"THE STRUCTURE AND DETERMINANTS OF EAST-WEST TRADE: A PRELIMINARY ANALYSIS OF THE MANUFACTURING SECTOR

by

Damien NEVEN*
and
Lars-Hendrik RÖLLER**

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* Associate Professor of Economics, INSEAD, Boulevard de Constance, Fontainebleau, 77305 Cedex, France.

** Assistant Professor of Economics, INSEAD, Boulevard de Constance, Fontainebleau, 77305 Cedex, France.

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The Structure and Determinants of East-West Trade: A Preliminary Analysis of the Manufacturing Sector

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Introduction

Since the fall of 1989, important political changes have taken place in Eastern European countries and the USSR. These changes are far from completed and much uncertainty remains with respect to the speed at which reforms will proceed as well as to the content of the reforms. However, it is rather uncontroversial at this point to presume that some form of a market system for goods and factors will be established and that trade between Eastern European countries and the rest of the world is likely to be liberalised. In this paper, we shall assume that this reform is indeed implemented and we shall focus on its consequences for Western European countries. We will try to assess how the liberalisation of trade will affect the EEC countries and whether the "1992" programme of integration could be jeopardised by such liberalisation.

The consequences for Western Europe of liberalising trade with the East are, in principle, relatively straightforward (see Smith and Venables (1988), or Norman (1989)); as barriers to trade between East and Western Europe are removed, one can expect that the comparative advantage of East and Western Europe will be further exploited and accordingly that inter-industry trade will develop between the two areas. Between countries having similar factor endowments, one can also expect that scale economies will be further exhausted and hence that intra-industry trade will increase. In order to assess the consequences of trade liberalisation with the East for Western Europe in terms of exports potential, competition from imports and associated restructuring, a useful approach will thus consist of trying to assess the comparative advantage of Eastern Europe which is currently unexhausted as well as the potential for further intra-industry trade.

A significant part of the benefits associated with the "1992" programme will also stem from a better exploitation of the comparative advantage of the Southern European countries within the EC, namely Portugal, Spain and Greece (see Neven (1990) for an estimate of those gains). These countries have a relatively large endowment of labour and should therefore benefit from further specialisation in labour intensive commodities. In

turn, Northern European countries will specialise further in capital and human capital intensive commodities; given their modest size, relative to the North, Southern European countries should still appropriate most of the benefit from specialisation. The potential conflict between the 1992 programme and trade liberalisation with the East could then arise to the extent that the Eastern European countries share many characteristics in terms of factor endowments with the Southern EC members. From the prospective of Southern European countries, the simultaneous liberalization with the East and the South would reduce the extent to which specialization can occur and the extent to which factor prices can be expected to change. The benefits from EC integration in the South would thus be reduced.

The likelihood of actually realising the potential benefits of integration might also be affected; the process through which comparative advantage in the South will actually be exploited could indeed be somewhat jeopardised. The reallocation of resources across industries associated with the exploitation of comparative advantage will require investments which in many cases would be undertaken more effectively by Northern European companies, i.e. through foreign direct investment. If a premium is attached to foreign direct investment in the East, the process of restructuring in the South could be impaired. Such a course of events is thought to be particularly likely as far as German companies are concerned; given the political and economic links between West Germany and the East, German companies might give a premium to investment in the East.

Needless to say, the simultaneous liberalization of trade with the East and the South can only benefit the Northern European countries, given that the scope for specialization and changes in factor prices will be enhanced in the North. The unskilled labour force should however be expected to lose out in those countries.

To sum up, this paper will try to identify the comparative advantage of Eastern European countries and thereby characterise the trade that will take place between East and Western Europe. We proceed by analysing the factor content of the actual trade between East and Western Europe, which should "reveal" such comparative advantage. As mentioned above, whether a conflict can arise for southern EC members between the

implementation of the 1992 programme and trade liberalisation with the East will depend on the relative labour endowment and comparative advantage of Eastern Europe. Our analysis of the comparative advantage revealed in East-West trade will thus shed some light on the issue of whether the 1992 programme could be jeopardised by East-West trade liberalisation.

The paper is organised as follows. In section 1, we provide a brief description of trade patterns in manufactures between East and Western Europe. We will characterize these trade patterns in terms of direction and size. In section 2, we will look more specifically at revealed comparative advantage between the Northern European countries on the one hand and Eastern and Southern European countries on the other hand (presuming that the revealed comparative advantage is a good guide to the actual one). In that section, we explicitly compare intra-industry trade indices between North-East and North-South trade. In section 3, we present an econometric study of the trade flows between Germany, France, Italy and the UK on the one hand and the COMECON countries on the other hand. The objective of this study is to explain actual trade balances at the industry level, in terms of a variety of variables, including the factor intensity of production in those industries. A summary of results and some conclusions will follow in section 4.

1. Trade patterns between Western Europe and COMECON

In this section, we shall describe the trade flows in manufactures between the Western European countries, which include 11 EC countries (Belgium and Luxembourg being taken together) and 5 EFTA members, and the European COMECON countries as a block (that is, East Germany, Poland, Bulgaria, Albania, Czechoslovakia, Hungary, Romania, Yugoslavia and the USSR). We obtained data from the OECD on exports and imports as recorded in the Western countries, at the three digit level of the ISIC industrial classification, for the period 1960-1987[1]. In what follows, we shall focus on three

1 Further details on data sources and manipulations are provided in the Appendix.

dimensions of East-West trade, namely the evolution of trade balances, the relative importance of Western countries as markets and sources of supply for COMECON and finally the relative importance of COMECON trade for Western countries. At the outset, an important caveat is in order. Quite to our surprise, there is no data available on trade flows between East and West Germany. The appropriate information is, so it seems, not communicated to the OECD (or the EEC) by the West German authorities. At the same time, these trade flows are likely to be fairly large. When making comparisons between Western countries in terms of their respective trade flows with the East, the absence of intra-German trade flows should be kept in mind.[2]

First, with respect to trade balance (as a % of total exports), we observe that the trade balance of most Western European countries with COMECON has deteriorated since 1975 (for the sake of brevity the data is not reported here). Most of the deterioration actually occurs after 1983 and in some cases, the deficit is now substantial. This timing suggests that the deterioration is probably due to the fall in the price of oil in the early eighties, which has reduced the foreign exchange earnings of COMECON countries and the USSR in particular. Facing a sharp reduction of oil exports, COMECON countries have presumably reduced their imports of manufactures. Interestingly, Finland, Austria and Germany have a surplus with COMECON, which is stable over time. This patterns might simply reflect the geographical (and cultural) proximity of these countries with the East. Alternatively, it could possibly indicate a conscious policy on behalf of COMECON of favouring those suppliers (i.e. of not restricting imports from those sources).

Table 1 assesses the relative importance of Western countries as markets and sources of supply for COMECON. The left hand side of table 1 presents the market shares of the various European countries in the total exports of the main non-communist trading partners of COMECON (EC, EFTA, Japan and the US), to the COMECON market, for

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2 Another minor remark is in order: exports are reported on a FOB basis, whereas imports are reported on a CIF basis. Given that the COMECON countries are not part of the OECD (and hence do not provide information on their imports), it is not possible to construct data for imports and exports on a common basis. In the data that we use here, the value for exports is thus biased upwards. This bias is however likely to be rather small and should be consistent across countries.

1975, 1980 and 1987. Similarly, the right hand side of table 1 presents the market shares of European countries in the total imports from COMECON to its main trading partners. The first observation is that the FRG has about one third of the export as well as import market with COMECON. Of course this does not imply that the FRG is going to keep this relative dominance wis-à-vis the East, but it says something about the relative starting position and may be more relevant in the short to medium run. Focusing on exports, we observe that a number of countries experience a decline in their market share; this is the case for Belgium, France (with a decrease of some 30%), Sweden, the UK, Germany and Italy (a 10% fall). Countries which experience a rise in their market shares include Finland (some 130% increase), Austria (up by some 50%) and Switzerland (54%). Finally, the Netherlands maintains a more or less constant market share.

Next, we observe that Belgium, France, Italy, Netherlands, Sweden, Finland and the UK experience a decline in their relative importance as import markets from COMECON. Germany and Switzerland tend to absorb a constant share of COMECON imports, whereas Austria takes an increasing share.

On the whole, the geographical pattern of trade with COMECON tend do change, away from the EC countries, and in favour of Finland and the alpine EFTA countries. For our purpose, it is particularly significant that the EC becomes less important, both as supplier to COMECON and as a market for COMECON.

Table 2 presents the exports to (imports from) COMECON for the Western European countries, as a percentage of their total exports (imports) for 1975, 1980 and 1987. We observe that the Eastern European countries are not very significant export markets for most Western countries. Only in Finland and Austria do total exports to the East represent more than 10% of total exports (in 1987). More importantly, the relative importance of the East as an export market tends to decline over time. Except for Finland (where the decrease is less pronounced), the share of Western countries exports to the East has declined by some 50% since 1975. Looking at imports from the East, a similar pattern emerges; the COMECON countries are a relatively less important source of supply than 15

years ago. By comparison with the fall in export shares, the fall in import shares is however less pronounced (as expected, given the trend in trade balances described above).

On the whole, we find that Eastern trade is rather unimportant for most European countries and particularly small for EC countries. To the extent that the effects of trade liberalisation would presumably take some time to come through, this evidence therefore suggests that at least initially the overall consequences of the Eastern European liberalisation on Western Europe should not be overestimated.

Section 2. Factor intensity of trade with COMECON

The objective of this section is to assess the comparative advantage of COMECON countries as a block relative to Western European countries. A standard approach to assess comparative advantage would consist of estimating differences in factor prices and productivity across countries. Such an approach is unlikely to be successful for Eastern European countries for at least two reasons; first, reliable information on factor prices and productivity is hard to come by. Second, in the absence of well organised labour and capital markets in the East, recorded factor prices might not be very meaningful. An alternative approach to assess comparative advantage would be to estimate differences in factor endowments. Such an exercise is again likely to be difficult because of a shortage of reliable data. Finally, comparative advantage can also be estimated from actual trade flows; the factor content of trade flows will indeed "reveal" the comparative advantage underlying actual trade. This revealed comparative advantage will provide insight into the effect of trade liberalization only to the extent that the revealed advantage is a fair guide to the actual comparative advantage. This would also be a natural prior for market economies. To the extent that trade in COMECON countries has been "managed" away from what comparative advantage would dictate, revealed comparative advantage with COMECON might have to be interpreted rather cautiously. In any event, it is however unlikely that revealed comparative advantage will be totally misleading; it would be

irrational on the part of central planners managing trade in Eastern Europe to try export commodities for which they have a comparative disadvantage.

As mentioned above, our data uses the three digit ISIC industrial classification (29 industries). We have sorted out these industries into five categories according to their factor intensity. The classification of industries that we use can be found in Neven (1990) and it contains the following classes; industries intensive in natural resources, industries with an average labour and capital intensity, industries highly intensive in labour, industries highly intensive in capital and industries with a high content of human capital. The classification of the 29 ISIC industries into these five classes is presented in Appendix A.

Table 3 presents the allocation of the total exports of each Western European country to COMECON over the five categories of industries for 1987. Similarly, the commodity composition of imports is presented in table 4. Table 5 presents, for each category of industries the net exports of each Western European country as a proportion of its total trade (sum of exports and imports) with COMECON.

Focusing first on trade in commodities intensive in natural resources, we observe that the exports of such commodities out of Ireland, Portugal and Greece account for some 35 to 60% of their total trade. A significant, albeit lower, share of imports from COMECON in Ireland and Greece also occurs in those commodities (to such an extent however that Greece has a trade deficit). The Netherlands has also a surprisingly large share of (bilateral) trade in this category. Finally, we observe that the other countries have a larger share of imports than exports and substantial trade deficits in those commodities. This is somewhat surprising, given the widespread belief that the agricultural sector in Eastern Europe is somewhat ineffective and that shortages occurs in food markets. The evidence presented here might suggest that food production is directed towards exports markets, despite shortages in the domestic economy. It also accords with intuition that the specialization of imports in such commodities is somewhat higher in Switzerland and Austria, which should indeed have a relatively low endowment of natural resources.

Turning to the second category of industries, with an average capital and labour content, we observe that for EC countries the proportion of imports and exports in this

category is rather similar. Northern European countries tend however to have a higher share in imports than exports, whereas the opposite holds for Southern European countries. Net trade accounts for a significant proportion of total trade, especially in Northern European countries (with the exception of Germany and Austria). On the whole, this suggest that there is some intra-industry trade in this category, especially strong with the Southern European countries and that COMECON has some comparative advantage in those products relative to the Northern European countries.

The trade pattern for labour intensive commodities is also revealing. First, there is no Western country which specializes in the export of such commodities to the East. Portugal and Greece come first with some 14% of their exports and exhibit a significant positive net trade. In terms of imports, however, it is striking that only Germany and the Netherlands exhibit a significant specialization in those industries. These two countries seem to be the only ones to use Eastern Europe as a source of labour intensive commodities. Given that countries like Belgium, France or the UK should have similar factor endowments to those found in Germany and the Netherlands, this observation is somewhat surprising. It might be the reflection of either highly managed trade or the existence of trade barriers.

With respect to commodities intensive in physical capital, we observe the following; Northern EC countries (except for Denmark and The Netherlands) Sweden, Finland, Austria and Spain exhibit some intra-industry trade in those industries, while still maintaining a relative specialization (as indicated by their positive net exports). Greece, Portugal and Ireland tend to import these commodities.

Finally, we observe that the majority of exports out of Northern European countries and EFTA countries occur in human capital intensive industries (up to 92% for Switzerland). Interestingly, imports of human capital intensive products in these countries are also significant; the import share is always in excess of 30% and the positive net exports of Western countries in most cases does not exceed 50%. Hence, for those countries, even though there is a relative specialization in human capital intensive industries, there is still evidence of a significant intra-industry trade. In accord with

intuition, Greece, Portugal and Ireland are characterized by a relative specialization out of those industries.

On the whole, the commodity composition of trade with Eastern Europe is somewhat surprising; trade between the North of Europe and EFTA and COMECON is characterized by a surprising share of intra-industry trade, especially in human capital intensive industries but also in capital intensive industries. The share of imports in labour intensive products is rather low and such imports are really limited to The Netherlands and Germany. Finally, Eastern Europe tends to specialize in the production of natural resource intensive products. These findings do not support the common intuition that Eastern Europe has a comparative advantage in labour intensive products. To the extent that Southern EC countries have a comparative advantage in labour intensive commodities (see Neven (1990)), this evidence also suggests that the potential conflict between the integration of Southern countries in the EC and trade liberalisation with the East could very well be limited. In order to assess this question further, we shall now explicitly compare the trade flows between some Northern European countries (Germany, France and the UK) and COMECON on the one hand, and between the same Northern European countries and Greece, Portugal and Spain on the other hand.

Table 6 reports average intra-industry trade indices (adjusted for total trade imbalances) across the 29 ISIC industries (in 1985) for North-South and North-East trade. It is apparent that intra-industry trade is more important between the North and the East than between the North and Portugal and Greece. Intra-industry trade indices between the North and Spain are however closer to those observed between the North and the East.

In order to assess further the extent to which North-East and North-South trade might conflict, we report in table 7 the average intra-industry trade indices for the labour intensive commodities. The contrast between the East and the South of Europe is again apparent. Portugal and Greece are much more specialized in labour intensive commodities, relative to the North, than COMECON countries. Trade patterns with Spain are also somewhat closer to those observed for Eastern Europe.

On the whole, the comparison of intra-industry trade indices for North-East and North-South trade suggests that the conflict between EC and European integration should not be exaggerated for Portugal and Greece. At least by this measure, North-South and North-East trade flows are somewhat different. Spain, so it seems, has most to worry about; it has a trade pattern which is closer to the pattern observed in COMECON.

3. The Determinants of Trade between the EC and COMECON

In this section we complement the descriptive analysis of the previous section by estimating an econometric model which tries to identify the factors underlying trade between the four "big" EC members, namely France (F), Italy (I), UK and West Germany (G), and the COMECON countries. The objective is to explain the trade balances at the sectoral level in terms of a variety of variables representing determinants of classical trade, variables pertaining to intra-industry trade, trade barriers as well as policy variables. Our dependent variable is the trade balance as a proportion of apparent consumption, at the sectoral level. This should be some measure of relative competitiveness of the COMECON countries vis-a-vis the EC.

The analysis is carried out with a panel data set covering 29 manufacturing industries from 1975-1987, for the four "big" European countries. It is worth recalling at this point that the intra-German trade flows are not reported, whereas trade flows between East Germany and France, Italy, and the UK are available. As a result, one should be cautious regarding cross-country comparison involving Germany. In order to compare trade structures across EC countries we specify a separate equation for each country, leading to the following system of equations,

$$TB_{kti} = a_k + b_k X_{kti} + e_{kti}, \quad k=F,G,I,UK$$

where TB_{ti} is the trade balance as a proportion of apparent consumption in country k at time t in sector i. Notice that this specification is a system of four equations, one for

each country, where the parameter vector (a_k,b_k) varies across countries. The vector X is a set of 12 explanatory variables representing inter-industry and intra-industry determinants of trade as well as trade barriers. These variables include proxies for the intensity of human and physical capital in production, the R&D intensity, a measure of the degree of scale economies, a proxy for non-tariff barriers, the Community common external tariff, a measure of product differentiation, the rate of growth of demand, a measure of transportation costs, dummies for the agricultural and wood sectors, as well as a dummy for industries with high public procurement. The data and the proxies used for theses variables are described further in the appendix. There are 29 sectors for the time period 1975-1987 (see the appendix for a list of sectors).

Notice that human and physical capital intensities as well as the R&D intensity attempt to capture the factors underlying inter-industry trade. Scale economies and product differentiation try to capture the factors underlying intra-industry trade. The common external tariff, the public procurement, and the non-tariff barriers variables, as well as transportation cost measure the extent of protection (natural or policy-induced).

We assume that the additive error terms e_{ti} are temporally uncorrelated (within as well as across equations), contemporaneously correlated, and multinormally distributed with,

$$E[e_{it}]=0,\ E[e_{it},e_{it}]=s_{kl},\ E[e_{it},e_{it'}]=0,\ \ k=F,G,I,UK$$

With the above stochastic assumptions we estimate the system by seemingly unrelated regression (SUR). Table 8 reports the SUR estimates for the four countries. It is interesting to note that the determinants of trade with COMECON, despite some commonality, are rather differentiated across EC members. Among the common effects, we observe that non-tariff barriers seem rather unimportant as a determinant of trade balance with the East. This is somewhat puzzling. Our NTB variable captures the barriers to intra-EC trade, which presumably also apply to imports from the rest of the world. In previous work (see Neven and Röller (1990)), we found that

NTBs, as represented by this variable, do indeed reduce trade within the EC and between the EC and the rest of the world. The lack of significance that we obtain here might suggest that COMECON manages to restrict imports from the EC, possibly through NTBs, in the same industry as those where NTBs are prevalent in the EC. Barriers in COMECON would then balance those of the EC, with no effect on the trade balance. Other trade barriers such as the common external tariff also turn out to be much more significant and there is a remarkable consistency across countries regarding the effect of the common external tariff. The role that these barriers play is very similar to what we have observed regarding trade between the EC and the rest of the world (see again Neven and Röller, 1990), namely that a high common external tariff is associated with increased imports. This suggests that the common external tariff is used as an instrument to counterbalance Europe's comparative disadvantage. This may be particularly relevant for labour intensive industries where the common external tariff is indeed quite high. Regarding the other policy variable, i.e. public procurement, it seems that in West Germany and the UK industries with high degree of public procurement are indicative of a positive trade balance with the East, whereas in Italy the reverse is observed.

A large degree of similarity across countries also exists regarding the impact of high transportation costs. In all countries except West Germany industries with large transportation costs favour western exports over eastern imports. This empirical finding might be explained by still rather poor transportation technology available to COMECON exporters. Since this sector is expected to be developing rather rapidly in the coming years one could expect some increased exports from the East in sectors where transportation costs are substantial.

Turning to the classical determinant of inter-industry trade, namely human and physical capital, as well as R&D intensity, no clear picture emerges. Indeed the only significant pattern is that none of these variables seem to be significant in explaining trade balances between the West and the East. The exceptions are Italy, where human and physical capital intensity is associated with a negative trade balance, and France, where the opposite occurs. West Germany is also somewhat of an outlier with respect to R&D

intensive industries, which are indicative of a large West German trade surplus[3]. On the whole, we do not find much consistent empirical evidence for inter-industry trade along the classical factor endowments. Notice that these results are also consistent with the descriptive analysis of the trade patterns in Section 1.3 and 1.4.

Economies of scale are either insignificant, i.e. in West Germany and the UK, or impact negatively on the EC members trade surplus with COMECON, i.e. in France and Italy. The relative advantage of COMECON countries in industries with significant scale economies could be related to the industrial structure of COMECON during the time period under investigation. Large worker cooperatives dominated the industrial landscape and the small businesses have been almost exclusively missing. This regulated industry structure, inefficient as it may be from a managerial point of view, will presumably have allowed for a full exploitation of technical scale economies.

A consistent picture emerges for all of the four EC countries in the wood industry, where COMECON has a large trade surplus. This is again consistent with the earlier observation that COMECON exports in natural resources have been significant over the last decades. It is not clear however whether this trade pattern is indicative of a future comparative advantage of COMECON in the wood sector. To the extent that their wood exports are associated with a lack of a proper accounting of environmental costs, a change of policy regarding the management of environmental resources could reduce these exports.

Finally, in the food sector a rather homogeneous picture emerges. In all EC countries trade is rather balanced, except for West Germany which has a surplus. This is rather surprising since one might expect more exports of agricultural products into COMECON, especially in light of the frequently reported food shortages. One might argue that these exports out of the West have not happened for political reasons, and will expand now that political systems have changed. On the other hand, it could be argued that Eastern Europe may have a comparative advantage in agricultural production which could be realized under the new political and economic system (this is due to fertile land

3 It should also be mentioned that the lack of R&D results may be due to Cocom, which restricts technology exports to the East.

and lower population density). In this case one may expect a large surplus in agricultural commodities for COMECON countries. Under this scenario a dismantling of the protectionist practices within the EC (within the CAP) may be vital to allow the COMECON countries to exploit their comparative advantage.

4. Conclusions

The main conclusion which emerges from this preliminary analysis of East-West trade is that the extent to which trade arises out of comparative advantage might be rather limited. Indeed, there is some evidence of significant intra-industry trade in capital and human capital intensive sectors. As a result, the conflict between EC integration and integration with the East, should not be overestimated for Southern European countries.

Our analysis of course presumes that East-West trade has not been systematically managed away from what market forces would dictate. This assumption might not be appropriate and it should be further examined. In particular, it would be quite informative to compare factor prices and the distribution of industrial output across sectors between Eastern and Western countries. This might however be difficult because of the scarcity of comparable data.

In this paper, we have focused on the COMECON countries as a block. There is however presumably a large diversity of factor endowments across COMECON countries and a more detailed analysis would be very useful. In particular, East Germany is likely to integrate with the EC much faster than the other COMECON countries. A detailed analysis of East German trade is thus especially pressing.

Table 1 IMPORTANCE OF WESTERN COUNTRIES FOR THE EAST

	Market Share of Exports			Market Share of Imports		
	75	80	87	75	80	87
Austria	5.32	6.07	8.17	3.85	4.15	5.42
Bel-Lux.	3.27	3.03	2.05	3.35	2.83	2.53
Finland	4.89	7.04	11.29	4.31	3.44	3.82
France	10.44	11.78	6.94	9.64	10.34	8.03
FRG	31.63	29.72	28.93	27.17	28.60	27.22
Italy	10.66	9.33	9.43	10.47	12.37	9.68
Nethl.	2.68	3.34	2.69	4.66	4.04	3.77
Sweden	3.69	3.06	3.02	4.31	3.44	3.82
Switz.	3.42	3.21	5.27	2.44	2.39	2.73
UK	5.31	6.04	4.24	9.55	7.11	7.33

Table 2 IMPORTANCE OF THE EAST FOR WESTERN COUNTRIES

	Share of exports to COMECON			Share of Imports from COMECON		
	75	80	87	75	80	87
Austria	21.54	15.68	10.65	5.01	4.53	3.93
Bel-Lux.	3.78	2.59	1.36	1.69	1.31	1.26
Denmark	3.99	2.43	1.76	2.9	2.30	2.24
Finland	24.44	21.48	17.87	6.41	7.06	5.43
France	6.32	5.05	2.57	2.70	2.39	1.90
FRG	9.85	6.63	4.53	4.83	4.24	4.00
Greece	12.12	8.27	3.70	5.01	8.63	4.57
Ireland	1.51	1.41	0.73	1.34	0.78	0.94
Italy	9.17	5.44	4.55	4.41	3.96	3.30
Nethl.	3.21	2.92	1.87	2.00	1.71	1.62
Norway	4.43	3.05	1.85	2.37	2.13	1.66
Portugal	2.52	2.36	1.10	0.92	1.17	0.69
Spain	3.91	3.26	1.79	3.02	1.59	1.27
Sweden	6.76	4.73	2.45	3.57	3.31	2.56
Switz.	7.77	5.24	4.35	2.24	1.71	1.36
UK	3.89	2.92	1.67	2.61	1.75	1.59

Table 3 COMPOSITION OF EXPORTS

% of total exports

	1	2	3	4	5
Austria	3.56	9.96	2.66	28.21	55.61
Bel-Lux.	4.39	14.18	0.68	26.18	54.56
Denmark	9.16	10.82	1.11	4.83	74.07
Finland	6.45	3.61	10.66	26.89	52.39
France	3.72	7.07	2.05	18.12	69.04
FRG	3.60	13.27	2.45	16.90	63.77
Greece	33.10	13.81	14.33	19.94	18.82
Ireland	59.95	5.99	1.51	19.94	18.82
Italy	2.24	14.72	3.32	19.28	60.44
Nethl.	17.92	11.79	1.94	3.91	64.44
Norway	8.30	6.93	0.34	49.69	34.74
Portugal	39.03	11.33	13.54	5.06	31.04
Spain	3.79	8.31	0.79	30.32	56.80
Sweden	4.17	5.99	0.22	21.80	67.81
Switz.	1.56	3.48	0.32	2.50	92.13
UK	2.82	11.00	0.82	11.53	73.92

1 = Natural resources
2 = Average labour/capital
3 = Labour intensive
4 = Capital intensive
5 = Human capital intensive

Table 4 COMPOSITION OF IMPORTS

% of total imports

	1	2	3	4	5
Austria	23.17	14.89	5.96	20.04	35.94
Bel-Lux.	19.61	17.17	8.02	11.53	43.67
Denmark	16.79	14.84	15.61	17.86	34.89
Finland	4.15	18.78	7.09	13.56	56.42
France	12.92	20.10	11.32	9.66	46.00
FRG	13.49	19.94	29.89	11.67	25.02
Greece	18.54	8.31	1.16	23.07	48.92
Ireland	13.95	14.49	11.71	8.91	50.94
Italy	23.29	16.89	5.64	22.00	32.19
Nethl.	16.42	18.53	23.52	11.04	30.48
Norway	4.89	29.91	8.27	9.65	47.28
Portugal	3.90	11.74	0.30	22.26	61.80
Spain	17.58	10.08	1.59	16.83	53.91
Sweden	14.17	20.87	7.84	14.06	43.06
Switz.	18.90	29.36	9.90	12.00	29.84
UK	16.05	20.65	8.18	12.86	34.54

1 = Natural resources
2 = Average labour/capital
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4 = Capital intensive
5 = Human capital intensive

Table 5 NET EXPORTS BY COMMODITY

% of total trade

	1	2	3	4	5
Austria	-0.45	0.25	0.05	0.55	0.58
Bel-Lux.	-0.58	-0.02	-0.82	0.45	0.19
Denmark	-0.40	-0.28	-0.89	-0.65	0.25
Finland	0.72	-0.13	0.71	0.77	0.57
France	-0.44	-0.36	-0.61	0.43	0.34
FRG	-0.37	0.07	-0.75	0.43	0.63
Greece	-0.18	-0.22	0.65	-0.50	-0.74
Ireland	0.62	-0.42	-0.77	-0.63	-0.25
Italy	-0.74	0.15	-0.04	0.16	0.49
Nethl.	0.12	-0.15	-0.83	-0.42	0.42
Norway	0.05	-0.74	-0.95	0.54	-0.35
Portugal	0.86	0.11	0.97	-0.54	-0.21
Spain	-0.62	-0.05	-0.30	0.33	0.07
Sweden	-0.49	-0.50	-0.94	0.29	0.29
Switz.	-0.59	-0.46	-0.81	-0.21	0.81
UK	-0.82	-0.37	-0.84	-0.13	0.30

1 = Natural resources
2 = Average labour/capital
3 = Labour intensive
4 = Capital intensive
5 = Human capital intensive

Table 6 AVERAGE INTRA-INDUSTRY TRADE INDICES (1985)

	Germany	France	U.K.
COMECON	0.49	0.52	0.55
Portugal	0.36	0.39	0.40
Greece	0.35	0.37	0.41
Spain	0.58	0.63	0.57

Table 7 AVERAGE INTRA-INDUSTRY TRADE INDICES (1985)
Labour intensive industries

	Germany	France	U.K.
COMECON	0.51	0.40	0.39
Portugal	0.07	0.08	0.05
Greece	0.17		0.22
Spain	0.26	0.27	0.43

Table 8

Seemingly Unrelated Regression Results
(t-statistics in parenthesis)

	France	Italy	UK	West Germany
Intercept	-.014 (-1.81)	.281 (7.48)	-.014 (-.86)	.019 (1.21)
Human Capital	.021 (3.36)	-.166 (-5.50)	.010 (.67)	.019 (1.45)
Investment	.076 (1.76)	-.166 (-2.95)	.187 (1.57)	.022 (.30)
R&D	.040 (.59)	.172 (.40)	.099 (1.12)	.388 (3.50)
Scale	-.197 (-2.13)	-1.604 (-4.30)	.117 (.78)	-.204 (-1.16)
NTB	.003 (1.52)	.005 (.65)	-.002 (-.78)	-.003 (-.72)
Tariff	-.020 (-1.81)	-.263 (-5.92)	-.009 (-.47)	-.112 (-5.22)
Product Diff.	-.004 (-1.61)	.032 (3.41)	.003 (.77)	-.014 (-3.06)
Growth	.001 (.11)	-.052 (-1.57)	-.012 (-.90)	-.004 (-.24)
Transportation	-.003 (-2.23)	-.029 (-4.55)	-.013 (-5.38)	-.001 (-.45)
Agriculture	-.000 (-.05)	-.021 (-1.10)	.002 (.30)	.019 (2.28)
Wood	-.022 (-5.38)	-.137 (-8.23)	-.046 (-7.49)	-.034 (-4.58)
Public Proc.	.004 (.95)	-.053 (-3.35)	.010 (1.71)	.017 (2.30)
R^2	.35	.32	.38	.42

Appendix

Data Overview

The period selected for the analysis includes the years 1975 to 1987. The data are available for all EEC countries, with Belgium and Luxemburg regrouped as one country. The currency retained is the ECU (in thousands and constant in the base year 1980). In order to obtain a coherent final data set, the conversion of foreign currencies into ECUs (Research and Development data, trade data) and the use of deflators (trade data, economics variable data) to obtain 1980 ECUs had to be performed. The classification of industries used is the International Standard Industrial Classification System (ISIC) (United Nations statistical Studies Serie M #4/REV.2, 1969).

In our analysis, we used manufacturing (sector 3), which represents 29 industries. The level of aggregation used is the ISIC 3-digit level. Industries from other data sources were therefore matched to the ISIC 3-digit level classification.

List of Industries

ISIC Code	Industry
311	FOODSTUFF
312	FOODSTUFF-OTHER
313	BEVERAGE
314	TOBACCO
321	TEXTILE
322	TEXTILE-CLOTHING
323	LEATHER-FUR
324	LEATHER-FOOTWEAR
331	WOOD
332	WOOD-FURNITURE
341	PAPER
342	PRINTING-PUBLISHING
351	CHEMICAL

352	CHEMICAL-OTHER
353	OIL REFINERIES
354	PRODUCTS DERIVED FROM PETROLEUM
355	RUBBER
356	RUBBER-OTHER
361	CERAMIC GOODS
362	GLASS & GLASSWARE
369	STONE & NON METALLIC MINERAL PRODUCTS
371	STEEL
372	PRODUCTION & TRANSFORMATION OF NON-FERROUS METALS
381	TOOLS & FINISHED METAL GOODS
382	MECHANICAL MACHINERY
383	ELECTRICAL MACHINERY
384	MOTOR VEHICLES,RAILWAY,AEROSPACE
385	CHIRURGICAL, OPTICAL INSTRUMENTS
390	OTHER MANUFACTURING

Classification of industries according to factor intensities

Natural Resources	Average Capital and Average Labour Intensity	High Labour Intensity
Foodstuff	Metallic Products	Clothing
Wood	Printing	Shoes
	Leather	Ceramic
	Wood Furniture	
	Non Ferrous Products	
	Printing	
	Rubber	
	Textile	

High Capital Intensity	High Human Capital Intensity
Plastics	Chemicals
Glass	Pharmaceuticals
Other Mineral Products	Mechanical Machinery
Beverage	Electrical Machinery
Paper	Transportation Equipment
Steel	Medical/Optical Instrument

Sources of data for Section 3

Number of employees, gross wages, production values (value added taxes excluded), total investments for the years 1975 to 1986 : Statistical Office of the European Communities, magnetic tape, extracted from Domaine:Inde:Enquete Industrielle Annuelle, Collection:01, Donnees Globales.(Luxemburg:S.O.E.C. 06/07/88). The NACE 3-digit classification used there was converted to the ISIC 3-digit classification. The variables, expressed in millions of ECUs, have been deflated to thousands of constant 1980 ECUs with unpublished deflator factors obtained at the Statistical Office of the European Communities in Luxemburg.

Imports and exports for individual countries for the years 1961 to 1987 were obtained from: The Organisation for Economic Co-operation and Development, National Economics Statistics and National Accounts Division, magnetic tape, extracted from International Trade by Products System. (Paris : O.E.C.D.).
Imports are expressed CIF (Cost, insurance and freight) and exports are expressed FOB (Free on board). The currency used there was thousands of dollars which has been converted (conversion rate tables - Eurostat - EEC) to thousands of ECUs and deflated similarly than the data obtained through the S.O.E.C. in Luxemburg.

Research and Development expenditures were obtained at the Organisation for Economic Co-operation and Development from unpublished sources for the years 1975 to 1985. It was made available to us by the Administrator of the Scientific, Technological and Industrial Indicators Division at the O.E.C.D. office in Paris. In order to expand the data base some data points had to be created when years and industries were missing for some countries. When a year was missing in a particular industry for a particular country the previous year was used and when an industry for a particular country was missing the average of existing country data for that industry was substituted. In addition, the ISIC 4-digit classification used there was converted to the ISIC 3-digit classification. Constant

1980 millions of dollars have been converted with unpublished conversion rate tables provided by the same source than above at the O.E.C.D. in Paris into constant 1980 ECUs. There are no data available for Greece.

Tariffs data was produced from the Bulletin International des Douanes - European Economic Community - Year 1987-1988. (International Customs Tariffs Bureau - Brussels). Averages were created within industries for the ISIC 3-digit classification.

Non-tariff barriers data for each sectors data were created based on the article - The Sectoral Impact of the Internal Market by Pierre Buigues and Fabienne Ilzkovitz - Commission of The European Communities - 1988 (the NACE 3-digit classification used there was converted to the ISIC 3-digit classification). In this article industrial sectors are classified into high, medium, and low intra-EC NTB sectors. Thus, our NTB variable ranges from 0-3. On the other hand, one could argue that sectors with an NTB ranking of 3, which are typically characterized by a large degree of public procurement, direct those NTBs to the same degree at other EC member countries as to non-EC countries. Sectors with a lower NTB classification may be more characteristic of larger extra-EC than intra-EC NTBs.

Price per kilo of Belgian imports: Belgium Ministry of Foreign Trade.

Economies of scale data, measured by the relative size of the mid-point plant for the German industry, for the years 1978 to 1984 : Scherer (1975) - pp 66. The SYPRO 4-digit classification used there was first converted into NACE 3-digit and secondly into ISIC 3-digit classification. A regression model was performed to create data for the years 75, 76, 77, 85.

A dummy variable is used for the agricultural and wood sectors, as well as for product differentiation where the dummy is 1 for the consumer industry and 0 otherwise. The

human capital variable is proxied by the deviation of industry wages from the country mean wage. Demand growth is computed as the percentage growth in apparent consumption.

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