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: 1953 - 1972.

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THE EFFECT OF TRADE LIBERALIZATION ON NATIONAL SPECIALIZATION
IN THREE EEC NATIONS : 1953 - 1972

by

ISMAIL M. DAIS

A dissertation submitted to the Graduate
Faculty in Economics in partial fulfillment
of the requirements for the degree of Doctor
of Philosophy, The City University of New York.

1979

TO MY PARENTS

This manuscript has been read and accepted for the Graduate Faculty in Economics in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

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Abstract

THE EFFECT OF TRADE LIBERALIZATION ON NATIONAL SPECIALIZATION IN THREE EEC NATIONS : 1953 - 1972

by

Ismail M. Dais

Adviser: Professor Elliot Zupnick

In this essay, we attempted to investigate the changes in trade patterns and industrial structure in the Federal Republic of Germany, France, and Netherlands after the formation of the European Economic Community (EEC). We used a comparative static partial equilibrium model to test the hypothesis that the formation of the EEC representing a movement toward free trade, would affect the patterns of trade and specialization and industrial structure in these countries as the traditional theory of trade predicts. To test this hypothesis, we employed two related sets of data: trade data, and industrial data that generally cover the period 1953-1972.

We analyzed real exports and real imports of each country from other union members and the rest of the world by individual commodity groups defined at the third-digit-level of the Standard International Trade Classification (SITC) in a sample of 30 industrial products. First, we calculated the ratio of each industry's net real exports or net real imports to total trade of that industry, for different years before and after the union. We computed the means and variances of the distributions

of these ratios. It was argued that changes in these ratios and their distributions over time would indicate the pattern of specialization taking place in each country and industry. We distinguished between "inter-industry" specialization, where the output of one industry tend to be concentrated in one country and tend to decline in other countries, and "intra-industry" specialization, where the output of an industry may rise in all countries, due perhaps to product differentiation. Second, we analyzed the growth of real exports and real imports of each country from other members and the rest of the world, and identified expanding industries. Third, we investigated the changes in trade flows during the union period compared to the pre-union period. Finally, we investigated specialization in a narrower range of products, in three major European industries that constitute 25 sub-products.

We also tested the hypothesis using data relating to production volume, employment, and investment in a sample of 10 major industries in each country. We identified expanding, stagnating, and contracting industries relative to the manufacturing sectors in these countries. Then we discussed the probable causes of changes in industrial structure, and used a statistical model to test if the growth of productivity and employment in each industry, were significantly different during the union period compared to the pre-union period. Finally, we attempted to link the changes in trade flows to changes in industrial structure.

The results generally showed that the freeing of trade via the formation of the EEC seems to have affected trade flows; but it did not lead to "inter-industry" specialization. It was found that the expanding industries, and less clearly, the stagnating and contracting industries

were about the same in the three countries studied; and thus the pattern of specialization might have taken the form of "intra-industry" rather than "inter-industry" specialization.

ACKNOWLEDGEMENTS

I would like to express my gratitude and appreciation to the members of my advisory committee for their assistance and support of my research effort. My greatest debt is to Professor Elliot Zupnick for his continuous guidance, encouragement, and support in the development of this work from its inception. My thanks and appreciation are also due to Professor Michael Grossman, for his invaluable and constructive criticisms; Professor Herbert Geyer, for his stimulating conversations; Professor Harold Hochman, for his encouragement and constructive criticisms; and Professor William Leonard, for his stimulating conversations at earlier stages of the development of this work. Without their encouragement and guidance, the completion of dissertation would not be possible.

My thanks are also due to the library staff at the United Nations in New York and the Offices of the European Communities in New York and Washington for their help in compiling the data; and to Jane House and Mary Chiffriller for their valued editing and typing of the final draft.

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INTRODUCTION

The purpose of this study is to investigate the effects of the European Economic Community on trade patterns and industrial structure in three member countries, namely, the Federal Republic of Germany, France and the Netherlands. The period of study is 1953-1972 where the sub-period 1953-58 is the "pre-integration" period. The study could, of course, be extended beyond 1972. However, the period after 1972 was disregarded to avoid some unnecessary complications. First, 1972 was the last full year before Britain entered the Market after a long debate; and the extension of the study beyond 1972 would require the adjustment of data to include or exclude Britain, as the case may be. Second, 1972 was the last full year before the Arab oil embargo in 1973. I believe that some industries were affected more than others, both within and between countries in the union; and since this essay is mainly a study of the industrial sectors in three member states in the union, the inclusion of the later years may distort the picture.

Theoretically, the European Economic Community is a form of economic integration that is higher than a "customs union" or a "Free Trade Area",¹ but falls short of a complete "Economic Union", which is what it was meant to be when it was established twenty years ago. However, the Community seems to have failed to be more than a customs union.²

The theory of customs unions is believed to have been pioneered by Jacob Viner.³ The analyses of Viner and others have created a well-

established theory of customs unions.⁴ The theory was confined mainly to a study of customs unions' effects on welfare—the "static effects". Rough estimates of gains and losses in welfare associated with the creation of customs unions were also derived from and found to count for a very small fraction of one-percent of the Gross National Products of member countries. That led some economists to focus attention on what is called the "dynamic effects" of customs unions. These effects may be classified as follows:⁵

- (a) Economies of scale: The elimination of tariffs and other trade restrictions would enlarge the markets open to producers within the union allowing them to capture economies of scale that come with greater output.
- (b) Specialization: Countries would tend to specialize in those products in which they have a comparative advantage and, therefore, gain the benefit of greater division of labor.
- (c) Increased competition: The free access of each member country to the markets of other countries would intensify competition among producers and thereby lead to greater efficiency.
- (d) Improved terms of trade: The members of the union as a group would be in a stronger position for trading with nonmember countries.

In contrast to the static effects which are theoretically and empirically well-established, the dynamic effects are debatable and unquantifiable. The debate over the British entry into the European Community during the Sixties left a great deal of literature on the

subject, literature that was written by some well-known economists, industrialists, and politicians.⁶ Some authors have attributed Britain's slow economic growth--relative to that of EEC countries--to the fact that Britain was left out of the European Community. Others have adopted negative views.

The fact that the rates of growth of industrial production and real income in most member countries in the union were higher than those of nonmember countries may be established from the published data. However, we cannot claim that the union was the only reason for this. There were many factors that influenced the industrial sectors of the European countries after the end of World War II. First, the rate of technological advance was increasing more than ever, and the advances in technology influenced production techniques in many industries. Second, there was a general increase in incomes during the Fifties and Sixties which affected the composition of demand. Third, there was the establishment of the European Economic Community (the Six) and the European Free Trade Area which, in geographically extending the market, changed the market for many industries (larger home market). Finally, there was a general decline in trade restrictions during the Sixties, especially after the "Kennedy Round". The economic factors mentioned above, therefore, plus other "noneconomic" factors, all influenced the economies of the EEC countries.

Given these factors, it seems difficult to isolate and measure the "integration effects"--economies of scale, increased efficiency, increased competition etc.--on the growth of real income of any individual union member or of the union as a whole. Even if such effects could be measured, it might still be difficult to argue that

they were due to integration.⁷

In what follows we shall be concerned with investigating the effects of the EEC on trade patterns and industrial structure in three member states: the Federal Republic of Germany, France, and The Netherlands.

The basic hypothesis to be tested in the empirical sections is stated in Chapter I along with the theoretical background needed to guide us through the statistical analysis that follows. First, a brief and general statement of the traditional Heckscher-Ohlin model of international trade is given. Then the "trade-creating" effects of customs unions are analyzed to assess the impact of customs unions on resource allocation in the framework of traditional trade theory. Further, some modifications to the theory--such as product differentiation, growth, and governmental policies--are discussed briefly.

Chapter II presents simple models that are used in the empirical sections to test for the effects of trade liberalization on trade patterns and industrial structure.

Chapter III presents the empirical evidence as to the effect of the EEC on trade patterns. First, the patterns of specialization in individual industries are presented. Then, the expansion of internal and external trade in our three countries are analyzed as well as the trade-creating effect of the union in terms of changes in the income elasticities of demand for imports.

In Chapter IV we present and analyze the structural changes in our three countries after the formation of the union. First, changes in industrial structure are analyzed in terms of growth of production volume, employment, and investment expenditures. Then, the sectoral

changes in a sample of ten industries and the probable causes of these changes are presented and analyzed. Then follow the statistical results obtained from applying a simple model to test whether the growth rates of employment and productivity in a sample of industries differed during the union period and the pre-union period.

The essay is concluded with a brief summary of the empirical findings, welfare and policy implications, and suggestions for further research.

Footnotes for Introduction

¹In a Free Trade Area member countries agree to abolish tariffs and trade barriers between themselves but each member maintains its own tariffs against outsiders. In a Customs Union, members abolish trade barriers between themselves and maintain a uniform tariff against nonmembers. In a Common Market, not only trade restrictions but also restrictions on factor movements are abolished. In an Economic Union, member countries agree to unify their monetary and fiscal policies with a supra-national authority whose decisions are binding for member states. See, for example, B. Balassa, The Theory of Economic Integration (Homewood, Ill.: R. D. Irwin, Inc., 1961).

²Francois Duchene, "Trends Within the European Community", a paper presented at the Graduate School, C.U.N.Y. under the aegis of the Center for European Studies, June, 1978.

³J. Viner, The Customs Union Issue (New York: Carnegie Endowment for International Peace, 1950).

⁴For a survey see M. Krauss, "Recent Developments in Customs Union Theory: An Interpretive Survey", Journal of Economic Literature (June, 1972). See also R. Lipsey, "The Theory of Custom Unions: A General Survey", Economic Journal (September, 1960).

⁵See for example, R. Lipsey, 1960; B. Balassa, 1961; and M. Krauss, 1972.

⁶Such as "On Britain and the European Communities", British White Paper (H. M. Stationery Office, Feb., 1971); D. Evans (Ed.), Destiny or Delusion: Britain and the Common Market (London: V. Gollancz, 1971), especially N. Kaldor article, "The Dynamic Effects of the Common Market". See also, J. Pinder (Ed.), The Economics of Europe: What the Common Market Means for Britain (London: C. Knight and Co., 1971).

⁷Dr. Lawrence Krause of The Brookings Institution in his book, European Integration and the United States (Washington: The Brookings Institution, 1968) applied a "Denison method" to calculate the effects of the EEC on economies of scale and increased efficiency. He made the assumption that the ratios of imports and exports to Gross Domestic Product would remain unchanged in the absence of integration. Dr. Denison, in his letter to me dated May 8, 1978, does "not believe it is safe to assume that ratios of imports and exports to GDP would have been constant in the absence of integration".

CHAPTER I

BASIC HYPOTHESIS AND THEORETICAL BACKGROUND

The outline of this chapter is as follows:

Section I.1 is a brief statement of the hypothesis to be tested.

Section I.2 is a general description of the effects of trade liberalization on national specialization in the framework of the Heckscher-Ohlin model of international trade.

Section I.3 reviews the trade-creating effects of customs unions, especially "production effects", to assess the impact of customs unions on resource reallocation within the framework of the traditional theory.

Section I.4 reviews some qualifications to the traditional theory of trade such as product differentiation, growth, and governmental policies to assess their impact on trade patterns and industrial structure.

I.1 Basic Hypothesis

Our analysis of the effects of customs unions on trade patterns and industrial structure rests upon a well-established theory and pattern of reasoning which may first be set out in general terms as a guide for following the more statistical account which follows:

1. Free trade shifts national specialization. A country would tend to specialize in the production of those commodities in which it has a cost advantage and import those commodities in which it has a

cost disadvantage. A country would export or import a commodity.

2. A customs union, or economic integration in general, is a movement toward free trade. A "trade-creating" customs union entails the shift of resources from import-competing to export industries.

3. Accordingly, we would observe in a unified area, an expansion of export industries and a corresponding contraction in import-competing industries. We would observe shifts of resources of manpower and capital between these industries, or "inter-industry specialization".

The first of these propositions is a brief restatement of the traditional theory of international trade and will be briefly discussed in section I.2. The second of these propositions is a restatement of the traditional theory of customs unions and will be discussed in section I.3. The third proposition follows from the second and can statistically tested. It will be the subject of our empirical investigations in Chapters III and IV.

I.2. The Effects of Trade Liberalization on National Specialization: The Traditional Heckscher-Ohlin Model

The traditional Heckscher-Ohlin model of international trade is well-known and will not be reproduced here. However, a clear statement of the assumptions and a brief description of the model may be necessary to assess the impact of trade liberalization if one or more of the assumptions are relaxed.¹

Assumptions:

1. A world consisting of two countries 1 and 2, each being able to produce two goods, X and Y, using two factors of production labor (L) and capital (K), inputs of L and K are homogeneous both within

and between countries

2. For each country, the endowments of labor and capital are fixed.
3. The production function for each good is linear homogeneous that shows constant returns to scale with the property of diminishing returns. The production functions in both countries are identical.
4. Each factor is fully utilized.
5. Perfect competition prevails in both the goods market and the factors market.
6. There is a free trade and goods are mobile internationally as well as domestically with negligible transport costs. Also factors of production are mobile domestically and completely immobile internationally.
7. Commodities produced and traded are homogeneous with respect to all functional characteristics and with respect to location, time of use, and packaging.
8. Consumers' preferences are given exogenously.
9. There are no joint products in production and consumption.

Under these conditions, international trade will occur as long as there are differences in the relative domestic goods price ratio, or the ratio of cost of production for the two goods, between the two countries in the absence of trade. The free trade assumption enables us to compare the pre-trade price ratio of the two countries directly. Thus, if good X is relatively cheaper than good Y in country 1 compared to country 2 before trade, then country 1 will usually export X and import Y after trade. Thus the production of X increases and the production of Y decreases in country 1; the production of X decreases and the production of Y increases in country 2.

This is shown in Figure 1.1 for country 1 which is assumed to be a small country. The production possibility curve of the two commodities is shown by xy in Figure 1.1. The equilibrium production and consumption point in isolation is attained at P_1 . The price ratio of the two commodities is illustrated by the slope of line I.

The country now is opened to trade with country 2 and thus foreign consumers and producers are introduced into the picture. The price ratio prevailing in the market would generally be different from the one which prevailed under no trade situation. If country 1 can produce commodity X at a lower cost compared to country 2, then the production point under free trade, due to differences in the price ratio of the two commodities, would move to point P_2 in Figure 1.1. Since country 1 is small enough compared to the rest of the world, the volume of her exports and imports will not affect the price line significantly.

The actual consumption point is somewhere on the price line II which is tangent to the production possibility curve at point P_2 , and its precise location depends on demand conditions of the two commodities. If we assume that C is the consumption point, then country 1 exports QP_2 of X and imports QC of Y.

From a welfare point of view, it is generally agreed that point C is superior to P_1 because it lies on a higher indifference curve, IC_2 .

The production point P_2 represents "incomplete specialization", whereas production points x and y represent "complete specialization"--the Ricardian case. This is more likely if the production possibility curve in Figure 1.1 is a straight line.

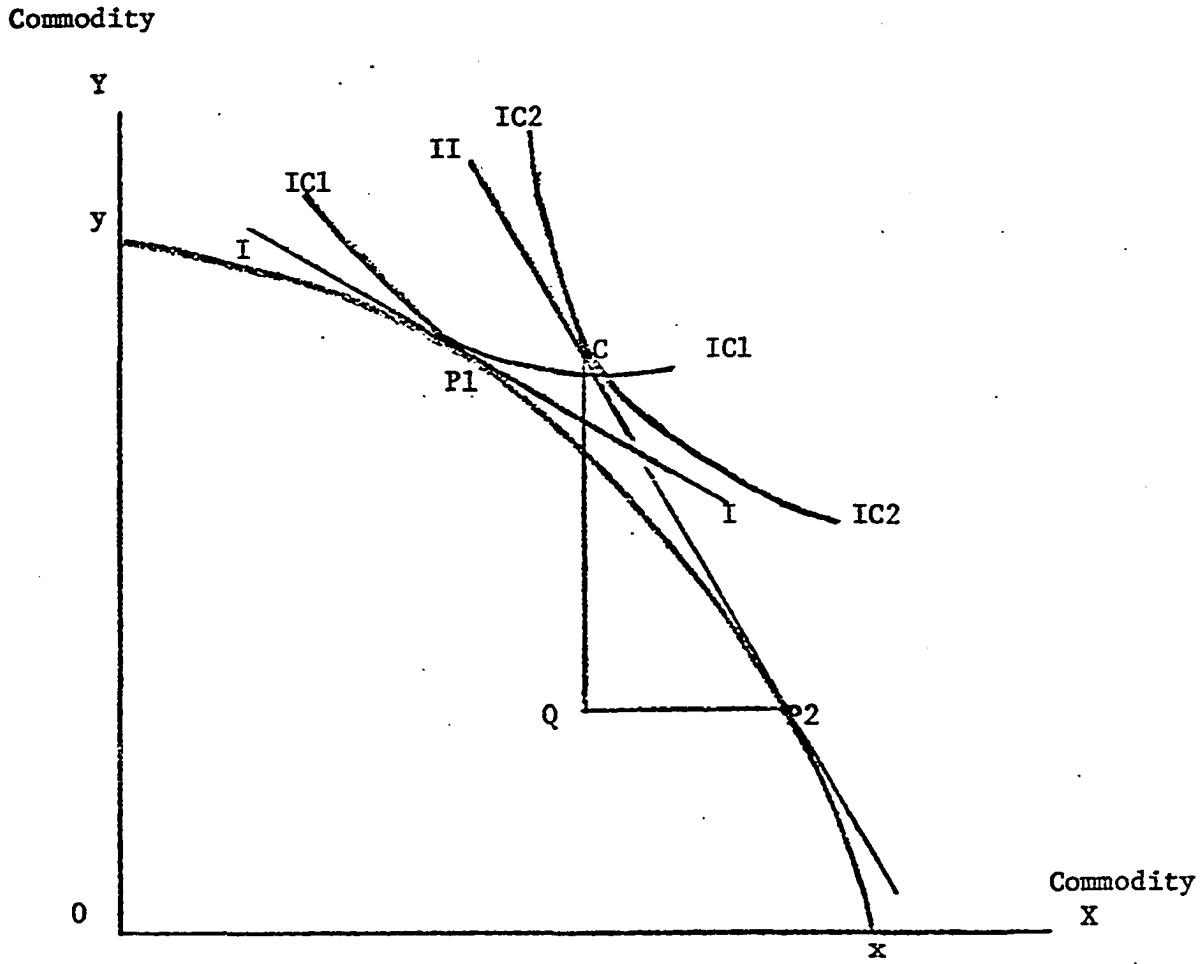


FIGURE 1.1 : Free Trade and Specialization

The price ratio that prevails in each country before trade determines the pattern of specialization. Given perfect competition in every market, and given that both countries produce both goods before trade opens, and the commodity price ratio in country 1 is p_{x1}/p_{y1} , and in country 2, p_{x2}/p_{y2} ; then if p_{x1}/p_{y1} is less than p_{x2}/p_{y2} , country 1 would export good X and import good Y, when trade is opened. Country 2 would export good Y and import good X. Similarly, if p_{x1}/p_{y1} is greater than p_{x2}/p_{y2} , country 1 would import good X and export good Y.

Demand conditions and supply conditions in each country cause the differences in pre-trade commodity price ratio. On the demand side, there are consumers' preferences and distribution of ownership of factors of production. On the supply side, there are the suppliers of factors of production and the physical conditions of production.

If demand conditions are negligible, and if production functions in both countries are similar, then according to Ohlin, the essential factor that determines the regional (or international) differences in the price ratio is the difference in the factor endowments of the two regions (or countries). This conclusion is known as the Heckscher-Ohlin theorem.

Under the assumptions and specifications of the model briefly described above, it is concluded:

1. A country exports (imports) that good which is relatively more intensive in the factor which is relatively more (less) abundant in that country.
2. Free trade would tend to equalize the relative price ratios in both countries and thus the equilibrium international price ratio is established.

3. A country cannot export and import the same commodity.
4. Free trade would lead to specialization and thus to reallocation of resources between industries, or "inter-industry" specialization.

A customs union is a movement toward free trade; and we should expect to observe a reallocation of resources from import-competing industries to export industries. This leads us to a brief discussion of trade-creating customs unions that may entail such reallocation of resources and specialization.

I.3. Gains From "Freer" Trade: Customs Unions

In discussing the effects of customs unions on patterns of trade and specialization, we shift our attention from a "general equilibrium" to a "partial equilibrium" comparative static model for simplicity of exposition. Attention is focussed on the "production effect" of a "trade-creating" customs union since the possibility of specialization lies here.

J. Viner² showed that a trade-creating customs union would increase welfare because it involves the replacement of a relatively costly domestic production by cheaper partner goods; and a "trade-diverting" customs union reduces welfare because it involves shifting sources of supply from a low-cost foreign producer to a high-cost partner source. Other economists showed that a trade-diverting customs union does not necessarily reduce welfare if both production effect and "consumption effect" are taken into account.³

To assess the magnitude of the production effect of a trade-creating customs union, we analyze two cases in a partial equilibrium context. The first case is when costs of production in the home country

are rising or constant; the second case when costs in the home country are decreasing--economies of scale.

It will be assumed throughout this analysis that governments in the union maintain full employment by an appropriate fiscal-monetary mix irrespective of the balance of payments; and that the balance of payments will be maintained in equilibrium by any necessary change in the exchange rate.⁴

Case 1: Constant or Increasing Costs:

The first case is illustrated in Figure 1.2. where, in a partial equilibrium context, D_h is assumed to be the demand curve in the home country for a homogeneous product X that is produced by a large number of firms under perfect competitive conditions.⁵ S_h is the upward-sloping supply curve in the home country reflecting increasing costs of production. Assume further that the partner's supply curve is horizontal at the given world price of commodity X (S_p in Figure 1.2). If imports from partner country are burdened by a tariff equal to t so that the partner's supply curve is S_p+t in the Figure, then domestic production of commodity X is OQ_1 , domestic consumption is OQ_2 , and imports $Q_1 Q_2$.

The elimination of tariffs on the imports of commodity X would lead to a reduction in price to OS_p , reduction in domestic production to OQ_3 , an increase in consumption to OQ_4 , and an increase in imports by $(Q_3Q_1 + Q_2Q_4)$. If we define consumers' surplus as the area under a constant utility demand curve and above the price line (in the Marshallian sense), then evidently, there is an increase in welfare (consumers' surplus) due to trade liberalization that is equal to the sum of areas $A+P+D+C$ in Figure 1.2. This gain is broken down as follows: Area A

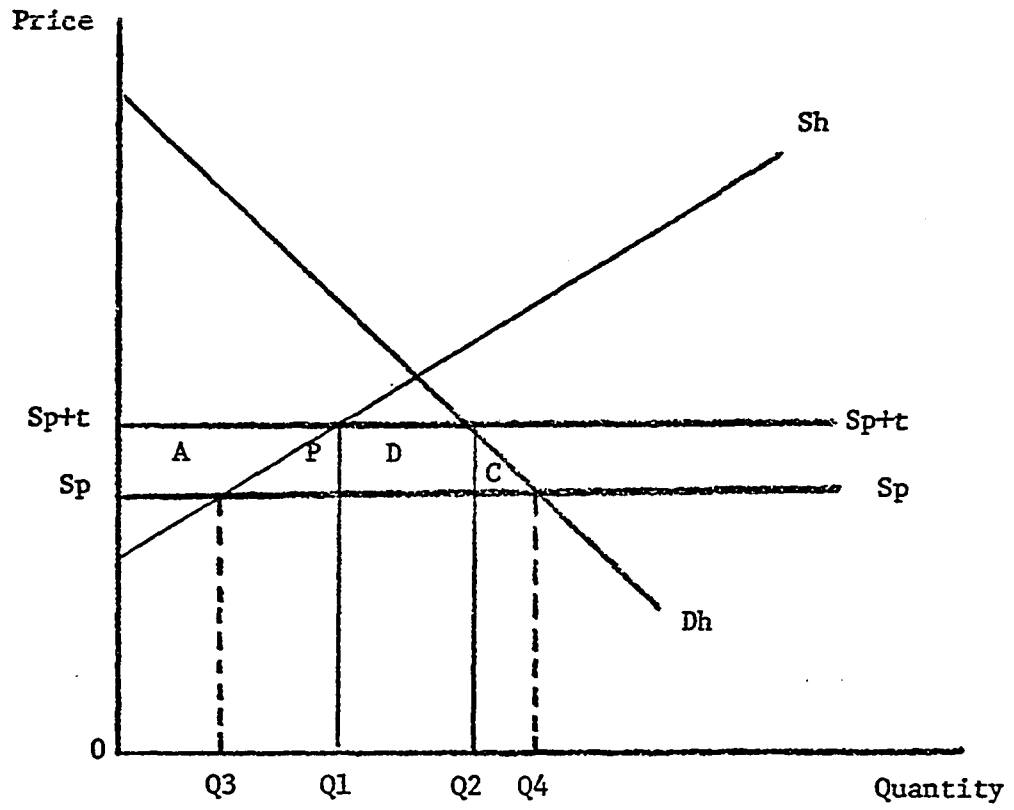


FIGURE 1.2 : Trade-creation - Increasing Costs

represents a loss of rents to domestic producers of the imported commodity; area D represents a loss of tariff revenue to the government. Therefore, the net gain in consumers' surplus is the sum of areas P and C. Area P is the "production effect"—the substitution of a higher cost domestic by a lower cost partner goods. Area C is the "consumption effect"—the increase in welfare due to the increased consumption. It can be easily shown that the increase in welfare due to trade liberalization is approximately equal to one-half the increase in imports multiplied by the tariff rate.

The results would not be much different if the supply curve of the partner country is upward-sloping as long as it lies below the home country supply curve.

Case 2: Decreasing costs--economies of scale:

The analysis presented above does not allow for economies of scale that are believed to be important in manufacturing industry. A theoretical model that deals with this possibility was developed by P. and R. Wonnacott in their study of a free trade area between the United States and Canada.⁶

Here, we may distinguish between two cases that we discuss in turn, disregarding the possibility of monopoly. Then we discuss the possibility of monopoly where the largest firm in the union may capture the entire market.

The two cases are illustrated in Figures 1.3 and 1.4, where in Figure 1.3 the minimum point on the firm's average cost curve lies above the horizontal supply curve of the partner country; and in Figure 1.4 the minimum point on the firm's average cost curve lies below the partner's supply curve.

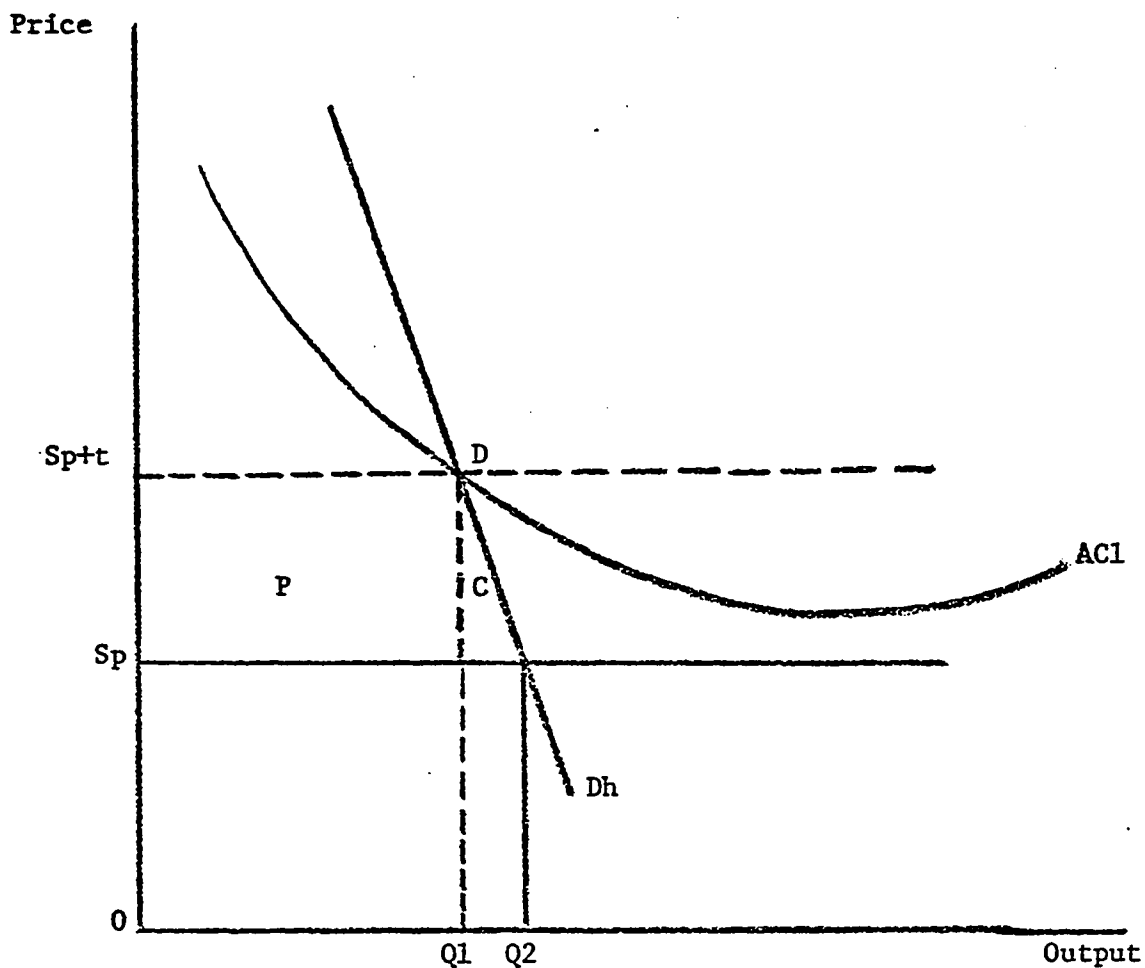


FIGURE 1.3: Trade-creation, economies of scale - minimum point on the firm's average cost curve lies above the partner's horizontal supply curve.

In the first case (Figure 1.3), AC_1 is assumed to be the firm's average cost curve of a homogeneous product X; D_h is the constant utility demand curve in the home country; S_p is the partner's constant supply curve at the given world price of good X. The domestic price including the tariff is S_{p+t} .

For domestic production to occur, protection is required and the average cost curve should pass through point D or to the left of it, where point D is defined by the intersection of the domestic demand curve and the partner's supply curve including the tariff. In this case, both production and consumption are equal to OQ_1 and imports are equal to zero. However, if trade is liberalized, domestic production of commodity X would cease altogether, and consumption would increase to OQ_2 .

The gain in welfare (consumers' surplus) is the sum of areas P and C in Figure 1.3, for which there is no loss in government revenue or producers' surplus. Area P is the "production effect" and area C is the "consumption effect". But since area P is a rectangle instead of a triangle as in the increasing cost case, it follows that the gain is twice as much when economies of scale are present.

The second case, where the firm's average cost curve lies below the partner's horizontal supply curve, is illustrated in Figure 1.4, where AC_2 is the firm's average cost curve; S_p is the partner's constant supply curve; D_h is the domestic demand curve for commodity X. If free trade prevails, then domestic production is equal to OQ_1 ; domestic consumption is equal to OQ_2 ; price is $p-t_f$ where t_f is the foreign tariff, and the home country exports Q_1Q_2 of commodity X. Assume now that all countries impose a tariff on the imports of

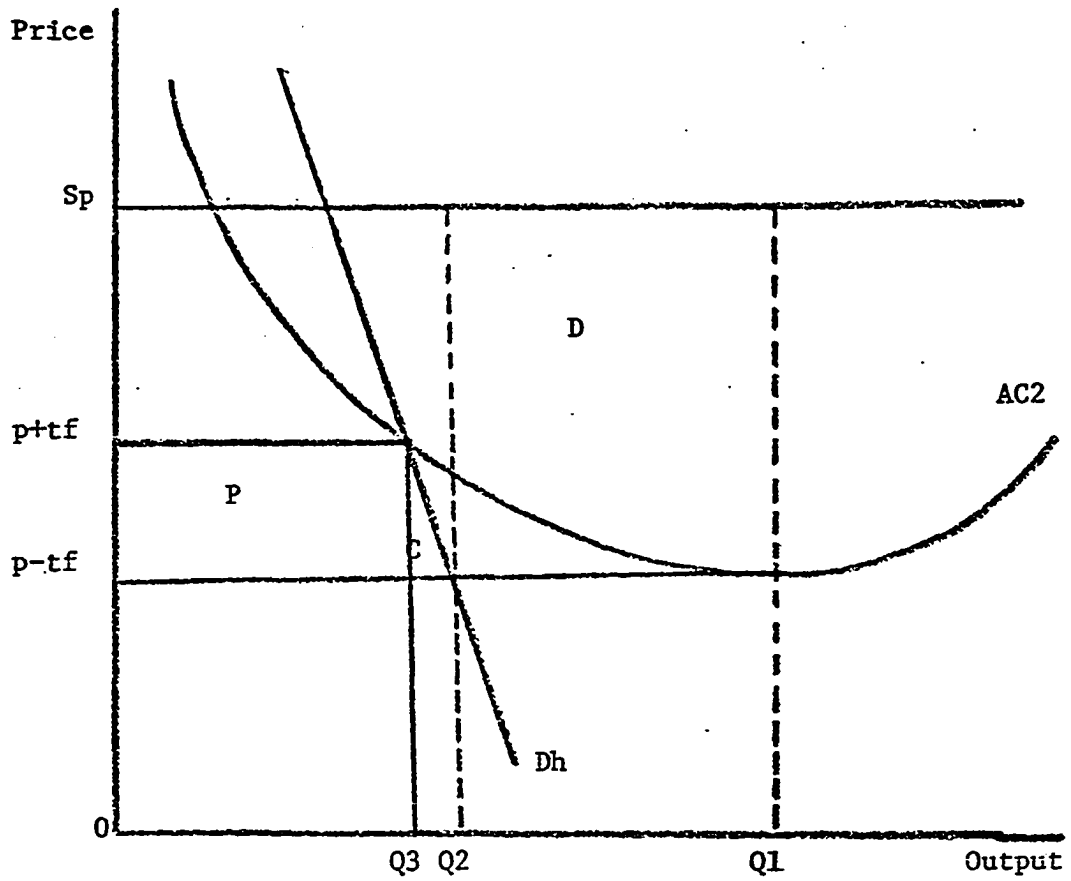


FIGURE 1.4 : Trade-creation, economies of scale - minimum point on the firm's average cost curve lies below the partner's horizontal supply curve

commodity X that is high enough to reduce the home country's exports to zero. Then domestic production and domestic consumption are equal to OQ_3 . If the home country now forms a customs union with the partner country, then domestic production would increase to OQ_1 in which case there is a gain in welfare (consumers' surplus) equal to the sum of areas $P + C + D$ in Figure 1.4. Area D is transferred into consumers' surplus in the partner country since it will not be practical to charge two different prices in the "same market". Hence, the net gain to the domestic country is area P (the cost-reduction effect)⁷, and the normal welfare triangle C . Again since area P is a rectangle and not a triangle as in the traditional increasing cost case, it follows that when economies of scale are present, gains are twice as much as in the traditional case.

There are at least two theoretical objections to this analysis:

(a) it was assumed that the average cost curve represents a firm's supply curve instead of the marginal cost curve. This implies an average cost theory of pricing which contradicts the traditional theory of marginal cost pricing for profit maximization; and (b) given economies of scale, one might observe a monopoly equilibrium with output determined by the intersection between the marginal cost curve and the market marginal revenue curve.

The first of these objections was realized by the Wonnacotts (1967) and they justified it "on the grounds that unmanageable complications will be avoided".⁸ The second objection will be dealt with below.⁹

The first case where the average cost curve lies above the partner's horizontal supply curve is shown in Figure 1.5, where S_p is

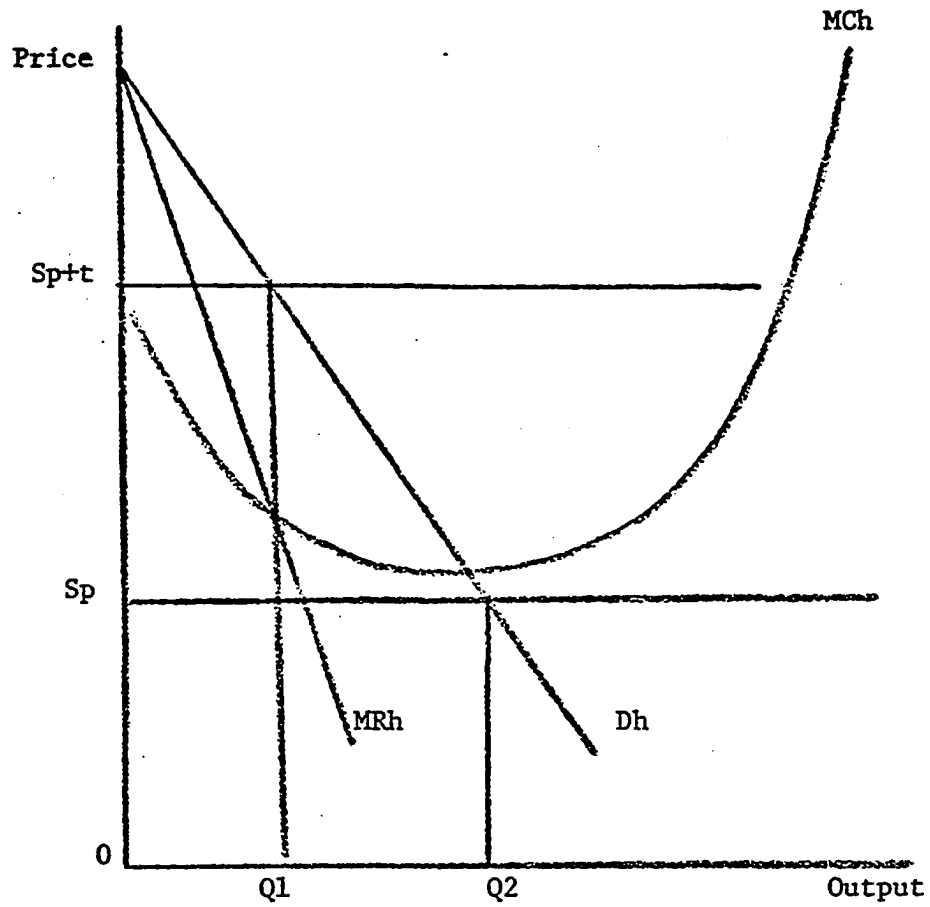


FIGURE 1.5 : Trade-creation , economies of scale-
the monopoly case

again the partner's horizontal supply curve; D_h is the market demand curve in the home country for commodity X; MR_h is the marginal revenue curve and MCh is the marginal cost curve (average cost curve is not shown in the Figure); $Sp+t$ is the partner's supply curve including the tariff. In this case, the domestic monopolist maximizes his profits by producing an output equal to OQ_1 and charging a price equal to $OSp+t$. That is, for domestic production to occur and the domestic monopolist to maximize his revenues, the home country should impose a tariff equal to t .

Now, assume that the home country forms a customs union with the partner country, the domestic monopolist would go out of business and domestic production would cease altogether. The home country would import OQ_2 to meet domestic demand. The welfare effects are similar to what we discussed above.

The "production effect" examined

In each of the cases analyzed above in the discussion of trade-creating customs unions, it was found that the increase in welfare is approximately equal to one-half the amount of increased imports multiplied by the tariff rate, when production costs in the home country are increasing and double that amount when costs are decreasing. This provides a convenient formula for calculating the welfare gains of customs unions. Empirical estimates of such gains were found to be very small ranging from $1/20$ to $1/10$ of one-percent of the Gross National Products of the EEC countries.¹⁰ However, the absolute value of such gains is not necessarily small.

I.4. Modifications to the Heckscher-Ohlin Model

In this section we relax three assumptions of the traditional Heckscher-Ohlin model of international trade, one at a time, and consider how such relaxation affects trade patterns and industrial structure. The assumptions to be relaxed are:

- (a) Commodities produced are homogeneous with respect to all functional characteristics and with respect to location, time of use, and packaging;
- (b) For each country, the endowment of labor and capital are fixed;
- (c) The absence of governmental regulations.

These are discussed briefly under the three subheadings: product differentiation, economic growth, and governmental policies.

I.4.1. Product differentiation. Traditional trade theory explicitly assumes that produced goods are homogeneous and predicts certain trade patterns when trade is liberalized, as was discussed in sections I.2. and I.3. However, most products that are traded internationally are differentiated with respect to location, timing, style, quality, brand name, etc. The conclusions may vary drastically when products are differentiated, or when output of an industry is diversified.¹¹ Two products produced in two countries, say XI and XII, may be functionally homogeneous, causing indifference in the consumer about which one to choose, but they may be differentiated by location, timing, or packaging characteristics. Let us consider two products: fresh strawberries and the

basic chemical that constitutes aspirin. In the first example, fresh strawberries produced in the northern hemisphere and fresh strawberries produced in the southern hemisphere tend to be functionally homogeneous but are differentiated by their location and time of economic usefulness. In the second example, the basic chemical that constitutes aspirin is functionally homogeneous yet it is differentiated through packaging and brand name.¹²

If the assumption of purely competitive markets for homogeneous products is relaxed, trade liberalization may lead to different conclusions regarding the patterns of trade and specialization. In the traditional Heckscher-Ohlin model discussed above, where produced goods were assumed to be homogeneous, it was concluded that free trade would lead to "inter-industry" specialization where the production of one industry would be concentrated in one country.

When the production of an "industry"¹³ is differentiated with respect to brand name, quality etc., the freeing of trade may lead to the decline in the production of an import-competing product of a certain brand or quality offset by an increase in the production of another product of different brand or quality within the same industry. In this case, the freeing of trade may lead a country to specialize in a narrower range of products or expand its product line, and in either case, no one national industry would decline or rise as a whole. This is generally known as "intra-industry" specialization.¹⁴ As we shall see below, this phenomenon has characterized trade in EEC countries, where each country expanded its exports to other countries.

I.4.2. Growth and Trade. In the traditional Heckscher-Ohlin model discussed above, it was assumed that the endowments of labor and capital are fixed for each country. But the supply of factors of production and technical progress grow over time, and this may offset some of the free trade results.

The literature on growth and trade is very rich indeed and to discuss it would fill several volumes.¹⁵ However, a brief discussion may prove to be useful in explaining our empirical results below.

To start with, in a comparatively static context, the supply of labor for productive activities grows with the growth of population. This expansion is certainly a source of growth which will shift the production possibility schedule of a country outward, especially in the direction of the labor-intensive commodity in a two factor Heckscher-Ohlin model. This does not necessarily imply that the per capita income in a country is raised when the population of the country increases. In fact, with capital fixed, an increase in labor will lower per capita income and hence welfare.

Second, in the traditional Heckscher-Ohlin model capital was assumed to be fixed. In real life, however, capital goods are produced by other factors of production (including capital) or may simply be imported. If such production exceeds the current depreciation rate of capital stock, then the net stock of capital rises and, with it, the production possibility schedule of the country shifts outward, perhaps in the direction of the capital intensive good in the case of a two factor two commodity Heckscher-Ohlin model.

Third, advances in technology allow greater levels of output and may alter the proportions in which labor and capital are employed. This

may affect the composition of output in a manner that is similar to changes in the commodity factor endowment proportions. Technological advances, assuming constant factor prices, could be: a) neutral, in which capital and labor are each reduced proportionately; b) labor-saving, in which the labor input coefficient is reduced relatively more than the capital input coefficient; or c) capital-saving, in which the capital input coefficient is reduced more than the labor input coefficient. The effect of technical progress on the production possibility schedule of a country depends on the relative extent of technical change in each industry, and on the nature of the bias in technical change.

The effect of growth of factors of production on the production of each good in a country is illustrated in Figure 1.6. For simplicity of exposition, we shall assume that the wage/rent ratio remains constant and see how the growth of one factor of production or both factors affect output growth at constant prices.

Assume in a two sector general equilibrium model that the X industry is labor-intensive and the Y industry capital intensive. Let units of labor, in Figure 1.6., be measured on the horizontal axis and units of capital on the vertical axis. Assume that the home country initial endowment of labor is OL_0 and of capital OC_0 and that this bundle of endowment is represented by point E. The slope of the OX ray shows the capital labor ratio that would be employed in the X industry, and that of OY, the capital-labor ratio that would be employed in the Y industry. Output level for each commodity can be measured along these rays. Given that the initial endowment is at E, the output combination that would lead to the full employment of both factors is OA of X and

OB of Y.

Consider, first, the increase in the home country's labor force with no change in the supply of capital, so that the new endowment bundle is represented by point E' in Figure 1.6. This would lead to the expansion of the output of the X industry, the labor-intensive industry to OA' and a contraction in the output of the Y industry, the capital intensive industry. The reason is that with factor prices constant, the expansion of the X industry, the labor-intensive industry, would require more capital to work with and that capital can only be obtained from the Y industry.¹⁶

Second, the increase in the home country's capital with no change in the supply of labor would lead to the expansion of the Y industry, capital intensive, and the contraction of the X industry, labor-intensive, for similar reasons. This is shown in Figure 1.6. with the new endowment at E''; the output of the X industry is OA''; and that of Y is OB''.

If the endowment of both factors rises proportionately, along the OZ line, we have a case of "balanced growth", so that the production of both commodities rises in the same proportion (adhering to the constant-returns-to-scale technology assumed in the discussion of the Heckscher-Ohlin model). Same analysis could of course be illustrated by utilizing the production possibility frontier diagrams.

Let us now consider the effects of technical advances. Technical advances release productive factors and are, on this count, equivalent to an expansion of the country's resource base. However, this depends on the type of technical progress--that is, whether it is labor-saving, capital-saving, or neutral.

The case of a labor-saving technical advance in the Y (capital-intensive) industry is illustrated in Figure 1.7, where, utilizing a "Lerner-Pearce" diagram as before, units of labor are measured on the horizontal axis and units of capital, on the vertical axis. The country's initial endowment is represented by point E. The slopes of OX and OY show the capital labor ratio in the X and Y industries, respectively. Output levels are OA of X and OB of Y. Now consider the effect of a labor-saving technical advance in the Y industry. This would cause a shift of the capital-labor ratio in the Y industry to OY'. The output of the X industry must rise. While the output of the Y industry may rise or fall, "depending on whether the resource exodus is or is not great enough to offset the improvement in productivity due to the innovation".¹⁷

If the technical advance is capital-saving in the Y capital-intensive industry, it may be easily shown, utilizing a similar diagram, that such an advance at constant factor cost reduces the ratio of capital to labor employed while reducing the cost of production. Such a reduction requires a redeployment of labor and capital from the X industry into the Y industry. X (labor-intensive) production must fall, and the Y production increases proportionately more than the cost-saving brought by the technical advance.

Finally, a neutral technical advance in the Y industry would increase the output of this industry in proportion to the technical progress. The output of the X industry would remain unchanged, if factor prices were to remain unchanged, as has been assumed throughout these analyses, and the income elasticities of demand for X and Y and the elasticity of substitution in consumption are all equal to unity.¹⁸

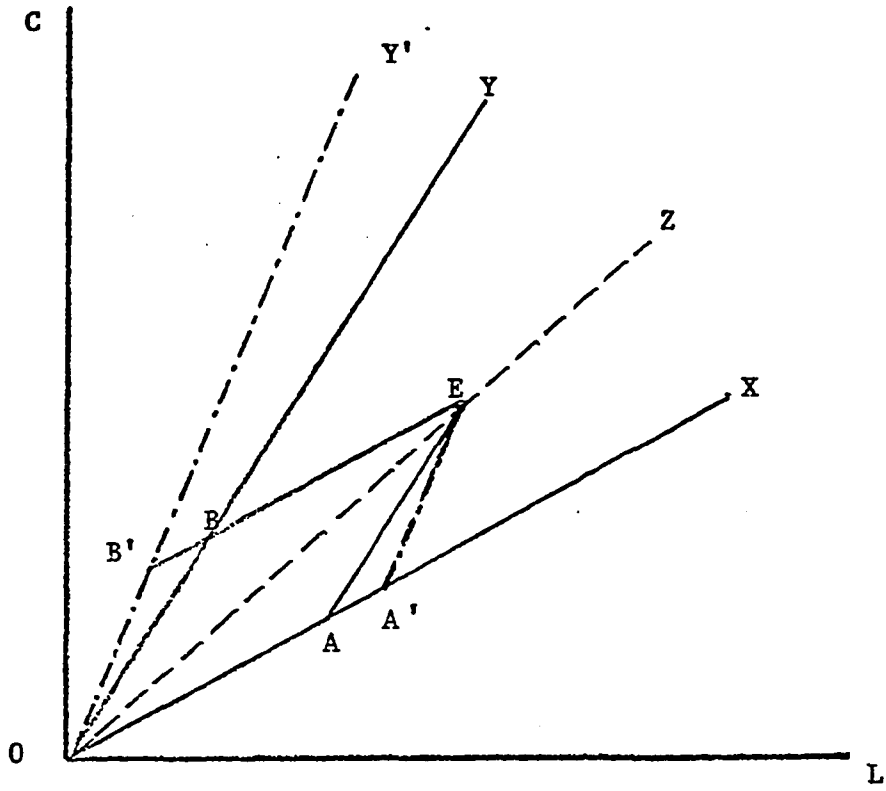


Figure 1.7 : Labor- saving Technical Progress in the Y - Capital-intensive Industry

The above analysis illustrates how the growth in the supply of factors of production and how technical progress, over time, affect the output of each industry (sector) in a two sector general equilibrium model. The analysis can easily be extended to show the effect of growth on a country's trade.

Growth could be "pro-trade-biased", which increases the country's demand for imports and supply of exports more than proportionally to output; ... unbiased or "neutral" which increases the country's demand for imports and supply of exports in proportion to output; ... anti-trade-biased, which increases the country's demand for imports and supply of exports less than proportionally to output; ... ultra-pro-trade-biased, in which more than the whole increase in national income is devoted to the purchase of imports so that the demand for the home-produced goods actually falls...; and ultra-anti-trade-biased, in which more than the whole increase in national income is devoted to the purchase of home-produced goods so the demand for imports actually falls...." 19

Thus the growth factor which was assumed to be constant in the discussion of the traditional Heckscher-Ohlin model, may affect the pattern of trade and specialization in a given country not necessarily in the same direction as the traditional Heckscher-Ohlin model predicts.

The above analysis would be very helpful indeed in dealing with a two-sector general equilibrium model. Since we shall be dealing with growth in specific industries in the manufacturing sector only, it becomes very difficult to make accurate predictions as to the patterns of specialization after trade liberalization. Therefore, we shall make use of the growth of specific industries "relative" to the growth of the manufacturing sector as a whole to identify expanding, stagnating, and declining industries.

I.4.3. Governmental National Policies. Governments through taxation and subsidization interfere in the market place and their actions may offset some of the free trade results. In the discussion of the traditional trade model, the role of the government is generally

neglected or assumed to be minimal. A thorough discussion of the impact of governmental regulations and policies on resource reallocation is not the subject of this essay. However, a few examples may shed some light on the empirical findings reported below.

First, although union members agree to abolish tariffs and other trade restrictions between themselves, national governments may exercise discrimination against purchases from partner countries, even though it might be cheaper to buy from partners, and by exercising discrimination they support inefficient domestic producers. Second, national governments, by giving subsidies (perhaps because of political pressures to avoid short-run unemployment in declining industries) may offset some of the free trade results. Third, the use of discriminatory taxes on the ownership of certain commodities has an impact on the consumption of such commodities.

Finally, some "basic" industries like Iron and Steel may flourish because of governmental national policies even though a country may not have a comparative advantage in the production of iron and steel. To avoid fluctuations in the output of other industries that use steel products as inputs, governments may "protect" the iron and steel industry, one way or another, although "officially" trade restrictions are removed between partners in a customs union.

Footnotes for Chapter I

¹In drafting this section, I benefitted from the works of H. G. Johnson, Money, Trade, and Economic Growth (Cambridge, Mass.: George Allen and Unwin, 1967), Lecture II; Bo Sodersten, International Economics (New York: Harper and Row, 1970); and A. Takayama, International Trade (New York: Holt, Rinehart and Winston, 1972) Chapters 1 and 3.

²J. Viner, The Customs Union Issue (New York: Carnegie Endowment for International Peace, 1950).

³R. Lipsey, The Theory of Customs Unions: A General Equilibrium Analysis (London: Weidenfeld and Nicolson, 1970) and the same author's survey article, "The Theory of Customs Unions: A General Survey", Economic Journal, 1960; and J. E. Meade, The Theory of Customs Unions (Amsterdam: North-Holland Publishing Co., 1956). This latter issue is not discussed in this essay.

⁴For a discussion of this point, see T. Scitovsky, Economic Theory and Western European Integration (Stanford, California: Stanford University Press, 1967) and John Pinder (ed.), The Economics of Europe: What the Common Market Means for Britain (London: C. Knight and Co., 1971).

⁵For an extensive discussion of Case 1, see H. G. Johnson, op cit, p. 53-54; and M. Krauss, "Recent Development in Customs Union Theory: An Interpretive Survey", Journal of Economics Literature, June, 1972.

⁶R. Wonnacott and P. Wonnacott, Free Trade Between the United States and Canada (Cambridge, Mass.: Harvard University Press, 1967).

⁷W. M. Cordon, "Economies of Scale and Customs Union Theory", Journal of Political Economy, #3, 1972.

⁸R. and P. Wonnacott, op cit, p. 286.

⁹I am indebted to Professor M. Grossman for the discussion of this point.

¹⁰For a survey of such estimates, see M. Krauss, op cit, 1972.

¹¹For a lengthy discussion of product differentiation in international trade see: H. Grubel and P. Lloyd, Intra-Industry Trade: The Theory and Measurement of International Trade in Differentiated Products (New York: John Wiley and Sons, 1975); B. Balassa, "Tariff Reduction and Trade in Manufactures", American Economic Review, June, 1966 and B. Balassa (ed.) European Economic Integration (Amsterdam: North-Holland Publishing Co., 1975); R. Caves and R. Jones, World Trade and Payments - An Introduction (Boston, Little, Brown, and Co., 1973).

¹²H. Grubel and P. Lloyd, op cit, p. 71.

¹³The concept of an industry is discussed in Section III.2 below.

¹⁴B. Balassa, op cit, 1966 and 1975. Also H. Grubel and P. Lloyd, op cit.

¹⁵See H. G. Johnson, "Bibliography of Recent Work on Trade and Growth", Appendix to Lecture IV, in Money, Trade and Economic Growth (Cambridge, Mass.: George Allen and Unwin, 1967); also H. G. Johnson, The Two-Sector Model of General Equilibrium (New York: Aldine-Atherton, 1971); and A. Takayama, op cit, Chapters 12 to 15.

¹⁶This is generally known as the Rybezenski Theorem: If commodity prices and, therefore, factor prices and, therefore, optimal factor utilization rate in the two industries are kept constant, and the quantity of one factor is augmented, maintenance of full employment of both factors require the output of the industry that uses the augmented factor intensively must increase in value by more than total output, and the output of the other industry must fall absolutely. See H. G. Johnson, op cit, 1971; and T. M. Rybezenski, "Factor Endowment and Relative Commodity Prices" reprinted in Caves and Johnson, Readings in International Economics (R. D. Irwin Inc., 1968).

¹⁷H. G. Johnson, op cit, 1971, p. 43.

¹⁸Suppose that the neutral technical progress in the y capital-intensive industry is equal to $\delta y\%$, given that both x and y use factors in the same proportions, it may be shown that,

$$\dot{y} = [k\eta_y + (1-k)\sigma] \delta y$$

$$\dot{x} = k(\eta_x - \sigma) \delta y$$

where \dot{x} and \dot{y} are the percentage changes in the quantity demanded of x and y, respectively, k is the share of income spent on x; η_x and η_y are the income elasticities of demand to x and y respectively, and σ is the elasticity of substitution. It is clearly seen that $\dot{y} = \delta y$ and $\dot{x} = 0$ if and only if $\eta_x = \eta_y = \sigma = 1$. (I am indebted to Professor M. Grossman for clarifying this point.)

¹⁹H. G. Johnson, op cit, 1967, p. 89.

CHAPTER II

ESTIMATION PROCEDURES

The outline of this chapter is as follows:

Section II.1 is a brief description of the problem and its setting.

Section II.2 discusses a model to estimate specialization trends in industries.

Section II.3 discusses a model to test for trade creation and diversion in a customs union in terms of changes in income elasticities of demand for imports.

Section II.4 discusses a model to test for changes in industrial structure that may be due to trade liberalization.

II.1 The Problem and Its Setting

Assume we have a world consisting of three countries: 1, 2 and 3. Each country trades with the other two in a set or subset of industrial products i , $i = 1, \dots, n$. Assume now that countries 1 and 3 form a customs union between themselves and eliminate all tariffs and trade restrictions, and impose a uniform tariff against country 3. The question is: How would this action affect trade patterns and industrial structure in countries 1 and 3?

A theoretical answer to this question was depicted in Chapter I. First, with free trade, in a general equilibrium model, countries 1 and

3 would tend to specialize in the production of those commodities in which they have a cost advantage--the traditional Heckscher-Ohlin model described in section I.2. Second, if the customs union is a trade-creating one, then high cost domestic products would be replaced by lower cost partner goods--the production effect of customs unions described in section I.3. In both cases of free trade or "freer" trade (customs unions), we should observe a reallocation of resources from import-competing to export industries. The former would tend to contract and thus release their labor and sell or scrap their fixed equipment. The latter would tend to expand in terms of production volume, employment, and investment expenditures. It should be remembered, however, that these affects might be offset by one or more of the factors discussed in section I.4.

Our task in this chapter is to develop statistical models that will be used to test for changes in trade patterns and industrial structure that may be due to trade liberalization.

Empirically, this may be done by studying two related sets of data for each country:

- (a) Trade data that show for each group of related industrial products "Industries" the value or volume of exports and imports from partner countries, and the rest of the world, in each period, before and after trade liberalization.
- (b) Industrial data that show for each industry the value or volume of production, employment, and fixed capital formation before and after trade liberalization.

Sections II.2 and II.3 present models to test for changes in patterns of trade and specialization using the first group of data.

Section II.4 presents a model to test for structural changes in industry using the second group of data.

Avoiding any statistical discrepancies or misspecifications of the models, the two approaches should yield similar results.

II.2 Estimation of Specialization Trends

In this section, we present a simple model to measure "inter-industry" specialization using trade data aggregated at a given level of the Standard International Trade Classification (SITC), say, 2, 3, or 4 digit level.¹

Define "intra-industry trade" as the value of exports of an "industry" which is exactly matched by the imports of the same industry at time period t ,

$$D_{it} = (X_{it} + M_{it}) - |X_{it} - M_{it}| \quad (2.1)$$

where X_{it} and M_{it} are the value of exports and imports of industry i , $i = 1, \dots, n$; and n is the number of industries at a chosen level of aggregation.

Define "inter-industry trade" of industry i at time period t as,

$$S_{it} = |X_{it} - M_{it}| \quad (2.2)$$

Clearly, inter-industry trade is the net exports or imports of an industry i at time period t .

Expressing D_{it} and S_{it} as a percentage of each industry combined exports and imports, we get

$$D_{rit} = \frac{(X_{it} + M_{it}) - |X_{it} - M_{it}|}{(X_{it} + M_{it})} \quad (2.3)$$

$$S_{rit} = \frac{|X_{it} - M_{it}|}{(X_{it} + M_{it})} \quad (2.4)$$

We shall call S_{rit} the "specialization ratio" in industry i at time period t , $i = 1, \dots, n$; and D_{rit} , the "differentiation ratio". Both ratios vary between zero and unity and thus if one ratio is calculated the other is easily obtained by subtracting the first from unity.

For a sample of n industries at any given time period t , we get a distribution of specialization ratios that is characterized by its mean and variance.

The mean and variance of the S_{ri} distribution are easily calculated. Since S_{ri} measures inter-industry trade as a percentage of the export and import trade, its weighted mean \hat{S}_{ri} is equal to the sum of the inter-industry trade for the industries as a percentage of the total export and import trade of the n industries,

$$\hat{S}_{rit} = \frac{\sum_{i=1}^n |X_{it} - M_{it}|}{\sum_{i=1}^n (X_{it} + M_{it})} \quad (2.5)$$

The "unweighted" mean of the distribution is simply,²

$$\overline{S_{rit}} = \frac{\sum_{i=1}^n \frac{|X_{it} - M_{it}|}{(X_{it} + M_{it})}}{n} \quad (2.5a)$$

and the variance,

$$\text{var}(S_{rit}) = \frac{1}{n-1} \sum_{i=1}^n (S_{rit} - \overline{S_{rit}})^2 \quad (2.6)$$

Empirically, specialization ratios and their distribution at time period t may be used for comparisons:

- (a) among different industries in the same country; and

- (b) among the same industries in different countries. Furthermore,
- (c) changes in these ratios over time between industries and countries; and
- (d) changes in these ratios after changes in tariff structure may be used as an indication of the pattern of specialization taking place in different industries and countries.

Clearly, if free trade prevails, and all of the assumptions of the traditional Heckscher-Ohlin model of trade especially those of perfect competition and homogeneity of products hold, then a country would tend to export or import a commodity but never both. In this case, the ratio would approach unity over time, an indication of "inter-industry" specialization as the traditional theory of trade predicts. If, however, the country exports and imports the same commodity due to product differentiation as discussed in section I.4.1 above, the calculated ratio would approach zero over time, an indication of "intra-industry" specialization.

Specialization in a Narrower Range of Products. If products are not differentiated, such as primary and some intermediate products, free trade may lead to "inter-industry" specialization as the traditional theory of trade predicts. If product differentiation is predominant, trade liberalization may lead a country to specialize in a narrower range of products (of certain brand or quality) or diversify its product line and the industry would not rise or decline as a whole, as discussed in section I.4.1 above.

To detect such pattern of specialization, we have to deal with industrial products defined at the finest division of the International

Standard Industrial Classification (ISIC) and the Standard International Trade Classification (SITC).

Assume for simplicity that countries 1, 2, and 3 form a customs union among themselves and thus eliminate all trade restrictions. Assume further that there are (j) industries in each country defined at a given level of aggregation, and the output of each industry is composed of the output of (n) industrial products. The output matrix of an industry (j) in the three countries is as follows:

| <u>Product</u> | <u>Country 1</u> | <u>Country 2</u> | <u>Country 3</u> | <u>Total (U)</u> |
|----------------|------------------|------------------|------------------|------------------|
| 1 | p11 | p12 | p13 | P1U |
| 2 | p21 | p22 | p23 | P2U |
| 3 | p31 | p32 | p33 | P3U |
| . | ... | ... | ... | ... |
| . | ... | ... | ... | ... |
| n | pn1 | pn2 | pn3 | PnU |
| <hr/> | <hr/> | <hr/> | <hr/> | <hr/> |
| Total | Pj1 | Pj2 | Pj3 | PjU |

Let the first subscript refer to product, the second to the country, and U to the union.

Let (t) refer to a post-union time period, and (0) to a pre-union time period.

Define the following shares of product's i ($i = 1, \dots, n$) that constitute the total output of industry j in country 1:

$$s_1 = p_{i1} / P_{j1}$$

$$s_2 = p_{i1} / P_{iU}$$

$$s_3 = P_{iU} / P_{jU},$$

and similarly for countries 2 and 3. Then, if

$$t^{s1} > 0^{s1} > t^{s3}, \text{ and}$$

$$t^{s2} > 0^{s2},$$

we may infer that there was an increase in country 1 specialization in product (i) after trade liberalization, other things being equal.

II.3 Estimating Changes in Trade Flows due to Trade Liberalization

In this section we present a simple model that will be used in the empirical sections to ascertain that changes in trade flows after the formation of a customs union are different compared to a pre-union period; and to assess the magnitude of trade-creation and trade-diversion by individual commodity groups. For simplicity of exposition we shall be dealing with a three country case where countries 1 and 3 form a customs union and country 2 represents the rest of the world.

The model presented here was originally developed by B. Balassa and seems to satisfy our purposes in this essay.³ It applies a residual imputation method that estimates the total effect of a customs union (or economic integration in general) for a given union year t , as the difference between the actual level of the variable studied, say V_t , and its expected "normal" level, without a customs union, V_t^* . The problem is to estimate the time path of V_t over the period 0 to t , where 0 is a pre-union period, assuming that there has been no customs union.

Thus, if we postulate that real imports of country j from country i of a certain commodity (m_{ij}) is a log linear function of the real Gross National Product in the importing country, y_j , and define the income elasticity of demand for real imports as,

$$\eta_{ij} \equiv d \ln m_{ij} / d \ln y_j \quad (2.7)$$

then,

$$\begin{aligned} t\eta_{13} &> o\eta_{13} && \text{points at "gross trade-creation"} \\ t\eta_{23} &< o\eta_{23} && \text{points at "trade-diversion"} \\ t\eta_{o3} &> o\eta_{o3} && \text{points at "net trade-creation"} \end{aligned} \quad (2.8)$$

where, as defined by Balassa, "gross trade-creation" is the increase in intra-area trade, irrespective of whether this increase has been due to substitution for domestic or for foreign sources of supply; trade-diversion is the decrease in trade due to shifts from foreign to partner country sources; and net trade-creation is the increase in trade due to shifts from domestic to partner country sources.

It should be pointed out that these elasticities are ex post estimates and computed by dividing the average annual rate of increase in real imports to that of real GNP.⁴

Inferences on trade-creation and trade diversion for each commodity are drawn from the values of these elasticities as indicated above.

II.4 Estimating Changes in Industrial Structure

We may use two methods to investigate changes in industrial structure after trade liberalization. The first is computational, the second applies dummy variables to ascertain the impact of trade liberalization on changes in industrial structure.

The first method is to calculate the growth rates of production volume, employment, and fixed capital formation in specific industries in an area before and after the union and identify expanding, stagnating,

and contracting industries in each country. If as the traditional trade theory predicts, countries would tend to specialize in the production of those commodities in which they have a cost advantage, then our calculations would show that some industries are expanding and others are contracting. This would be evident if we examine production volume, employment, and investment expenditures in a sample of industries. For example, if we find that industry i in country 1 is expanding and the same industry in country 2 is contracting, then, other things being equal, we may infer that trade liberalization has led to resource reallocation within industries in the union, as the theory predicts.

The second method reinforces the first and applies dummy variables. Fairly close relationships have been found between the growth of production volume in an industry on the one hand, and on the other, the growth of productivity and employment in that industry. The correlation between a fast growth of output and a fast growth of productivity is in itself a familiar and well-established proposition.⁵ Thus the following two relations may be estimated for each industry and country.

$$p_{ijt} = B_1 + B_2 q_{ijt} + u_t \quad (2.9)$$

$$e_{ijt} = B'_1 + B'_2 q_{ijt} + u'_t \quad (2.10)$$

where p is the annual growth rate in productivity, e the annual growth rate in employment, q the annual growth rate in production volume (output), B_1 and B_2 , the estimated intercept and slope of each relation, and u , an error term.

The meaning of these relations (propositions) is as follows: Equation (2.9) means that productivity in an industry can be taken to

increase independently of the rise of output by B1 percent per annum plus B2 percent per annum for each percentage point of output growth.

Equation (2.10) simply means that employment in an industry (falls) by B1' if there is no increase in output offset by a rise of B2' percent per annum for each percentage increase in output. The coefficients B1 and B1' add up to zero; the coefficients B2 and B2' sum up to unity. Thus, if we estimate the parameters of one equation, the parameters of the other equation are easily obtained.⁶

To test for a "union effect", that is to see if the productivity growth and employment growth in specific industries are significantly different during the union period compared to the pre-union period, we may use the dummy variable one and zero in the above equations and modify them to read

$$P_{ijt} = B1 + B2 q_{ijt} + B3 Dt + B4(Dt q_{ijt}) + u_t \quad (2.11)$$

$$e_{ijt} = \acute{B}1 + \acute{B}2 q_{ijt} + \acute{B}3 Dt + \acute{B}4(Dt q_{ijt}) + u_t \quad (2.12)$$

where D is a dummy variable that equals one for a union year, and equals zero for a pre-union year. B3 is the "differential intercept" and B4 is the "differential slope"⁷, and everything else is as defined above. This formulation will enable us to see if the intercepts and/or slopes of the estimated relations during the union period are significantly different from those in the pre-union period.

It should be pointed out that since (q) is part of the dependent variable and the independent variable in equations (2.9) and (2.11), any errors of measurement in (q) will cause B2 to be biased toward unity. Further, a positive value of (B2), (rates of growth of output and output per manhour are positively correlated) is not necessarily an evidence of

economies of scale.⁸ It should be emphasized here that we are not using the above formulations that were used somewhere else in the literature⁹ to prove or disprove the presence or absence of economies of scale. Our main objective is simply to see if rates of growth of productivity and employment in specific industries during the union period are statistically different from those during the pre-union period.

Footnotes for Chapter II

¹The model presented here is similar to B. Balassa's in "Tariff reduction and trade in manufactures among the Industrial Countries", American Economic Review, June, 1966. Also in B. Balassa (ed.), European Economic Integration, (Amsterdam: North-Holland Publishing Co., 1975). A similar model was also used by H. Grubel and P. Lloyd, Intra-industry Trade: The Theory and Measurement of International Trade in Differentiated Products (New York: John Wiley and Sons, 1975). The latter emphasized "intra-industry" specialization.

²B. Balassa (op cit, 1975) calculated unweighted means for the countries in the EEC. The weighted mean is more accurate; however, our sample of 30 industries gave weighted and unweighted mean that are approximately the same.

³B. Balassa, "Trade Creation and Trade Diversion in the European Common Market", Economic Journal, March, 1967. Also, B. Balassa (ed.) op cit, 1975.

⁴If $mT = m_0 e^{g \cdot T}$ where m_0 is real imports at the initial period and mT is real imports at time T where T is the length of time period, then, $\ln mT = \ln m_0 + g \cdot T$; and g , the average annual percentage increase in imports, is simply equal to $(\ln mT - \ln m_0)/T$. Dividing g by the average annual percentage increase in real GNP, we get the income elasticity of demand for real imports, as defined above.

⁵W. Salter, Productivity and Technical Change, 2nd edition (Cambridge, Massachusetts: Cambridge University Press, 1969) investigated these relationships in sample of industries in the United Kingdom. N. Kaldor, Causes of Slow Rate of Economic Growth in the United Kingdom (Cambridge, Massachusetts: Cambridge University Press, 1968) made an inter-industry comparison among industrial market economies. The United Nations, The Secretariat of the European Commission for Europe, "Economic Survey of Europe in 1969 - Part I", Structural Trends and Prospects in the European Economy (Geneva, 1969) also estimated these relationships in 13 industrial countries.

⁶Let q be the percentage rate of change in output, and e the percentage rate of change in employment, then $(q - e)$ is the percentage change in productivity. Given that $e = B_1 + B_2 q$ and $(q - e) = B'_1 + B'_2 q$, adding these equations, we get $q = (B_1 + B'_1) + (B_2 + B'_2)q$. That is, $(B_1 + B'_1) = 0$ and $(B_2 + B'_2) = 1$. I am indebted the Professor M. Grossman for clarifying this point.

⁷This formulation is standard in econometric texts. See for example R. Pindyk and D. Rubinfeld, Econometric Models and Economic Forecasts (New York: McGraw-Hill Co., 1976).

⁸I am indebted to Professor M. Grossman for the discussion of this point.

⁹See references in footnote 5.

CHAPTER III

PATTERNS OF TRADE AND SPECIALIZATION IN THREE EEC COUNTRIES

The outline of this chapter is as follows:

Section III.1 is a brief introduction. It describes the sample of industrial products covered, the sources, availability and quality of data.

Section III.2 presents and analyzes the empirical results obtained from the application of model (2.4) to a sample of 30 industries for the period 1953-1972 to measure the patterns of specialization in those industries.

Section III.3 identifies those industrial products that expanded most in terms of exports and imports after the formation of the Community; then we present the empirical results obtained from the application of model (2.7) to test for trade creation and trade diversion in our sample.

Section III.4 investigates specialization in a narrower range of products in a small sample of industries.

Section III.5 presents a brief summary of the empirical findings reported in this Chapter.

III.1 Introduction

In this chapter we investigate the patterns of trade and specialization in F.R. of Germany, France and Netherlands after the formation of the European Economic Community. We shall test the basic hypothesis presented in Chapter I applying the models presented in Chapter II to trade data relating to 30 industrial groupings "industries" chosen from

the SITC divisions 5, 6, 7 and 8, which relate to manufacturing, at the third-digit level.

The scope of this study is limited. It covers only a small sample of industrial products and industries in only three countries of the union. Further, the industrial commodities covered (as listed in Exhibit 3.1) may not comprise a randomly selected sample. The choice has been governed by the availability and quality of data. In spite of this shortcoming, I believe that the sample covers the most important industrial commodities traded internationally.

Trade Data: Trade statistics report imports and exports of each industrial commodity in million United States dollars at the official exchange rates. Import and export data are broken down into those imports and exports from EEC countries and those from the rest of the world, and are listed in tables A.1 to A.12 in the Appendix. For the subsequent analysis of this data, imports and exports of each commodity were "deflated" by Import Price Index and Export Price Index respectively. Price Indexes are listed in Tables A.13 to A.15 in the Appendix.

Both import and export statistics in our sample of 30 industrial products are aggregated at the third-digit level of the Standard International Trade Classification (SITC), and published by the United Nations, "Commodity Trade Statistics, Series D," and the Organization of Economic Cooperation and Development, "Commodity Trade, Series C."

Trade statistics are available and "consistent" for all industrial commodities at the first, second and third-digit levels of the SITC. However, trade statistics classified at the fourth and fifth-digit levels are not available for the Fifties and early Sixties, and not

Exhibit 3.1

Sample of Industrial Products Analyzed, Defined at the Third-Digit Level of the SITC

| <u>SITC #</u> | <u>Description</u> |
|---------------|---|
| 512 | Organic chemicals |
| 541 | Medical and pharmaceutical products |
| 561 | Manufactured fertilizers |
| 599 | Chemical material and products, nes (not elsewhere specified) |
| 611 | Leather |
| 629 | Articles of rubber, nes |
| 631 | Plywood board, etc. |
| 641 | Paper and paperboard |
| 642 | Articles made of paper pulp . . . etc. |
| 651 | Textile yarn and thread |
| 652 | Cotton fabrics |
| 653 | Textile fabrics other than cotton |
| 655 | Special textile fabrics |
| 657 | Floor covering |
| 661 | Lime, cement, prefabricated building materials |
| 664 | Glass |
| 665 | Glassware |
| 670 | Iron and steel products |
| 712 | Agricultural machinery |
| 714 | Office machines |
| 715 | Metal working machinery |
| 731 | Railway vehicles |
| 732 | Road motor vehicles |
| 734 | Aircraft |
| 735 | Ships and boats |
| 821 | Furniture |
| 841 | Clothing (except fur) |
| 861 | Scientific, medical instruments |
| 891 | Musical instruments, sound record |
| 899 | Manufactured articles, nes. |

Source: United Nations, Standard International Trade Classification, Statistical papers, series M, No. 34, 1971.

complete for all countries. Most likely, a finer division of the SITC may give more precise results in regard to the direction of specialization. However, for our purposes in this essay, three-digit aggregation seems to be very satisfactory and corresponds to the definition of an "industry" used in economic analysis, as discussed below.

III.2 Patterns of Specialization in Three EEC Countries

Before presenting our empirical results, we have to clear a basic concept: the concept of an industry.

III.2.1 The Concept of "an industry." The Heckscher-Ohlin model of international trade uses the term "industry" as a group of firms which produce a perfectly homogeneous product, such as wheat and cotton, etc. With this concept of an industry and other assumptions listed in Section I.2 above, the theory predicts certain patterns of specialization when trade is liberalized. But when it comes to testing the theory, we are confronted with the problem of finding the data that is consistent with such definition.

The concept of an industry as compiled by international data normally used as a group of commodities that are substitutes in consumption and similar in terms of input requirements in production. (Grubel and Lloyd, 1975). Accordingly, the two and three-digit aggregation of the Standard International Trade Classification would correspond to the concept of an industry as used in economic analysis.

Our analysis in this selection and the next will consider the three-digit aggregation of the SITC as "industries" although each industry includes many products that are differentiated one way or another as we discussed in section I.4.1 above.

III.2.2 Specialization Ratios. As discussed in Section II.2 above, "specialization ratio" for industry i at time period t was defined as:

$$S_{rit} = \left| X_{it} - M_{it} \right| / (X_{it} + M_{it})$$

where X_{it} and M_{it} are exports and imports of industry i at time period t "deflated" by Export Price Index and Import Price Index respectively and,

$$0 \leq S_{rit} \leq 1$$

where $S_{rit} = 1$ is an indication of "inter-industry" specialization where a country exports or imports a commodity but never both; and $S_{rit} = 0$ implies a country exports and imports the same commodity, and exports and imports of each industry are equal. This case as was explained in Section I.4.1 above may be due to product differentiation and may be an indication of increased "intra-industry" specialization.

We have calculated these ratios for a sample of 30 industrial products "industries" in three EEC countries, for selected years: 1953, 1959, 1965 and 1972. Before discussing specialization ratios in individual industries and changes in these ratios over time, we present a summary of the distributions of these ratios characterized by their means and variances.

The results are shown in Table 3.1 below where it is seen that both the means and variances of the distributions are declining over time in each country. The decline in the means of the distributions of the computed ratios indicates the importance of intra-industry trade; the decline in the variances of the distributions is not easily explained but may indicate that each country's trade with other members and the rest of the world has become more uniform. However, the

Table 3.1

Distribution of "Specialization Ratios" in 30 Industries in
3 EEC Countries Selected Years

| | Total Trade | | | | Trade with EEC | | | | Trade with non-EEC | | | |
|---------------------|-------------|-----|-----|-----|----------------|-----|-----|-----|--------------------|-----|-----|-----|
| | '53 | '59 | '65 | '72 | '53 | '59 | '65 | '72 | '53 | '59 | '65 | '72 |
| <u>F.R. Germany</u> | | | | | | | | | | | | |
| mean | .59 | .47 | .40 | .30 | .56 | .47 | .36 | .25 | .62 | .52 | .50 | .45 |
| var. | .09 | .08 | .06 | .04 | .08 | .06 | .04 | .03 | .10 | .08 | .07 | .05 |
| <u>France</u> | | | | | | | | | | | | |
| mean | .59 | .57 | .35 | .24 | .39 | .40 | .28 | .29 | .62 | .63 | .50 | .34 |
| var. | .08 | .06 | .04 | .03 | .09 | .06 | .04 | .04 | .10 | .10 | .08 | .07 |
| <u>Netherlands</u> | | | | | | | | | | | | |
| mean | .38 | .29 | .31 | .27 | .51 | .34 | .36 | .28 | .50 | .35 | .37 | .34 |
| var. | .06 | .04 | .07 | .06 | .10 | .07 | .07 | .06 | .07 | .07 | .07 | .06 |

Source: Tables 3.2, 3.4, 3.6.

percentage decline in the means during the period is not the same in the three countries studied. The percentage decline during the period 1953-1972 computed from total trade, trade with EEC countries, and trade with the rest of the world, is as follows:

| <u>Country</u> | <u>Total Trade</u> | <u>Trade with EEC</u> | <u>Trade with non-EEC</u> |
|-----------------|--------------------|-----------------------|---------------------------|
| F.R. of Germany | 49% | 55% | 27% |
| France | 59% | 26% | 45% |
| Netherlands | 30% | 45% | 32% |

Thus, in relation to total trade, the mean has declined by 59% in France compared to 49% in F.R. of Germany and only 30% in Netherlands. If the percentage decline in the mean is used as an indication of the importance of "intra-industry" trade, then it is seen that French trade in differentiated products has become, on the average, more important compared to Germany and Netherlands, the smallest country in our sample where the mean has declined by one-half that of France.

However, the picture is somewhat different with regard to each country's trade with other EEC members and the rest of the world. Using the above terminology, it is seen that intra-industry trade of Germany with other EEC members is more important compared to its trade with non-EEC countries. This is in contrast to France where intra-industry trade with non-EEC countries is more important. In Netherlands, intra-industry trade with other EEC members is more important than with non-EEC countries. Accordingly, although "inter-industry" specialization is not apparent in any one of these countries, trade liberalization seems to have affected each member differently.

However, before drawing any general conclusions it may be worthwhile to discuss specialization ratios on an industry by industry and a country by country basis.

F.R. of Germany. Table 3.2 below lists specialization ratios calculated for a sample of 30 German industries aggregated at the third-digit level of the SITC for selected years: 1953, 1959, 1965 and 1972. As was explained above, changes in these ratios over time would tell us something about the trend of specialization taking place in industries and countries.

The picture that emerges from these ratios is clear: intra-industry trade is the predominant factor where a country's real exports and real imports of a certain commodity tend to be equal over time. This is apparent from the decline of the ratios in most industries during the study period. There is no clear indication of inter-industry specialization as the traditional theory of trade predicts.

Table 3.2

F.R. of Germany
"Specialization Ratios" by SITC Division

| SITC# | Total Trade | | | | Trade with EEC | | | | Trade with non-EEC | | | |
|-------|-------------|-----|-----|-----|----------------|-----|-----|-----|--------------------|-----|-----|-----|
| | '53 | '59 | '65 | '72 | '53 | '59 | '65 | '72 | '53 | '59 | '65 | '72 |
| 512 | .76 | .72 | .34 | .23 | .69 | .68 | .28 | .03 | .79 | .74 | .36 | .45 |
| 541 | .61 | .10 | .59 | .45 | .20 | .16 | .37 | .19 | .71 | .16 | .64 | .57 |
| 561 | .92 | .90 | .80 | .31 | .50 | .69 | .25 | .02 | 1.0 | .93 | .99 | .49 |
| 599 | .39 | .49 | .42 | .42 | .36 | .41 | .32 | .30 | .40 | .51 | .48 | .52 |
| 611 | .12 | .05 | .18 | .36 | .54 | .38 | .51 | .61 | .14 | .14 | .16 | .05 |
| 629 | .74 | .38 | .02 | .08 | .50 | .10 | .28 | .09 | .79 | .49 | .19 | .30 |
| 631 | .20 | .04 | .21 | .32 | .20 | .13 | .39 | .43 | .20 | .14 | .01 | .20 |
| 641 | .27 | .51 | .56 | .35 | .09 | .27 | .24 | .08 | .36 | .56 | .68 | .57 |
| 642 | .64 | .55 | .29 | .22 | .82 | .44 | .14 | .18 | .60 | .61 | .43 | .31 |
| 651 | .39 | .28 | .31 | .04 | .77 | .70 | .64 | .25 | .06 | .06 | .14 | .41 |
| 652 | .47 | .30 | .05 | .02 | .08 | .25 | .31 | .08 | .53 | .50 | .34 | .16 |
| 653 | .19 | .07 | .09 | .02 | .51 | .59 | .35 | .28 | .51 | .29 | .32 | .51 |
| 655 | .36 | .32 | .32 | .22 | .25 | .39 | .14 | .10 | .43 | .30 | .51 | .59 |
| 657 | .33 | .44 | .63 | .61 | .71 | .66 | .76 | .52 | 0.0 | .31 | .53 | .70 |
| 661 | .89 | .20 | .11 | .47 | .80 | .31 | .11 | .51 | .92 | .05 | .12 | .31 |
| 664 | .69 | .64 | .10 | .02 | .50 | .64 | .23 | .37 | .78 | .63 | .40 | .58 |
| 665 | .89 | .69 | .30 | .09 | .96 | .53 | .11 | .04 | .88 | .77 | .50 | .28 |
| 670 | .37 | .35 | .29 | .15 | .20 | .10 | 0.0 | .09 | .77 | .69 | .59 | .42 |
| 712 | .89 | .79 | .50 | .55 | .80 | .85 | .41 | .35 | .93 | .74 | .60 | .74 |
| 714 | .41 | .35 | .16 | .13 | .45 | .06 | .03 | .13 | .38 | .55 | .30 | .12 |
| 715 | .86 | .76 | .65 | .65 | .94 | .80 | .62 | .57 | .83 | .75 | .66 | .69 |
| 731 | .96 | .91 | .77 | .55 | .67 | .49 | .52 | .37 | 1.0 | .97 | .83 | .66 |
| 732 | .91 | .83 | .73 | .53 | .81 | .26 | .35 | .11 | .95 | .97 | .94 | .89 |
| 734 | 0.0 | .56 | .33 | .45 | 0.0 | .89 | .44 | .09 | 0.0 | .47 | .74 | .56 |
| 735 | .87 | .86 | .60 | .36 | .86 | .74 | .18 | .43 | .88 | .88 | .73 | .64 |
| 821 | .94 | .47 | .99 | .18 | .94 | .61 | .99 | .16 | .94 | .34 | .99 | .21 |
| 841 | .05 | .03 | .33 | .50 | .54 | .43 | .38 | .48 | .31 | .31 | .27 | .54 |
| 861 | .91 | .79 | .55 | .35 | .89 | .79 | .64 | .40 | .91 | .78 | .51 | .33 |
| 891 | .79 | .70 | .52 | .42 | .50 | .74 | .40 | .17 | .87 | .68 | .58 | .63 |
| 899 | .81 | .17 | .35 | .09 | .74 | .01 | .26 | .12 | .84 | .21 | .41 | .06 |
| Mean | .59 | .47 | .40 | .30 | .56 | .47 | .36 | .25 | .62 | .52 | .50 | .45 |
| Var. | .09 | .08 | .06 | .04 | .08 | .06 | .04 | .03 | .10 | .08 | .07 | .05 |

Source: Tables A-1 to A-4, and A-13.

In our sample of 30 industries only six show a tendency towards increase specialization although it is too far from being complete. These industries are listed in Table 3.3 below:

Table 3.3
 F.R. of Germany
 Industries with Increasing "Specialization Ratios," 1959-1972
 (Total Trade)

| SITC # | 1959 | | 1972 | |
|--------|-------|---------------|-------|---------------|
| | Ratio | Trade balance | Ratio | Trade balance |
| 541 | .10 | net export | .45 | net export |
| 611 | .05 | net import | .36 | net import |
| 631 | .04 | net export | .32 | net import |
| 657 | .44 | net import | .61 | net import |
| 661 | .20 | net export | .47 | net export |
| 841 | .03 | net export | .50 | net import |

Source: Table 3.2

It is seen from Table 3.3 that four of these industries have maintained their trade balance — that is, net export industries continued to be net export, and net import continued to be net import. Two of these industries have switched from net import to net export or vice versa.

France: Table 3.4 below lists the specialization ratios calculated for a sample of 30 "industries" in France — the same sample covered for F.R. of Germany and Netherlands — for selected years: 1953, 1959, 1965

and 1972. Specialization ratios were calculated in relation to total trade, trade with EEC countries and trade with the rest of the world for the periods indicated.

Again the tendency for these ratios to decline over time is very clear. Further, as shown at the bottom of table 3.4, the means and variances of these ratios are declining over time, an indication that trade in differentiated products is the dominant factor. The figures do not show any clear tendency towards "inter-industry" specialization, as the traditional theory predicts.

Table 3.5 lists those "industries" that show a tendency towards increased specialization in terms of increased specialization ratios over time, and they are very few indeed. Only three out of our sample of 30 industries show a tendency towards increasing specialization although it is too far from being complete. Two of these industries, SITC 657 and SITC 664 have switched from net export industries to net import during the period 1959-1972.

Table 3.4

France
"Specialization Ratios" by SITC Division

| SITC # | Total Trade | | | | Trade with EEC | | | | Trade with non-EEC | | | |
|--------|-------------|-----|-----|-----|----------------|-----|-----|-----|--------------------|-----|-----|-----|
| | '53 | '59 | '65 | '72 | '53 | '59 | '65 | '72 | '53 | '59 | '65 | '72 |
| 512 | .05 | .46 | 0.0 | .24 | .33 | .32 | .13 | .35 | .24 | .54 | .09 | .12 |
| 541 | .73 | .61 | .36 | .21 | .66 | .07 | .03 | .04 | .73 | .71 | .47 | .29 |
| 561 | .94 | .63 | .22 | .37 | .33 | .33 | .38 | .71 | .99 | .83 | .84 | .17 |
| 599 | .08 | .14 | .29 | .09 | .23 | .01 | .19 | .10 | .18 | .21 | .38 | .32 |
| 611 | .59 | .64 | .51 | .27 | .85 | .78 | .71 | .55 | .43 | .53 | .28 | .01 |
| 629 | .77 | .78 | .64 | .43 | 0.0 | .21 | .44 | .22 | .83 | .87 | .76 | .65 |
| 631 | .68 | .64 | .63 | .76 | .67 | .67 | .47 | .24 | .68 | .62 | .73 | .22 |
| 641 | .28 | .04 | .37 | .33 | .50 | .43 | .07 | .16 | .26 | .08 | .52 | .54 |
| 642 | .85 | .73 | .35 | .12 | .82 | .21 | .08 | .30 | .86 | .84 | .66 | .49 |
| 651 | .80 | .85 | .62 | .25 | .74 | .82 | .48 | .09 | .82 | .88 | .80 | .56 |
| 652 | .89 | .90 | .55 | .81 | .43 | .60 | .42 | .06 | .96 | .95 | .64 | .11 |
| 653 | .83 | .78 | .37 | .47 | .47 | .62 | .12 | .14 | .88 | .83 | .64 | .50 |
| 655 | .53 | .67 | .21 | .11 | 0.0 | .50 | .65 | .09 | .60 | .72 | .36 | .51 |
| 657 | .24 | .34 | .18 | .50 | 0.0 | .63 | .15 | .61 | .25 | .50 | .23 | .17 |
| 661 | .82 | .68 | .21 | .16 | 0.0 | .26 | .10 | .02 | .99 | .88 | .71 | .46 |
| 664 | .82 | .80 | .55 | .89 | 0.0 | .60 | .32 | .36 | .83 | .90 | .78 | .60 |
| 665 | .67 | .67 | .46 | .53 | .33 | .34 | .16 | .30 | .73 | .81 | .73 | .78 |
| 670 | .85 | .60 | .26 | .25 | .77 | .20 | .10 | .28 | .87 | .93 | .78 | .57 |
| 712 | .04 | .39 | .29 | .30 | .67 | .75 | .49 | .36 | .16 | .13 | 0.0 | .16 |
| 714 | .16 | .03 | .03 | .12 | .11 | .05 | .02 | .36 | .18 | .02 | .09 | .20 |
| 715 | .21 | .39 | .15 | .29 | .68 | .79 | .51 | .58 | .04 | .10 | .18 | .05 |
| 731 | .90 | .79 | .73 | .79 | .50 | .15 | .27 | .44 | .95 | .93 | .93 | .93 |
| 732 | .78 | .88 | .38 | .34 | .56 | .63 | .29 | .13 | .82 | .94 | .53 | .69 |
| 734 | .68 | .23 | .40 | .04 | 0.0 | .58 | .31 | .09 | .68 | .14 | .43 | .03 |
| 735 | .35 | .26 | .49 | .21 | .73 | .38 | .36 | .60 | .14 | .45 | .78 | .64 |
| 821 | .78 | .66 | .33 | .43 | .82 | .42 | .67 | .59 | .88 | .93 | .25 | .11 |
| 841 | .79 | .87 | .64 | .25 | .25 | .42 | .47 | .30 | .90 | .95 | .85 | .09 |
| 861 | .21 | .24 | .13 | .19 | .14 | .12 | .27 | .37 | .29 | .37 | .05 | .04 |
| 891 | .60 | .58 | .03 | .33 | 0.0 | .21 | .30 | .42 | .75 | .72 | .27 | .21 |
| 899 | .51 | .69 | .17 | .03 | .14 | .58 | .01 | .02 | .57 | .71 | .29 | .41 |
| Mean | .58 | .57 | .35 | .24 | .39 | .40 | .28 | .29 | .62 | .64 | .50 | .34 |
| Var. | .08 | .06 | .04 | .03 | .09 | .06 | .04 | .04 | .10 | .10 | .08 | .07 |

Source: Tables A-5 to A-8, and A-14.

Table 3.5

 France
 Industries with Increasing "Specialization Ratios" 1959-1972
 (Total Trade)

| SITC # | 1959 | | 1972 | |
|--------|-------|---------------|-------|---------------|
| | Ratio | Trade Balance | Ratio | Trade Balance |
| 641 | .04 | net import | .33 | net import |
| 657 | .34 | net export | .50 | net import |
| 664 | .80 | net export | .89 | net import |

Source: Table 3.4

Netherlands: Specialization ratios for the same German and French sample of 30 "Industries" are calculated for the Netherlands and listed in Table 3.6 below. Generally, the results for Netherlands are not much different from those in Germany and France. As it is clearly seen from Table 3.6 "specialization ratios" are declining over time indicating the importance of product differentiation in trade. The means and variances of the specialization ratios' distributions are also declining as seen at the bottom of Table 3.6. Thus the figures do not show a clear tendency towards inter-industry specialization as the traditional theory of trade predicts.

Table 3.7 lists those industries with increasing specialization ratios over time. There are more of such industries in Netherlands than in Germany and France. This might be an indication that "inter-industry" specialization, although far from being complete, is more evident in Netherlands, the smallest country in our sample.

Table 3.6

Netherlands
"Specialization Ratios" by SITC Division

| SITC # | Total Trade | | | | Trade with EEC | | | | Trade with non-EEC | | | |
|--------|-------------|-----|-----|-----|----------------|-----|-----|-----|--------------------|-----|-----|-----|
| | '53 | '59 | '65 | '72 | '53 | '59 | '65 | '72 | '53 | '59 | '65 | '72 |
| 512 | .23 | .08 | .04 | .26 | .45 | .13 | .03 | .38 | .07 | .24 | .10 | .10 |
| 541 | .44 | .29 | .30 | .17 | .20 | .23 | .25 | .06 | .54 | .32 | .35 | .44 |
| 561 | .42 | .60 | .48 | .69 | .99 | .98 | .45 | .28 | .95 | .93 | .86 | .88 |
| 599 | .38 | .19 | .26 | .27 | .24 | .07 | .12 | .20 | .45 | .32 | .37 | .36 |
| 611 | .07 | .15 | .03 | .10 | .95 | .24 | .10 | .10 | .45 | .02 | .34 | .11 |
| 629 | 0.0 | .22 | .04 | .06 | .25 | .07 | .09 | .08 | .25 | .44 | .15 | .02 |
| 631 | .62 | .55 | .68 | .60 | .94 | .59 | .68 | .64 | .50 | .53 | .69 | .50 |
| 641 | 0.0 | .08 | .14 | .11 | .05 | .17 | .28 | .12 | .03 | .30 | .62 | .55 |
| 642 | .25 | .23 | .13 | .10 | .20 | .40 | .13 | .14 | .33 | .02 | .12 | .06 |
| 651 | .15 | 0.0 | .03 | .15 | .53 | .39 | .15 | .06 | .50 | .66 | .55 | .05 |
| 652 | .52 | .38 | .24 | .13 | .36 | 0.0 | .01 | .06 | .84 | .63 | .54 | .22 |
| 653 | .20 | .04 | .05 | .07 | .02 | .17 | .11 | .09 | .57 | .44 | .23 | .42 |
| 655 | .17 | .07 | 0.0 | .24 | .67 | .02 | .18 | .17 | .33 | .11 | .33 | .39 |
| 657 | .33 | .51 | .08 | .06 | 0.0 | .13 | .25 | .05 | .71 | .74 | .30 | .10 |
| 661 | .71 | .73 | .92 | .87 | .92 | .76 | .92 | .89 | .50 | .32 | .91 | .50 |
| 664 | .20 | .23 | .22 | .10 | .45 | .53 | .30 | .16 | .50 | .41 | .09 | .20 |
| 665 | .43 | .49 | .71 | .52 | .50 | .66 | .81 | .54 | .33 | .02 | .34 | .38 |
| 670 | .81 | .24 | .22 | .19 | .81 | .53 | .51 | .01 | .83 | .39 | .46 | .56 |
| 712 | .64 | .27 | .39 | .01 | .50 | .49 | .49 | .19 | .90 | .02 | .19 | .29 |
| 714 | .33 | .40 | .04 | .09 | .60 | .21 | .23 | .06 | .14 | .20 | .09 | .13 |
| 715 | .68 | .54 | .44 | .32 | .80 | .54 | .58 | .40 | .56 | .54 | .18 | .20 |
| 731 | .58 | .54 | .30 | .65 | .96 | .71 | .43 | .77 | .86 | .02 | .33 | .74 |
| 732 | .66 | .71 | .51 | .56 | .76 | .75 | .72 | .67 | .54 | .54 | .05 | .17 |
| 734 | .18 | .02 | .20 | .06 | .97 | .51 | .40 | .22 | .48 | .07 | .18 | 0.0 |
| 735 | .77 | .56 | .67 | .76 | .30 | .44 | .43 | .62 | .91 | .90 | .79 | .84 |
| 821 | .69 | .18 | .99 | .40 | .67 | .16 | 1.0 | .42 | .82 | .22 | .98 | .31 |
| 841 | .08 | .19 | .42 | .39 | .03 | .19 | .44 | .32 | .23 | .18 | .35 | .66 |
| 861 | .41 | .22 | .25 | .06 | .43 | .02 | .22 | .32 | .40 | .43 | .27 | .26 |
| 891 | .33 | .01 | .07 | .13 | .33 | .36 | .13 | .26 | .33 | .35 | .05 | .05 |
| 899 | .23 | .25 | .34 | .19 | .38 | .32 | .30 | .08 | .08 | .14 | .39 | .35 |
| Mean | .38 | .30 | .31 | .28 | .51 | .36 | .36 | .28 | .50 | .35 | .37 | .33 |
| Var. | .06 | .04 | .07 | .06 | .10 | .07 | .07 | .06 | .07 | .07 | .07 | .06 |

Source: Table A-9 to A-12, and A-15.

Table 3.7
Netherlands
 Industries with Increasing "Specialization Ratios" 1959-1972

(Total Trade)

| SITC # | 1959 | | 1972 | |
|--------|-------|---------------|-------|---------------|
| | Ratio | Trade Balance | Ratio | Trade Balance |
| 561 | .60 | net export | .69 | net export |
| 631 | .55 | net import | .60 | net import |
| 661 | .73 | net import | .87 | net import |
| 665 | .49 | net import | .52 | net import |
| 731 | .54 | net import | .65 | net import |
| 735 | .56 | net export | .76 | net export |
| 841 | .19 | net import | .39 | net import |

Source: Table 3.6

It is also seen from Table 3.7 that out of the 7 "industries" listed, only two are net export industries. The rest are net import industries.

III.3 The Effect of EEC on Trade Flows

In this section we investigate the changes in trade flows in three EEC countries after the formation of the union. First, we examine the growth of each country's trade with other members and the rest of the world; then we investigate trade-creation and trade-diversion in each country in a sample of 30 industrial commodities.

The purpose of this investigation is twofold: First, the results will reinforce the empirical findings above as to the direction of specialization in each country by individual commodity groups, and

second, we shall be able to assess the magnitude of trade creation and diversion in each country in our sample.

III.3.1 Internal and External Trade Expansion: In Section III.2 above, we analyzed the absolute values of exports and imports of each "industry" to examine the patterns of specialization. Here we examine the growth of internal and external trade (trade with EEC members and non-EEC members) of each country by individual commodity groups. An "industry" could be expanding or contracting in all countries; yet the annual rate of growth or decline may be different in different countries.

Our task here is to identify the most expansive "industries" in terms of the growth of real exports and imports. If, as the traditional theory of trade predicts, free trade would lead to "inter-industry" specialization, then the exports or imports of a country of a given commodity would expand relatively more than other countries.

Tables A-16 - A-18 in the Appendix list the average annual growth rates of each country's trade (exports and imports) with other EEC countries and the rest of the world, by industrial commodities at the third-digit level of the SITC. It is clearly seen that almost all industrial products in our sample have expanded at high rates in terms of real exports and real imports from other EEC countries and the rest of the world. This expansion however, started from the early Fifties before the formation of the union. The general picture that emerges from these numbers is clear:

- (a) The industrial products that have expanded in terms of real exports have also expanded in terms of real imports.
- (b) Each country's exports to and imports from other partners have expanded at higher rates than exports to and imports from non-partners.

Table 3.8

Average Annual Growth Rates of Real Exports and Imports of
Each Country from Other EEC Countries, by SITC Division,
1959-1972

(The Most Expansive Industries)

| SITC# | Description | EXPORTS | | | IMPORTS | | |
|-------|-------------------------|---------|------|-------|---------|------|-------|
| | | Ger. | Fra. | Neth. | Ger. | Fra. | Neth. |
| 512 | Organic Chemicals | 11 | 13 | 20 | 23 | 23 | 12 |
| 561 | Mftd. Fertilizers | 6 | 11 | 41 | 18 | 19 | 3 |
| 629 | Articles of Rubber | 18 | 21 | 11 | 20 | 21 | 13 |
| 641 | Paper and Board | 20 | 17 | 12 | 17 | 26 | 13 |
| 651 | Textile Yarn | 19 | 7 | 14 | 10 | 23 | 7 |
| 653 | Textile Fabrics . . . | 18 | 13 | 12 | 12 | 26 | 11 |
| 655 | Special Text. Fabrics | 15 | 20 | 20 | 22 | 30 | 18 |
| 657 | Floor Covering | 20 | 14 | 19 | 17 | 24 | 20 |
| 661 | Lime, Cement . . . | 6 | 12 | 1 | 19 | 16 | 6 |
| 670 | Iron and Steel | 10 | 5 | 12 | 9 | 13 | 4 |
| 712 | Agric. Machinery | 10 | 23 | 19 | 23 | 15 | 14 |
| 714 | Office Machines | 20 | 17 | 18 | 17 | 16 | 16 |
| 715 | Metal Working Mach. | 10 | 17 | 10 | 17 | 11 | 7 |
| 731 | Railway Vehicles | 11 | 18 | 7 | 13 | 13 | 9 |
| 732 | Road Motor Vehicles | 17 | 16 | 17 | 19 | 26 | 14 |
| 734 | Aircraft | 25 | 13 | 15 | 6 | 21 | 26 |
| 735 | Ships and Boats | 4 | 14 | 17 | 24 | 18 | 0 |
| 821 | Furniture | 19 | 22 | 15 | 27 | 25 | 23 |
| 841 | Clothing Except Fur | 21 | 23 | 15 | 22 | 25 | 18 |
| 861 | Scientific & Med. Inst. | 14 | 16 | 19 | 23 | 20 | 14 |
| 891 | Musical Inst. | 15 | 16 | 12 | 26 | 26 | 11 |

Source: Tables A.16-A.18

(c) The expanding industries in terms of the growth of real exports and real imports are about the same in the three countries in our sample.

This phenomenon is in accord with the findings above that trade liberalization may have led to intra- rather than inter-industry specialization.

However, a careful examination of the growth rates reveals the fact that although the expansive industries are generally the same, the rates of growth in individual industries in different countries, differ. This is shown in Table 3.8 where we only listed those industries that expanded most in terms of real exports and real imports of each country from other EEC members.

This, however, would not affect the above conclusion regarding the trend of specialization, for none of these industries expanded in one country and contracted in all other countries. Further, there appears to have been specialization in some sub-products the identification of which requires one to deal with the finest division of the SITC and ISIC. For example, it is seen from Table 3.8 that there is a tendency for the Netherlands to specialize in some "intermediate" products such as organic chemicals, fertilizers, and some steel products where real exports of those products expanded by more than the other two countries, and real imports expanded by less. In Section III.4 below, we investigate specialization in a narrower range of products in a small sample of industries.

III.3.2 Trade-creation and Trade-diversion: Most empirical studies that investigated trade-creation and trade-diversion in the EEC have concluded that the EEC was a trade-creating customs union. Such

Table 3.9

F.R. of Germany

Income Elasticities of Demand for Imports by SITC Division

| SITC # | Imports from EEC | | Imports from non-EEC | | Total Imports | |
|-----------------|------------------|-------|----------------------|-------|---------------|-------|
| | I | II | I | II | I | II |
| 512 | 1.4 | 4.5 | 1.6 | 2.9 | 1.5 | 3.7 |
| 541 | 3.2 | 2.0 | 4.5 | 0.7 | 4.1 | 1.2 |
| 561 | (0.4) | 3.6 | 7.6 | 2.6 | 1.5 | 3.1 |
| 599 | 2.1 | 2.0 | 2.3 | 0.4 | 2.2 | 1.1 |
| 611 | 1.2 | 2.4 | 1.5 | 1.4 | 1.3 | 2.0 |
| 629 | 4.1 | 4.0 | 3.7 | 2.3 | 3.8 | 3.2 |
| 631 | 2.0 | 3.1 | 1.3 | 2.2 | 1.6 | 2.7 |
| 641 | 2.7 | 3.3 | 2.3 | 1.8 | 2.4 | 2.2 |
| 642 | 6.5 | 4.2 | 2.4 | 2.9 | 3.4 | 3.6 |
| 651 | 0.8 | 1.9 | 0.8 | 1.1 | 0.8 | 1.7 |
| 652 | 2.2 | 2.2 | 0.2 | 1.2 | 0.9 | 1.8 |
| 653 | 1.7 | 2.4 | 1.4 | 1.0 | 1.6 | 2.0 |
| 655 | 0.6 | 4.4 | 2.0 | 1.5 | 1.5 | 3.0 |
| 657 | 1.6 | 3.4 | 3.0 | 3.2 | 2.2 | 3.3 |
| 661 | 3.8 | 3.7 | 3.8 | 1.7 | 3.8 | 3.0 |
| 664 | 3.2 | 3.9 | 1.0 | 3.2 | 2.4 | 3.7 |
| 665 | 7.1 | 3.9 | 2.4 | 2.8 | 3.6 | 3.5 |
| 67 | 1.8 | 1.8 | 2.4 | 2.2 | 1.9 | 1.9 |
| 712 | 1.8 | 4.4 | 3.5 | 2.1 | 2.9 | 3.3 |
| 714 | 4.1 | 3.3 | 1.6 | 4.0 | 2.6 | 3.7 |
| 715 | 2.4 | 3.2 | 2.1 | 1.5 | 2.2 | 2.0 |
| 731 | 1.8 | 2.6 | 4.3 | 3.9 | 2.2 | 3.0 |
| 732 | 5.1 | 3.8 | 2.1 | 3.6 | 4.3 | 3.8 |
| 734 | 10.2 | 1.3 | 12.2 | 2.0 | 11.4 | 1.8 |
| 735 | 3.2 | 4.8 | 2.1 | 2.9 | 2.3 | 3.7 |
| 821 | 7.1 | 5.2 | 8.3 | 3.5 | 7.8 | 4.4 |
| 841 | 1.4 | 4.2 | 1.9 | 4.1 | 1.6 | 4.2 |
| 861 | 2.9 | 4.5 | 3.1 | 3.5 | 3.1 | 3.7 |
| 891 | 1.0 | 5.1 | 4.1 | 2.1 | 3.1 | 3.3 |
| 899 | 5.7 | (0.3) | 7.7 | (1.8) | 7.1 | (1.4) |
| All 30 products | 2.07 | 2.83 | 2.65 | 1.95 | 2.36 | 2.43 |

Source: Tables A-3, A-4, and A-13.

I = 1953-59

II = 1959-72

Table 3-10

France

Income Elasticities of Demand for Imports by SITC Division

| SITC # | Imports from EEC | | Imports from non-EEC | | Total | |
|-----------------|------------------|------|----------------------|------|-------|-----|
| | I | II | I | II | I | II |
| 512 | (2.5) | 4.0 | (2.2) | 3.4 | (2.4) | 3.7 |
| 541 | 4.8 | 2.5 | (0.4) | 2.5 | 0.8 | 2.5 |
| 561 | 4.8 | 3.3 | 10.8 | 2.4 | 6.1 | 3.1 |
| 599 | 1.2 | 2.3 | 0.6 | 0.8 | 0.8 | 1.6 |
| 611 | 1.6 | 2.6 | (1.0) | 2.4 | (0.5) | 2.5 |
| 629 | 0.3 | 3.7 | (2.0) | 2.7 | (1.0) | 3.3 |
| 631 | 0.3 | 3.3 | (0.3) | 2.0 | (0.1) | 2.6 |
| 641 | 2.5 | 4.5 | 0.3 | 2.3 | 0.5 | 2.9 |
| 642 | 7.8 | 4.3 | 0.3 | 2.6 | 2.2 | 3.7 |
| 651 | (2.0) | 4.0 | (3.3) | 2.3 | (2.7) | 3.4 |
| 652 | (3.6) | 4.2 | (3.3) | 4.0 | (3.5) | 4.1 |
| 653 | (0.6) | 4.5 | (1.0) | 2.0 | (0.9) | 3.7 |
| 655 | (2.0) | 5.2 | (3.3) | 2.5 | (2.9) | 4.1 |
| 657 | 7.8 | 4.3 | (3.3) | 2.5 | (1.1) | 3.7 |
| 661 | (0.6) | 2.7 | 5.5 | 2.7 | 0.1 | 2.7 |
| 664 | 7.9 | 4.5 | (2.0) | 2.7 | 1.3 | 4.2 |
| 665 | 1.6 | 2.9 | (2.0) | 1.8 | 0.3 | 2.5 |
| 67 | 6.3 | 2.2 | (2.9) | 3.0 | 3.4 | 2.3 |
| 712 | 2.7 | 2.6 | (2.4) | 2.6 | 0.5 | 2.6 |
| 714 | 2.5 | 2.9 | (0.7) | 3.3 | 0.6 | 3.1 |
| 715 | (0.4) | 1.9 | (2.6) | 1.2 | (1.6) | 1.7 |
| 731 | 1.6 | 2.3 | (2.0) | 2.3 | 0.3 | 2.3 |
| 732 | 1.8 | 4.6 | (1.8) | 3.1 | (0.2) | 4.2 |
| 734 | 9.1 | 3.7 | (3.6) | 2.5 | (3.3) | 2.7 |
| 735 | (3.2) | 3.1 | (2.9) | 1.7 | (3.0) | 2.5 |
| 821 | 3.3 | 4.5 | (2.0) | 4.3 | 1.6 | 4.4 |
| 841 | 0.8 | 4.4 | (0.6) | 4.6 | 0.3 | 4.5 |
| 861 | 0.7 | 3.5 | (1.2) | 2.9 | (0.6) | 3.2 |
| 891 | 0.3 | 4.5 | 0.3 | 3.9 | 0.3 | 4.3 |
| 899 | (1.0) | 2.6 | (1.0) | 1.4 | (1.0) | 1.8 |
| All 30 products | 1.93 | 3.11 | (1.68) | 2.55 | (0.6) | 2.9 |

Source: Tables A-7, A-8 and A-14.

I = 1953-59

II = 1959-72

Table 3.11

Netherlands

Income Elasticities of Demand for Imports by SITC Division

| SITC # | Imports from EEC | | Imports from non-EEC | | Total Imports | |
|-----------------|------------------|------|----------------------|-------|---------------|------|
| | I | II | I | II | I | II |
| 512 | 3.1 | 2.5 | 2.7 | 2.8 | 2.9 | 2.6 |
| 541 | 4.0 | 3.3 | 4.1 | 1.5 | 4.0 | 2.5 |
| 561 | (1.9) | 0.7 | 1.2 | 1.8 | (1.6) | 0.9 |
| 599 | 3.3 | 1.4 | 2.3 | 1.0 | 2.8 | 1.2 |
| 611 | 0.8 | 1.7 | 1.2 | 1.2 | 1.0 | 1.5 |
| 629 | 1.2 | 2.7 | (0.2) | 2.3 | 0.8 | 2.6 |
| 631 | 2.2 | 2.7 | 0.6 | 0.9 | 1.2 | 2.0 |
| 641 | 1.0 | 2.7 | 1.3 | 1.7 | 1.2 | 2.1 |
| 642 | 1.2 | 3.9 | 4.3 | 1.7 | 2.6 | 3.1 |
| 651 | (0.1) | 1.4 | (1.1) | 1.6 | (0.3) | 1.5 |
| 652 | 0.6 | 0.9 | 2.4 | 1.1 | 1.1 | 1.0 |
| 653 | 1.0 | 2.2 | 0.9 | 1.3 | 1.0 | 2.1 |
| 655 | (1.9) | 3.6 | 4.0 | 0.7 | 1.0 | 2.3 |
| 657 | (1.1) | 4.0 | 1.2 | 2.5 | (0.5) | 3.7 |
| 661 | (0.1) | 1.2 | 1.2 | 0.4 | (0.1) | 1.2 |
| 664 | 1.4 | 1.7 | 2.6 | 1.2 | 1.6 | 1.6 |
| 665 | 2.9 | 2.3 | (1.1) | 2.0 | 1.8 | 2.2 |
| 67 | 0.5 | 0.8 | (1.4) | 1.2 | 0.1 | 0.9 |
| 712 | 1.2 | 2.8 | 0.2 | 2.3 | 0.9 | 2.7 |
| 714 | 2.3 | 3.3 | 2.3 | 2.9 | 2.3 | 3.0 |
| 715 | 0.4 | 1.4 | (1.1) | 1.4 | (0.2) | 1.4 |
| 731 | (0.5) | 1.8 | (3.5) | (1.9) | (1.1) | 1.6 |
| 732 | 3.0 | 2.9 | (1.0) | 1.3 | 1.8 | 2.7 |
| 734 | 6.7 | 5.2 | (0.2) | 1.7 | (0.1) | 2.2 |
| 735 | 3.6 | 0.1 | 1.7 | 1.9 | 3.2 | 0.6 |
| 821 | 4.9 | 4.8 | 9.0 | 3.8 | 5.6 | 4.6 |
| 841 | 1.5 | 3.5 | 3.2 | 2.9 | 1.9 | 3.4 |
| 861 | 2.1 | 2.8 | 2.1 | 2.9 | 2.1 | 2.8 |
| 891 | 9.6 | 2.1 | 4.6 | 2.5 | 7.2 | 2.3 |
| 899 | 2.5 | 0.1 | 1.4 | 0.7 | 2.1 | 0.4 |
| All 30 products | 1.21 | 1.24 | .78 | 1.87 | 1.07 | 1.46 |

Source: Tables A-11, A-12 and A-15.

studies have mostly dealt with aggregate trade flows classified at the first and second-digit levels of the SITC.

In this essay we sought to investigate trade-creation and trade-diversion in our sample of 30 industrial products. Tables 3.9-3.11 below list the income elasticities of demand for real imports of each country from other EEC countries, the rest of the world and total imports for two periods, 1953-1959 (the pre-union period) and 1959-1972 (the union period). The method of calculation was explained in Section II.3 above.

Such elasticities defined in equation (2.7) above would enable us to test for trade creation and trade diversion by individual industrial products per equation (2.8) above.

The results show that overall, there was a strong trade creation in France, very slight trade creation in F.R. of Germany and Netherlands. This may be explained by the fact that France was a high tariff country before the union; and thus trade liberalization, would lead to trade creation. As for F.R. of Germany and Netherlands, both countries were low-tariff countries before the union, and thus we should not expect any drastic results after the formation of the union.

In terms of individual industrial products we found that there was a net trade creation in only 18 products out of 30 in Germany; in 28 products in France; and in 22 products in Netherlands.

III.4 Specialization in a Narrower Range of Products

In this section we investigate the possibility of increased specialization in some sub-products in a small sample of industries in the six EEC countries after the union using the model explained in Section II.2 above.

The three industries investigated constitute 25 sub-products defined at the finest division of the ISIC and SITC. They are the following:

| | |
|-------------------------|----------------------|
| Iron and steel industry | 9 sub-products, |
| Textile Industry | 10 sub-products, and |
| Man-made Fibers | 6 sub-products. |

For each sub-product and country we calculated product shares s_1 , s_2 , and s_3 , as defined in Section II.2 above. The results are listed in Tables 3.12, 3.13 and 3.14.

We have identified some sub-products where there seems to have been increased specialization as shown in Table 3.15 below. However the sample size is too small to draw any general conclusion.

III.4 Summary

In this chapter we have analyzed trade patterns in three EEC countries using trade data relating to 30 industrial products chosen from the SITC divisions 5, 6, 7 and 8 at the three-digit level.

First, we calculated "specialization ratios" for each "industry" and found that specialization is not taking the form of inter-industry specialization as the traditional theory of trade predicts. That is, the same "industries" expanded and less clearly, the same industries contracted. We calculated the means and variances of the specialization ratios and found that both statistics are declining over time. Had the patterns of specialization in our sample taken the form of inter-industry specialization, the means of these distributions should be increasing and approaching unity over time. We have identified few industries in each country with increasing specialization ratios

Table 3.12
Iron and Steel Industry (as defined by ECSC Treaty), Product Percentages, 1958, 1972

| Product | Share | Germany | | France | | Italy | | Netherlands | | Belg.-Lux | | EEC-6 | |
|--------------------------|-------|---------|------|--------|------|-------|------|-------------|------|-----------|------|-------|------------------|
| | | 58 | 72 | 58 | 72 | 58 | 72 | 58 | 72 | 58 | 72 | 58 | 72 ⁹³ |
| Liquid Steel for Cast. | s1 | 4.5 | 2.3 | 5.9 | 2.8 | 4.4 | 2.5 | 1.9 | 1.0 | 2.5 | 0.9 | 4.4 | 2.2 |
| | s2 | 46.9 | 41.4 | 30.8 | 31.5 | 12.4 | 18.1 | 1.6 | 2.5 | 8.3 | 6.4 | | |
| Ingots and semi-Mfd St. | s1 | 13.3 | 6.4 | 6.2 | 4.8 | 20.1 | 7.8 | 1.3 | 3.9 | 14.1 | 2.3 | 12.2 | 5.4 |
| | s2 | 50.7 | 45.2 | 11.7 | 21.7 | 20.0 | 22.1 | 0.4 | 4.0 | 16.9 | 7.0 | | |
| Heavy Sections | s1 | 12.1 | 9.4 | 11.8 | 8.8 | 9.8 | 7.0 | - | - | 16.3 | 22.4 | 11.9 | 10.5 |
| | s2 | 47.1 | 34.3 | 22.8 | 20.5 | 10.0 | 10.3 | - | - | 20.0 | 35.0 | | |
| Blanks for Tubes | s1 | 7.8 | 4.7 | 5.4 | 3.3 | 5.0 | 4.0 | - | 0.4 | 0.3 | 0.5 | 5.5 | 3.3 |
| | s2 | 65.5 | 53.9 | 22.7 | 24.1 | 11.2 | 18.8 | - | 0.8 | 0.7 | 2.4 | | |
| Wire Rods | s1 | 13.7 | 16.0 | 18.0 | 17.3 | 12.9 | 10.8 | 9.2 | 10.8 | 18.0 | 12.5 | 15.1 | 14.6 |
| | s2 | 42.2 | 41.8 | 27.5 | 28.8 | 10.5 | 11.4 | 2.3 | 4.1 | 17.5 | 13.9 | | |
| Sheets and Plates (3mm) | s1 | 28.9 | 21.3 | 19.7 | 12.1 | 18.9 | 18.0 | 32.6 | 13.0 | 19.2 | 16.9 | 24.3 | 17.4 |
| | s2 | 55.2 | 46.9 | 18.6 | 17.0 | 9.5 | 16.1 | 5.0 | 4.1 | 11.6 | 15.9 | | |
| Sheets and Plates (3mm) | s1 | 9.0 | 29.2 | 30.4 | 37.7 | 22.5 | 39.1 | 46.2 | 57.5 | 21.3 | 34.0 | 18.8 | 35.1 |
| | s2 | 22.2 | 31.8 | 37.2 | 26.1 | 14.7 | 17.2 | 9.2 | 9.0 | 16.6 | 15.8 | | |
| Elect. Sheets & Plates | s1 | 1.9 | 1.4 | 2.6 | 1.4 | 1.1 | 1.9 | - | - | 1.0 | 0.9 | 1.7 | 1.3 |
| | s2 | 49.5 | 40.7 | 34.6 | 25.8 | 7.6 | 22.6 | - | - | 8.3 | 10.9 | | |
| Tinplates & other Tin. | s1 | 8.8 | 9.4 | - | 11.9 | 5.4 | 9.0 | 8.9 | 13.3 | 7.4 | 9.7 | 6.1 | 10.2 |
| | s2 | 65.9 | 35.2 | - | 28.5 | 10.9 | 13.7 | 5.4 | 7.1 | 17.7 | 15.6 | | |

Source: Table A-33

Table 3.13
Textile Industry, Product Percentages, Selected Years, 1958, 1972

| Product | Share | Germany | | France | | Italy | | Netherlands | | Bel.-Lux. | | EEC-6 (s3) | |
|----------------------|-------|---------|------|--------|------|-------|------|-------------|------|-----------|------|------------|------|
| | | 58 | 72 | 58 | 72 | 58 | 72 | 58 | 72 | 58 | 72 | 58 | 72 |
| Wool: Worsted Yarn | s1 | 4.3 | 10.0 | 7.5 | 13.6 | 6.2 | 15.3 | 4.0 | 4.7 | 7.0 | 16.2 | 5.9 | 12.8 |
| | s2 | 23.7 | 24.1 | 37.4 | 27.3 | 22.1 | 32.4 | 4.7 | 2.0 | 12.1 | 14.5 | | |
| Wool: Carded Yarn | s1 | 5.9 | 4.5 | 6.6 | 5.4 | 13.9 | 17.1 | 8.0 | 7.6 | 4.6 | 8.5 | 7.8 | 8.8 |
| | s2 | 24.4 | 15.8 | 25.2 | 15.8 | 37.6 | 53.0 | 7.2 | 4.7 | 6.0 | 11.1 | | |
| Woven Wool Fab. App. | s1 | 4.0 | 4.6 | 4.5 | 5.8 | 9.0 | 12.7 | 7.6 | 6.5 | 2.4 | 1.9 | 5.3 | 6.9 |
| | s2 | 24.6 | 20.4 | 25.1 | 21.4 | 35.7 | 50.0 | 9.9 | 5.0 | 4.7 | 3.2 | | |
| Woven Wool Fab. Bl. | s1 | 0.3 | 0.1 | 1.8 | 1.3 | 2.2 | 1.5 | 2.2 | 1.8 | 0.9 | 1.1 | 1.3 | 1.0 |
| | s2 | 7.0 | 3.2 | 39.5 | 35.5 | 34.9 | 41.9 | 11.6 | 9.7 | 7.0 | 12.9 | | |
| Cotton Yarn | s1 | 37.8 | 38.1 | 32.3 | 33.4 | 29.5 | 27.6 | 32.1 | 33.5 | 28.0 | 24.9 | 33.0 | 32.4 |
| | s2 | 36.9 | 36.1 | 28.9 | 26.5 | 18.8 | 23.1 | 6.8 | 5.5 | 8.6 | 8.8 | | |
| Woven Cot. Fab. | s1 | 26.3 | 26.0 | 23.3 | 23.9 | 23.2 | 18.8 | 34.4 | 40.6 | 20.4 | 20.3 | 24.7 | 23.6 |
| | s2 | 34.4 | 33.7 | 27.9 | 25.9 | 19.7 | 21.5 | 9.7 | 9.2 | 8.4 | 9.8 | | |
| Woven Fab. Silk | s1 | 3.8 | 6.2 | 2.7 | 5.9 | 1.6 | 2.4 | - | - | - | - | 2.4 | 4.1 |
| | s2 | 51.9 | 46.9 | 33.8 | 36.9 | 14.3 | 16.2 | - | - | - | - | | |
| Woven Fab. Linen | s1 | 4.0 | 5.5 | 3.8 | 1.7 | 1.7 | 0.8 | 0.4 | 0.2 | 2.1 | 1.9 | 3.0 | 2.6 |
| | s2 | 42.9 | 65.9 | 36.7 | 17.1 | 12.2 | 8.5 | 1.0 | 0.5 | 7.1 | 8.5 | | |
| Yarn of Jute | s1 | 7.6 | 2.6 | 9.9 | 5.0 | 6.5 | 2.2 | 4.5 | 1.8 | 22.3 | 17.5 | 9.3 | 4.8 |
| | s2 | 26.3 | 16.4 | 31.3 | 27.0 | 14.7 | 12.5 | 3.3 | 2.0 | 24.3 | 42.1 | | |
| Woven Fab. Jute | s1 | 6.0 | 2.4 | 7.7 | 3.8 | 6.1 | 1.5 | 6.7 | 2.9 | 12.2 | 7.7 | 7.2 | 3.1 |
| | s2 | 26.8 | 23.5 | 31.6 | 31.6 | 17.7 | 13.3 | 6.5 | 5.1 | 17.3 | 28.6 | | |

Source: Table A-34.

Table 3.14

Man-made Fibers, Product Percentages, Selected Years, 1958, 1972

| Product | Share | Germany | | France | | Italy | | Netherlands | | Bel.-Lux. | | EEC-6 (s3) | |
|------------------------|-------|---------|------|--------|------|-------|------|-------------|------|-----------|------|------------|------|
| | | 58 | 72 | 58 | 72 | 58 | 72 | 58 | 72 | 58 | 72 | 58 | 72 |
| Synth. Man-made Fib. | s1 | 0.5 | 12.9 | 0.7 | 5.7 | 5.4 | 0.5 | 0.5 | 6.8 | 0.4 | 6.6 | 0.5 | 7.8 |
| | s2 | 32.4 | 47.5 | 31.1 | 17.3 | 25.7 | 24.1 | 6.8 | 7.4 | 2.7 | 3.7 | | |
| Yarn of Con. Syn. Fib. | s1 | 0.4 | 6.4 | 0.4 | 2.5 | 0.3 | 2.3 | 0.4 | 3.8 | 0.2 | 3.7 | 0.3 | 3.7 |
| | s2 | 34.0 | 49.3 | 31.9 | 16.3 | 25.5 | 21.4 | 8.5 | 8.6 | 2.1 | 4.4 | | |
| Yarn of Syn. St. Fib. | s1 | 0.2 | 6.5 | 0.2 | 3.2 | 0.2 | 3.1 | 0.1 | 3.0 | 0.2 | 2.9 | 0.2 | 4.1 |
| | s2 | 34.6 | 45.7 | 30.8 | 18.5 | 27.9 | 26.5 | 3.8 | 6.2 | 3.8 | 3.1 | | |
| Rayon | s1 | 1.4 | 1.4 | 1.6 | 1.2 | 1.5 | 1.1 | 3.1 | 2.5 | 1.9 | 1.9 | 1.7 | 1.4 |
| | s2 | 28.9 | 29.5 | 24.9 | 21.1 | 27.6 | 28.7 | 14.2 | 15.2 | 4.4 | 5.9 | | |
| Cellulosic St. Fib. | s1 | 3.1 | 1.8 | 2.1 | 2.1 | 1.9 | 1.7 | 1.2 | - | 3.3 | 3.7 | 2.3 | 1.8 |
| | s2 | 44.4 | 29.6 | 22.4 | 28.0 | 24.3 | 33.2 | 3.8 | - | 5.4 | 9.2 | | |
| Wastes of Cill. & Ray. | s1 | 94.4 | 70.9 | 94.9 | 85.4 | 95.7 | 86.4 | 94.8 | 83.9 | 94.1 | 81.4 | 94.9 | 81.3 |
| | s2 | 33.1 | 24.9 | 25.1 | 25.0 | 30.3 | 37.0 | 7.6 | 8.7 | 3.8 | 4.3 | | |

Source: Table A-35.

Table 3.15

Probable Increase in Specialization (X), Product, by Country,
1958-1972

| Product | Germany | France | Italy | Neth | Bel-Lux |
|---------------------------------|---------|--------|-------|------|---------|
| <u>Iron and Steel Industry:</u> | | | | | |
| Liquid Steel for Casting | | | | | |
| Ingots and Semi Mfd of St. | | | | | |
| Heavy Section | | | | | X |
| Blanks for Tubes | | | | | |
| Wire Rods | X | | | | |
| Sheets and Plates (≥3mm) | | | X | | |
| Sheets and Plates (<3mm) | X | | X | X | |
| Electric Sheets & Plates | | | X | | |
| Tinplates and other Tin Sh. | | X | X | X | |
| <u>Textile Industry:</u> | | | | | |
| Wool: Worsted Yarn | X | | X | | X |
| Wool: Carded Yarn | | | X | | X |
| Woven Wool Fab. for Apparel | | | X | | |
| Cotton Yarn | X | | | | |
| Woven Cotton Fabric | | X | X | | |
| Woven Fabric of Silk | | | | | |
| Woven Fabric of Linen | X | | | | |
| Yarn of Jute | | | | | |
| Woven Fabric of Jute | | | | | |
| <u>Man-made Fibers:</u> | | | | | |
| Synth. man-made Fib. | X | | | X | X |
| Yarn of Contin. Syn. Tex. | X | | | | |
| Yarn of Synth. Staple Fib. | X | | | | X |
| Rayon | X | | | | X |
| Cellulosic St. Fib. | | X | | | X |
| Wastes of Cell. and Rayon | | | | | |

Source: Tables 3.12-3.14.

although specialization, in the traditional theory sense, is far from being complete.

Second, we investigated trade expansion in three EEC countries after the formation of the union. We found that those industries that expanded most in terms of exports also expanded in terms of imports, and what is more important such industries are about the same in the three countries of our sample.

Third, we investigated trade creation and trade diversion in three EEC countries by individual industrial commodities. We found that there was a net trade creation in France in 28 out of 30 industrial products. We explained that France was a high tariff country before the union compared to F.R. Germany and Netherlands, and thus imports expanded significantly after trade liberalization. In F.R. Germany, we found that there was a net trade creation in only 18 industrial products and overall, there was a slight net trade-creation in that country after the union. In Netherlands, we found that there was a net trade-creation in only 22 out of 30 industrial products investigated. Overall, there was a slight net trade-creation in that country after the formation of the union.

Finally, we investigated the possibility of specialization in a narrower range of products. Thus, in a sample of three industries in the six EEC countries, namely Iron and Steel, Textile, and Man-made Fibers that constitute 25 subproducts, we found that there was an increase in specialization in some sub-products. However, the sample size is too small to draw any general conclusion.

CHAPTER IV

STRUCTURAL CHANGES IN INDUSTRY IN THREE EEC COUNTRIES

The outline of this chapter is as follows:

Section IV.1 is a brief introduction. It describes the sample of industries covered, sources, availability and quality of data.

Section IV.2 presents a general outlook of the industrial expansion in three EEC countries after the formation of the EEC.

Section IV.3 presents and analyzes production volume, fixed capital formation, and employment trends in a sample of ten industries. This will enable us to identify expanding, stagnating, and contracting industries in three EEC countries.

Section IV.4 analyzes the possible causes of changes in industrial structure and relates these causes to our sample of industries. We also present our empirical results testing for a "union" effect in a small sample of industries.

Section IV.5 discusses briefly the linkage between changes in trade flows and changes in industrial structure.

Section IV.6 presents a brief summary of the empirical findings reported in this chapter.

IV. 1 Introduction

In this chapter we discuss the changes in industrial structure in three EEC countries after the formation of the union. We also analyze

production volume, fixed capital formation, and employment trends in a sample of ten industries.

Our objective is to answer the following questions:

- (a) Which industries have expanded and which have stagnated or contracted in each country after the formation of the union?
- (b) Was this due to the formation of the union?
- (c) What other causes might explain such structural changes?

Our concern in this chapter is to find answers to these questions empirically. Thus we shall study the production volume, fixed capital formation, and employment trends in a sample of industries. The industries studied are:

- (a) Coal mining
- (b) Iron ore mining
- (c) Iron and steel industry
- (d) Chemical industry
- (e) Man-made fibers industry
- (f) Motor vehicles industry
- (g) Machine tools for working metal industry
- (h) Textile industry
- (i) Paper and board industry
- (j) Shipbuilding industry

This sample constitutes at least 15 "industries" at the three-digit aggregation of the SITC discussed in the previous chapter.

It should be emphasized here that this sample is not randomly selected nor does it cover all major industries. The choice of the sample was governed by the availability of reliable and uniform data taking into consideration that our sample covers both the "growth" industries and the "sick" industries.

The first three industries were originally covered by the European Coal and Steel Community Treaty (ECSC) that was signed in Paris in 1951 and was in effect in 1953. Thus their inclusion is of some interest since ECSC is a form of integration anyhow. The fourth and fifth industries are examples of "new" industries that flourished with the advancement of technology.

Industrial Data: For each of the above industries we have compiled the following set of data:

1. Yearly production volume: The volume of physical output of each industry.

In some industries we utilized the Index of Industrial Production of that industry. The data was compiled from the publications of the Statistical Office of the European Communities, Industrial Statistics Yearbook, different yearly volumes; and the United Nations, Yearbook of Industrial Statistics, different yearly volumes.

2. Fixed Capital Formation: in million units of national currency in each country. Relatively good and uniform data were published by the Statistical Office of the European Communities, Statistical Studies and Surveys, #2, 1972, and Investment in Fixed Capital Assets, yearly volumes. Investment series generally cover the period 1962-1972. Unfortunately, we couldn't find any uniform investment series for the earlier years.

Investment values have been deflated by the Price Index of Gross Capital Formation published by the Statistical Office of the European Communities, Basic Statistics, 1977.

3. Employment: reported in thousand employees working in each industry for a full year. Unfortunately, employment data is not available for all industries. We used the publications of the Statistical Office of the European Communities, Population and Employment Statistics, 1950-1976, and Social Statistics, different yearly volumes. We also compiled some employment figures from the United Nations, Yearbook of Industrial Statistics, Volume I, General Industrial Statistics, yearly volumes.

Before working on our sample of industries, it may be worthwhile to take a brief look at the industrial expansion in three EEC countries during the study period.

IV.2 The Growth of Industry in Three EEC Countries:

Most European economies have grown at a rapid rate during the Fifties long before the EEC was formed. Thus the post-union industrial expansion may be considered as a continuation of the pre-union expansion. Table 4.1 below lists the average annual rates of growth of production volume, employment and gross fixed capital formation in industry in the Federal Republic of Germany, France and Netherlands during the period 1958-1972.

Production Volume: It is seen from Table 4.1 that the growth rate in production volume in our three countries exceeded 5% per annum during the period '58-'72. The industrial sector in the Netherlands was the most expansive — 7% per annum during the study period, followed by F.R. of Germany and France. As shown in Table A.30 in the Appendix, the growth of industrial production in the six EEC countries during the same period was 5.5% p.a compared to 2.8% in the United Kingdom, and 4.6% in the United States, but less than one-half that of Japan during the same period.

Employment in Industry: The employment picture is somewhat different. Total employment in the three EEC countries increased during the period, as is shown in Table A.31, and a major portion of the increase went into the industrial sector. In F.R. of Germany, total employment during the study period increased by 812 thousand and employment in industry increased by 819 thousand. In France, the

total increase was 1571 and in industry 557 thousand. In Netherlands, the total increase was 686 thousand and in industry 141 thousand.

The share of industrial employment in total employment during the period 1950-70 has increased from 42.7% to 49.3% in Germany; in France from approximately 37.6% to 39%. In Netherlands the industry share increased from 41.5% in 1950 to 42.7% in 1960 and declined to 38.6% in 1970.

Employment in industry grew at an average annual rate of approximately 0.6% p.a. in our three countries. During the study period most European countries attained "full employment" and some countries had to rely on foreign labor, except perhaps Netherlands during the earlier period where workers may have been attracted from non-industrial sectors more easily.

The moderate increase in employment was probably offset by the declining number of working man hours during the period. Accordingly, the moderate increase in employment does not seem to be a major factor in the industrial growth in these countries. The productivity in the industrial sector must have increased at a high rate. If we disregard the decline in number of man-hours, our calculations based on tables A.30 and A.31 show that the productivity in the industrial sector has increased at an average annual rate of 5.2% in Germany, 4.5% in France, and 6.3% in Netherlands during the period 1958-72. This increase in productivity may be explained by the increase in investment both in human and physical capital, better working methods and, probably, economies of scale.

Table 4.1

Average Annual Rates of Growth of Production Volume, Employment, and Fixed Capital Formation in Industry, 1958-1972

| | Production Volume % | Employment % | Fixed Capital Formation % |
|------------------------|------------------------|-------------------|------------------------------|
| <u>F.R. of Germany</u> | | | |
| 1958-65 | 5.6 | 0.9 | --- |
| 1966-72 | 4.8 | -0.1 ^b | 6.1 |
| 1958-72 | 5.8 | 0.5 ^c | 8.5 ^a |
| <u>France</u> | | | |
| 1958-65 | 4.3 | 0.6 | --- |
| 1966-72 | 5.4 | 0.5 ^b | 10.2 |
| 1958-72 | 5.2 | 0.6 ^c | 9.4 ^a |
| <u>Netherlands</u> | | | |
| 1958-65 | 6.1 | 1.2 | --- |
| 1966-72 | 7.1 | -0.2 ^b | 5.9 |
| 1958-72 | 7.0 | 0.6 ^c | 7.2 ^a |

Source: Tables A.30 - A.32

(a) base period 1964-72; (b) base period 1965-70; (c) base period 1958-70.

Total Fixed Capital Formation in Industry: As is shown in Table 4.1, total investment in industry during the period 1964-72 has increased at an average annual rate of 8.5% in Germany, 9.4% in France, and 7.2% in Netherlands. Total fixed capital formation series for the earlier period are not available. However, most likely, this investment trend had started just after World War II, especially in the war-ravaged industries. Further, there have emerged a new type of industries: "growth" industries, such as chemicals and man-made fibers, where major investment programs were under way in these industries.

IV.3 Production, Investment and Employment Trends in a Sample of 10 Industries:

In this section we analyze briefly the growth of production volume, employment, and fixed capital formation in a sample of ten industries chosen from the second and third-digit-levels of the "Industrial Classification of Economic Activities Within the European Communities," N.A.C.E.

Our examination of production volume, employment and fixed capital formation will enable us to identify those industries that were expanding, and those that were stagnating or contracting in each country.

Tables 4.2, 4.3 and 4.4 list the average annual growth rates of production volume, total fixed capital formation, and employment on an industry-by-industry and country-by-country basis. The growth rates in these tables were calculated from Table A.19-A.28 in the Appendix. Total Fixed Capital Formation Series in each industry and country are listed in million units of national currencies, and were "deflated" by Gross Fixed Capital Formation Price Index in each country listed in

tables A.13-A.15 in the Appendix. Thus the growth rates calculated show the growth of "real" total gross fixed capital formation, or simply, real investment. No attempt has been made to calculate "net" investment.

Unfortunately, the employment statistics are not available for all industries in our sample to be able to analyze productivity trends in each industry. Therefore, our analysis will be presented mainly in terms of growth of production volume and total fixed capital formation. Growth of employment is shown in industries where data is available.

Table 4.2.

Average Annual Growth Rates of Production Volume in Three
EEC Countries (by industry)

| NACE # | Industry | F.R. of Germany | | | France | | | Netherlands | | |
|-----------|-----------------|-----------------|------|------|--------|------|------|-------------|-------|------|
| | | I | II | III | I | II | III | I | II | III |
| 111 | Coal mining | -1.2 | -3.7 | -2.4 | -1.4 | -7.6 | -4.3 | 0 | -15.4 | -7.2 |
| 211 | Iron ore mining | -6.2 | -8.6 | -7.3 | -0.2 | -1.2 | -0.5 | - | - | - |
| 221 | Iron and steel | 4.9 | 3.6 | 4.3 | 5.6 | 5.7 | 5.7 | 10.0 | 10.1 | 10.0 |
| 25 | Chemicals | 9.0 | 8.4 | 8.7 | 9.0 | 8.6 | 8.8 | 11.7 | 13.9 | 12.5 |
| 26 | Man-made fibers | 11.7 | 11.2 | 11.5 | 7.0 | 9.7 | 8.2 | 22.9 | 15.9 | 19.6 |
| 372 | Machine tools | 4.5 | 1.8 | 3.3 | 2.3 | 4.7 | 3.4 | 24.3 | 1.9 | 13.8 |
| 35 | Motor vehicles | 8.6 | 3.7 | 6.3 | 4.9 | 10.1 | 7.3 | 16.5 | 6.5 | 11.8 |
| 361 | Shipbuilding | -4.1 | 6.4 | 0.8 | 0.8 | 12.2 | 6.1 | -10.9 | 16.9 | 2.1 |
| 43 | Textiles | 3.7 | 3.8 | 3.7 | 0.4 | 4.6 | 2.4 | 3.6 | 2.0 | 2.8 |
| 47 | Paper and Board | 5.3 | 5.0 | 5.1 | 5.3 | 4.7 | 5.0 | 7.7 | 4.9 | 6.4 |

Source: Tables A.19 - A.28

I: 1958-1965
II: 1966-1972
III: 1958-1972

Table 4.3

Average Annual Growth Rates of Total Fixed Capital Formation
in Three EEC Countries (by industry)

| NACE # | Industry | F.R. of Germany | | | France | | | Netherlands | | |
|-----------|-----------------|-----------------|------|------|--------|-------|-------|-------------|-------|-------|
| | | I | II | III | I | II | III | I | III | III |
| 111 | Coal mining | -5.3 | -5.5 | -5.4 | 6.1 | -20.8 | -8.8 | -31.6 | -35.7 | -33.8 |
| 211 | Iron ore mining | -11.0 | - | - | -32.1 | -6.2 | -15.6 | - | - | - |
| 221 | Iron and steel | -5.8 | 3.0 | -0.2 | -24.2 | 19.9 | 3.6 | -10.2 | 8.9 | 1.9 |
| 25 | Chemicals | 7.6 | -1.0 | 2.2 | 3.8 | 1.3 | 2.2 | 15.5* | 3.4* | 7.8* |
| 26 | Man-made fibers | 18.7 | -8.1 | 1.6 | 12.5 | -10.6 | -2.2 | ** | ** | ** |
| 372 | Machine tools | -7.4 | 2.1 | -1.3 | -26.8 | 10.5 | -3.1 | -13.9 | 4.1 | -2.5 |
| 35 | Motor vehicles | 3.0 | -0.1 | 1.1 | 0.6 | 9.9 | 6.5 | 8.7 | 4.8 | 6.2 |
| 361 | Shipbuilding | 5.6 | -2.8 | 0.3 | -23.9 | 14.3 | 0.4 | -8.3 | 4.4 | -0.2 |
| 43 | Textiles | 1.5 | -0.4 | 0.3 | -11.1 | 7.6 | 0.8 | -3.5 | -5.5 | -4.8 |
| 47 | Paperboard | 7.7 | 2.0 | 3.3 | 0.7 | 6.4 | 5.1 | 2.8 | 1.1 | 1.5 |

Source: Tables A.19 - A.28

*including man-made fibers

**included in chemicals

I: 1958-1965

II: 1966-1972

III: 1958-1972

Table 4.4

Average Annual Growth Rates of Employment in Three EEC Countries (by industry)

| NACE # | Industry | F.R. of Germany | | | France | | | Netherlands | | |
|--------|-----------------|-----------------|-------|-------|--------|------|------|-------------|-------|------|
| | | I | II | III | I | II | III | I | II | III |
| 111 | Coal mining | -6.0 | -6.6 | -6.3 | -3.4 | -7.9 | -5.5 | -1.9 | -13.2 | -7.2 |
| 211 | Iron ore mining | -13.7 | -14.0 | -13.8 | -3.6 | -9.2 | -6.2 | 0 | 0 | 0 |
| 221 | Iron and steel | 1.5 | -2.0 | -0.1 | 0.8 | -1.6 | -0.3 | 6.8 | 2.7 | 4.9 |
| 25 | Chemicals | 3.5 | 1.1 | 2.4 | - | - | - | 3.5 | 3.0 | 3.3 |
| 26 | Man-made fibers | - | - | - | - | - | - | - | - | - |
| 322 | Machine tools | - | - | - | - | - | - | - | - | - |
| 355 | Motor vehicles | - | - | - | - | - | - | - | - | - |
| 361 | Shipbuilding | -3.8 | -1.0 | -2.6 | - | - | - | - | - | - |
| 43 | Textiles | -1.5 | -2.5 | -2.0 | -1.8 | -2.6 | -2.3 | -1.2 | -3.0 | -1.9 |
| 47 | Paper and board | - | - | - | - | - | - | - | - | - |

Source: Tables A.19 - A.28

I: 1958-1965
 II: 1966-1972
 III: 1958-1972

F.R. of Germany:

The German picture is illustrated in Table 4.5 below which shows expanding, stagnating and contracting industries in terms of production volumes, investment expenditures, and employment during the period 1958-1972.

Table 4.5

F.R. of Germany
Average Annual Growth Rates in Production Volume, Investment Expenditures and Employment, 1958-1972 (selected industries)

| | Prod. Vol. % | Investment % | Empl. % |
|--------------------------------|--------------|--------------|---------|
| <u>Expanding industries:</u> | | | |
| Man-made fibers | 11.5 | 1.6 | - |
| Chemicals | 8.7 | 2.2 | 2.4 |
| Motor vehicles | 6.3 | 1.1 | - |
| Paper and board | 5.1 | 3.3 | - |
| <u>Stagnating industries:</u> | | | |
| Iron and steel | 4.3 | -0.2 | -0.1 |
| Machine tools | 3.3 | -1.3 | - |
| Textiles | 3.7 | 0.3 | -2.0 |
| <u>Contracting industries:</u> | | | |
| Ironore mining | -7.3 | -11.0 | -13.8 |
| Coal mining | -2.4 | -5.4 | -6.3 |
| Shipbuilding | 0.8 | 0.3 | -2.6 |

Source: Tables 4.2, 4.3, 4.4.

As shown in Table 4.5 there were four expansive industries in Germany with an annual growth rate of production volume that exceeded 5%. Man-made fibers was the most expansive with an annual growth rate in production volume of 11.7% during the period '58-'65, 11.2% during the period '66-'72, and 11.5% during the entire integration period. In terms of real investment expenditures, this industry was growing at an average annual rate of 18.1% during the period '58-'65, and started to decline during the period '66-'72 at an average annual rate of 8.1% realizing an average annual growth rate of 1.6% during the integration period.

Chemical industry was the second expansive industry in Germany with an annual growth rate in production volume of 9% during the period '58-'65, 8.4% during the period '66-'72, and 8.7% during the entire period. Investment expenditure in this industry was also increasing at an annual rate of 2.2% during the entire period after a high rate of 7.6% during the period '58-'72. In terms of employment, employment in the chemical industry was growing at an annual rate of 3.5% during the period '58-'65, 1.1% during the period '66-'72, and 2.4% during the entire period.

It should be noted that both of these industries are two of the "growth" industries in the world that were born with the advancement of technology after World War II.

Motor vehicles industry, along with paper and board industry, are also among the expansive industries in Germany. The annual growth in production volume in the former was 8.6% during the period '58-'65, 3.7% during the period '66-'72, and 6.3% during the entire period. In the latter, production volume was growing at an average annual rate of

5.3% during the period '58-'65, 5.0% during the period '66-'72, and 5.1% during the entire period.

Investment expenditures in the paper and board industry were relatively high during the period '58-'65 but slowed down afterwards as it is seen from Tables 4.3. Investment expenditures in the motor vehicles industry were declining during the period '58-'65 then started to increase afterwards.

There are three industries listed in table 4.5 above that were characterized as stagnating. Production volume in these industries was increasing at an annual rate between 3.3 and 4.3%. These industries are iron and steel, machine tools for working metal, and textiles.

The three declining industries in Germany are ironore mining, coal mining, and shipbuilding.

France:

The French picture is illustrated in Table 4.6 where we classified our sample of industries into expanding, stagnating and contracting in terms of growth in production volume, investment expenditures, and employment.

Comparing Table 4.5 to 4.6 we find that the expansive industries in both Germany and France are approximately the same. Chemicals, man-made fibers, motor vehicles and paper and board industries are common in both countries except that growth rates were slightly different in both countries.

Table 4.6.

France
Average Annual Growth Rates in Production Volume, Investment
Expenditures and Employment, 1958-1972 (selected industries)

| | Prod. Vol. % | Invest. % | Empl. % |
|--------------------------------|--------------|-----------|---------|
| <u>Expanding industries:</u> | | | |
| Chemicals | 8.8 | 2.2 | - |
| Man-made fibers | 8.2 | -2.2 | - |
| Motor vehicles | 7.3 | 6.5 | - |
| Iron and steel | 5.7 | 3.6 | -0.3 |
| Paper and board | 5.0 | 5.1 | - |
| Shipbuilding | 6.1 | 0.4 | - |
| <u>Stagnating industries:</u> | | | |
| Machine tools | 3.4 | -3.1 | - |
| Textiles | 2.4 | 0.8 | -2.3 |
| <u>Contracting industries:</u> | | | |
| Coal mining | -4.3 | -8.8 | -5.5 |
| Ironore mining | -0.5 | -15.6 | -6.2 |

Source: Table 4.2, 4.4.

The annual growth rates in production volume in the chemical industry was the same in both countries. Motor vehicles industry expanded more in France than in Germany both in terms of production volume and real investment expenditures. Paper and board industry expanded at about the same rate in both countries.

Iron and steel industry and shipbuilding industry have grown at a higher rate in France compared to Germany. It is not clear whether that was due to the workings of the Community or to other factors. In the next section we test for a "union" effect in these two and other industries.

Netherlands: Table 4.7 shows those expansive, stagnating and contracting industries in Netherlands in terms of growth in production volume, real investment and employment during the period 1958-1972.

There are six industries in Netherlands that are described as expansive and are the same expansive industries in Germany and France. However, each of these industries was growing at a much faster rate than their counterparts in the other two countries. Chemicals and man-made fibers were the most expansive both in terms of production volume and real investment expenditures. This is easily seen in Table 4.7 below. The motor vehicles industry was also growing at faster rates than in Germany and France.

What is interesting here is the growth of iron and steel and machine tools for working metals industries. Both industries realized a moderate growth rate in both Germany and France.

Stagnating and contracting industries are one way or another stagnating or contracting in the other two countries. Those are textiles, shipbuilding and coal mining industries.

Table 4.7

Netherlands

Average Annual Growth Rates in Production Volume, Real Investment Expenditures and Employment, 1958-1972 (selected industries)

| | Prod. Vol. % | Invest. % | Empl. % |
|--------------------------------|--------------|------------------|---------|
| <u>Expanding industries:</u> | | | |
| Man-made fibers | 19.6 | (a) | - |
| Chemicals | 12.5 | 7.8 ^b | 3.3 |
| Motor vehicles | 11.8 | 6.2 | - |
| Iron and steel | 10.0 | 1.9 | 4.9 |
| Machine tools | 13.8 | -2.5 | - |
| Paper and board | 6.4 | 1.5 | - |
| <u>Stagnating industries:</u> | | | |
| Textiles | 2.8 | -4.8 | -1.9 |
| Shipbuilding | 2.1 | -0.2 | - |
| <u>Contracting industries:</u> | | | |
| Coal mining | -7.2 | -33.8 | -7.2 |

Source: Tables 4.2, 4.4.

(a): Included in chemicals.

b: Including investments in man-made fibers.

In the next section, we try to explain the probable causes of structural changes in industry; then we use a simple model to test if the post-union trends are different from the pre-union trends.

IV.4 Causes of Structural Changes in Industry

Having identified those expanding, stagnating or contracting industries in our three countries, what remains to be explained is if these changes are due to the workings of the EEC or to other factors. In section IV.4.1 we present briefly the possible causes of these changes. In section IV.4.2 we report the results of testing for a "union-effect" in a sample of industries.

IV.4.1 Causes of structural changes in industry: Industries tend to expand or contract due to demand and supply conditions. Others may expand or contract due to governmental national policies and other factors. The first group of factors, supply and demand conditions are discussed in this section; governmental policies are not discussed here.

On the demand side, we may distinguish between internal demand and external demand. As for internal demand, we know that income elasticities of demand are different for different products. Therefore, when incomes rise, as was the case in the European countries during the study period, the demand for some products would increase more than the demand for others. Therefore, on this count alone, other things being equal, some industries expand more than others. In this context, we are interested to see how the formation of the EEC enters into the picture. To assess the impact of the EEC we have to estimate the growth of real income in each country that was attributed to the formation of the union.

As for external demand, the demand for a country's export of a certain product tends to increase with the increase in its international competitiveness and its ability to expand production (supply factor). These factors, along with consumers' tastes for differentiated products, would determine how much a country would export of a certain product. The question here is how the EEC affected the international competitiveness of its members and how it attributed to economies of scale and increased investments (the dynamic effects) that are believed to be unquantifiable.

Demand factors — both internal and external — may explain the expansion of certain industries in the union, and the contraction of others. However, we have provided no evidence on the magnitude of demand factors on industrial structure.

On the supply side, the advancement of technology, the availability of manpower and unused capacity may explain the expansion of certain industries more than others. For example, chemical and man-made fibers have expanded with the advancement of technology. As we saw in the previous section, these industries have expanded in all of our countries and are considered among the "growth" industries. Furthermore, their expansion started before the formation of the Community.

Shortages of labor and the unavailability of unused capacity are further constraints on the expansion of some industries. For example, Germany had to rely on foreign labor during the expansionary period; and the Netherlands was able to realize slightly higher growth in industrial production perhaps due to the ability of the industrial sector to draw the necessary labor from other sectors during the earlier period of study. However, this point has to be empirically investigated.

There are, as we identified, "contracting" industries in the three EEC countries we studied. To a certain degree such industries are the same in the three countries. Such industries as coal, ironore and textiles have contracted due perhaps to demand and supply conditions, the decline in the stock of national resources and the advancement of technology. Oil as a cheap source of energy during the study period, no doubt, affected the coal industry. The new products of man-made fibers, may have affected the textile industry which was stagnating in all of our countries. Further, the foreign competition from third world countries may have exerted pressure on this industry in spite of the protection this industry receives from governments. This point again has to be empirically investigated.

Iron and steel industry is the most interesting. Governmental policies of course have their say in the development of this basic industry; but the question to be answered is whether the EEC had its workings on this industry. As our analysis above showed, this industry has expanded in our three countries to different degrees and there appears to have been specialization in some sub-products as was shown above.

IV.4.2 Statistical Results: In this section we present the statistical results of testing for a "union effect in a sample of industries.

First, for each industry we estimated the following relations:

$$P_{ijt} = B_1 + B_2 q_{ijt} + u_t$$

$$e_{fjt} = B'_1 + B'_2 q_{ijt} + u'_t$$

Where p is the annual growth rate in productivity; e the annual growth rate in employment; q , the annual growth rate in production volume

(output), B_1 and B_2 are the estimated intercept and slope of each relation, and u is an error term.

The meaning of these relations (propositions) was explained in Section II.4 above.

The number of industries covered is few indeed. We were confronted with the problem of finding uniform and reliable data on a yearly basis that cover the period before integration. The industries covered in our sample are the following:

F.R. of Germany: (a) Coal mining, (b) Ironore mining, (c) Iron and steel industry (d) Chemical industry, (e) Textile industry, (f) Electric machinery industry, (g) Non-electric machinery and (h) Shipbuilding industry.

France: (a) Coal mining, (b) Ironore mining and (c) Iron and steel industry.

Netherlands: (a) Coal mining, (b) Iron and steel industry, (c) Chemical industry, (d) Textile industry and (e) Paper and board industry.

We have compiled data on the above 16 industries and estimated productivity growth and employment growth in each industry for the period 1955-1972. The results are listed in detail in the appendix to this chapter. The estimated coefficients for most industries are significant at the 5% level.

Second, we used the dummy variables one and zero to test if the growth of productivity and employment in each industry during the pre-union period (1955-1959) are different from those during the union period (1960-1972). Thus, we have estimated the following two relations for each industry:

$$p_{ijt} = B_1 + B_2 q_{ijt} + B_3 D_{3t} + B_4 (D_{4t} q_{ijt}) + u_t$$

$$e_{ijt} = B'_1 + B'_2 q_{ijt} + B'_3 D_{3t} + B'_4 (D_{4t} q_{ijt}) + u'_t$$

where D is a dummy variable that equals one for a union year and zero for a preunion year and everything else is as defined above. B_3 is the "differential intercept" and B_4 is the "differential slope." This formulation will enable us to see if the intercepts and/or slopes of the above relations during the union period are significantly different from those in the pre-union period. It was found that only in few industries the "differential intercept" and/or "differential slope" are statistically significant at the 5% level. These industries are listed below. A complete listing of the estimated relations for all industries is given in the appendix to this chapter.

(a) F.R. of Germany:

1. Coal mining:

$$p = -.014 - .54 q + .075 D + 1.3 D q$$

$$(-.75) (-.76) (3.73)^* (1.74)$$

$$R^2 = .59, D-W = 1.30$$

$$e = .014 + 1.54 q - .075 D - 1.3 D q$$

$$(.75) (2.14)^* (-3.73)^* (-1.74)$$

$$R^2 = .66, D-W = 1.30$$

2. Shipbuilding:

$$p = .004 - .01 q + .025 D + .68 D q$$

$$(.33) (-.086) (1.89) (3.4)^*$$

$$R^2 = .76, D-W = 1.46$$

$$e = -.004 + 1.01 q - .025 D - .68 D q$$

$$(-.33) (6.32)^* (-1.89) (-3.4)^*$$

$$R^2 = .83, D-W = 1.46$$

France:

Coal mining:

$$p = .012 + .81 q + .035 D - .10 D q$$

(.94) (1.37) (2.21)* (-0.17)

$$R^2 = .74 \quad D-W = 1.53$$

$$e = -.012 + .19 q - .035 D + .10 D q$$

(.94) (.31) (-2.21)* (0.17)

$$R^2 = .60 \quad D-W = 1.53$$

The figures in parentheses are the (t) ratios.

*statistically significant at the 5% level.

Thus only in coal mining both in F.R. of Germany and France and in shipbuilding in Germany we found that the differential intercept and/or differential slope as indicated are statistically significant at the 5% level. As shown in the appendix below, none of the other industries in our sample showed different trends during the union period compared to the pre-union period. As we discussed in the previous section both of these industries were identified as "declining" industries and their decline was explained in terms of international supply and demand conditions.

However, we should not jump to any conclusions regarding the insignificance of the EEC on industrial structure on the basis of such a small sample.

IV.5 Linking Trade Results to Industry Results

Thus far we have tested the null hypothesis using two related but distinctive sets of data: Trade data that report real exports and real imports of each "industry" defined at certain levels of aggregation, and

industrial data that report production volume, employment and fixed capital formation in each industry defined at a certain level of aggregation, and generally reached the same conclusions. However, there is not necessarily a one-to-one correspondence between these two sets of data. Due to data collection problems, trade data is aggregated at the third-digit level of the Standard International Trade Classification (SITC); and industrial data is aggregated at the second and third-digit levels of the Classification of Economic Activities Within the European Communities (NACE). Thus the definition of an industry based on trade data does not necessarily correspond to the definition of an industry based on industrial data. Generally, our trade data is more disaggregated than the industrial data; and thus the industrial data includes more industrial products than our sample shows.

In this section, we recap some of our results obtained from both sets of data and then relate them to each other. Our objective is to link trade changes to changes in industrial structure.

Tables 4.8-4.10 below summarize these results for each country. On the left side of each table, we listed the average annual rates of growth of real exports and real imports of each country from the other EEC members by individual commodity group, at the third-digit level of the SITC; on the right side, we listed the average annual rate of growth in production volume, employment, and fixed capital formation of each industry at the second and third-digit level of the NACE.

It was noted above that although the expansive industries, and less clearly, the stagnating industries are about the same in the three countries studied, the rates of growth of each industry in different

Table 4.8

F.R. of Germany

Linking Changes in Trade Flows to Changes in Industrial
Structure (selected ind.) 1958-1972

| SITC # | Description | x% | m% | NACE # | Description | p% | e% | k% |
|--------|----------------------------|----|----|--------|------------------|-----|------|------|
| 515 | Orgn. Chemicals | 11 | 23 | 250 | Chemical Ind. | 8.7 | 2.2 | 2.4 |
| 541 | Med. & Pharm. prod. | 15 | 10 | | | | | |
| 561 | Mfd. Fert. | 6 | 18 | | | | | |
| 599 | Chem. Mat. (nes) | 9 | 10 | | | | | |
| 631 | Plywood Board | 11 | 16 | 470 | Paper and board | 5.1 | - | 3.3 |
| 641 | Paper & Board | 20 | 17 | | | | | |
| 642 | Articles made of paper | 17 | 22 | | | | | |
| 651 | Textile yarn & thread | 19 | 10 | 430 | Textile Industry | 3.7 | -2.0 | 0.3 |
| 652 | Cotton Fabrics | 14 | 11 | | | | | |
| 653 | Text. fab. other than Cot. | 18 | 12 | | | | | |
| 670 | Iron & Steel products | 10 | 9 | 221 | Iron & Steel | 4.3 | -0.1 | -0.2 |
| 715 | Metal Work. Mach. | 10 | 17 | 372 | Met. Work. Mach. | 3.3 | - | -1.3 |
| 732 | Road Mot. veh. | 17 | 19 | 350 | Road Mot. Veh. | 6.3 | - | 1.1 |
| 735 | Ships and Boats | 4 | 24 | 361 | Shipbuilding | 0.8 | -2.6 | 0.3 |

Source: Tables A.16, 3.2, 4.5.

Table 4.9

France

Linking Changes in Trade Flows to Changes in Industrial
Structure (selected ind.) 1958-1972

| SITC # | Description | x% | m% | NACE # | Description | p% | e% | k% |
|--------|---------------------|----|----|--------|-------------------|-----|------|------|
| 512 | Org. Chemicals | 13 | 23 | 250 | Chemical Industry | 8.8 | 0.1 | 2.2 |
| 541 | Mfd. Phar. Products | 14 | 14 | | | | | |
| 561 | Mfd. Fertilizers | 11 | 19 | | | | | |
| 599 | Chem. Mat. (nes) | 12 | 13 | | | | | |
| 631 | Plywood Board | 11 | 19 | 470 | Paper & Board | 5.0 | - | 5.1 |
| 641 | Paper & Board | 17 | 26 | | | | | |
| 642 | Articles of Paper | 17 | 24 | | | | | |
| 651 | Textile Yarn | 7 | 23 | 430 | Textiles Ind. | 2.4 | -2.3 | 0.8 |
| 652 | Cotton Fabrics | 13 | 24 | | | | | |
| 653 | Text. Fab. other | 13 | 26 | | | | | |
| 670 | Iron & Steel | 5 | 13 | 221 | Iron & Steel | 5.7 | -0.3 | 3.6 |
| 715 | Met. Work. Mach | 17 | 11 | 372 | Met. Work. Mach | 3.4 | - | -3.1 |
| 732 | Road Mot. Veh. | 16 | 26 | 350 | Road. Mot. Veh. | 7.3 | - | 6.5 |
| 735 | Ships & Boats | 14 | 18 | 361 | Shipbuilding | 6.1 | - | 0.4 |

Source: Tables A.17, 3.4, 4.6.

Table 4.10

Netherlands

Linking Changes in Trade to Changes in Industrial Structure
(selected ind.) 1958-1972

| SITC # | Description | x% | m% | NACE # | Description | p% | e% | k% |
|--------|---------------------|----|----|--------|-------------------|------|------|------|
| 512 | Org. Chemicals | 20 | 12 | 250 | Chemical Ind. | 12.5 | 3.3 | 7.8 |
| 541 | Mfd. Phar. Prod. | 12 | 16 | | | | | |
| 561 | Mfd. Fertilizers | 41 | 3 | | | | | |
| 599 | Chem. Mat. (nes) | 10 | 7 | | | | | |
| 631 | Plywood Board | 12 | 13 | 470 | Paper & Board | 6.4 | - | 1.5 |
| 641 | Paper & Board | 12 | 13 | | | | | |
| 642 | Artic. of Paper | 15 | 19 | | | | | |
| 651 | Textile Yarn Thread | 14 | 7 | 430 | Textile Industry | 2.8 | -1.9 | -4.8 |
| 652 | Cotton Fabrics | 5 | 5 | | | | | |
| 653 | Text. Fab. other | 12 | 11 | | | | | |
| 670 | Iron & Steel | 12 | 4 | 221 | Iron & Steel | 10.0 | 4.9 | 1.9 |
| 715 | Metal Work. Mach. | 10 | 7 | 372 | Metal Work. Mach. | 13.8 | - | -2.5 |
| 732 | Road Motor Veh. | 17 | 14 | 350 | Road Motor Veh. | 11.8 | - | 6.2 |
| 735 | Ships & Boats | 17 | - | 361 | Shipbuilding | 2.1 | - | -0.2 |

Source: Tables A.18, 3.6, 4.7.

countries differ. Now we discuss briefly if the differential growth rates in production volume, employment and fixed capital formation in specific industries are explained in terms of changes in trade flows. For this purpose, we singled out three industries, namely, Chemical industry, Textile Industry, and Iron and Steel Industry where there appears to be a rough linkage between trade changes and changes in industrial structure. However, the results are not conclusive for we only have a very small sample of industrial products in each industry.

Chemical Industry. This industry was one of the most expansive industries in our sample. However, it is seen from tables 4.8-4.10 that it expanded most in Netherlands. Examining the trade results, we see that Netherlands exports of the four industrial products listed to other EEC countries have generally grown at faster rates than its imports of the same commodities from other members. Thus, other things being equal, it seems reasonable to infer that changes in trade flows have affected this industry.

Textile Industry. This industry was described as stagnating in three countries studied; however, it stagnated by less in Germany compared to France and Netherlands. It was noted above, when we discussed specialization in a narrower range of products that there was an increase in specialization in some sub-products in German textile industry. Our trade data shows that German textile exports to other EEC members have expanded relatively more than the other two countries. Thus we may infer, other things being equal, that changes in trade flows have affected this industry.

Iron and Steel Industry. This industry expanded more in Netherlands. Again we can see that there may be a linkage between the

expansion of this industry in Netherlands and changes in trade flows. Netherlands real exports of iron and steel to other EEC members have expanded more than the other two countries and imports expanded by less. Further, as we showed above, there was an increase in specialization in some sub-products in this industry.

IV.6 Summary

In this chapter we investigated the changes in industrial structure in three EEC countries after the formation of the union. Our main concern was to find answers to the following questions: Which industries have expanded and which have stagnated or contracted after the formation of the union? Was that due to the formation of the union? What other causes may explain structural changes in industry?

First, we depicted a general picture of the industrial expansion in three EEC countries in terms of the growth in the production volume, employment and fixed capital formation in industry.

Second, we analyzed production volume, investment and employment trends in a sample of 10 industries in our three countries. We identified expanding, stagnating and contracting industries in each country, and found that the expansive industries, and less clearly, the stagnating industries are about the same in the three countries.

Third, we tried to explain the causes of structural changes in industry and relate such causes to our sample of ten industries. We explained the expansion and contraction of industries in terms of demand factors and supply factors, both internal and external. On the demand side, it was noted that income elasticities of demand are different for different products; thus when incomes rise, some industries expand more than others.

On the supply side, the advancement of technology and the availability of labor and unused capacity would affect some industries more than others. The fast growth of chemical and man-made fibers industries may be attributed to the advancement of technology. The expansion of motor vehicles and paper and board industries may be attributed to demand conditions. The stagnation of textiles and ship-building industries may be attributed to supply conditions and increased foreign competition. However, the exact causes of expansion and contraction of each of these industries is still open to empirical investigation.

Formally, we investigated the growth of productivity and employment in a sample of industries as a function of output growth in each industry. We used dummy variables to test for a "union effect" and found that in most industries in our sample the union trends were not significantly different from the pre-union trends.

Finally, we tried to link changes in trade flows to changes in industrial structure in a small sample of industries.

As indicated above, the size of our sample is small and the industries studied were not randomly selected. Thus we cannot argue that our sample is representative.

Statistical Appendix for Chapter IV

(a) Estimated equations without dummy variables: (OLS Regressions; n=17)

Dependent variable: p: productivity growth per annum
 e: employment growth per annum
 Independent variable: q: output growth per annum

| Industry | Country | Estimated equation | R ² | D-W |
|-------------------|-------------------|--------------------|----------------|------|
| 1. Coal mining | Germany | P = .05 + .614q | .28 | |
| | | (4.35)* (1.51) | | |
| | e + -.05 + .385q | .13 | .78 | |
| | -(4.35)* (2.40)* | | | |
| | France | P = .035 + .592q | .63 | |
| | | (4.55)* (5.09)* | | 1.64 |
| e = -.035 + .408q | | .45 | | |
| (-4.55)* (3.5)* | | | | |
| Netherlands | P = .0248 + .413q | .52 | | |
| | (2.14)* (4.06)* | | 1.19 | |
| | e = .0248 + .587q | .69 | | |
| | | (-2.14)* (5.87)* | | |

| Industry | Country | Estimated equation | R2 | D-W |
|--------------------|---------|---------------------|-----|------|
| 2. Iron ore mining | Germany | $P = .09 + .50q$ | .15 | |
| | | $(2.74)^* (1.63)$ | | 1.65 |
| | | $e = -.09 + .50q$ | .15 | |
| | | $(-2.74)^* (1.65)$ | | |
| | France | $P = .057 + .784q$ | .66 | |
| | | $(4.71)^* (5.44)^*$ | | 1.37 |
| | | $e = -.057 + .216q$ | .13 | |
| | | $(-4.71)^* (1.50)$ | | |
| 3. Iron and Steel | Germany | $P = .005 + .80q$ | .75 | |
| | | $(.44) (6.73)^*$ | | .95 |
| | | $e = .005 + .20q$ | .16 | |
| | | $(-.44) (1.69)$ | | |
| | France | $P = .007 + .888q$ | .78 | |
| | | $(.72) (7.39)^*$ | | .90 |
| | | $e = -.007 + .112q$ | .05 | |
| | | $(-.72) (.93)$ | | |

| Industry | Country | Estimated equation | R ² | D-W |
|--------------|-------------|---|----------------|------|
| | Netherlands | $P = -.0419 + .913q$ (-2.22)* (4.99)* $e = .0419 + .0871q$ (2.22)* (.476) | .62 | 1.83 |
| 4. Chemicals | Germany | $P = .016 + .52q$ (.60) (1.80) $e = -.016 + .48q$ (-.60) (1.66) | .18 | 1.51 |
| | Netherlands | $P = -.0269 + .945q$ -(3.09)* (13.17)* $e = .0269 + .0553q$ (3.09)* (.771) | .92 | 2.24 |
| 5. Textiles | Germany | $P = .029 + .69q$ (3.02)* (4.60)* $e = -.029 + .69q$ -(3.02)* (2.09) | .59 | 1.86 |

| Industry | Country | Estimated equation | R ² | D-W |
|---------------------------|-------------|-------------------------------------|----------------|------|
| | Netherlands | P = .0215 + .797q (1.50) (3.16)* | .40 | |
| | | e = -.0215 + .203q (-1.50) (.80) | .04 | 2.18 |
| 6. Electric machinery | Germany | P = .03 + .09q (1.45) (.46) | .01 | |
| | | e = -.03 + .91q (-1.45) (4.67)* | .59 | 1.79 |
| 7. Non-electric machinery | Germany | P = -.006 + .40q (-.73) (3.58)* | .46 | |
| | | e = .006 + .60q (.73) (5.38)* | .66 | 1.25 |
| 8. Shipbuilding | Germany | P = .023 + .40q (2.73)* (2.74)* | .33 | |
| | | e = -.023 + .60q (2.73)* (4.14)* | .53 | .92 |

| Industry | Country | Estimated equation | R ² | D-W |
|--------------------|-------------|--------------------|----------------|-------|
| 9. Paper and board | Netherlands | P = .0196 + .978q | .63 | |
| | | (1.31) (5.09)* | | .63** |
| | | e = .0196 + .0216q | .001 | |
| | | (1.31) (.112) | | |

(b) Estimated equations with dummy variables: (OLS Regressions; n=17)

| Industry | Country | Dep. Var. | B1 | B2 | B3 | B4 | R ² | D-W |
|-------------|---------|-----------|---------|---------|---------|--------|----------------|------|
| Coal Mining | Germany | P | -.014 | -.54 | .075 | 1.3 | .66 | 1.30 |
| | | | (-.75) | (-.76) | (3.73)* | 1.74 | | |
| | | e | .014 | 1.54 | -.075 | -1.3 | .59 | |
| | | (.75) | (2.14)* | (-3.7)* | (-1.74) | | | |
| | France | P | .012 | .81 | .035 | -.10 | .74 | 1.53 |
| | | | (.94) | (1.37) | (2.21)* | (-.17) | | |
| e | | -.012 | .19 | -.035 | .10 | .60 | | |
| | (-.94) | (.31) | (-2.2)* | (.17) | | | | |

| Industry | Country | Dep. Var. | B1 | B2 | B3 | B4 | R ² | D-W |
|-----------------|---------|-----------|--------|---------|----------|---------|----------------|------|
| Iron ore mining | Germany | P | .03 | -1.03 | .12 | 1.94 | .43 | |
| | | | (.55) | (-.55) | (1.81) | (1.03) | | 1.80 |
| | | e | -.03 | 2.03 | -.12 | -1.94 | .43 | |
| | | | (-.55) | (1.09) | (-1.81) | (-1.03) | | |
| Iron and Steel | Germany | P | .014 | .86 | .064 | .16 | .75 | |
| | | | (.60) | (6.24)* | (2.12)* | (.65) | | 1.69 |
| | | e | -.014 | .14 | -.064 | -.16 | .36 | |
| | | | (-.60) | (1.02) | (-2.12)* | (-.65) | | |
| Iron and Steel | France | P | -.02 | .73 | .03 | .09 | .81 | |
| | | | (-.76) | (2.0) | (1.13) | (.23) | | 1.60 |
| | | e | .02 | .27 | -.03 | -.09 | .36 | |
| | | | (.76) | (.73) | (-1.13) | (-.23) | | |
| Iron and Steel | France | P | -.005 | .91 | .017 | .03 | .80 | |
| | | | (-.30) | (6.65)* | (.90) | (.18) | | 1.03 |
| | | e | .005 | .095 | -.017 | -.03 | .11 | |
| | | | (.30) | (.70) | (-.90) | (-.18) | | |

| Industry | Country | Dep. Var. | B1 | B2 | B3 | B4 | R ² | D-W |
|-----------|-------------|-----------|------------------|-----------------|-----------------|-----------------|----------------|------|
| | Netherlands | P | -.014 (-.26) | .66 (1.24) | -.032 (-.53) | .29 (.50) | .63 | 1.92 |
| | | e | .014 (.26) | .34 (.64) | .032 (.53) | -.29 (-.50) | .04 | |
| | | | | | | | | |
| Chemicals | Germany | P | .054 (.65) | -.03 (-.034) | -.041 (-.46) | .63 (.64) | .24 | 1.72 |
| | | e | -.054 (-.65) | 1.03 (1.12) | .041 (.46) | -.63 (-.64) | .22 | |
| | | | | | | | | |
| | Netherlands | P | -.046 (-1.69) | 1.13 (4.08)* | .022 (.76) | -.20 (-.71) | .92 | 2.07 |
| | | e | .046 (1.69) | -.13 (-.47) | -.022 (-.76) | .20 (.71) | .08 | |
| | | | | | | | | |
| Textiles | Germany | F | .001 (.08) | 1.03 (3.0)* | .04 (1.70) | -.44 (-1.16) | .66 | 2.14 |
| | | e | -.001 (-.08) | -.03 (-.09) | -.04 (-.17) | .44 (1.16) | .37 | |
| | | | | | | | | |

| Industry | Country | Dep. Var. | B1 | B2 | B3 | B4 | R2 | D-W |
|--------------------|---------|-----------|--------|---------|---------|---------|-----|------|
| Netherlands | P | | .011 | .90 | .013 | -.12 | .40 | |
| | | | (.30) | (1.39) | (.31) | (-.16) | | 2.21 |
| e | | | -.011 | .10 | -.013 | .12 | .05 | |
| | | | | | | | | |
| Electric Mach. | Germany | P | .10 | -.64 | -.071 | .77 | .05 | |
| | | | (.37) | (-.27) | (-.26) | (.33) | | 1.90 |
| e | | | -.10 | 1.64 | .071 | -.77 | .61 | |
| | | | (-.37) | (.70) | (.26) | (-.33) | | |
| Non-electric Mach. | Germany | P | -.05 | 1.10 | .05 | -.72 | .59 | |
| | | | (-.81) | (.61) | (.83) | (-.40) | | 1.94 |
| e | | | .05 | -.10 | -.05 | .72 | .74 | |
| | | | (.81) | (-.06) | (-.83) | (.40) | | |
| Shipbuilding | Germany | P | .004 | -.01 | .025 | .68 | .76 | |
| | | | (.33) | (-.086) | (1.89) | (3.4)* | | 1.46 |
| e | | | -.004 | 1.01 | -.025 | -.68 | .83 | |
| | | | (-.33) | (6.32)* | (-1.89) | (-3.4)* | | |

| Industry | Country | Dep. Var. | B1 | B2 | B3 | B4 | R ² | D-W |
|---------------|-------------|-----------|-----------------|-----------------|----------------|----------------|----------------|-------|
| Paper & Board | Netherlands | P | -.046 (-.82) | 1.13 (1.75)* | .03 (.46) | -.11 (-.16) | .67 | |
| | | e | .046 (.82) | -.13 (-.21) | -.03 (-.46) | .11 (.16) | .11 | .62** |

The figures in parentheses are the (t) ratios.

*significant at the 5% level.

CHAPTER V

CONCLUSIONS

V.1 Summary:

1. In this essay we investigated the changes in trade patterns and industrial structure in F.R. of Germany, France and Netherlands after the formation of the European Economic Community. We used a comparative static partial equilibrium model to test the hypothesis that the EEC as a movement toward free trade affected the patterns of trade and specialization and industrial structure in these countries as the traditional theory of trade predicts employing two related sets of data: trade data and industrial data that generally cover the period 1953-1972.

2. Defining an industry as a group of commodities that are substitutes in consumption and similar in terms of input requirements in production, a concept that is generally used in compiling international data, we calculated "specialization ratios" defined as the ratio of the absolute value of the net real export or net real import of an industry to total trade of that industry, for a sample of 30 industries chosen from the SITC divisions 5, 6, 7 and 8 that relate to manufacturing, at the third-digit level of classification. It was found that in the majority of industries in our sample, the computed ratios were approaching zero over time; and the means and variances of the distributions of these ratios were also declining. This is in contrast to what the traditional theory of trade predicts, according to which, a country would tend to export or import a commodity when trade is liberalized and thus the ratio should approach unity over time.

3. This phenomenon was explained in terms of product differentiation. The traditional theory of trade assumes, among other things, that traded products are homogeneous and produced under perfectly competitive conditions, and thus the conclusion of "inter-industry" specialization is reached. The fact that products traded internationally are differentiated with respect to location, timing of use, style, quality, and Brand name, may lead to different conclusions when trade is liberalized. Generally, the freeing of trade via the formation of the EEC did not seem to have led to the concentration of all European production of one industry in one country and the decline of other industries, or "inter-industry" specialization. The results based on our sample of 30 industries generally showed that trade in differentiated products was important and thus a tendency towards "intra-industry" specialization where no one national industry declined or rose as a whole. In this case, the decline in the production of one import-competing product of a certain brand or quality, etc., may be offset by an increase in the production of another product of different brand or quality.

4. The importance of "intra-industry" trade was evident not only from changes in the absolute values of real exports and real imports but also from the growth of trade of each member country with other members in the union and the rest of the world. It was observed that the industries that expanded in terms of real exports have also expanded in terms of real imports; and the expansive industries, and less clearly, the stagnating industries are about the same in all countries. Although the growth of trade in individual industries and countries differ, there was no clear indication of "inter-industry" specialization in any of the 30 industries investigated.

5. The EEC was generally a "trade-creating" customs union. We investigated trade-creation and trade-diversion in each country by individual commodity groups and found that there was a net trade-creation in all countries in our sample, although it was the strongest in France

6. To see if there was specialization in a narrower range of products, we investigated three industries in the six EEC countries that constitute 25 sub-products at the finest division of the ISIC. The results showed that there was an increase in specialization in some sub-products.

7. We also tested the null hypothesis using industrial data which, unfortunately, leaves a lot to be desired. We investigated the growth of production volume, employment, and real fixed capital formation in a sample of ten major industries. We identified expanding, stagnating and contracting industries in each country after the formation of the EEC. The results generally showed that the expansive industries, and less clearly, the stagnating industries, are about the same in the three countries studied. However, the rates of growth in individual industries and countries differ, and it was not clear whether that was due to the workings of the EEC or to other factors that were identified.

8. Formally, we applied a simple model to a sample of industries to see if the growth rates of productivity and employment in those industries after the union were statistically different from the pre-union trends. The results generally showed that the union growth rates were not statistically different from the pre-union rates at the 5% level of significance.

9. Finally, we tried to link changes in trade flows to changes in industrial structure, where we found that a "rough" linkage exists.

10. Thus the results based on both trade data and industrial data seem to reject the null hypothesis in favor of the alternative that the freeing of trade via the formation of the EEC did not lead to "inter-industry" specialization, and might have led to "intra-industry" specialization. This conclusion is strictly general; for it is not easy to draw any specific conclusions as to the effect of the EEC on specialization and industrial structure from a small sample of industries which was not randomly selected and which selection was mainly governed by the availability of uniform and reliable data. Furthermore, we did not investigate the impact of governmental national policies and growth that might have offset some of the results of free trade.

V.2 Welfare and Policy Implications: Our empirical findings support earlier discussions (see Section I.4.1 above) of the importance of product differentiation in international trade:

1. The freeing of trade via the formation of a customs union among industrialized countries that are at the same level of development and engaged in the production of differentiated products may increase the welfare of the residents of those countries if the union succeeds in increasing trade flows among them. Consumers would have wider range of products to choose from leading to an increase in their satisfaction.

2. In "intra-industry" specialization the decline in the production of one import-competing product of certain brand or quality may be offset by an increase in the production of another product of different brand or quality. In this case, the process of adjustment may be much faster and less severe since resources released by the contraction of

an import-competing product are easily transferred to the production of another product within the same industry instead of being transferred to a new kind of employment in another industry — the case of "inter-industry" specialization. Further, the expansion in the production of a certain product may lead to economies of scale.

3. A customs union formed between countries that are not at the same level of development may lead to specialization in the traditional sense if all trade barriers are removed.

V.3 Suggestions for Further Research:

1. The study could be extended to include the countries that were excluded, namely Belgium-Luxembourg and Italy. Further, investigating the changes in trade patterns and industrial structure in the United Kingdom after joining the EEC in 1973 would be of special interest since there was much speculation and debate in the literature on this subject.

2. The sample of industrial products and industries covered could be extended to have a more representative sample of industrial products and industries at a more disaggregative level of the Standard International Trade Classification (SITC) and the International Standard Industrial Classification (ISIC), where specialization in some sub-products and economies of scale may be investigated.

3. Governmental national policies of taxation, subsidization, and discrimination against purchases from partner countries, that may offset some of free trade results, also need to be investigated.

4. The seemingly unquantifiable dynamic effects of customs unions of increased competition, increased efficiency, and increased investment that are thought to be more important than the static effects have to be

dealt with more seriously at least in a two sector general equilibrium model. The quantification of these effects in specific industries seems to be very difficult; but could be estimated for the manufacturing sector as a whole.

APPENDIX TABLES

Table A-1

F.R. of Germany

Exports to EEC Countries By SITC Division, Selected Years
(mill. US \$)

| SITC # | 1953 | 1959 | 1965 | 1966 | 1972 |
|--------|------|------|------|------|------|
| 512 | 33 | 71 | 140 | 178 | 394 |
| 541 | 6 | 16 | 41 | 52 | 168 |
| 561 | 1 | 15 | 27 | 24 | 46 |
| 599 | 19 | 67 | 84 | 106 | 281 |
| 611 | 3 | 9 | 15 | 23 | 33 |
| 629 | 3 | 10 | 31 | 39 | 149 |
| 631 | 2 | 7 | 17 | 20 | 41 |
| 641 | 6 | 12 | 43 | 55 | 232 |
| 642 | 1 | 7 | 24 | 29 | 100 |
| 651 | 7 | 16 | 48 | 75 | 266 |
| 652 | 7 | 12 | 25 | 28 | 105 |
| 653 | 10 | 21 | 116 | 129 | 309 |
| 655 | 5 | 10 | 39 | 48 | 104 |
| 657 | 1 | 3 | 10 | 14 | 63 |
| 661 | 9 | 14 | 19 | 21 | 41 |
| 664 | 3 | 25 | 20 | 24 | 49 |
| 665 | 5 | 12 | 25 | 26 | 71 |
| 670 | 80 | 265 | 573 | 652 | 1255 |
| 712 | 9 | 35 | 105 | 114 | 170 |
| 714 | 8 | 22 | 85 | 113 | 429 |
| 715 | 60 | 65 | 123 | 138 | 341 |
| 731 | 5 | 8 | 15 | 13 | 48 |
| 732 | 66 | 159 | 672 | 754 | 2161 |
| 734 | 0.1 | 1 | 53 | 25 | 42 |
| 735 | 13 | 38 | 15 | 22 | 83 |
| 821 | 3 | 15 | 0.1 | 72 | 267 |
| 841 | 6 | 18 | 102 | 132 | 401 |
| 861 | 18 | 40 | 118 | 137 | 336 |
| 891 | 3 | 12 | 35 | 41 | 122 |
| 899 | 20 | 56 | 24 | 30 | 69 |

Source: Union Nations, Commodity Trade Statistics, Series D, yearly volumes.

Table A-2

F.R. of Germany

Exports to non-EEC countries by SITC Division, Selected Years
(mill. US \$)

| SITC # | 1953 | 1959 | 1965 | 1966 | 1972 |
|--------|------|------|------|------|------|
| 512 | 84 | 166 | 315 | 358 | 664 |
| 541 | 35 | 85 | 184 | 207 | 461 |
| 561 | 75 | 125 | 129 | 134 | 109 |
| 599 | 51 | 239 | 190 | 227 | 416 |
| 611 | 12 | 28 | 34 | 36 | 66 |
| 629 | 17 | 39 | 62 | 68 | 158 |
| 631 | 4 | 17 | 24 | 25 | 52 |
| 641 | 14 | 25 | 51 | 53 | 133 |
| 642 | 4 | 15 | 31 | 35 | 67 |
| 651 | 32 | 68 | 112 | 140 | 403 |
| 652 | 59 | 68 | 61 | 68 | 89 |
| 653 | 70 | 93 | 144 | 150 | 388 |
| 655 | 10 | 22 | 49 | 58 | 165 |
| 657 | 4 | 10 | 22 | 25 | 42 |
| 661 | 26 | 8 | 12 | 9 | 16 |
| 664 | 8 | 8 | 40 | 41 | 84 |
| 665 | 15 | 28 | 31 | 33 | 61 |
| 670 | 255 | 662 | 844 | 809 | 1750 |
| 712 | 36 | 42 | 101 | 210 | 243 |
| 714 | 18 | 70 | 158 | 228 | 575 |
| 715 | 127 | 270 | 314 | 381 | 747 |
| 731 | 55 | 69 | 82 | 74 | 88 |
| 732 | 197 | 1012 | 1745 | 1891 | 4350 |
| 734 | 0.1 | 16 | 18 | 21 | 64 |
| 735 | 76 | 234 | 190 | 333 | 683 |
| 821 | 3 | 13 | 0.1 | 47 | 152 |
| 841 | 23 | 66 | 99 | 103 | 236 |
| 861 | 88 | 170 | 271 | 303 | 627 |
| 891 | 14 | 44 | 79 | 91 | 205 |
| 899 | 58 | 156 | 47 | 52 | 94 |

Source: Same as in Table A-1.

Table A-3

F.R. of Germany

Imports from EEC Countries by SITC Division, Selected Years
(mill. US \$)

| SITC # | 1953 | 1959 | 1965 | 1966 | 1972 |
|--------|------|------|------|------|------|
| 512 | 6 | 15 | 83 | 95 | 396 |
| 541 | 4 | 24 | 20 | 53 | 108 |
| 561 | 3 | 3 | 17 | 20 | 42 |
| 599 | 9 | 31 | 46 | 54 | 143 |
| 611 | 10 | 22 | 49 | 59 | 131 |
| 629 | 1 | 9 | 58 | 66 | 170 |
| 631 | 3 | 10 | 41 | 45 | 98 |
| 641 | 5 | 23 | 74 | 84 | 259 |
| 642 | 0.1 | 3 | 19 | 22 | 67 |
| 651 | 53 | 99 | 233 | 219 | 426 |
| 652 | 6 | 22 | 50 | 45 | 117 |
| 653 | 31 | 80 | 252 | 260 | 521 |
| 655 | 3 | 5 | 31 | 40 | 122 |
| 657 | 6 | 16 | 76 | 51 | 191 |
| 661 | 1 | 8 | 25 | 33 | 120 |
| 664 | 1 | 6 | 34 | 32 | 102 |
| 665 | 0.1 | 4 | 21 | 22 | 73 |
| 670 | 121 | 357 | 600 | 597 | 1447 |
| 712 | 1 | 3 | 46 | 44 | 78 |
| 714 | 3 | 27 | 96 | 123 | 313 |
| 715 | 2 | 8 | 30 | 60 | 88 |
| 731 | 1 | 3 | 5 | 40 | 21 |
| 732 | 7 | 103 | 343 | 496 | 1670 |
| 734 | 0.1 | 18 | 22 | 25 | 49 |
| 735 | 1 | 6 | 23 | 27 | 199 |
| 821 | 0.1 | 4 | 26 | 36 | 183 |
| 841 | 20 | 49 | 239 | 295 | 1089 |
| 861 | 1 | 5 | 27 | 37 | 138 |
| 891 | 1 | 2 | 16 | 21 | 83 |
| 899 | 3 | 60 | 15 | 17 | 52 |

Source: Same as in Table A-1.

Table A-4

F.R. of Germany

Imports from Non-EEC Countries by SITC Division, Selected Years
(mill. US \$)

| SITC # | 1953 | 1959 | 1965 | 1966 | 1972 |
|--------|------|------|------|------|------|
| 512 | 10 | 27 | 155 | 134 | 239 |
| 541 | 6 | 67 | 42 | 22 | 122 |
| 561 | 0.1 | 5 | 1 | 2 | 36 |
| 599 | 22 | 84 | 71 | 70 | 125 |
| 611 | 9 | 23 | 26 | 34 | 70 |
| 629 | 2 | 15 | 45 | 44 | 82 |
| 631 | 6 | 14 | 26 | 26 | 75 |
| 641 | 30 | 114 | 282 | 281 | 463 |
| 642 | 1 | 4 | 13 | 13 | 34 |
| 651 | 36 | 66 | 89 | 80 | 160 |
| 652 | 18 | 25 | 32 | 29 | 62 |
| 653 | 23 | 56 | 78 | 77 | 121 |
| 655 | 4 | 13 | 17 | 18 | 41 |
| 657 | 4 | 21 | 75 | 104 | 229 |
| 661 | 1 | 8 | 16 | 15 | 29 |
| 664 | 1 | 2 | 18 | 7 | 21 |
| 665 | 1 | 4 | 11 | 12 | 33 |
| 670 | 33 | 133 | 227 | 225 | 689 |
| 712 | 1 | 7 | 27 | 32 | 35 |
| 714 | 8 | 22 | 90 | 124 | 430 |
| 715 | 12 | 42 | 68 | 26 | 133 |
| 731 | 0.1 | 1 | 8 | 3 | 17 |
| 732 | 5 | 17 | 55 | 52 | 235 |
| 734 | 0.1 | 48 | 127 | 107 | 219 |
| 735 | 5 | 17 | 31 | 28 | 144 |
| 821 | 0.1 | 7 | 28 | 31 | 94 |
| 841 | 12 | 38 | 182 | 214 | 757 |
| 861 | 4 | 23 | 94 | 107 | 304 |
| 891 | 1 | 9 | 22 | 26 | 45 |
| 899 | 5 | 264 | 21 | 26 | 79 |

Source: See Table A-1.

Table A-5

France

Exports to EEC Countries by SITC Division, Selected Years
(mill. US \$)

| SITC # | 1953 | 1959 | 1965 | 1966 | 1972 |
|--------|------|------|------|------|------|
| 512 | 6 | 19 | 69 | 87 | 156 |
| 541 | 5 | 9 | 25 | 31 | 85 |
| 561 | 2 | 4 | 21 | 22 | 25 |
| 599 | 5 | 21 | 54 | 69 | 142 |
| 611 | 12 | 24 | 48 | 57 | 112 |
| 629 | 2 | 6 | 40 | 49 | 161 |
| 631 | 5 | 10 | 20 | 20 | 61 |
| 641 | 3 | 10 | 34 | 37 | 142 |
| 642 | 1 | 3 | 14 | 14 | 43 |
| 651 | 41 | 61 | 128 | 124 | 229 |
| 652 | 3 | 12 | 38 | 35 | 98 |
| 653 | 11 | 25 | 81 | 91 | 218 |
| 655 | 1 | 3 | 21 | 26 | 70 |
| 657 | 0.1 | 2 | 21 | 17 | 19 |
| 661 | 2 | 5 | 10 | 12 | 34 |
| 664 | 0.1 | 8 | 24 | 21 | 46 |
| 665 | 2 | 6 | 20 | 23 | 71 |
| 670 | 114 | 281 | 407 | 404 | 800 |
| 712 | 1 | 3 | 38 | 52 | 102 |
| 714 | 4 | 18 | 85 | 117 | 241 |
| 715 | 4 | 4 | 22 | 24 | 55 |
| 731 | 3 | 4 | 9 | 6 | 62 |
| 732 | 25 | 116 | 438 | 268 | 1532 |
| 734 | 0.1 | 11 | 31 | 28 | 92 |
| 735 | 2 | 4 | 12 | 22 | 36 |
| 821 | 0.1 | 2 | 10 | 12 | 59 |

Source: See Table A-1.

Table A-6

France

Exports to non-EEC Countries by SITC Division, Selected Years
(mill. US \$)

| SITC # | 1953 | 1959 | 1965 | 1966 | 1972 |
|--------|------|------|------|------|------|
| 512 | 23 | 43 | 131 | 144 | 195 |
| 541 | 52 | 77 | 113 | 130 | 223 |
| 561 | 36 | 52 | 60 | 63 | 61 |
| 599 | 23 | 53 | 68 | 78 | 164 |
| 611 | 15 | 26 | 33 | 41 | 72 |
| 629 | 44 | 59 | 83 | 95 | 213 |
| 631 | 16 | 21 | 39 | 17 | 21 |
| 641 | 22 | 22 | 34 | 36 | 63 |
| 642 | 13 | 22 | 35 | 40 | 70 |
| 651 | 93 | 89 | 119 | 126 | 173 |
| 652 | 135 | 79 | 65 | 57 | 51 |
| 653 | 93 | 87 | 109 | 107 | 159 |
| 655 | 12 | 12 | 26 | 29 | 58 |
| 657 | 5 | 6 | 13 | 12 | 14 |
| 661 | 19 | 16 | 12 | 14 | 31 |
| 664 | 11 | 19 | 33 | 33 | 45 |
| 665 | 13 | 19 | 66 | 37 | 92 |
| 670 | 364 | 530 | 559 | 519 | 1001 |
| 712 | 11 | 9 | 52 | 42 | 52 |
| 714 | 9 | 18 | 65 | 104 | 233 |
| 715 | 33 | 24 | 58 | 59 | 117 |
| 731 | 36 | 29 | 30 | 24 | 214 |
| 732 | 152 | 498 | 275 | 492 | 1354 |
| 734 | 8 | 33 | 101 | 180 | 249 |
| 735 | 12 | 31 | 100 | 64 | 283 |
| 821 | 16 | 27 | 22 | 25 | 49 |
| 841 | 37 | 120 | 217 | 148 | 184 |
| 861 | 20 | 30 | 66 | 71 | 174 |
| 891 | 7 | 12 | 18 | 18 | 40 |
| 899 | 33 | 71 | 24 | 25 | 54 |

Source: See Table A-1.

Table A-7

France

Imports from EEC Countries by SITC Division, Selected Years
(mill. US \$)

| SITC # | 1953 | 1959 | 1965 | 1966 | 1972 |
|--------|------|------|------|------|------|
| 512 | 12 | 10 | 88 | 108 | 312 |
| 541 | 1 | 8 | 23 | 28 | 76 |
| 561 | 1 | 8 | 46 | 47 | 140 |
| 599 | 8 | 21 | 36 | 42 | 166 |
| 611 | 1 | 3 | 8 | 15 | 31 |
| 629 | 2 | 4 | 15 | 21 | 100 |
| 631 | 1 | 2 | 7 | 10 | 36 |
| 641 | 1 | 4 | 38 | 50 | 191 |
| 642 | 0.1 | 2 | 16 | 21 | 77 |
| 651 | 6 | 6 | 44 | 65 | 186 |
| 652 | 5 | 3 | 15 | 21 | 107 |
| 653 | 4 | 7 | 62 | 84 | 280 |
| 655 | 1 | 1 | 18 | 23 | 81 |
| 657 | 0.1 | 2 | 15 | 18 | 76 |
| 661 | 2 | 3 | 12 | 16 | 34 |
| 664 | 0.1 | 2 | 12 | 16 | 94 |
| 665 | 1 | 3 | 14 | 15 | 37 |
| 670 | 15 | 188 | 481 | 550 | 1386 |
| 712 | 5 | 21 | 108 | 120 | 210 |
| 714 | 5 | 20 | 79 | 122 | 250 |
| 715 | 21 | 34 | 66 | 68 | 201 |
| 731 | 1 | 3 | 5 | 3 | 23 |
| 732 | 7 | 22 | 234 | 317 | 1130 |
| 734 | 0.1 | 3 | 16 | 28 | 74 |
| 735 | 13 | 9 | 25 | 28 | 138 |
| 821 | 1 | 5 | 49 | 59 | 221 |
| 841 | 3 | 7 | 73 | 96 | 307 |
| 861 | 4 | 9 | 48 | 58 | 189 |
| 891 | 1 | 2 | 20 | 25 | 94 |
| 899 | 3 | 4 | 12 | 17 | 39 |

Source: See Table A-1.

Table A-8

France

Imports from Non-EEC Countries by SITC Division, Selected Years
(mill US \$)

| SITC # | 1953 | 1959 | 1965 | 1966 | 1972 |
|--------|------|------|------|------|------|
| 512 | 14 | 13 | 107 | 121 | 240 |
| 541 | 8 | 13 | 40 | 48 | 118 |
| 561 | 0.1 | 5 | 5 | 4 | 42 |
| 599 | 16 | 35 | 30 | 41 | 82 |
| 611 | 6 | 8 | 18 | 30 | 71 |
| 629 | 4 | 4 | 11 | 13 | 44 |
| 631 | 3 | 5 | 6 | 6 | 32 |
| 641 | 13 | 26 | 105 | 100 | 205 |
| 642 | 1 | 2 | 7 | 9 | 20 |
| 651 | 9 | 6 | 13 | 16 | 47 |
| 652 | 3 | 2 | 14 | 21 | 62 |
| 653 | 6 | 8 | 23 | 23 | 51 |
| 655 | 3 | 2 | 12 | 12 | 18 |
| 657 | 3 | 2 | 8 | 9 | 19 |
| 661 | 0.1 | 1 | 2 | 4 | 11 |
| 664 | 1 | 1 | 4 | 4 | 11 |
| 665 | 2 | 2 | 5 | 5 | 11 |
| 670 | 25 | 19 | 68 | 76 | 268 |
| 712 | 8 | 7 | 51 | 57 | 69 |
| 714 | 13 | 19 | 76 | 108 | 338 |
| 715 | 36 | 30 | 39 | 42 | 102 |
| 731 | 1 | 1 | 1 | 2 | 8 |
| 732 | 15 | 16 | 82 | 86 | 237 |
| 734 | 42 | 25 | 39 | 40 | 227 |
| 735 | 16 | 12 | 12 | 15 | 71 |
| 821 | 1 | 1 | 13 | 14 | 38 |
| 841 | 2 | 3 | 17 | 26 | 148 |
| 861 | 11 | 14 | 71 | 83 | 183 |
| 891 | 1 | 2 | 10 | 13 | 59 |
| 899 | 9 | 12 | 13 | 15 | 48 |

Source: See Table A-1.

Table A-9

Netherlands

Exports to EEC Countries by SITC Division, Selected Years
(mill. US \$)

| SITC # | 1953 | 1959 | 1965 | 1966 | 1972 |
|--------|------|------|------|------|------|
| 512 | 3 | 21 | 60 | 75 | 379 |
| 541 | 3 | 14 | 30 | 32 | 88 |
| 561 | 0.1 | 0.1 | 8 | 9 | 39 |
| 599 | 13 | 29 | 41 | 45 | 137 |
| 611 | 0.1 | 11 | 17 | 19 | 30 |
| 629 | 3 | 11 | 28 | 28 | 61 |
| 631 | 0.1 | 2 | 4 | 4 | 13 |
| 641 | 11 | 26 | 72 | 80 | 172 |
| 642 | 3 | 9 | 25 | 30 | 88 |
| 651 | 16 | 30 | 93 | 106 | 239 |
| 652 | 7 | 24 | 38 | 34 | 60 |
| 653 | 23 | 31 | 106 | 112 | 197 |
| 655 | 1 | 4 | 19 | 28 | 78 |
| 657 | 4 | 5 | 17 | 17 | 79 |
| 661 | 1 | 4 | 2 | 2 | 5 |
| 664 | 3 | 5 | 14 | 15 | 44 |
| 665 | 1 | 2 | 2 | 3 | 16 |
| 670 | 14 | 74 | 106 | 141 | 405 |
| 712 | 1 | 2 | 11 | 14 | 32 |
| 714 | 1 | 7 | 17 | 21 | 98 |
| 715 | 1 | 4 | 7 | 9 | 18 |
| 731 | 0.1 | 1 | 4 | 2 | 3 |
| 732 | 5 | 17 | 60 | 69 | 200 |
| 734 | 7 | 3 | 82 | 53 | 27 |
| 755 | 15 | 12 | 38 | 38 | 161 |
| 821 | 5 | 8 | 0.1 | 29 | 76 |
| 841 | 20 | 27 | 72 | 85 | 275 |
| 861 | 2 | 12 | 25 | 28 | 193 |
| 891 | 2 | 11 | 45 | 33 | 70 |
| 899 | 4 | 13 | 7 | 7 | 27 |

Source: See Table A-1.

Table A-10

Netherlands

Exports to non-EEC Countries by SITC Division, Selected Years
(mill. US \$)

| SITC # | 1953 | 1959 | 1965 | 1966 | 1972 |
|--------|------|------|------|------|------|
| 512 | 7 | 39 | 84 | 104 | 234 |
| 541 | 10 | 26 | 40 | 46 | 114 |
| 561 | 39 | 54 | 66 | 53 | 122 |
| 599 | 29 | 56 | 62 | 66 | 139 |
| 611 | 8 | 6 | 4 | 5 | 20 |
| 629 | 5 | 10 | 6 | 9 | 23 |
| 631 | 2 | 3 | 2 | 2 | 7 |
| 641 | 16 | 18 | 19 | 19 | 38 |
| 642 | 2 | 5 | 9 | 11 | 16 |
| 651 | 30 | 47 | 56 | 57 | 93 |
| 652 | 56 | 59 | 47 | 42 | 53 |
| 653 | 22 | 27 | 32 | 31 | 73 |
| 655 | 4 | 7 | 16 | 17 | 39 |
| 657 | 6 | 13 | 13 | 14 | 16 |
| 661 | 3 | 1 | 0.1 | 0.1 | 1 |
| 664 | 3 | 7 | 7 | 7 | 12 |
| 665 | 1 | 2 | 2 | 1 | 4 |
| 670 | 4 | 84 | 137 | 121 | 359 |
| 712 | 0.1 | 3 | 9 | 10 | 31 |
| 714 | 3 | 16 | 34 | 39 | 71 |
| 715 | 2 | 2 | 7 | 7 | 14 |
| 731 | 26 | 1 | 2 | 1 | 2 |
| 732 | 8 | 8 | 83 | 22 | 98 |
| 734 | 7 | 22 | 26 | 33 | 96 |
| 735 | 67 | 122 | 98 | 147 | 326 |
| 821 | 1 | 3 | 0.1 | 7 | 17 |
| 841 | 8 | 12 | 16 | 15 | 31 |
| 861 | 3 | 7 | 23 | 21 | 87 |
| 891 | 4 | 22 | 27 | 40 | 75 |
| 899 | 6 | 11 | 4 | 5 | 13 |

Source: See Table A-1.

Table A-11

Netherlands

Imports from EEC Countries by SITC Division, Selected Years
(mill. US \$)

| SITC # | 1953 | 1959 | 1965 | 1966 | 1972 |
|--------|------|------|------|------|------|
| 512 | 8 | 28 | 63 | 86 | 172 |
| 541 | 2 | 9 | 18 | 24 | 100 |
| 561 | 15 | 12 | 21 | 18 | 22 |
| 599 | 8 | 30 | 32 | 40 | 91 |
| 611 | 4 | 7 | 14 | 15 | 25 |
| 629 | 5 | 10 | 23 | 27 | 72 |
| 631 | 3 | 8 | 21 | 23 | 59 |
| 641 | 10 | 19 | 40 | 44 | 134 |
| 642 | 2 | 4 | 19 | 21 | 67 |
| 651 | 52 | 70 | 124 | 133 | 211 |
| 652 | 15 | 25 | 37 | 37 | 53 |
| 653 | 24 | 45 | 131 | 146 | 236 |
| 655 | 5 | 4 | 27 | 34 | 55 |
| 657 | 4 | 4 | 28 | 31 | 72 |
| 661 | 23 | 31 | 48 | 47 | 82 |
| 664 | 8 | 17 | 26 | 27 | 61 |
| 665 | 3 | 10 | 19 | 21 | 54 |
| 670 | 132 | 213 | 326 | 351 | 416 |
| 712 | 3 | 6 | 32 | 46 | 47 |
| 714 | 4 | 11 | 27 | 41 | 111 |
| 715 | 9 | 14 | 26 | 31 | 42 |
| 731 | 5 | 6 | 10 | 8 | 23 |
| 732 | 36 | 123 | 367 | 345 | 1002 |
| 734 | 0.1 | 1 | 35 | 23 | 42 |
| 735 | 8 | 32 | 15 | 18 | 38 |
| 821 | 1 | 6 | 40 | 52 | 187 |
| 841 | 19 | 41 | 183 | 241 | 539 |
| 861 | 5 | 13 | 39 | 44 | 99 |
| 891 | 1 | 24 | 58 | 64 | 119 |
| 899 | 9 | 26 | 13 | 15 | 32 |

Source: See Table A-1.

Table A-12

Netherlands

Imports from Non-EEC Countries. Selected Years, by SITC Division

(mil. US \$)

| SITC # | 1953 | 1959 | 1965 | 1966 | 1972 |
|--------|------|------|------|------|------|
| 512 | 8 | 25 | 68 | 77 | 191 |
| 541 | 3 | 14 | 19 | 22 | 44 |
| 561 | 1 | 2 | 5 | 4 | 8 |
| 599 | 11 | 30 | 28 | 31 | 66 |
| 611 | 3 | 6 | 8 | 8 | 16 |
| 629 | 3 | 4 | 8 | 9 | 22 |
| 631 | 7 | 10 | 11 | 11 | 21 |
| 641 | 17 | 35 | 80 | 82 | 130 |
| 642 | 1 | 5 | 7 | 9 | 18 |
| 651 | 10 | 10 | 17 | 18 | 35 |
| 652 | 5 | 14 | 14 | 9 | 34 |
| 653 | 6 | 11 | 20 | 21 | 30 |
| 655 | 2 | 9 | 8 | 8 | 17 |
| 657 | 1 | 2 | 7 | 10 | 13 |
| 661 | 1 | 2 | 2 | 2 | 3 |
| 664 | 1 | 3 | 5 | 6 | 8 |
| 665 | 2 | 2 | 4 | 4 | 9 |
| 670 | 42 | 39 | 50 | 54 | 100 |
| 712 | 2 | 3 | 13 | 2 | 17 |
| 714 | 4 | 11 | 28 | 39 | 93 |
| 715 | 7 | 7 | 10 | 15 | 21 |
| 731 | 2 | 1 | 1 | 0.4 | 0.3 |
| 732 | 27 | 28 | 74 | 69 | 69 |
| 734 | 20 | 26 | 37 | 75 | 96 |
| 735 | 3 | 7 | 11 | 5 | 29 |
| 821 | 0.1 | 2 | 11 | 12 | 32 |
| 841 | 5 | 18 | 33 | 43 | 151 |
| 861 | 7 | 18 | 40 | 47 | 148 |
| 891 | 2 | 11 | 24 | 25 | 68 |
| 899 | 7 | 15 | 9 | 11 | 27 |

Source: See Table A-1.

Table A-13

F.R. of Germany

Price Indexes, 1953-76

(1970 = 100)

| Year | Wholesale Price Index | Export Price Index | Import Price Index | Fixed Capital Formation Price Index |
|------|--------------------------|-----------------------|-----------------------|--|
| 1953 | 89 | - | - | - |
| 1959 | 91 | - | - | - |
| 1960 | 93 | 86.6 | 94.8 | 67.4 |
| 1961 | 94 | 86.3 | 92.0 | 71.3 |
| 1962 | 95 | 87.3 | 91.0 | 75.9 |
| 1963 | 95 | 87.9 | 93.0 | 78.9 |
| 1964 | 96 | 90.0 | 94.7 | 81.1 |
| 1965 | 97 | 92.0 | 97.2 | 83.0 |
| 1966 | 99 | 93.9 | 98.7 | 84.9 |
| 1967 | 98 | 94.4 | 97.4 | 83.8 |
| 1968 | 92 | 93.8 | 97.2 | 84.7 |
| 1969 | 95 | 96.8 | 99.7 | 89.1 |
| 1970 | 100.0 | 100.0 | 100.0 | 100.0 |
| 1971 | 105 | 103.5 | 100.8 | 108.0 |
| 1972 | 108 | 105.4 | 100.6 | 112.0 |
| 1973 | 117 | 110.6 | 111.1 | 117.6 |
| 1974 | 135 | 128.5 | 136.1 | 125.4 |
| 1975 | 144 | 135.7 | 135.3 | 129.7 |
| 1976 | 152 | 139.2 | 142.9 | 134.0 |

Source: Statistical Office of the European Communities, Eurostat, Basic Statistics, 1977; and National Accounts ESA Aggregates, 1960-1975.

Table A-14

France

Price Indexes, 1953-76

(1970 = 100)

| Year | Wholesale Price Index | Export Price Index | Import Price Index | Fixed Capital Formation Price Index |
|------|--------------------------|-----------------------|-----------------------|---|
| 1953 | 44 | - | - | - |
| 1959 | 71 | - | - | - |
| 1960 | 73 | 80.9 | 81.1 | 68.3 |
| 1961 | 75 | 81.0 | 81.2 | 70.9 |
| 1962 | 77 | 81.8 | 83.5 | 73.6 |
| 1963 | 80 | 83.8 | 84.4 | 78.8 |
| 1964 | 81 | 87.5 | 84.9 | 82.2 |
| 1965 | 82 | 88.3 | 86.2 | 84.4 |
| 1966 | 84 | 90.0 | 89.0 | 86.6 |
| 1967 | 83 | 89.3 | 87.7 | 88.7 |
| 1968 | 85 | 88.5 | 86.2 | 89.5 |
| 1969 | 92 | 92.6 | 91.1 | 93.5 |
| 1970 | 100 | 100.0 | 100.0 | 100.0 |
| 1971 | 103 | 104.8 | 103.7 | 105.1 |
| 1972 | 110 | 105.5 | 101.8 | 109.7 |
| 1973 | 124 | 113.4 | 108.9 | 118.0 |
| 1974 | 153 | 140.3 | 156.1 | 137.2 |
| 1975 | 155 | 147.0 | 155.3 | 152.6 |
| 1976 | 171 | 159.5 | 168.5 | 165.7 |

Source: Same as in Table A-13.

Table A.15
 Netherlands
 Price Indexes 1953-76
 (1970 = 100)

| Year | Wholesale Price Index | Export Price Index | Import Price Index | Fixed Capital Formation Price Index |
|------|--------------------------|-----------------------|-----------------------|---|
| 1953 | 66 | - | - | - |
| 1959 | 81 | - | - | - |
| 1960 | 79 | - | - | - |
| 1961 | 78 | - | - | - |
| 1962 | 79 | - | - | - |
| 1963 | 81 | 90 | 90.4 | 72.7 |
| 1964 | 86 | 92 | 92.7 | 77.2 |
| 1965 | 89 | 94 | 93.2 | 80.8 |
| 1966 | 93 | 94.3 | 94.0 | 84.9 |
| 1967 | 93 | 94.0 | 93.3 | 86.5 |
| 1968 | 93 | 93.3 | 90.8 | 88.0 |
| 1969 | 94 | 95.1 | 94.0 | 93.0 |
| 1970 | 100 | 100.0 | 100.0 | 100.0 |
| 1971 | 101 | 102.8 | 104.4 | 109.8 |
| 1972 | 105 | 103.7 | 103.7 | 118.2 |
| 1973 | 118 | 110.9 | 111.4 | 124.9 |
| 1974 | 134 | 140.4 | 149.1 | 138.6 |
| 1975 | 143 | 147.0 | 153.2 | 153.5 |
| 1976 | 166 | 156.1 | 163.0 | 166.1 |

Source: Same as in Table A-13.

Table A-16

F.R. Germany

Growth of Trade by SITC Division (Ave. annual rates)

| SITC # | Trade with EEC | | | | Trade with ROW | | | |
|--------|----------------|----|---------|----|----------------|----|---------|----|
| | Exports | | Imports | | Exports | | Imports | |
| | I | II | I | II | I | II | I | II |
| 512 | 9 | 11 | 10 | 23 | 8 | 8 | 11 | 15 |
| 541 | 12 | 15 | 23 | 10 | 11 | 11 | 31 | 4 |
| 561 | 37 | 6 | -3 | 18 | 6 | -3 | 53 | 14 |
| 599 | 16 | 9 | 15 | 10 | 20 | 2 | 16 | 2 |
| 611 | 14 | 8 | 8 | 12 | 10 | 5 | 10 | 7 |
| 629 | 15 | 18 | 28 | 20 | 10 | 8 | 26 | 12 |
| 631 | 16 | 11 | 14 | 16 | 19 | 6 | 9 | 11 |
| 641 | 8 | 20 | 19 | 17 | 9 | 9 | 16 | 9 |
| 642 | 26 | 17 | 46 | 22 | 17 | 9 | 17 | 15 |
| 651 | 10 | 19 | 6 | 10 | 9 | 11 | 6 | 6 |
| 652 | 6 | 14 | 15 | 11 | - | - | 2 | 6 |
| 653 | 9 | 18 | 12 | 12 | 2 | 9 | 10 | 5 |
| 655 | 8 | 15 | 4 | 22 | 9 | 13 | 14 | 8 |
| 657 | 14 | 20 | 11 | 17 | 11 | 9 | 21 | 17 |
| 661 | 5 | 6 | 27 | 19 | -19 | 3 | 27 | 9 |
| 664 | 28 | 3 | 22 | 20 | -2 | 15 | 7 | 16 |
| 665 | 11 | 11 | 50 | 20 | 7 | 4 | 17 | 14 |
| 670 | 15 | 10 | 12 | 9 | 12 | 5 | 17 | 11 |
| 712 | 18 | 10 | 13 | 22 | 5 | 11 | 25 | 11 |
| 714 | 13 | 20 | 28 | 17 | 18 | 14 | 11 | 21 |
| 715 | - | 10 | 17 | 17 | 9 | 6 | 15 | 8 |
| 731 | 5 | 11 | 13 | 13 | 1 | - | 30 | 20 |
| 732 | 11 | 17 | 35 | 19 | 22 | 9 | 14 | 18 |
| 734 | 31 | 25 | 71 | 6 | 71 | 8 | 85 | 10 |
| 735 | 14 | 4 | 23 | 24 | 14 | 6 | 14 | 15 |
| 821 | 21 | 19 | 50 | 27 | 19 | 16 | 58 | 18 |
| 841 | 14 | 21 | 10 | 22 | 13 | 8 | 13 | 21 |
| 861 | 10 | 14 | 20 | 23 | 8 | 8 | 22 | 18 |
| 891 | 18 | 15 | 7 | 26 | 15 | 9 | 28 | 11 |
| 899 | 13 | -5 | 40 | -2 | 12 | -1 | 54 | -9 |

Source: Tables A-1-A-4.

I: 1953-59

II: 1959-72

Table A-17

France

Growth of Trade by SITC Division (ave. Annual Rates)

| SITC # | Trade with EEC | | | | Trade with ROW | | | |
|--------|----------------|----|---------|----|----------------|----|---------|----|
| | Exports | | Imports | | Exports | | Imports | |
| | I | II | I | II | I | II | I | II |
| 512 | 8 | 13 | -11 | 23 | 1 | 9 | -10 | 19 |
| 541 | - | 14 | 21 | 14 | -3 | 6 | -2 | 14 |
| 561 | .1 | 11 | 21 | 19 | -3 | -1 | 47 | 14 |
| 599 | 12 | 12 | 5 | 13 | 3 | 6 | 26 | 4 |
| 611 | 1 | 9 | 7 | 15 | -1 | 5 | -5 | 14 |
| 629 | 7 | 21 | 1 | 21 | -4 | 7 | -9 | 15 |
| 631 | 1 | 11 | 1 | 19 | -5 | -2 | -1 | 12 |
| 641 | 9 | 17 | 11 | 26 | -8 | 5 | 1 | 13 |
| 642 | 7 | 17 | 34 | 24 | -1 | 5 | 1 | 15 |
| 651 | -3 | 7 | -9 | 23 | -9 | 3 | -14 | 13 |
| 652 | 17 | 13 | -15 | 24 | -16 | -5 | -14 | 23 |
| 653 | 3 | 13 | -3 | 26 | -10 | 23 | -5 | 12 |
| 655 | 7 | 20 | -9 | 30 | -8 | 9 | -14 | 14 |
| 657 | 34 | 14 | 34 | 24 | -6 | 4 | -14 | 14 |
| 661 | 5 | 12 | -3 | 16 | -10 | 27 | 24 | 15 |
| 664 | 5 | 10 | 34 | 26 | -1 | 4 | -9 | 15 |
| 665 | 7 | 16 | 7 | 16 | -3 | 9 | -9 | 10 |
| 670 | 4 | 5 | 28 | 13 | -3 | 3 | -12 | 17 |
| 712 | 7 | 23 | 12 | 15 | -11 | 10 | -11 | 15 |
| 714 | 13 | 17 | 11 | 16 | 15 | 16 | -3 | 19 |
| 715 | -8 | 17 | -2 | 11 | -13 | 9 | -11 | 7 |
| 731 | -4 | 18 | 7 | 13 | -11 | 12 | -9 | 13 |
| 732 | 13 | 16 | 8 | 26 | 9 | 5 | -8 | 18 |
| 734 | 59 | 13 | 40 | 21 | 12 | 12 | -16 | 14 |
| 735 | 1 | 14 | -14 | 18 | 5 | 14 | -12 | 10 |
| 821 | 34 | 22 | 14 | 25 | -1 | 2 | -9 | 24 |
| 841 | 9 | 23 | 3 | 25 | 8 | 1 | -3 | 27 |
| 861 | 4 | 16 | 3 | 20 | -3 | 11 | -5 | 17 |
| 891 | 7 | 16 | 1 | 26 | -1 | 7 | 1 | 22 |
| 899 | 10 | 5 | -5 | 15 | 3 | 4 | -5 | 8 |

Source: A-5-A-8
 I: 1953-1959
 II: 1959-1972

Table A-18

Netherlands

Growth of Trade by SITC Division (Ave. Annual Rates)

| SITC # | Trade with EEC | | | | Trade with ROW | | | |
|--------|----------------|----|---------|----|----------------|----|---------|----|
| | Exports | | Imports | | Exports | | Imports | |
| | I | II | I | II | I | II | I | II |
| 512 | 24 | 20 | 13 | 12 | 20 | 12 | 11 | 14 |
| 541 | 18 | 12 | 17 | 16 | 9 | 9 | 17 | 7 |
| 561 | -4 | 41 | -8 | 3 | — | 5 | 5 | 9 |
| 599 | 7 | 10 | 14 | 7 | 5 | 5 | 10 | 5 |
| 611 | 63 | 6 | 3 | 8 | -8 | 8 | 5 | 6 |
| 629 | 14 | 11 | 5 | 13 | 5 | 5 | -1 | 11 |
| 631 | 39 | 12 | 9 | 13 | 15 | 5 | 3 | 4 |
| 641 | 8 | 12 | 4 | 13 | -3 | 4 | 6 | 9 |
| 642 | 11 | 15 | 5 | 19 | 9 | 7 | 18 | 8 |
| 651 | 5 | 14 | -1 | 7 | 2 | 4 | -5 | 8 |
| 652 | 13 | 5 | 3 | 5 | -4 | -2 | 10 | 6 |
| 653 | — | 12 | 4 | 11 | -1 | 6 | 4 | 6 |
| 655 | 16 | 20 | -8 | 18 | 4 | 11 | 17 | 4 |
| 657 | -1 | 19 | -5 | 20 | 7 | - | 5 | 13 |
| 661 | 16 | 1 | -1 | 6 | -20 | -1 | 5 | 2 |
| 664 | 3 | 14 | 6 | 8 | 8 | 3 | 11 | 6 |
| 665 | 6 | 14 | 12 | 11 | 6 | 4 | -5 | 10 |
| 670 | 17 | 12 | 2 | 4 | 39 | 9 | -6 | 6 |
| 712 | 6 | 19 | 5 | 14 | 44 | 16 | 1 | 12 |
| 714 | 24 | 18 | 10 | 16 | 20 | 10 | 10 | 14 |
| 715 | 16 | 10 | 2 | 7 | -4 | 13 | -5 | 7 |
| 731 | 29 | 7 | -2 | 9 | -51 | 4 | -15 | -9 |
| 732 | 13 | 17 | 13 | 14 | -4 | 17 | -4 | 6 |
| 734 | -16 | 15 | 28 | 26 | 12 | 9 | -1 | 8 |
| 735 | -7 | 17 | 15 | — | 4 | 7 | 7 | 9 |
| 821 | 2 | 15 | 21 | 23 | 11 | 11 | 38 | 19 |
| 841 | — | 15 | 6 | 18 | 2 | 6 | 14 | 14 |
| 861 | 21 | 19 | 9 | 14 | 8 | 17 | 9 | 14 |
| 891 | 20 | 12 | 41 | 11 | 20 | 8 | 20 | 12 |
| 899 | 13 | 4 | 10 | 1 | 4 | - | 6 | 3 |

Source: A-9 - 8.12

I: 1953-59

II: 1959-72

Table A-19

Coal Mining: NACE # 111
 Production Volume, Employment, and Total Fixed Capital Formation, 1955-72

| Year | F.R. of Germany | | | France | | | Netherlands | | |
|------|------------------------------------|--------------------------|-----------------------------|------------------------------------|--------------------------|----------------------------|------------------------------------|--------------------------|----------------------------|
| | Production Volume (mil.tons) | Employ- ment (000) | Invest- ment Mil D.M. | Production Volume (mil.tons) | Employ- ment (000) | Invest- ment mil. FF | Production Volume (mil.tons) | Employ- ment (000) | Invest- ment mil.Fl. |
| 1955 | - | 586 | - | - | 242 | - | - | 61 | - |
| 1956 | 158 | 592 | - | 55 | 240 | - | 12 | 61 | - |
| 1957 | 156 | 603 | - | 57 | 239 | - | 12 | 62 | - |
| 1958 | 154 | 597 | - | 58 | 238 | - | 12 | 63 | - |
| 1959 | 147 | 559 | - | 58 | 232 | - | 12 | 62 | - |
| 1960 | 148 | 507 | - | 56 | 221 | - | 13 | 60 | - |
| 1961 | 148 | 478 | - | 42 | 207 | - | 13 | 58 | - |
| 1962 | 147 | 448 | 821 | 52 | 201 | 532 | 12 | 57 | 87 |
| 1963 | 148 | 423 | - | 49 | 197 | 405 | 12 | 57 | 67 |
| 1964 | 148 | 397 | 700 | 53 | 189 | 790 | 12 | 55 | 36 |
| 1965 | 141 | 372 | 726 | 51 | 181 | 782 | 12 | 53 | 28 |
| 1966 | 132 | 348 | 490 | 50 | 175 | 796 | 12 | 50 | 17 |
| 1967 | 117 | 311 | 668 | 48 | 166 | 762 | 10 | 43 | 9 |
| 1968 | 117 | 276 | 618 | 42 | 151 | 759 | 8 | 36 | 6 |
| 1969 | 117 | 259 | 333 | 41 | 135 | 818 | 7 | 30 | 3 |
| 1970 | 117 | 252 | 488 | 37 | 123 | 328 | 6 | 26 | 6 |
| 1971 | 117 | 248 | - | 33 | 113 | - | 5 | 24 | - |
| 1972 | 109 | 233 | 668 | 30 | 104 | - | 4 | 21 | - |

Source: Production Volume: Statistical Office of the European Communities, Industrial Statistics, yearly volumes. Employment: Statistical Office of the European Communities, Social Statistics #2, 1973. Investment: Statistical Office of the European Communities, Statistical Studies and Surveys, Vol. 2, 1972.

Table A-20
Iron ore Mining: NACE #211

Production Volume, Employment, and Total Fixed Capital Formation, 1955-72

| Year | F.R. of Germany | | | France | | | Netherlands | | |
|------|-----------------------------|----------------|-----------------------|-----------------------------|----------------|---------------------|-----------------------------|----------------|----------------------|
| | Prod. Vol. (mil.tons) | Empl. (000) | Invest. Mil. DM | Prod. Vol. (mil.tons) | Empl. (000) | Inv. (mil FF) | Prod. Vol. (mil.tons) | Empl. (000) | Inv. (mil Fl.) |
| 1955 | - | 22 | - | - | 29 | | | | |
| 1956 | 17 | 22 | - | 53 | 29 | | | | |
| 1957 | 18 | 24 | - | 59 | 29 | | | | |
| 1958 | 18 | 23 | - | 60 | 28 | | | | |
| 1959 | 18 | 22 | - | 62 | 28 | | | | |
| 1960 | 19 | 20 | - | 68 | 28 | | | | |
| 1961 | 19 | 19 | - | 67 | 27 | | | | |
| 1962 | 17 | 16 | 34 | 67 | 26 | | | | |
| 1963 | 13 | 12 | - | 59 | 25 | | | | |
| 1964 | 12 | 10 | 19 | 62 | 22 | | | | |
| 1965 | 11 | 8 | 24 | 60 | 21 | | | | |
| 1966 | 10 | 7 | - | 56 | 18 | | | | |
| 1967 | 9 | 6 | - | 50 | 16 | | | | |
| 1968 | 8 | 5 | - | 56 | 14 | | | | |
| 1969 | 8 | 4 | - | 56 | 14 | | | | |
| 1970 | 7 | 4 | - | 57 | 12 | | | | |
| 1971 | 6 | 4 | - | 56 | 12 | | | | |
| 1972 | 6 | 3 | - | 55 | 11 | | | | |

Source: Same as Table A-19.

Table A-21
Iron and Steel Industry: NACE 221
Production Volume, Employment, and Fixed Capital Formation, 1955-72

| Year | F.R. of Germany | | | France | | | Netherlands | | |
|------|-----------------------|-------------|-----------------|-----------------------|-------------|-----------------|-----------------------|-------------|------------------|
| | Prod. Vol. (000) tons | Empl. (000) | Invest. mil. DM | Prod. Vol. (000) tons | Empl. (000) | Invest. mil. FF | Prod. Vol. (000) tons | Empl. (000) | Invest. mil. Fl. |
| 1955 | 10320 | 203 | - | 5407 | 146 | - | 811 | 10 | - |
| 1956 | 11688 | 213 | - | 5801 | 150 | - | 831 | 10 | - |
| 1957 | 12464 | 228 | - | 6456 | 153 | - | 896 | 11 | - |
| 1958 | 12498 | 235 | - | 6905 | 155 | - | 1015 | 11 | - |
| 1959 | 12989 | 234 | - | 7537 | 154 | - | 1174 | 12 | - |
| 1960 | 14720 | 248 | - | 8776 | 159 | - | 1376 | 14 | - |
| 1961 | 15335 | 254 | - | 9158 | 163 | - | 1389 | 15 | - |
| 1962 | 15026 | 252 | 2082 | 9041 | 162 | 2310 | 1628 | 16 | 215 |
| 1963 | 14560 | 246 | - | 9423 | 164 | 1670 | 1804 | 16 | 160 |
| 1964 | 17716 | 252 | 2152 | 10871 | 165 | 1192 | 1899 | 17 | 156 |
| 1965 | 18452 | 256 | 1807 | 10132 | 162 | 1002 | 1989 | 19 | 167 |
| 1966 | 17835 | 247 | 1766 | 10320 | 155 | 1015 | 2139 | 19 | 267 |
| 1967 | 18560 | 233 | 1202 | 11368 | 147 | 1122 | 2440 | 19 | 362 |
| 1968 | 22221 | 230 | 1010 | 11886 | 140 | 1596 | 2626 | 19 | 499 |
| 1969 | 23809 | 232 | 1361 | 13722 | 140 | 1551 | 3148 | 20 | 484 |
| 1970 | 24191 | 238 | 2395 | 14093 | 146 | 2097 | 2955 | 21 | 439 |
| 1971 | 22202 | 234 | - | 14432 | 146 | - | 3026 | 22 | - |
| 1972 | 23672 | 222 | 3013 | 15075 | 145 | 5098 | 3260 | 23 | 432 |

Source: Same as Table A-19.

Table A-22
 Chemical Industry: NACE #25-0
 Production Volume, Employment, and Fixed Capital Formation, 1955-72

| Year | F.R. of Germany | | | France | | | Netherlands | | |
|------|------------------------------|--------------------|-------------------|------------------------------|-------------|----------------|------------------------------|-------------------|------------------|
| | Prod. Vol. Index 63 = 100 | Empl. (000) | Invest. Mil. D.M. | Prod. Vol. Index 63 = 100 | Empl. (000) | Invest. Mil FF | Prod. Vol. Index 63 = 100 | Empl. (000) | Invest. Mil. Fl. |
| 1955 | 49 | 335 ^(a) | - | 52 | - | - | 48 | 64 ^(a) | - |
| 1956 | 53 | - | - | 54 | - | - | 53 | - | - |
| 1957 | 59 | - | - | 59 | - | - | 58 | - | - |
| 1958 | 63 | 425 | - | 63 | - | - | 61 | 82 | - |
| 1959 | 70 | 437 | - | 68 | - | - | 70 | 83 | - |
| 1960 | 80 | 475 | - | 79 | - | - | 77 | 87 | - |
| 1961 | 84 | 502 | - | 85 | - | - | 81 | 90 | - |
| 1962 | 91 | 507 | 2450 | 92 | - | 1521 | 92 | 93 | 379 |
| 1963 | 100 | 513 | 2486 | 100 | 356 | 1650 | 100 | 96 | 561 |
| 1964 | 111 | 522 | 2783 | 112 | - | 1683 | 122 | 101 | 711 |
| 1965 | 121 | 539 | 3631 | 121 | - | 2030 | 144 | 104 | 814 |
| 1966 | 132 | 547 | 4394 | 131 | - | 2495 | 159 | 106 | 1253 |
| 1967 | 143 | 536 | 3484 | 142 | 383 | 2286 | 177 | 108 | 1194 |
| 1968 | 162 | 537 | 3097 | 154 | 388 | 2259 | 221 | 110 | 1110 |
| 1969 | 184 | 569 | 4603 | 179 | 402 | 2434 | 259 | 118 | 1124 |
| 1970 | 194 | 598 | 6314 | 194 | 413 | 3472 | 288 | 121 | 1833 |
| 1971 | 202 | 591 | - | 208 | - | - | - | - | - |
| 1972 | 218 | 583 | 4579 | 221 | - | 4150 | - | - | 1471 |

Source: Production Volume and Investment same as in Table A-19.

Employment: United Nations, Yearbook of International Statistics, Vol. I, General Statistics, different yearly volumes.

(a) pertains to 1953.

Table A-23
 Man-made Fibers: NACE 26-0
 Production Volume and Total Fixed Capital Formation, 1958-72

| Year | F.R. of Germany | | France | | Netherlands ^(a) | |
|------|-----------------------|-----------------|-----------------------|-----------------|----------------------------|------------------|
| | Prod. Vol. (000) tons | Invest. mil. DM | Prod. Vol. (000) tons | Invest. mil. FF | Prod. Vol. (000) tons | Invest. Mil. Fl. |
| 1958 | 257 | - | 176 | - | 24 | (a) |
| 1962 | - | 133 | - | 220 | - | (a) |
| 1963 | - | - | - | 253 | - | (a) |
| 1964 | - | 179 | - | 373 | - | (a) |
| 1965 | 658 | 307 | 307 | 416 | 150 | (a) |
| 1966 | 714 | 249 | 347 | 330 | 167 | (a) |
| 1967 | 154 | 155 | 331 | 226 | 157 | (a) |
| 1968 | 990 | 296 | 384 | 150 | 188 | (a) |
| 1969 | 1174 | 440 | 447 | 180 | 221 | (a) |
| 1970 | 1226 | 531 | 485 | 501 | 275 | (a) |
| 1971 | 1392 | - | 561 | - | 314 | (a) |
| 1972 | 1445 | 234 | 606 | 258 | 456 | (a) |

Source: Same as Table A-19.

(a) included in chemical industry NACE 25-0.

Table A-24
Machine Tools for Working Metal: NACE #322
Production Volume and Total Fixed Capital Formation, 1958-72

| Year | F.R. of Germany | | France | | Netherlands | |
|------|--------------------------|--------------------|--------------------------|--------------------|-------------------------|---------------------|
| | Prod. Vol. (000) tons | Invest. Mil. DM | Prod. Vol. (000) tons | Invest. mil. FF | Prod. Vol (000) tons | Invest. Mil. Fl. |
| 1958 | 235 | - | 55 | - | 2 | - |
| 1962 | - | 362 | - | 196 | - | 15 |
| 1963 | - | - | - | 155 | - | 11 |
| 1964 | - | 257 | - | 84 | - | 9 |
| 1965 | 336 | 294 | 66 | 77 | 14 | 10 |
| 1966 | 341 | 310 | 67 | 88 | 12 | 11 |
| 1967 | 307 | 266 | 77 | 161 | 13 | 8 |
| 1968 | 317 | 324 | 73 | 126 | 14 | 15 |
| 1969 | 376 | 506 | 84 | 126 | 16 | 15 |
| 1970 | 427 | 612 | 94 | 206 | 16 | 29 |
| 1971 | 433 | - | 100 | - | - ^e | - |
| 1972 | 382 | 460 | 92 | 207 | 16 ^e | 19 |

Source: Same as Table A-19.

Table A-25
 Motor Vehicles and Parts: NACE 35-0
 Production Volume and Total Fixed Capital Formation, 1958-72

| Year | F.R. of Germany | | France | | Netherlands | |
|------|---------------------|--------------------|---------------------|--------------------|---------------------|---------------------|
| | Prod. Vol. (000) | Invest. Mil. DM | Prod. Vol. (000) | Invest. Mil. FF | Prod. Vol. (000) | Invest. Mil. Fl. |
| 1958 | 1507 | - | 1135 | - | 16 | - |
| 1962 | - | 1953 | - | 937 | - | 25 |
| 1963 | - | - | - | 1062 | - | 25 |
| 1964 | - | 1930 | - | 1221 | - | 42 |
| 1965 | 3001 | 2411 | 1684 | 1101 | 60 | 41 |
| 1966 | 3073 | 2435 | 2068 | 1279 | 55 | 73 |
| 1967 | 2502 | 1854 | 2060 | 1711 | 75 | 83 |
| 1968 | 3032 | 1879 | 2128 | 1519 | 89 | 38 |
| 1969 | 3767 | 2741 | 2513 | 1946 | 87 | 60 |
| 1970 | 3896 | 3881 | 2820 | 3436 | 85 | 79 |
| 1971 | 4045 | - | 3026 | - | 92 | - |
| 1972 | 3875 | 3236 | 3418 | 2857 | 100 | 84 |

Source: See Table A-19.

Table A-26
 Shipbuilding & Marine Engineering: NACE 361
 Production Volume and Total Fixed Capital Formation, 1958-72

| Year | F.R. of Germany | | | France | | Netherlands | |
|------|-------------------------|-------------|----------------|-------------------------|----------------|------------------------|------------------|
| | Prod. Vol. Gross R.tons | Empl. (000) | Invest. Mil.DM | Prod. Vol. Gross R.tons | Invest. mil FF | Prod.Vol. Gross R.tons | Invest. mil. Fl. |
| 1958 | 1429 | 110 | - | 451 | - | 556 | - |
| 1962 | - | 93 | 101 | - | 105 | - | 79 |
| 1963 | - | 84 | - | - | - | - | 69 |
| 1964 | - | 81 | 129 | - | 41 | - | 104 |
| 1965 | 1023 | 81 | 139 | 479 | 46 | 233 | 67 |
| 1966 | 1184 | 80 | 162 | 443 | 88 | 284 | 114 |
| 1967 | 1010 | 78 | 116 | 579 | 111 | 334 | 78 |
| 1968 | 1346 | 78 | 114 | 503 | 146 | 293 | 91 |
| 1969 | 1608 | 78 | 115 | 791 | 120 | 596 | 78 |
| 1970 | 1687 | 78 | 127 | 960 | 116 | 461 | 129 |
| 1971 | 1649 | 77 | - | 1112 | - | 821 | - |
| 1972 | 1606 | 75 | 153 | 1129 | 165 | 761 | 133 |

Source: See Table A-19.

Table A-27
Textile Industry: NACE #43-0
Production Volume, Employment and Total Fixed Capital Formation, 1953-72

| Year | F.R. of Germany | | | France | | | Netherlands | | |
|------|------------------|-------------|----------------|------------------|-------------|----------------|------------------|-------------|------------------|
| | Prod. Vol. Index | Empl. (000) | Invest. Mil DM | Prod. Vol. Index | Empl. (000) | Invest. mil FF | Prod. Vol. Index | Empl. (000) | Invest. mil. Fl. |
| 1953 | - | 593 | - | - | - | - | - | 110 | - |
| 19-4 | - | - | - | - | - | - | - | - | - |
| 1955 | 70 | - | - | 73 | - | - | 73 | - | - |
| 1956 | 75 | - | - | 78 | - | - | 74 | - | - |
| 1957 | 80 | - | - | 86 | - | - | 75 | - | - |
| 1958 | 77 | 614 | - | 83 | - | - | 76 | 103 | - |
| 1959 | 80 | 590 | - | 81 | - | - | 85 | 103 | - |
| 1960 | 87 | 614 | - | 89 | - | - | 91 | 105 | - |
| 1961 | 90 | 607 | - | 91 | - | - | 94 | 105 | - |
| 1962 | 96 | 585 | 980 | 91 | - | 900 | 94 | 103 | 158 |
| 1963 | 100 | 568 | 857 | 100 | 528 | 760 | 100 | 101 | 148 |
| 1964 | 103 | 551 | 958 | 100 | - | 851 | 105 | 98 | 174 |
| 1965 | 107 | 542 | 1138 | 89 | - | 661 | 101 | 94 | 158 |
| 1966 | 107 | 534 | 1098 | 101 | - | 720 | 106 | 90 | 154 |
| 1967 | 100 | 486 | 893 | 93 | 482 | 664 | 96 | 80 | 140 |
| 1968 | 116 | 485 | 1078 | 95 | 450 | 643 | 108 | 74 | 177 |
| 1969 | 128 | 504 | 1414 | 105 | 449 | 1059 | 112 | 84 | 188 |
| 1970 | 128 | 498 | 1545 | 102 | 439 | 1246 | 115 | 81 | 216 |
| 1971 | 135 | 478 | - | 109 | - | - | 117 | - | - |
| 1972 | 140 | 455 | 1386 | 118 | - | 1460 | 116 | - | 160 |

Source: Production and Investment: same as Table A-19.
Employment: Same as Table A-22.

Table A-28
 Paper and Paper Board Industry: NACE #47-0
 Production Volume, Employment, and Fixed Capital Formation, 1958-72

| Year | F.R. of Germany | | | France | | | Netherlands | | |
|------|---------------------------|-------------|-----------------|---------------------------|-------------|-----------------|---------------------------|-------------|------------------|
| | Prod. Vol. Index 1963=100 | Empl. (000) | Invest. Mil. DM | Prod. Vol. Index 1963=100 | Empl. (000) | Invest. mil. FF | Prod. Vol. Index 1963=100 | Empl. (000) | Invest. Mil. Fl. |
| 1958 | 75 | - | - | 72 | - | - | 65 | 27 | - |
| 1962 | 97 | - | - | 94 | - | - | 89 | 32 | - |
| 1963 | 100 | - | - | 100 | 132 | - | 100 | 33 | - |
| 1964 | 108 | 200 | 931 | 104 | - | 842 | 112 | 34 | 239 |
| 1965 | 115 | 203 | 1113 | 107 | - | 877 | 120 | 35 | 265 |
| 1966 | 118 | 204 | 1130 | 116 | - | 941 | 129 | 36 | 253 |
| 1967 | 118 | 194 | 1159 | 120 | 136 | 1026 | 133 | 36 | 270 |
| 1968 | 132 | 195 | 1241 | 122 | 134 | 1072 | 145 | 35 | 272 |
| 1969 | 145 | 202 | 1702 | 130 | 137 | 1037 | 160 | 34 | 278 |
| 1970 | 151 | 212 | 2203 | 136 | 141 | 1467 | 164 | 34 | 406 |
| 1971 | 153 | 205 | - | 138 | - | - | 162 | - | - |
| 1972 | 160 | 197 | 1727 | 149 | - | 151 | 169 | - | 418 |

Source: Production and Investment, same as Table A-19.
 Employment, same as Table A-22.

Table A-29

Index of Industrial Production (excluding construction)
Selected Countries
(1963 = 100)

| <u>Year</u> | <u>Germany</u> | <u>France</u> | <u>Neth.</u> | <u>EEC-6</u> | <u>UK</u> | <u>US</u> | <u>Japan</u> |
|-------------|----------------|---------------|--------------|--------------|-----------|-----------|--------------|
| 1958 | 73 | 78 | 71 | 72 | 84 | 76 | 47 |
| 1964 | 108 | 107 | 110 | 107 | 108 | 107 | 116 |
| 1965 | 114 | 110 | 116 | 111 | 111 | 117 | 120 |
| 1966 | 116 | 117 | 123 | 117 | 113 | 128 | 136 |
| 1967 | 114 | 121 | 128 | 119 | 113 | 131 | 162 |
| 1968 | 127 | 126 | 143 | 129 | 121 | 138 | 186 |
| 1969 | 144 | 142 | 160 | 143 | 125 | 145 | 216 |
| 1970 | 153 | 151 | 176 | 152 | 125 | 140 | 246 |
| 1971 | 156 | 160 | 188 | 157 | 125 | 139 | 252 |
| 1972 | 162 | 171 | 203 | 165 | 127 | 151 | 271 |

Source: Statistical Office of the European Communities, Industrial Statistics Yearbook, Luxembourg, 1973.

Table A-30

Average Annual Rates of Growth of Industrial Production,
Selected Years and Countries

| <u>Country</u> | <u>1958-65</u> | <u>1966-72</u> | <u>1958-72</u> |
|-----------------|----------------|----------------|----------------|
| F.R. of Germany | 5.6 | 4.8 | 5.3 |
| France | 4.3 | 5.4 | 5.3 |
| Netherlands | 6.1 | 7.1 | 7.0 |
| EEC-6 | 5.4 | 4.9 | 5.5 |
| United States | 5.4 | 2.4 | 4.6 |
| United Kingdom | 3.5 | 1.7 | 2.8 |
| Japan | 11.7 | 9.8 | 11.7 |

Source: Table A-29.

Table A-31

Employment in 3 EEC Countries, 1950-1970, (000) Workers

| <u>Year</u> | <u>F.R. of Germany</u> | | | <u>France</u> | | | <u>Netherlands</u> | | |
|-------------|------------------------|-----------------|----------|---------------|-----------------|----------|--------------------|-----------------|----------|
| | <u>Total</u> | <u>Industry</u> | <u>%</u> | <u>Total</u> | <u>Industry</u> | <u>%</u> | <u>Total</u> | <u>Industry</u> | <u>%</u> |
| 1950 | 21,153 | 9,035 | 42.7 | - | - | - | 3,665 | 1,520 | 41.5 |
| 1955 | 24,162 | 11,420 | 47.3 | 18,765 | 7,050 | 37.6 | 3,800 | 1,600 | 42.1 |
| 1958 | 25,357 | 12,083 | 47.7 | 18,823 | 7,346 | 39.0 | 3,899 | 1,631 | 41.8 |
| 1960 | 25,954 | 12,518 | 48.2 | 18,712 | 7,313 | 39.1 | 4,019 | 1,715 | 42.7 |
| 1965 | 26,418 | 13,017 | 49.3 | 19,544 | 7,692 | 39.4 | 4,382 | 1,792 | 40.9 |
| 1970 | 26,169 | 12,902 | 49.3 | 20,394 | 7,903 | 38.8 | 4,585 | 1,772 | 38.6 |

Source: Statistical Office of the European Communities, Population and Employment, 1959-1976, Luxembourg, 1977.

Table A-32

Total Fixed Capital Formation in Industry, 3 EEC Countries,
1964-72

| Year | Germany Mil. DM | France Mil. FF | Netherlands Mil. Fl. |
|------|--------------------|-------------------|-------------------------|
| 1964 | 23,443 | 24,438 | 5,217 |
| 1965 | 34,049 | 25,757 | 5,659 |
| 1966 | 33,026 | 28,045 | 6,613 |
| 1967 | 31,798 | 29,850 | 6,770 |
| 1968 | 28,911 | 30,947 | 7,089 |
| 1969 | 38,742 | 32,779 | 6,961 |
| 1970 | 50,511 | 40,229 | 9,006 |
| 1971 | - | - | - |
| 1972 | 50,698 | 57,238 | 10,013 |

Source: Statistical Office of the European Communities, Statistical Studies & Surveys, #2, 1972, and Investment in Fixed Assets 1972-1974, Luxembourg, 1976.

Table A-33

Iron and Steel Industry (as defined by ECSC Treaty), Output by Sub-product
1959 and 1972, (1000 tons)

| Product | 1958 | | | | | | 1972 | | | | | |
|---------------------------------|------|------|-----|-----|-----|-------|------|------|------|------|------|-------|
| | G | F | I | N | B-L | EEC-6 | G | F | I | N | B-L | EEC-6 |
| Liquid Steel for Casting | 558 | 367 | 147 | 19 | 99 | 1190 | 552 | 420 | 241 | 33 | 86 | 1332 |
| Ingots and semi-mfr. of Steel | 1668 | 384 | 667 | 13 | 557 | 3289 | 1516 | 727 | 743 | 133 | 236 | 3355 |
| Heavy Sections | 1516 | 734 | 324 | 0 | 644 | 3218 | 2223 | 1327 | 668 | 0 | 2268 | 6486 |
| Blanks for Tubes | 970 | 336 | 166 | 0 | 10 | 1482 | 1102 | 493 | 384 | 16 | 50 | 2045 |
| Wire Rod | 1715 | 1118 | 428 | 93 | 713 | 4067 | 3780 | 2601 | 1030 | 368 | 1261 | 9040 |
| Sheets & Plates (3mm) | 3618 | 1222 | 624 | 331 | 761 | 6556 | 5040 | 1824 | 1724 | 442 | 1710 | 10740 |
| Sheets & Plates (3mm) | 1126 | 1892 | 748 | 469 | 845 | 5080 | 6915 | 5677 | 3740 | 1951 | 3434 | 21718 |
| Electrical Sheets and Plates | 233 | 163 | 36 | 0 | 39 | 471 | 328 | 208 | 182 | 0 | 87 | 806 |
| Tinplates & other Tinned Sheets | 1094 | -- | 181 | 90 | 294 | 1659 | 2217 | 1798 | 861 | 450 | 982 | 6307 |

Source: Statistical Office of the European Communities, Industrial Statistics, 1973.

Table A-34
Textile Industry, Output by Sub-Product, 1958-1972, (000 tons)

| Product | 1958 | | | | | | 1972 | | | | | |
|---------------------------------|------|-----|-----|----|-----|-------|------|-----|-----|-----|-----|-------|
| | G | F | I | N | B-L | EEC-6 | G | F | I | N | B-L | EEC-6 |
| Wool: Worsted Yarn | 45 | 71 | 42 | 9 | 23 | 190 | 98 | 111 | 132 | 8 | 59 | 407 |
| Wool: Carded Yarn | 61 | 63 | 94 | 18 | 15 | 250 | 44 | 44 | 148 | 13 | 31 | 279 |
| Woven Wool Fabrics for Appl. | 42 | 43 | 61 | 17 | 8 | 171 | 45 | 47 | 110 | 11 | 7 | 220 |
| Woven Wool Fabrics for Blankts. | 3 | 17 | 15 | 5 | 3 | 43 | 1 | 11 | 13 | 3 | 4 | 31 |
| Cotton Yarn | 393 | 308 | 200 | 72 | 92 | 1064 | 373 | 273 | 238 | 57 | 91 | 1032 |
| Woven Cotton Fabric | 274 | 222 | 157 | 77 | 67 | 797 | 254 | 195 | 162 | 69 | 74 | 753 |
| Woven Fabric of Silk | 40 | 26 | 11 | 0 | 0 | 77 | 61 | 48 | 21 | 0 | 0 | 130 |
| Woven Fabric of Linen | 42 | 36 | 12 | 1 | 7 | 98 | 54 | 14 | 7 | 0.4 | 7 | 82 |
| Yarn of Jute | 79 | 94 | 44 | 10 | 73 | 300 | 25 | 41 | 19 | 3 | 64 | 152 |
| Woven Fabric of Jute | 62 | 73 | 41 | 15 | 40 | 231 | 23 | 31 | 13 | 5 | 28 | 98 |

Source: Same as in Table A-33.

Table A-35

Man-Made Fibers, Output by Sub-Product, 1958 & 1972 (1000 tons)

| Product | 1958 | | | | | | 1972 | | | | | |
|-----------------------------------|------|------|------|-----|-----|-------|------|------|------|------|-----|-------|
| | G | F | I | N | B-L | EEC-6 | G | F | I | N | B-L | EEC-6 |
| Synth. Man-made Fib. | 24 | 23 | 19 | 5 | 2 | 74 | 641 | 234 | 325 | 100 | 50 | 1349 |
| Yarn of Contin. Synth. Text. Fib. | 16 | 15 | 12 | 4 | 1 | 47 | 316 | 104 | 137 | 55 | 28 | 640 |
| Yarn of Synth. Staple Fib. | 9 | 8 | 7 | 1 | 1 | 26 | 324 | 131 | 188 | 44 | 22 | 709 |
| Rayon | 65 | 56 | 62 | 32 | 10 | 225 | 70 | 50 | 68 | 36 | 14 | 237 |
| Cellulose Staple Fib. | 139 | 70 | 76 | 12 | 17 | 313 | 90 | 85 | 101 | 0 | 28 | 304 |
| Wastes of Cell. & Rayon | 4264 | 3232 | 3896 | 984 | 492 | 12865 | 3509 | 3521 | 5212 | 1224 | 612 | 14078 |

Source: Same as Table A-33.

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