 'Soviet-COMECON trade: the question of intra-industry specialisation', *Welwirtschaftliches Archiv.*, vol. 114, p. 461.

CONCLUSION

In conclusion, one should emphasise that the theoretical aspects of IIT are both well-founded and generally applauded. However, there are many limitations to the studies by Pelzman and Drabek and Greenaway. Apart from the lack of comparative data, it is difficult to accept the proposition that W for the EC can be represented by four members of the European Free Trade Association (EFTA). Since the UK left EFTA to join the EC, the whole of Western Europe has become an effective free trade area in manufacturing products. This was achieved through a series of agreements which were signed by both the EC and EFTA. Therefore, one could argue that for all intents and purposes, the four outsiders should be treated as members of the EC. Moreover, the bulk of extra-EC trade by member countries of the EC is with Japan and the USA, hence a control group which excludes these two countries leaves a lot to be desired, particularly when Japan and the USA have comparable data.

However, a more fundamental point to stress is that these works completely ignore the reality of the situation. As discussed in some detail in Chapter 7, intra-CMEA trade is conducted through joint investment planning with foreign currencies playing a substantial role in economic management. Moreover, the CMEA countries display a huge disparity in the level of their industrial development. These two factors, taken together, seem to suggest that the CMEA cannot be compared with the EC. If this argument is accepted, it follows that a study of the CMEA could be carried out in spite of inconsistent data, provided one concentrates on the CMEA alone.

Therefore, there is no point in dwelling on this subject here since the interested reader should turn back to Chapter 7 and also consult the references cited there.

The overall conclusion should be brief. The studies discussed in this chapter are either subject to the same reservations as those stated at the end of Chapters 10 and 11 (the first section on Pelzman's work) or are defective because of failure to take into account some basic realities of the situation, and these realities are expressed elsewhere, e.g. in Chapter 7. Hence, the overall conclusions should be too familiar to warrant repetition here.

15 Estimates of the Effects of Economic Integration among the LDCs

INTRODUCTION

The analysis in Chapter 5 clearly indicated that both the static and dynamic (as traditionally defined) resource reallocation effects of economic integration are irrelevant for schemes of integration among less developed countries (LDCs). This is due to the fact that perfect competition, hence free trade, lies at the very heart of the analysis and that economies of scale have to be achieved through enhanced competition in order to guarantee the attainment of the necessary cost reductions per unit of output. The neoclassical approach to economic integration among a group of LDCs is based on an entirely different framework. It is built on the understanding that there is a rationale for protecting certain areas of economic activity (especially industry, which is why trade theorists have conceded the 'infant industry' argument as the only exception to free trade, but only under very specific conditions – see El-Agraa (1983b) for a full discussion of this issue) in these countries in order to raise their income levels or their rates of economic growth or to realise certain non-economic aims which are desired for their own sake. Hence, the quest for economic integration among the LDCs has to be seen in the much wider context of economies of scale, which cannot be achieved within single national markets, and divergencies between private and social costs because of distortions in both factor and commodity prices, which are the result of government policies.

Because economies of scale are seen in the context of economic development, their analysis is intimately connected with planned investment decisions. The coordination of investment and production programmes contributes to a more rational division of labour within the integrated bloc. It widens the scope for efficient investments through the reallocation of available funds within the integrated area together with the inflows of capital, new technologies and know-how from the outside world. This should make it possible to expand production in those industries where economies of scale are likely to

occur, and to coordinate planning for the large public services, such as transport and communication systems.

Moreover, it is increasingly realised that the industrialisation of the LDCs is partly determined by the operations of the multinational corporations. These introduce new patterns of production which are largely determined by the differences in the price they charge different nations for technology, specialised intermediate inputs and other factors imported from the parent enterprise. Moreover, through their ability to transfer profits from one member country to another in order to take advantage of more liberal tax and profit repatriation policies, they can determine both the pattern and volume of production. Of course, this does not mean that multinational corporations are undesirable, particularly since they may have no influence on which policies a member nation of an integrated scheme may adopt. However, what is crucial is that the operations of the multinational corporations do point to the existence of market imperfections.

It follows from this that the estimation of the impact of economic integration among a group of LDCs must concentrate on the calculation of the achievement (or otherwise) of economies of scale. It is only when such estimates are available that one should expect to see calculations of the equitable distribution of benefits and costs. However, the empirical studies in this area are not only very scanty, but also either deal entirely with the calculation of changes in the shares of intra-bloc trade or apply the gravity model used by Linnemann (1966) and later adopted by Aitken (1973 – see equation (15) in Chapter 10) and Pelzman (1977 – see equation (1) in Chapter 14). Given the reservations expressed about the work in the field of quantitative estimation, the paucity of studies regarding the LDCs may be welcome, but when one considers the extensive number of studies relating to the European Community (EC), a sense of perspective is warranted. In order to do justice to the LDCs, the chapter tackles two representative approaches.

STRAUBHAAR'S TRADE SHARE APPROACH

As stated in Chapter 1, since 1960 a large number of integrated blocs have been established among the LDCs. Straubhaar (1987) tried to assess the changes in the trade shares in the ten most important blocs within this group. To add a sense of perspective, he also included the EC, the European Free Trade Association (EFTA) and the Council

for Mutual Economic Assistance (CMEA). Table 15.1 lists the integrated blocs of LDCs included in this study (for a comprehensive list of all schemes of economic integration, see El-Agraa, 1987d), briefly summarises their intended degree of cooperation and shows some of the problems and conflicts in achieving it.

Table 15.2 gives the share of intra-bloc trade as a percentage of the total exports of the relevant bloc for 1983. This information led Straubhaar to conclude that for integrated groups of LDCs, intra-bloc trade, as a share of the total exports of the bloc, was very modest in the best cases (ASEAN 23.1 per cent and the CACM 21.8 per cent) and insignificant (less than 10 per cent) in the majority of cases, with the value of intra-bloc trade exceeding US $1 billion in 1983 only in the cases of ASEAN and ALADI. The table also shows that in comparison with the EC and the CMEA, intra-bloc trade among the LDCs had clearly been less significant, accounting in both the EC and the CMEA for more than half of total trade.

In order to give an estimate regarding how far trade flows had been influenced by the integration schemes, Table 15.2 also gives the (uncompounded) growth rates of intra-bloc trade and compares them with the rates for external trade. Very briefly, for Straubhaar, these rates indicated that at the time of the formation of a new scheme, the elimination of trade restrictions increased the volume of intra-bloc trade, with intra-bloc trade growing much faster than external trade. In the case of ALADI, intra-bloc trade rose from 7.7 per cent in 1960 to 10.2 per cent in 1970. For the CACM, it increased from 7.5 per cent in 1960 to 26.8 per cent in 1970. This effect was also witnessed in the African schemes: in the case of the CEAO, intra-bloc trade increased from 2.0 per cent in 1960 to 9.1 per cent in 1970 and in the UDEAC it rose from 1.6 per cent to 3.4 per cent for the respective years. However, except for ASEAN, this momentum was greatly diminished, with intra-bloc trade increasing only insignificantly more than external trade, with ALADI maintaining its 1970 rate in 1983 and UDEAC registering a negative difference by then.

Straubhaar then emphasised three problems in connection with these results. Firstly, in contrast to integration schemes among advanced nations, the estimates for the LDCs were heavily influenced by frequent and repeated fundamental economic, social and political changes within the integrated group since practically no single bloc was spared from multiple, and often violent, uprisings in one or more member countries within the bloc. Secondly, there were frequent changes in the composition of the individual blocs. Finally, there

Table 15.1 Economic groupings among LDCs

	Grouping	*Year of establishment*	*Members*	*Degree of Co-operation*	*Problems and conflicts*
Africa					
UDEAC	(Union Douananière et Economique de l'Afrique Centrale)	1964	Cameroon, Central African Republic, Chad, Congo, Equatorial Guinea, Gabon	3	Because of remaining trade barriers within the area rather a PTA than a CU or even a CM. No large common industrial projects.
MRU	(Mano River Union)	1973	Liberia, Sierra Leone, Guinea (after 1980)	2	Overlapped by the policy of ECOWAS.
CEAO	(Communauté Economique de l'Afrique Centrale), preceded by the West African Custons Union, established in 1959	1974	Benin, Burkina Faso, Ivory Coast, Mali, Mauritania, Niger, Senegal	2	The area has reached the level of a monetary integration with a relatively well operating compensation system.
ECOWAS	(Economic Community of West African States)	1975	All members of the MRU, the CEAO and Cape Verde, Gambia, Ghana, Guinea-Bissau, Nigeria, Togo	3	The declared and intended steps towards a CU and a monetary integration have been realised only to a very limited extent.
CEPGL	(Communauté Economique de Pays de Grands Lacs)	1976	Burundi, Rwanda, Zaire	3	
SENE-GAMBIA	(Senegambian Confederation)	1981	Senegal, Gambia		
EAC	(East African Community)	1967	Kenya, Uganda, United Republic of Tanzania	2	Broke up in 1978.

Latin America					
CACM	(Central American Common Market)	1960	Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua	1	Relatively successful by eliminating the trade barriers within the area, until 1970 when Honduras did break out. Since the political tension has increased, the economic co-operation declined.
ANDEAN	(Andean Group)	1969	Bolivia, Colombia, Ecuador, Peru, Venezuela	2	Where a joint industrialisation has taken place (in only three sectors) there have appeared disagreements about the going on.
CARICOM	(Caribbean Common Market)	1968	Bahamas, Barbados, Belize, Guayana, Jamaica, Trinidad and Tobago	3	
ALADI	(Asociación Latino Americana de Integración) preceded by the Latin American Free Trade Area established in 1960	1980	Andean Group plus CACM plus CARICOM plus Argentina, Brazil, Chile, Mexico, Paraguay, Uruguay, Antigua and Barbuda, Dominica, Grenada, Montserrat, St Christopher and Nevis, Saint Lucia, Saint Vincent and the Grenadines	1	After a successful beginning, large divergences between more and less industrialised members led to the break-up of the LAFTA and to the formation of a new sub-grouping (ANDEAN), in 1969, and ALADI, which is a weaker alliance than LAFTA, in 1980.
Asia					
RCD	(Regional Co-operation for Development)	1964	Iran, Pakistan and Turkey	2	
ASEAN	(Association of South-East Asian Nations)	1967	Indonesia, Malaysia, Philippines, Singapore, Thailand	2	The speed of the integration process is very slow by intention. A stepwise procedure beginning with a PTA has been planned and seems to be effective now.

Source: T. Straubhaar (1987) 'South–South trade: is integration a solution?', *Intereconomics*, January/February, p. 36.

Table 15.2 Annual growth rates of intra-bloc trade and external trade of schemes of economic integration, 1976–83

	Growth rates intra-bloc trade		*Growth rates of external trade*		*Difference*	
	1976–80	*1980–83*	*1976–80*	*1980–83*	*1976–80*	*1980–83*
ASEAN	57.3	14.4	36.4	1.1	21.0	13.3
ALADI	–19.2	232.8	–19.6	332.4	0.3	–30.0
ANDEAN	15.2	2.9	23.6	–4.1	–8.4	7.0
ECOWAS	30.2	–6.2	18.5	–7.6	11.7	1.4
CACM	18.7	–8.8	17.7	–8.5	1.0	–0.3
CARICOM	16.7	0.6	18.8	–10.7	–2.1	11.3
CEAO	16.8	12.4	15.5	–7.5	1.3	19.9
UDEAC	41.7	–20.0	38.3	–5.4	3.4	–14.6
CEPGL	16.7	0.0	–4.2	0.0	20.9	0.0
MRU	0.0	83.3	25.1	83.3	–25.1	0.0
EC	34.5	–4.6	26.9	–4.2	7.6	–0.5
EFTA	18.5	–6.5	21.4	–4.7	–2.9	–1.9
CMEA	19.5	6.0	25.1	4.0	–5.6	2.0

	Value of intra-bloc trade ($ million)			*Intra-bloc trade as a % of total exports of the area*				
	1976	*1980*	*1983*	*1960*	*1970*	*1976*	*1980*	*1983*
ASEAN	3 619.0	11 918.0	17 080.0	27.1	14.9	13.9	17.8	23.1
ALADI	4 434.0	1 027.0	8 200.0	7.7	10.2	12.8	13.5	10.2
ANDEAN	594.0	955.0	1 037.0	0.7	2.3	4.2	3.5	4.3
ECOWAS	478.0	1 056.0	860.0	1.2	2.1	3.1	3.9	4.1
CACM	653.0	1 141.0	840.0	7.5	26.8	21.6	22.0	21.8
CARICOM	212.0	354.0	360.0	4.5	7.3	6.7	6.4	9.3
CEAO	177.0	296.0	406.0	2.0	9.0	6.7	6.9	11.6
UDEAC	75.0	200.2	80.0	1.6	3.4	3.9	4.1	2.0
CEPGL	3.0	5.0	5.0	0.0	0.2	0.1	0.2	0.2
MRU	2.0	2.0	7.0	0.0	0.1	0.2	0.1	0.1
EC	145 900.0	347 000.0	298 900.0	34.6	49.5	49.4	52.8	52.4
EFTA	8 500.0	148 000.0	11 900.0	15.7	21.8	12.8	12.1	11.4
CMEA	44 400.0	79 000.0	93 100.0	62.3	59.4	57.4	51.0	53.7

Source: T. Straubhaar (1987) 'South–South trade: is integration a solution?', *Intereconomics*, January/February, p. 37.

were also frequent changes in the degree of coordination within the individual blocs.

From the discussion in this book, particularly in Part II, it should be apparent by now that estimates of simple trade percentages do not form a solid basis for analysis. Moreover, and more fundamentally, since the aim of economic integration among a group of LDCs is to enable the establishment of optimum plant installations financed by imported investments, it follows that economic integration may actually result in increased trade with the outside world, particularly since most of the capital equipment and intermediate products which are needed for plant installation and production are imported from the advanced world. Of course, sometimes such trade is a precondition for advancing the foreign technology, know-how and finance which are desperately needed. In short, an estimate which fails to take these fundamental considerations into account should not be taken seriously.

THE ESTIMATES BY BRADA AND MÉNDEZ

The only rigorous estimates of the effects of economic integration among a group of LDCs were made by Brada and Méndez (1985) for the CACM, LAFTA and the Andean Pact. For comparison purposes, they also included results for the EC and EFTA. They utilised Linnemann's gravitational equation (see equation (14) in Chapter 10) as their starting point since they believed that it had a sound theoretical basis (see Bergstrand, 1985) and provided an empirically tractable general equilibrium framework for modelling bilateral trade flows. Hence, the reader is advised to turn to that equation so as to recall all its properties before proceeding with this section.

However, Brada and Méndez felt that the use of the variables in equation (14) (Chapter 10) to model the relationship between endowments, tastes and trade with a sample which included both developed countries and LDCs raised some conceptual problems. Firstly, it had to be assumed that all the countries included in the study were developing along similar lines and that the development process did not change their trade behaviour in any manner that was not predicted by the Linnemann equation. However, they accepted Chenery's (1960) evidence which had suggested that this assumption was acceptable. Secondly, aggregate measures of income varied between developed countries and the LDCs both in terms of their

coverage of economic activity and in the mix of commodities included. The biases generated by this tended to work in the same direction: incomes in the LDCs were likely to be understated and each dollar of income included fewer tradables relative to incomes in the developed nations. But they were convinced that the log-linear specification of the equation took care of such biases since the equation weighted each dollar of income in an LDC more than a dollar of income in a developed country. They also introduced measures to adjust for these differences – see below. Thirdly, the distance variable indicating resistance to trade comprised an economic element (consisting of transport and information costs), a structural element (reflecting differences in consumption patterns and factor endowments) and a policy element which included the impact of economic integration. Because the effects of the structural elements are ambiguous (differences in factor endowments promote trade while differences in consumption hinder it), they decided to focus their attention on the remaining factors by improving on the manner of specifying the impact of economic integration on resistance to trade. Finally, they felt that although both the procedures of introducing dummy variables (DVs) (Aitken's method – see Chapter 10) and selecting a pre-integration period on the basis of which the equation is estimated for projection purposes (Pelzman's method – see Chapter 14) were legitimate for measuring the trade-augmenting effects of economic integration among countries at the same level of development, or with similar size or economic system, they were not appropriate for the blocs they chose.

Some of these issues warranted elaboration. They stressed that the impact of economic integration on inter-member trade was influenced by three sets of factors. The first was the *environment*, which they took to mean the physical and economic characteristics of the integrating group of countries and their economic relations with the outside world (W). As an example, they hypothesised that countries closer to each other would experience, *ceteris paribus*, more trade augmentation after integration than countries which were far apart. The second was the *economic system* of the countries under consideration. Here they pointed to the literature which suggested that centrally planned economies tended to trade less, *ceteris paribus*, than comparable market oriented economies. The third, and final, was the *policy* element. Some schemes of economic integration lowered their inter-member trade barriers to a greater extent than others, hence the former were expected to be more effective in

augmenting inter-bloc trade. They concluded that when one dealt with a homogeneous group of nations, one could presume that the integration DVs or the difference between the actual and predicted trade flows did not reflect systematic differences. Also, one did not expect environmental factors to change drastically over time or differ greatly between integration schemes. Therefore, the coefficients of integration DVs or the differences between expected and actual post-integration trade could safely be attributed to economic integration as a policy variable. However, with a more heterogeneous group, the estimates of the impact of economic integration would become 'tainted at best and swamped at worst by the differences in system and environment' that prevailed among the various schemes (Brada and Méndez, 1985, p. 551).

In order to cater for these problems, Brada and Méndez modified the gravity equation to include the environmental effects as well as the effectiveness of economic integration. Two environmental variables were modelled for the distance between members of the scheme and for their level of economic development. As explained above, the distance hypothesis amounted to stating that if, for example, three countries decided to establish a form of economic integration, the two closest to each other would experience greater expansion in their mutual trade relative to the third. This could be partly due to the fact that it may be feasible to trade highly perishable products between geographically closer countries, but such trade might be uneconomic with distant nations. Also, the further distance would place traders at a disadvantage in terms of evaluating reactions to opportunities in the partner's markets due to lack of more precise information and to less direct acquaintance with the culture and the economy of the place. Moreover, countries closer to each other are supposed to be more likely to have greater similarity in terms of culture and climate; thus they are more likely to have similar patterns of consumption and production. In short, the hypothesis is that a scheme of economic integration among geographically closer countries should stimulate inter-bloc trade more, *ceteris paribus*, than one whose member nations are far apart.

Brada and Méndez noted that, on the one hand, the LDCs had a structural bias against trade since their production was mainly in subsistence agriculture and in services, neither of which entered into international trade. Thus, most of their trade tended to be conducted with the advanced nations, exchanging agricultural products and raw materials for manufactured goods. On the other hand, the advanced

nations tended to have large manufacturing sectors which encouraged both complementary trade (manufactured products being exchanged for raw materials) as well as intra-industry trade (see Chapter 14) which is generally not available to the LDCs. Therefore, the hypothesis advanced was that the level of economic development would also have a positive impact on economic integration.

In order to measure the impact of these environmental factors on trade flows, they respecified the Linnemann equation in the following way:

$$\begin{aligned}\log X_{ij} = {} & A + \alpha_1 \log Y_i + \alpha_2 \log Y_j + \alpha_3 \log N_i \\ & + \alpha_4 \log N_j + \alpha_5 \log D_{ij} + \beta \log Q_{ij} \\ & + \gamma_1 P_{ij} \log (Y_i/N_i)(Y_j/N_j) \\ & + \gamma_2 P_{ij} \log D_{ij} + \log e_{ij} \end{aligned} \tag{1}$$

where $Q_{ij} = 2$ and $P_{ij} = 1$ if countries i and j belong to the same preference area and 1 and 0, respectively, when countries i and j belong to different or no preference areas. The coefficient γ_1 measures the effect of per capita income on the effectiveness of economic integration, and a positive value indicates that the impact of integration on inter-bloc trade increases with the level of development of the countries joining the scheme, reflecting the higher proportion of tradables in their output. The coefficient γ_2 measures the effect of distance on the trade augmenting effect of economic integration: the further the distance among the members, the smaller, *ceteris paribus*, is the augmentation in their mutual trade.

Brada and Méndez collected data for the trade between the member countries of the EC, EFTA, CACM, LAFTA and the Andean Pact with each other and with eighteen developed countries and LDCs which belonged to no scheme of economic integration. The trade flows for the CMEA countries were not used to estimate the parameters of equation (1) since the systemic differences between them and the rest of the groups implied that they could not be expected to follow the market oriented regime depicted by the equation.

Because the observations could not be pooled over time, it was necessary to estimate parameters for the equation for each year. Due to space limitations, Brada and Méndez presented the parameter estimates for only the last year for which complete data were available (1976), together with 1970 and 1973. These are given in Table 15.3. They drew attention to the fact that this period was one during which all the schemes under consideration were in existence. They

Table 15.3 Parameter estimates for equation (1) (t-ratios in parentheses)

	Year		
Parameter	*1970*	*1973*	*1976*
A	0.0974	2.711	1.606
α_1	1.092	0.972	1.034
	(15.80)	(15.92)	(17.98)
α_2	0.157	0.136	0.146
	(3.94)	(3.95)	(4.15)
α_3	–0.291	–0.089	–0.185
	(–3.05)	(–1.02)	(–2.42)
α_4	0.574	0.477	0.442
	(9.57)	(8.41)	(8.57)
α_5	–0.543	–0.581	–0.472
	(–8.09)	(–8.64)	(–7.39)
β	3.772	4.679	4.831
	(1.85)	(1.87)	(1.97)
γ_1	0.194	0.104	0.058
	(2.13)	(1.85)	(0.83)
γ_2	–0.619	–0.630	–0.525
	(–4.40)	(–4.91)	(–4.25)
R^2	0.651	0.693	0.706
N	864	774	789

Source: J. C. Brada and J. A. Méndez (1985) 'Economic integration among developed, developing and centrally planned economies: a comparative analysis', *Review of Economics and Statistics*, vol. 67, p. 552.

noted that the coefficients for income and population had the expected signs, and these together with the coefficient for distance (α_5), were similar to those reported by Aitken (1973 – see Chapter 10) and by Hewett (1976). Except for the constant term and α_3, they found the coefficients to be relatively stable over time.

The results given in Table 15.3 point to certain values for the integration coefficients. Because β is positive, the implication is that economic integration tends to reduce the resistance to trade between member countries of an integration scheme. The coefficient for per capita incomes (γ_1) is positive, suggesting that, *ceteris paribus*, economic integration among countries with high per capita incomes tends to increase trade by more than integration among countries with low per capita incomes.The value of this parameter falls over time and in 1976 was not significantly different from zero. Brada and Méndez attributed this to the global increase in the prices of fuels and

raw materials, since they were of the opinion that these price increases then resulted in complementary trade in these goods among countries with different per capita incomes being weighted more heavily in total trade relative to competitive trade flows among the advanced nations. Finally, the coefficient for the distance DV (γ_2) is negative, thus supporting the hypothesis that the impact of economic integration on trade tended to diminish as the distance between members of an integrated scheme increased.

The ratio of post- to pre-integration trade is indicated by the expression:

$$\beta + \gamma_1(Y^*/N^*)^2 + \gamma_2 D^*$$

where Y^* and N^* are the average income and population of the integrated bloc and D^* the average distance among them. Brada and Méndez indicated that this number represented the trade creation (TC) to be expected in a scheme of economic integration among countries with a given level of per capita incomes and inter-member distances on the understanding that the policies adopted to promote economic integration were as effective as the average of those adopted by all five schemes. Hence, column 5 of Table 15.4 gives the ratio of post- to pre-integration trade expected in each bloc had each bloc adopted integration policies of the same effectiveness. Thus the differences among the schemes shown in this column reflect only the impact of the environment on the performance of individual integration schemes. Column 2 shows the effect of the level of economic development on the effectiveness of economic integration and column 3 that of inter-member distance; for example in 1970, the EC was expected to increase inter-EC trade by 863 per cent, the figure in EFTA's case being 550 per cent, which suggested that the slightly higher level of per capita incomes in EFTA did not compensate for the greater distance among the members (1732 miles against 801 for the EC).

Altogether, the differences between the five schemes given in column 2 of Table 15.4 are very small. This suggests that differences in per capita incomes do not explain much of the difference in the capability of an integration scheme to augment inter-bloc trade. However, the results in column 3 indicate that differences in average inter-member distance do explain these differences – note that the average distances vary from 306 miles for the CACM to 9173 miles for LAFTA. Consequently, although the CACM consists of the least developed countries in the study, it is expected to increase inter-

member trade by 500 per cent, slightly more than for EFTA. Note that the decline in the value of γ_1 over time changes the relative influence of environment on economic integration. Given the decline in the significance of the level of development as a factor promoting inter-member trade in the results for 1973 and 1976, it appears that integration schemes among the LDCs become less disadvantaged relative to schemes among advanced nations with the progress of time. Brada and Méndez thus conclude, given their reservations regarding the decline in the value of γ_1, that it would seem more appropriate to consider the results in column 5 of this table as the *range* of likely environmental influences on economic integration rather than as point results. But they were quick to add that the results in the table as a whole clearly indicate that the impact of environmental factors cannot be ignored.

Brada and Méndez then turned to the results regarding the policies by which economic integration was promoted. They drew attention to the fact that there were significant differences in the integration policies of the five schemes under consideration, for example: some were free trade areas while others were common markets, thus resulting in different types of scheme; there were differences in the extent to which non-tariff trade barriers were lowered among the member countries; and there were differences in the height of their common external tariffs (CETs). The procedure they followed in comparing the effectiveness of the integration policies pursued by the five schemes was to establish whether the actual increase in inter-member trade was greater than that predicted by Table 15.4. Their justification for this procedure was that since the increases in inter-member trade predicted by the table reflected the environmental differences between the five groups when *identical integration policies* were adopted in all the schemes, it followed that any differences between the predicted and the actual increases in inter-member trade indicated differences in the *effectiveness of the integration policies* of each integration bloc. They took the ratio of the actual to the expected pre-integration trade for the *i*th integration bloc to be:

$$2\beta(i) = \frac{\text{(actual post-integration trade)}}{\text{(expected pre-integration trade)}}, \tag{2}$$

$$\beta(i) = [\beta + \pi(i)] + \gamma_1(Y^*/N^*)^2 + \gamma_2 D^* \tag{3}$$

where $\pi(i)$ measures the difference between the effectiveness of the policies of the *i*th integration bloc and the effectiveness of the *average* integration policy.

Table 15.4 Effect of environment on inter-member trade flows in regional integration

Integration scheme	*Year*	β *(1)*	$\gamma_1(Y^*/N^*)^2$ *(2)*	$\gamma_2 D^*$ *(3)*	*Total (1 + 2 + 3)* *(4)*	2^{Total} *(5)*
	1970	3.77	3.05	–3.71	3.11	8.63
EC	1973	4.68	1.74	–3.95	2.47	5.54
	1976	4.83	1.01	–3.30	2.54	5.82
	1970	3.77	3.06	–4.37	2.46	5.50
EFTA	1973	4.68	1.74	–4.56	1.86	3.63
	1976	4.83	1.02	–3.80	2.05	4.14
	1970	3.77	2.46	–5.08	1.15	2.22
LAFTA	1973	4.68	1.46	–5.13	1.01	2.01
	1976	4.83	0.79	–4.27	1.35	2.55
	1970	3.77	2.35	–4.61	1.51	2.85
Andean Pact	1973	4.68	1.41	–4.68	1.41	2.66
	1976	4.83	0.79	–3.95	1.67	3.18
	1970	3.77	2.31	–3.58	2.50	5.66
CACM	1973	4.68	1.30	–3.65	2.33	5.03
	1976	4.83	0.78	–3.04	2.57	5.94

Source: J. C. Brada and J. A. Méndez (1985) 'Economic integration among developed, developing and centrally planned economies: a comparative analysis', *Review of Economics and Statistics*, vol. 67, p. 553.

The results for integration policy effectiveness are given in Table 15.5. They show that for the Andean Pact, the EC and LAFTA, the value of $\pi(i)$ was negative, suggesting that the integration policies pursued by these three blocs had less than average effectiveness. For example, column 4 indicates that the increases in trade obtained by the EC were only 60 per cent of what could have been achieved had it pursued integration policies of average effectiveness. Brada and Méndez pointed out that although the $\pi(i)$s for the Andean Pact and LAFTA fluctuated more than those for the EC, they 'bracketed' them, indicating that integration policies in Latin America were about as effective as those of the EC and that the differences in TC between the EC and the Latin American blocs given in column 1 reflected mainly environmental factors. To restore the average, the CACM and EFTA seem to have adopted integration policies of above average effectiveness, with the CACM faring better than EFTA. Brada and Méndez then advanced an explanation for these

Table 15.5 Effects of policy on inter-member trade flows in regional integration

Integration scheme	*Year*	$\beta(i)$ *(1)*	$\beta + \gamma_1(Y^*/N^*) + \gamma_2 D^*$ *(2)*	$\pi(i)$ *(3)*	$2^{\pi(i)}$ *(4)*
	1970	2.35	3.11	–0.76	0.59
EEC	1973	1.73	2.47	–0.74	0.60
	1976	1.77	2.54	–0.77	0.59
	1970	2.50	2.46	0.04	1.03
EFTA	1973	2.34	1.86	0.48	1.39
	1976	1.91	2.05	–0.14	0.91
	1970	0.63	11.5	–0.52	0.70
LAFTA	1973	–0.34	1.01	1.35	0.39
	1976	0.53	1.35	–0.82	0.57
	1970	1.01	1.51	–0.50	0.71
Andean Pact	1973	–0.27	1.41	–1.68	0.31
	1976	0.91	1.67	–0.76	0.59
	1970	4.00	2.50	1.50	2.83
CACM	1973	3.07	2.33	0.74	1.67
	1976	3.13	2.57	0.56	1.47

Source: J. C. Brada and J. A. Méndez (1985) 'Economic integration among developed, developing and centrally planned economies: a comparative analysis', *Review of Economics and Statistics*, vol. 67, p. 555.

seemingly puzzling results: the CACM and EFTA pursued economic integration mainly for its possible economic benefits while the other three blocs included important non-economic objectives as well, such as the protection of agriculture in the EC and the promotion of industry with reduced power for the multinational corporations in Latin America – see El-Agraa (1980; 1982; 1985b; 1988) for a full coverage of the policies adopted by these schemes.

Although Brada and Méndez realised that the analysis of the influence of the economic system on the effectiveness of economic integration was more complex than that of environment and policy (due to the fact that there was only one integration scheme for centrally planned economies and all the centrally planned economies were members), they nevertheless felt that some rough results could be obtained for the effect of the economic system and integration policies on the effectiveness of CMEA integration. First, they calculated the value of the expression for environmental impact which gave values of 2.47, 2.03 and 2.22 for the years 1970, 1973 and 1976 respectively. Comparing these values with those in column 4 of Table

15.4, they reached the conclusion that, on the basis of environmental factors, the CMEA had about the same potential for increasing inter-member trade as did EFTA. The values of $\beta(i)$s for the CMEA were 1.62, 1.36 and 1.46 for the corresponding years, suggesting that the CMEA did not raise inter-member trade by the amount it possibly could have. The values of the $\pi(i)$s for the respective three years were all *minus* figures (0.85, 0.67 and 0.76) and, interestingly enough, were similar to those of the EC. Remembering that in the case of the CMEA the latter results capture both the system and policy effects, the conclusion was reached that the combined effect led the CMEA to underfulfil its potential by an amount equivalent to that of the EC. From this they concluded that 'it does not seem that CMEA integration policies or the system of central planning appear to be significantly greater barriers to promoting inter-member trade than do policies adopted among integrating market economies' (Brada and Méndez, 1985, p. 555).

Again, there is no point in repeating the criticisms of the methodology employing the Linnemann gravity equation at the end of this section since all that is stated in Chapter 10 still applies here. What should be added is that the factors that determine the three elements analysed in this study (environment, policy and system) are very complex indeed and are usually pursued via a package of policy instruments. Hence, to analyse them within a context which averages their impact is to by-pass all their complexity. If the results are to be taken seriously, the methodology must explicitly incorporate all the dimensions employed in carrying out the policies. Of course, this is an impossible task since econometrics cannot tackle complex systems, and as long as econometricians work with simple testable hypotheses, they cannot hope to have their results taken seriously. However, in spite of the methodological difficulties involved in aggregating advanced nations with the LDCs, one should finish by adding that Brada and Méndez should be congratulated for attempting to carry out an integrated and fairly comprehensive coverage of all the significant economic integration schemes in existence today – see the following chapter for more on this issue.

CONCLUSION

Given the comments made at the end of each section and the criticisms accumulated over the last six chapters, there is no need for an overall conclusion.

16 Conclusions

The purpose of this chapter is to provide an overall picture of the methodologies employed, make some broad criticisms and suggest an alternative way for estimation.

THE EFFECTS OF ECONOMIC INTEGRATION

Part I of this book was devoted to a full discussion of the effects of economic integration. It was shown there that, at the customs union (CU) and free trade area (FTA) levels, these effects could be due to:

(i) enhanced efficiency in production made possible by increased specialisation in accordance with the law of comparative advantage;
(ii) increased production levels due to better exploitation of economies of scale made possible by the increased size of the market;
(iii) an improved international bargaining position, made possible by the larger size, leading to better terms of trade;
(iv) enforced changes in efficiency brought about by enhanced competition; and
(v) changes affecting both the amount and quality of the factors of production due to technological advances, i.e. changes in the rate of growth.

If the level of economic integration is to go beyond the CU/FTA level to common markets (CMs) and economic unions (EUs), the impact of (vi) factor mobility, (vii) the coordination of monetary and fiscal policies and (viii) the unification of targets for full employment, higher growth rates and better income distribution must also be investigated.

However, Part II of the book showed that the majority of empirical studies attempted estimates of the gross trade creation (GTC), TC, trade diversion (TD) and external trade creation/destruction (ETC) effects. These are only the short-term resource reallocation effects, i.e. they are concerned with only (i). There is only one *major* study dealing with (iii), the terms of trade effects. One may be misled into feeling that Chapter 12 on the estimates of the costs of the 'common agricultural policy' (CAP) of the European Community (EC) repre-

sented an element within (viii) and possibly (vi), but the estimates there were carried out in that fashion simply because the bulk of the empirical studies dealt with only the manufacturing sector, as Chapters 9–11 and Chapters 14 and 15 clearly demonstrated. Of course, some of the studies attempted a discussion of some of the other elements, but these were cursory, and were often carried out as an afterthought. Hence, this is the first major deficiency of these studies, particularly since changes in the rate of economic growth are bound to influence the pattern of trade.

One must also add to this list of omissions other, possibly more important, considerations. A substantial part of the theoretical interest in economic integration arises not from its impact, positive or negative, on the trade balance, but from the fact that the overall impact on world welfare depends upon the particular form of economic integration adopted or being contemplated. Moreover, there is also Kaldor's (1971a; 1971b) 'resource cost' effect: when the static resource reallocation effects of economic integration have a negative impact on a country, it may feel compelled to carry out policies to redress the situation – 'the cost of this rectification is the resource cost of integration, the value of the resources which have to be used in sustaining integration' (Mayes, 1978, p. 4).

A GENERAL CRITIQUE OF EMPIRICAL STUDIES

There are some general and some specific points of criticism to be made against these studies. Since the specific points were raised either during the discussion of each contribution or above, this section is devoted to the general points.

(i) All the studies, excepting the Brada and Méndez (1985), Truman (1975) and Williamson and Bottrill (1971) studies and to a certain extent the Aitken (1973) and Mayes (1978) estimates, assume that the formation of the EC (or EFTA) has been the sole factor to influence the pattern of trade. Since the EC and EFTA were established more or less simultaneously (there is a year's difference between them), it is not justifiable to attribute changes in the pattern of trade to either alone. After all, EFTA was established in order to counteract the possible damaging effects of the EC! Moreover, a few years after the establishment of these two blocs, a number of schemes were formed all over the world – see El-Agraa (1982; 1988) for a detailed specification

and discussion of these. Hence, the impact of these latter groupings should not have been ignored by studies conducted in the late 1960s and thereafter.

(ii) Most of the recent studies ignore the fact that Britain used to be a member of EFTA before joining the EC. Since the UK is a substantial force as a member of either scheme, it seems misleading to attempt estimates which do not take into consideration this switch by the UK. A similar argument applies to Denmark. This point of course lends force to the previous one.

(iii) In the period prior to the formation of the EC and EFTA, certain significant changes were happening on the international scene. The most important of these was that the discrimination against the US was greatly reduced. Is it at all possible that such developments had no effect whatsoever on the trade pattern of the EC and EFTA? It seems unrealistic to assume that this should have been the case.

(iv) All the studies, except for Truman's (1975) and to some extent Winter's (1984a), dealt with trade data in spite of the fact that a proper evaluation of the effects of economic integration requires analysis of *both* trade *and* production data. TC indicates a reduction in domestic production combined with new imports of the same quantity from the partner, while TD indicates new imports from the partner combined with less imports from the rest of the world (W) and a reduction in production in the W.

(v) Tariffs are universally recognised as only one of many trade impediments, yet all the studies, except Krause's (1968) and Prewo's (1974), were based on the assumption that the only effect of economic integration in Western Europe was on discriminatory tariff removal. This is a very unsatisfactory premise, particularly if one recalls that the EC had to resort to explicit legislation against cheaper imports of textiles from India, Japan and Pakistan in the 1960s and early 1970s. The EC later forced Japan to adopt voluntary export restraints (VERs) with regard to cars, and some unusual practices were adopted, like France's diverting of Japanese video recorders to the relatively small town of Poitiers to slow down their penetration of the French market – see El-Agraa (1987c) for a detailed specification of these issues. Moreover, the level of tariffs and their effective protection is very difficult to measure:

> Tariff schedules are public, but their interpretation is often made difficult by peculiar institutional clauses. Furthermore,

> it is difficult to obtain a good measure of the restrictive impact of tariffs. Average tariff rates will not do, for, if the rate is zero on one good and prohibitive on another, the average tariff is zero. It is necessary to use *a priori* weights, which inevitably is arbitrary . . . [Others] raised a more subtle issue by proposing to use input–output analysis to measure the effective *rates of protection* achieved by tariffs on value added. This approach raises a host of problems. The assumptions of fixed technical coefficients and of perfectly competitive price adjustments are both debatable. It is clear that the concept of effective protection . . . relies on oversimplified assumptions. (Waelbroeck, 1977, p. 89)

(vi) The Dillon and Kennedy rounds of tariff negotiations resulted in global tariff reductions which coincided with the first stage of the removal of tariffs by the EC. Does this not mean that any evidence of ETC should be devalued, and any evidence of TD is an under-estimate?

More specifically, however:

> In all these studies, the integration effect, whether trade creation or trade diversion, is estimated by the difference between actual and extrapolated imports for a post-integration year. The extrapolation of imports is done by a time trend of imports or by relating imports with income or consumption in the importing country. The difference between the actual and estimated imports would be due to (i) autonomous changes in prices in the supplying and importing countries, (ii) changes in income, consumption or some other variable representing macroeconomic activity, (iii) changes in variables other than income/consumption and autonomous price movements, (iv) revisions of tariffs and/or other barriers as a result of integration, (v) residual errors due to the random error term in the estimating equation, misspecification of the form of the equation, errors in the data, omission or misrepresentation of certain variables, etc. The studies . . . try to segregate the effect of (ii) only. The remaining difference between the actual and estimated imports would be due to (i), (iii), (iv) and (v), but it is ascribed only to (iv), i.e. the effect of revision of tariff and/or other barriers to trade as a result of integration. Clearly, it is a totally unreliable way of estimating the integration effect on trade creation or trade diversion. Even if prices are included as an additional variable in

> the estimating equation, it would amount to segregating the effect of (i) and (ii), so that the difference between the actual and estimated imports would be due to (iii), (iv) and (v). It would still be wrong to ascribe it to (iv) only. The error term at (v) is often responsible for a divergence of ±10% between the actual and estimated imports, which might often overshadow the effect of integration. For this reason, the 'residual method' used by Balassa, the EFTA Secretariat and many others, is highly unreliable for estimating the trade creation and trade diversion effects of integration. (Dayal, R. and N., 1977, pp. 136–7)

Moreover, the effects of economic integration, be they TC or TD, occur in two stages: the effects of changes in tariffs on prices and the effect of price changes on trade. These two effects have to be separately calculated before the TC and TD effects of economic integration can be estimated. This procedure is not followed.

In addition, the accuracy of the *ex ante* forcasts of the impact of economic integration on the level and direction of trade rests on the reliability of the price elasticities utilised. Furthermore, apart from this general problem, a critical issue is whether the effect of a tariff is the same as that of an equivalent price change; tariff elasticities substantially exceed the usual import-demand elasticities, and the elimination of a tariff is perceived by the business world as irreversible.

It therefore seems inevitable to conclude that:

> All estimates of trade creation and diversion by the [EC] which have been presented in the empirical literature are so much affected by *ceteris paribus* assumptions, by the choice of the length of the pre- and post-integration periods, by the choice of benchmark year (or years), by the methods to compute income elasticities, changes in trade matrices and in relative shares and by structural changes not attributable to the [EC] but which occurred during the pre- and post-integration periods (such as the trade liberalisation amongst industrial countries and autonomous changes in relative prices) that the magnitude of no . . . estimate should be taken too seriously. (Sellekaerts, 1973, p. 548)

Moreover, given the validity of these criticisms, one should not take seriously such statements as:

> There are a number of studies that have reported on attempts to

> construct . . . estimates. Individually the various methods must be judged unreliable. . . . But collectively the available evidence is capable of indicating conclusions of about the same degree of reliability as is customary in applied economics. That is to say, there is a wide margin of uncertainty about the correct figure, but the order of magnitude can be established with reasonable confidence. (Williamson and Bottrill, 1971, p. 323)

Since no single study can be justified in its own right and the fact that the degree of reliability in applied economics leaves a lot to be desired, it is difficult to see the collective virtue in individual misgivings!

AN ALTERNATIVE

It seems evident that there is nothing wrong with the methodology for the empirical testing of integration effects, but that the problems of actual measurement are insurmountable. However, these difficulties are due to some basic misconceptions regarding the welfare implications of TC and TD: TC is good while TD is bad – using the Johnson (1974) definition.

In an interdependent macroeconomic world, TC is inferior to TD for the country concerned – see Chapter 6 of this book and El-Agraa (1979b), El-Agraa and Jones (1981) and Jones (1983) – and both are certainly detrimental to the outside world. This conclusion is also substantiated by Johnson's work which incorporates the collective consumption of a public good – see Chapter 2 of this book and Johnson (1965a). It therefore seems rather futile, *for estimation purposes*, to attach too much significance to the welfare implications of TC/TD in this respect. Lest it be misunderstood, I should hasten to add that this is not a criticism of the TC/TD *theoretical* dichotomy, rather the futility/impossibility of its empirical estimation. Moreover:

> trade creation and trade diversion . . . are static concepts. Their effects are once-for-all changes in the allocation of resources. At any date in the future their effects must be measured against what *would otherwise have been*, not by what is happening to trade at that time. In the economic theorist's model without adjustment lags, the introduction of a scheme for regional integration causes a once-for-all shift to more intra-integrated area trade and less trade

> with the outside world, and the forces that *subsequently* influence the allocation of resources become once again cost changes due to technological advance, and demand changes due to differing income elasticities of demand as real income rises as a result of growth [,] . . . call the first set of forces affecting the allocation of resources *integration induced* and the second set *growth induced*. . . . The two sets of forces . . . are intermixed (the problem becomes even more complex conceptually if integration itself affects the growth rate). The more sudden the integration, the more likely it is that integration induced effects will dominate, at least for the first few years; but the longer the time lapse the more would normal growth-induced effects dominate. The morals are: (1) the longer the time since a relatively sudden move towards integration, the harder it is to discern the effects by studying changes in the pattern of trade; and (2) the more gradually the integration measures are introduced, the more will the effects be mixed up, even in the short term, with growth-induced effects. (Lipsey, 1977, pp. 37–8)

For all these reasons I have suggested (El-Agraa, 1985b) that the measurement of the impact of economic integration should be confined to estimating its effect on intra-union trade and, *if at all possible*, to finding out whether or not any changes have been at the expense of the outside world. The statistical procedure for such estimates should be straightforward if one uses the El-Agraa/Jones interdependent global macro model (see Chapter 6) and incorporates into it the import demand functions suggested by the Dayals (1977). One can then utilise the concepts of income and substitution effects (suggested by the Dayals and spelt out in the Jones's version of the macroeconomic model in chapter 6) without some of the unnecessary details created by using simple marginal utility functions. Although the macroeconomic framework is subject to some serious limitations, it provides, at the very least, a genuine alternative against which one can judge the quality of the estimates obtained from the previous models.

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