

"EEC INTEGRATION TOWARDS 1992:  
SOME DISTRIBUTIONAL ASPECTS"

by

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N° 90/23/EP/SM

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Printed at INSEAD,  
Fontainebleau, France

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INSEAD and CEPR

September 1989

Revised - December 1989

I would like to thank the editors of Economic Policy, C. Wyplosz and D. Begg, the discussants of this paper, A. Jacquemin and V. Norman and the Economic Policy panel members for useful comments on a earlier draft of this paper. I am also thankful to R. Parker for excellent research assistance. The financial support of INSEAD under grant N° 2152R is gratefully acknowledged.

## Gains and losses

Damien J. Neven

### Summary

This paper evaluates how the benefits and costs of the internal market programme will be shared across countries. The main conclusion which emerges is that the Northern European countries have little to expect from the internal market. The only exception is the UK which can expect some gains, because it is less integrated than the other Northern European countries. The main beneficiaries of the programme will be the Southern European countries. These countries will benefit both from a better exploitation of their comparative advantage and from a better use of scale economies to a much larger extent than the countries of Northern Europe.

I evaluate first the benefits that can accrue through a better exploitation of comparative advantages within Europe. I observe that the specialisation of production occurs mainly between the North and the South of Europe, with little specialisation between Northern European countries. Portugal and Greece are specialised in labour intensive commodities (footwear, shoes, ceramics), whereas Germany and France are specialised in the production of goods intensive in human capital (chemicals, pharmaceuticals, medical equipment, electrical and mechanical machinery and transport equipment). The removal of non tariff barriers should increase the extent to which those "revealed" comparative advantages will be exploited. In addition, I find that Spain has a comparative advantage in labour intensive products comparable to those of Greece and Portugal but that this advantage has so far been left unexploited. Spain could thus also benefit from specialising more in labour intensive productions. I also find that the UK seems to have a comparative advantage in industries intensive in

human capital, which has not been exploited. As a result, UK firms involved in chemicals, pharmaceuticals, transport equipment, electrical and mechanical machinery should be in a favourable position to compete in Europe. Otherwise, I find that the comparative advantages which remain unexploited between Northern European countries are negligible. This suggests that the gains from completing the Internal Market in the North should be limited both in terms of gains from more competition and in terms of gains from unexploited comparative advantages. Next, I try to quantify the overall benefits accruing from the better exploitation of the comparative advantages between the North and the South. I find that the effect will be potentially much stronger in the South, mainly because the Northern European markets of labour intensive products are quite important for the South, whereas the Southern European markets of human capital intensive products are quite small for the North. Still, whether it is feasible, and advisable, for the South to exploit its comparative advantage depends on the extent to which trade with labour abundant countries outside the EC is liberalised. It is found that if trade with the rest of the world is liberalised at the same pace as intra-EC trade, labour intensive production (clothing, footwear) in the South could increase by as much as 14%. Such an increase would correspond to a deterioration of the balance of payments in the Northern European countries of about 0.5% and a boost in GNP in the South amounting to 0.6%. As a result, the areas in the North where clothing and footwear industries are concentrated, like Baden Württemberg, Oost-Vlaanderen, Nord-Pas-de-Calais or East Midlands, could experience a significant further decline. Next, one observes that a wider trade liberalisation between the EC and the rest of the world than between EC members would primarily affect Northern European countries. It seems that even under a scenario of wide liberalisation, the Southern European countries would benefit from exploiting their intra-EC comparative advantage.

Next, I concentrate on benefits which can accrue from a better utilisation of scale economies; it is concluded that little benefits can in general be expected in Northern Europe. Yet, large benefits from rationalisation could accrue in Spain, where companies are much smaller than in the rest of Europe. Surprisingly, we find that benefits from rationalisation in Portugal should be much smaller than in Spain.

## EEC Integration towards 1992: Some Distributional Aspects

Damien J. Neven

INSEAD and CEPR

Since the publication of the European White Paper on the Internal market, the potential benefits that could accrue from a more integrated Europe have been widely studied. The "Cecchini report" and the simulations undertaken by Smith and Venables (1988) and Norman (1989) all conclude that the static benefits from integration will be significant and in particular that the change in European welfare could amount to some 4% of base consumption. Baldwin (1989) has also convincingly argued that substantial dynamic gains should be added to those estimates. Yet, the question of how these benefits will be distributed among countries has not been widely addressed. Indeed, the European Commission has been remarkably silent on the matter.

The actual distribution of these benefits will affect the political process and the feasibility of the whole project. Distribution matters can be looked at through several lenses. Will all countries benefit, or obtain a "fair" share of the benefit? Perceptions of member states will influence the political process at the European Commission and at the European Parliament. Second, how will the distribution of surplus between consumers and producers be affected? How will the relative price of capital and labour change? Finally, what will be the impact of the programme at the sectoral level, given that industries tend to be concentrated in particular regions. The perceptions of voters and interest groups will surely influence national and European politics.

In order to select the appropriate framework for analysis, it is worth spelling out at the outset the content of the internal market program. This program is centered around the removal of border controls and technical barriers to trade in goods and services and the removal of barriers to the movement of factors, the approximation of indirect taxes and the liberalization of public procurement policies. From the perspective of intra-EEC trade, the removal of border controls, the harmonization of technical standards and the liberalization of public procurement amount to the removal of non-tariff barriers. The removal of these barriers is equivalent to a reduction (in the absolute level) of the cost of intra-EC exports. It also appears that the approximation of indirect taxes is not a central element, given that the current system of taxation does not entail any distortion of trade or competition.<sup>1</sup> Consequently, it seems that the economic benefits (costs) of the current programme can be appropriately assessed by focusing on the removal of non tariff barriers, so that trade theory is the appropriate framework for analysis<sup>2</sup>.

From the perspective of trade theory, it is however not obvious a priori (i) that all countries should benefit from the program of integration (ii) that consumers and producers will both benefit and finally (iii) that all factor of production will be better off. The reasons are as follows.

At the outset, it is useful to distinguish between two classes of factors which give rise to international trade. On the one hand, trade can arise from comparative advantage, i.e. relative cost differences across

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1. The removal of border posts might indeed lead to arbitrage in goods for final consumption if rates are not harmonised. The extent to which final consumers will undertake arbitrage is however a matter of debate.

2. Trade theory will however focus on static gains. To the extent that external scale economies are important, a dynamic analysis, as in Baldwin (1989), is a necessary complement.

countries. On the other hand, trade can arise from scale economies and product differentiation. In practice, any trade flow will stem from both cost differences and scale economies at the same time. For the sake of exposition, it is useful to concentrate initially on the extreme cases where only one factor prevails. Let us also assume for the time being that factors are not mobile internationally.

If trade is governed by traditional comparative advantage, it will be unilateral and inter-industry. Each member country will be a net exporter of the commodities in which it has a comparative advantage and import commodities in which it has a comparative disadvantage. In principle, removal of non-tariff barriers within the EC should increase the scope for exploiting comparative advantage; in a simple Heckscher-Ohlin world, with two countries and two commodities, a reduction in trade costs will lead to further specialization. Indeed, the effect of non-tariff barriers will be to drive a wedge between the domestic price of the import commodity and the price of the same commodity in the exporting country. In equilibrium, relative price inclusive of trade costs will equalise across countries. The relative prices exclusive of trade costs will thus differ, each country having a relatively higher price for its import commodity. As trade costs are reduced, there is scope for more specialization: in each country, the import price will fall, which prompts a reduction in the domestic production of the import competing good and further specialization in the export commodity. Relative prices exclusive of trade costs in the two countries will also converge and the relative price of the import commodity fall in both countries.

What are the welfare consequences of such a change? First, the distribution of income between factors will be affected (the Stolper-Samuelson theorem applies); the increase in the relative price of the export

commodity will lead to an increase in the production of that commodity. In turn, the demand for the factor used intensively in the production of that commodity will increase and the demand for other factors will be reduced. Consequently, the relative price of the factor which is used intensively in the production of the export commodity will increase. That is also to say that distribution of income between factors of production will be affected and that at least one factor will be worse off. Second, it is not entirely clear that all countries will benefit. In principle, the increased specialisation should be beneficial because production is now allocated in a more efficient manner, such that low cost producers increase their share of total output. Yet, the removal of non-tariff barriers within the Community might induce some member countries to import from other members rather than import from the rest of the world. That is to say that trade might be diverted from the rest of the world. Some tariff revenues might then be foregone, representing a net loss for the importing country. This effect could in principle compensate and over the gains from specialisation, so that some countries could possibly suffer an overall loss. Such an instance might indeed be rather unlikely but it cannot be ruled out.

Let us now turn to cases where trade stems from scale economies and product differentiation. This type of trade will occur mainly between countries with similar factor endowments (and technology) and one observes trade flows in both directions between countries, i.e. intra-industry trade. In the pure case where trade stems only from scale economies, relative factor prices should in principle be equalised in the first place so that the liberalization of intra-industry trade should not have any impact on the distribution of income between factors. The liberalisation of trade will lead to some benefits stemming from more intense competition, a larger variety of products and a better exploitation of scale economies. What

about the distribution of these benefits between countries, and between consumers and producers? At the country level, the welfare consequences can be summarised as follows (see also Norman 1989) : in any country, the reduction in trade costs will increase exports and hence, increase the producer surplus in that country. However, given that trade is bilateral, there will also be an increase in import penetration. This should reduce local production. While consumers will benefit from lower prices (and possibly a higher degree of variety), domestic producers lose out. Each country will thus gain for sure in export markets and might lose in the domestic markets, where local production is displaced. Whether a country gains or loses in the aggregate will thus also depend on what happens in each market. The outcome in terms of welfare is in general indeterminate. It will depend very much on the view that one takes of the competition between firms. In particular, the extent to which additional surplus will accrue from foreign markets and the extent to which domestic production will be reduced will be heavily influenced by the way in which competition takes place. This is illustrated by the diversity of welfare results obtained by Smith and Venables (1988); for example, they conclude that welfare (as % of consumption) in the cement industry could fall by 1% or increase by 2.2%, depending on one's assumption regarding competition between firms. The final outcome will also be heavily dependent on initial conditions. In particular, the extent to which foreign firms will gain market share in the domestic economy, thereby lowering the profits of domestic competitors, will hinge on whether these firms can obtain a better cost position by increasing output. If indeed the enlargement of the market leads to a better use of scale economies, foreign firms will obtain a large benefit and domestic competitors will be badly hurt. All this is to say that the distribution of the benefits from integration will be affected by the extent

to which scale economies are exploited in the first place. Countries which currently do not exhaust scale economies should in principle benefit more.

The distribution of surplus between consumers and producers will also depend on what happens to competition. The increase of competition, which would presumably result from increased foreign penetration in all markets, should favour consumers. Yet, if tacit (or implicit) collusion develops at the European (rather than national) level, consumers will tend to lose out. Once again, everything will depend on the way in which competition takes place.

So far, I have also assumed that the removal of non-tariff barriers would primarily affect the substitutability of goods but not factor mobility. If one allows for the movement of factors as well as goods, distributional consequences will also be modified; in particular, we have assumed so far that increases in output and exports following the removal of NTBs would be undertaken by domestic firms, so that the domestic producer surplus would be enhanced. If instead foreign firms undertake the increase in output and exports, through foreign direct investment, the producer surplus is likely to accrue to the parent company. For example, the profits of Volkswagen in Spain are likely to be repatriated to Germany. Another issue arises when all countries do not have access to the same technology, so that total factor productivity differs significantly across countries. In such case, some country may offer higher returns to all factors of production. For example, the returns to human capital, capital and labour might be higher in the North than in the South of Europe. All factors, provided they are mobile, would then move North. If labour alone moves North, the effect would still be to raise the capital/labour ratio in the South. However, if capital also moves, real wages and output can actually fall in the South. There is some evidence that labour migration in Europe

has been more consistently directed to the North than capital movements, so that one could presume that this extreme consequence will not materialise and that the capital/labour ratio in the South would increase.

Yet, the presence of external economies is an additional source of worry for the South such that differentials in factor prices would not narrow down. Caballero and Lyons (1989) suggest that external economies might be significant. At the same time, it is difficult to estimate external economies, given that one cannot determine a priori the geographical coverage of externalities. By estimating external economies at the national level, Caballero and Lyons might substantially overestimate them. Given the uncertainty of the importance of external economies, I shall assume in what follows that factor movements and trade specialization lead to a convergence in factor prices.

On the whole, there is thus no a priori argument suggesting that all countries could benefit from the internal market programme. There are also good reasons to presume that the distribution of income between factors and the distribution of surplus will be affected. As a consequence, an empirical assessment of how the benefits could be distributed is necessary. That is the objective of the present paper.

One should also emphasize that the internal market programme will have a significant impact on European economies only to the extent that the non-tariff barriers are indeed hampering trade and competition. The whole rationale for the internal market programme must be grounded in the belief that barriers to trade are important. The Cecchini report, though listing many such barriers, fell short of systematically assessing their effects on trade and industry structures. In a recent paper, Neven and Röller (1989)

have cast doubts on the importance of non-tariff barriers<sup>3</sup>. These authors estimate a structural model for the share of EC and rest of the world imports in the four big European countries. Non-tariff barriers have a marginal impact on intra-EC trade, but significantly hamper trade with the rest of the world. These findings suggest that one should not overestimate the consequences of removing non-tariff barriers for intra-EC trade.

Given that the internal market programme has given rise to many fears in the rest of the world that Europe might become a "fortress", it is worth commenting briefly on the welfare consequences for the rest of the world of reducing intra-EC barriers to trade. The most direct consequence for non-members is indeed a loss of market share in the EC, resulting from trade diversion. This will happen when a member country, which used to import from the rest of the world, chooses to import from another member, because the reduction in trade barriers within the EC makes this source of supply more attractive. If the amount of trade being diverted is sufficient, the terms of trade between the EC and the rest of the world will be affected. As a result, producer surplus in the rest of the world will fall. In a static analysis, this is also the only welfare effect on the rest of the world. Hence, the rest of the world can only lose from the completion of the internal market programme, at least in terms of the static effect. Potential benefits could presumably accrue from increased output and consumption in the EC which would increase the demand for imports (into the

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3. At the sectoral level these authors estimate equations which can be seen as reduced forms of the import markets, where the demand for imports cannot be disentangled from the supply of exports from partners (respectively in the EC and the rest of the world). The explanatory variables represent the factors which underlie the demand and supply schedules; these factors include variables representing comparative advantage, the determinants of intra-industry trade, transportation costs, non-tariff barriers and policy variables.

EC). Such benefits will however take time to materialise, if at all, so that the short-term effect on the rest of the world is almost certainly negative. Such negative effect could however be avoided by an appropriate change in the common external tariff ; indeed, the external tariff could be adjusted in such a way that trade between the EC and the rest of the world involves in the aggregate exactly the same collection and quantities of goods as before the formation of the union (see Kemp and Wan, 1975). As a result, the rest of the world could be left unaffected.

In order to characterise the distribution of benefits, I shall proceed as follows. I shall deal with comparative advantage and scale economies separately. First, I shall try to identify the comparative advantage between European countries which can be exploited. A useful guide to potential comparative advantage is "revealed comparative advantage", i.e. the pattern of trade and specialization which can be observed. The presumption here is that existing comparative advantage could potentially be better exploited following trade liberalization. In order to characterise this pattern of "revealed comparative advantage", I shall examine intra-EC trade flows and identify the industries and countries where inter-industry trade is prevalent. This is the object of Section 1. Section 2 then analyses the pattern of comparative advantage which generates these inter-industry trade flows. In Section 3, I look at factor prices; the purpose of this analysis is first to assess the scope for a better exploitation of the comparative advantage previously "revealed" and second to identify potential comparative advantage which are not presently revealed in trade flows. In Section 4, I shall try to assess the extent to which the removal of non-tariff barriers could lead to more specialization and changes in relative factor prices. Next, Section 5 deals with scale economies. From detailed data on the degree of scale economies and firms' actual size, I identify

some countries in which there is considerable potential for cost reduction. Some conclusions follow in Section 6.

### 1. Intra-EC trade patterns

It is important to distinguish intra-industry trade arising from product differentiation and scale economies, and inter-industry trade arising from specialization to exploit comparative advantage. Industry by industry, trade patterns can be measured by the adjusted Grubel-Lloyd index, which expresses the net trade between two countries to the total amount of their bilateral trade. Looking at the trade between countries  $i$  and  $j$ , in industry  $k$ , the index ( $AIIT_{ijk}$ ) is formally defined as<sup>4</sup> :

$$AIIT_{ijk} = 1 - \frac{\left| \frac{X_{ijk}}{\bar{X}_{ij}} - \frac{M_{ijk}}{\bar{M}_{ij}} \right|}{\frac{X_{ijk}}{\bar{X}_{ij}} + \frac{M_{ijk}}{\bar{M}_{ij}}}$$

where  $X_{ijk}$  and  $M_{ijk}$  denote respectively the exports from country  $i$  to country  $j$  and the imports in country  $i$  from country  $j$ , in industry  $k$ .  $\bar{X}_{ij}$  and  $\bar{M}_{ij}$  denote the total manufacturing exports and imports between countries  $i$  and  $j$ . In any given industry  $k$ , this index will be equal to one, when exports and imports (as a % of total exports and imports, respectively) are

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4. The original (unadjusted) Grubel-Lloyd index uses the absolute values of trade flows. The adjusted index has been preferred because the original index tend to overestimate the extent of intra-industry trade in countries which have total trade imbalances, which can be due to temporary exchange rate misalignment (see Balassa & Bauwens 1988).

equal. This would occur when trade is purely intra-industry. Conversely, the index will be equal to zero when either exports or imports are zero, so that trade is unilateral. This would be a case of pure inter-industry trade.

I have computed this adjusted index for 29 industries representing the whole manufacturing sector and all bilateral trade flows between the EC 12 countries in 1985. Details about the data sources and the list of industries is provided in appendix A.

Table 1 presents the average over the 29 industries of the trade indices for all bilateral trade flows. From this Table, it is apparent that Greece and Portugal tend to have less intra-industry trade than the other countries. This accords with the intuition that the two countries have factor endowments which differ significantly from the Community average. Ireland, Spain and Italy seem to have intermediate values of the indices. Finally, Germany, France, the Netherlands, the UK and Belgium are characterised by intense intra-industry trade, mostly with one another.

<Insert Table 1 about here>

To characterise the pattern of (intra-European) comparative advantage, one should analyse the indices at the industry level. However, there are many such indices (1,914 in total). Such a large collection of numbers is difficult to interpret by inspection. Consequently, to summarise the information, I have used a clustering procedure. The objective of this procedure is to create groups of countries which are most similar in terms of their trading pattern. It is briefly described in appendix A.

<Insert Table 2 about here>

Table 2 presents the results of the clustering procedure, where the pre-specified number of groups is equal to 2 and 3. We observe that with two groups, Portugal and Greece split from the rest of the Community. Increasing the number of clusters to three, Greece become isolated, a second group comprises Spain, Italy and Portugal, the third group the rest of the Community. If the number of clusters is increased beyond three, both Portugal and Greece are individually isolated.

Having obtained these clusters, I examined whether different trade patterns could be identified across groups. This analysis is performed by inspecting the average value taken by all variables in the various clusters<sup>5</sup>. The following conclusions emerge:

First, there are five industries where significant inter-industry trade is observed in Europe<sup>6</sup>. These industries are tobacco processing, clothing, shoes, wood and electrical machinery.

Second, the pattern of the inter-industry trade can be described as follows. In the tobacco processing industry, there are two main producers in Europe, namely the Netherlands and the UK. All other countries are net importers. The clothing and shoes industries follow a very similar pattern. In these industries, Portugal and Greece export to the rest of the Community. Italy and Spain are also net exporters in these two industries, but to a lesser extent. In the wood industry, Portugal is an exporter to the rest of the Community and Greece is an importer. Both Greece and

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5. Given that there are 12x29 variables, the data is not reported. It is available on request from the author.

6. Inter-industry trade is "significant" in the sense that for the bilateral trade flows identified below, the (adjusted) intra-industry trade is lower than 0.2. This criteria is fairly arbitrary but using 0.15 or 0.1 instead does not change the conclusions.

Portugal are net importers from the rest of the Community in the electrical machinery industry.

Third, inter-industry trade is also observed, but on a smaller scale in the animal feed, ceramic and paper industries. In the animal feed industry, Portugal and Greece import from the rest of the Community. In the paper and ceramic industries, Portugal is a net exporter to the Community, whereas Greece is a net importer.

On the whole, trade arising from the "classical" factors is fairly limited between European countries, at least in terms of the product scope. It is worth noting however that trade in agricultural products is also likely to respond to a classical factor, namely the endowment of natural resources. Since the sample focuses on manufacturing, this might significantly underestimate the total amount of intra-European trade stemming from classical factors. A caveat should also be added, regarding the level of aggregation at which I compute the intra-industry trade indices. The higher the level of aggregation, the higher the indices will be: some inter-industry trade is likely to be buried in the aggregation. For example, it is reasonable to conjecture that France and the UK have some inter-industry trade in wine. Wine is included in the food sector, where the net exports of French wine to the UK are presumably compensated by net imports of other food products, so that on the whole the intra-industry trade index is fairly high. Yet, by using a high level of aggregation, one will still capture the instances where inter-industry trade is particularly important, being prevalent in a collection of similar sub-industries. This level of aggregation was also selected in order to be able to match the trade data with the data on industry characteristics, which I use to identify factor intensities (Section 2).

The pattern of inter-industry trade that I report above also accords with intuition; inter-industry trade occurs mainly with Portugal and Greece, which indeed are presumably most different from the Community average in terms of factor endowments. This intuition will be confirmed in the next Section. There are however some important differences between Portugal and Greece, Portugal seems to have more inter-industry trade based on natural resources (wood/paper). A detailed comparison of the intra-industry trade indices of Portugal and Greece with the rest of the Community also reveals that Portugal has systematically higher indices. Hence, Portugal is closer to the Community average in terms of the underlying factors endowment leading to trade. Greece is most different from the rest of the Community, and as such should benefit most from the common market. Looking at the intra-industry trade indices between Portugal and Greece, we also observe that in the clothing and shoes industries, where they are net exporters to rest of the Community, Portugal and Greece actually have a fair amount of trade between themselves. This is indeed consistent with what theory would suggest.

To my surprise, the trade patterns reported above indicate that Spain, in terms of the structure of her external trade, is actually very similar to Italy and France. This issue will be taken up further below, when looking at factor prices (Section 3). In any event, the Iberian peninsula is not homogenous.

## 2. Inter-industry trade and revealed comparative advantage

Having identified the inter-industry trade flows in the previous Section, I shall next characterise the comparative advantage underlying these flows.

At the outset, the wood and paper industries, where Portugal is a net exporter, can be characterised as "Ricardo" types of industries, where natural resources drive the comparative advantage. One would also presume that trade in clothing and shoes out of Portugal and Greece stems from a comparative advantage in labour intensive commodities. Similarly, the net exports from the rest of the Community to Portugal and Greece in electrical machinery corresponds to a comparative advantage in industries intensive in human or physical capital.

In what follows, I shall check whether these presumptions can be confirmed. More generally, I shall characterise the comparative advantage of the various European countries. I proceed as follows. First, I classify industries according to their factor intensity. I end up with five types of industries. For each country and each type of industry, I then compute the net exports in percentage of domestic production (adjusted for total trade imbalances). In any given countries, differences in these relative net exports across types of industries will reveal some comparative advantage.

In order to characterise the industries in terms of their factor intensity, I have computed, for each industry, the following variables<sup>7</sup> : the ratio of investment over output as a proxy for capital intensity; the

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7. For a complete description of the data sources, see Neven and Röller (1989).

number of employees per unit of output to capture labour intensity; and the ratio of research and development expenditures over output to represent the intensity of human capital. These variables have been computed for the 29 industries mentioned above in the four big European countries (Germany, France, the UK and Italy), for the period 1980-1985. The industries have then been classified by using the average values<sup>8</sup> taken by these variables over the period. The industries have been sorted into five categories; these include highly capital-intensive industries, highly labour-intensive industries, industries characterised by average capital and labour intensity, industries intensive in human capital and industries intensive in natural resources. Details of the procedure that was followed to classify the industries can be found in appendix A.

<Insert Table 3 about here>

Table 3 presents the final classification of industries. As expected, the clothing, shoes and ceramics industries can be characterised as highly labour intensive. Chemicals, electrical and mechanical machinery, medical/optical instruments and transportation equipment are intensive in human capital. Plastics, glass, beverage, paper, steel and other mineral products also stand out as particularly capital-intensive.

Having determined the factor-intensities of the various industries, we are in a position to characterise the (ex post) comparative advantage of the European countries with respect to one another. In Table 4, we present for all EC 12 countries, the deviation from the national average, in each of the

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8. We take ours over five years, to avoid misleading short term variations in some of the flow variables that we use to proxy stocks.

five categories of industries described above, of the net exports (exports to EC - imports from the EC) as a percentage of domestic production. This a measure, adjusted for overall deficits (surpluses), of the extent to which countries are net exporters in any particular industry category.

<Insert Table 4 about here>

First, Portugal and Greece have a strong comparative advantage in labour intensive products. These products are exchanged for commodities which are highly intensive in human capital. Interestingly, Portugal and Greece do not appear to have a comparative "disadvantage " in industries which are highly capital-intensive or in industries where capital and labour intensity is average. Italy also seems to have some comparative advantage in labour intensive industries but, by contrast with Portugal and Greece, does not have a comparative disadvantage in productions intensive in human capital. Interestingly, even though it has positive net exports, Spain does not seem to be specialising in labour intensive industries. This is consistent with the observation, put forward above, that Spain exhibits a trade pattern which is quite different from those of Portugal and Greece.

Next, it seems that Portugal, the Netherlands, Belgium and in particular Ireland and Denmark, have some comparative advantage in resource based industries. For the case of Portugal, this advantage appears in the wood industry (as mentioned above), whereas for the Netherlands, Ireland and Denmark, it appears in the food industry.

Germany and to some extent France seem to have a comparative advantage in industries intensive in human capital, whereas in addition to Greece and Portugal, Belgium, Denmark and the Netherlands have a slight comparative disadvantage. Belgium and to a lesser degree Italy also have an advantage

in capital-intensive commodities. For the remaining category of industries, characterised by average capital and labour intensities, no clear pattern emerges.

It is also interesting to note that France and especially the UK do not have any large revealed comparative advantage or disadvantage. Even in labour intensive industries, their deficit is rather small. These two countries thus appear to have relative stocks of factors which correspond to the Community average. They are not particularly good at anything but they are not particularly bad either, relative to their EC partners.

On the whole, there is some specialization of production in Europe. The specialisation of production occurs basically between the North and the South of Europe, with little specialisation in between countries in the North. The two factors of production which seem to determine the comparative advantage between the North and the South are respectively labour and human capital. Greece and Portugal have revealed comparative advantage in labour intensive industries. Germany and France have a comparative advantage in human capital intensive industries. By contrast, physical capital does not seem to generate significant comparative advantage. Trade in capital-intensive industries or in industries characterised by average capital and labour intensity, is mostly of intra-industry nature. Within the Northern European countries, France and Germany seem to have specialised more in human capital intensive industries than the UK, Belgium, Denmark and the Netherlands.

### 3. Factor prices and potential comparative advantage

So far, the various comparative advantage underlying observed inter-industry trade in Europe have been identified. In principle, one could presume that the removal of non-tariff barriers should lead to a better exploitation of the comparative advantage observed so far. The output of footwear, clothing and ceramics may increase in Greece and Portugal (and to some extent in Spain), with a corresponding fall in production of those commodities in Northern European countries. Germany and France could specialise more in chemicals, pharmaceuticals, electrical and mechanical machinery, medical and transport equipment. Yet, one should try to assess the extent to which these comparative advantages have already been exploited and possibly identify a form of comparative advantage which has not so far been revealed. This is the object of the present Section.

A useful insight into the question of whether comparative advantage is already fully exploited can be obtained from a comparison of factor prices across European countries. Traditional trade theory based on the assumption of perfect competition suggests that a full exploitation of comparative advantage will lead to an equalization of relative factor prices across countries. Along those lines, a deviation from the equality of factor prices could be interpreted as an indicator that comparative advantage is not fully exploited because of NTBs. Even if one allows for imperfect competition, a condition of free entry will usually guarantee that factor prices will tend to equalise (see Helpman and Krugman 1986). If there is significant market power, it is possible that factor prices will not converge. Yet, it will still be the case that some comparative advantage is left unexploited. A removal of NTBs should increase the degree of competition, lead to an increase in market share of low cost producers, further specialisation and a convergence in factor prices.

As observed above, the Southern European countries tend to export labour intensive commodities: if factor prices are not equalised, one should find that labour is relatively cheap in the South. Similarly, one should find that human capital is relatively cheap in Germany and France. To assess this, Table 5 presents the hourly labour costs in the manufacturing sector of the EC countries. The hourly labour cost is unfortunately not a pure measure of the price of labour; in countries where human capital is used more intensively, labour costs will tend to be larger.

<Insert Table 5 about here>

From Table 5, it appears that some differences in the cost of labour still exists between EC countries; in particular, France and Denmark have labour costs some 25% above the European average; Germany, Belgium and The Netherlands some 35 to 45% above the average. The UK and Ireland are 10% below the average. Finally, Spain, Portugal and Greece have remuneration at least 40% below the average. This observation tends to confirm that there is ample scope for exploiting comparative advantage in Portugal and Greece. The situation of Spain is interesting; as observed above, Spain has not specialized in labour intensive industries nearly as much as Portugal and Greece. Yet, factor prices seem to suggest that Spain should have done so ! The scope for specialization in labour intensive industries is larger in Spain than in Portugal and Greece.

The differences in labour costs that we observe between the Northern European countries can be better assessed by looking at deviations from the average labour costs in the North (EC 9 minus Ireland) rather than from the EC average. It is then observed at one extreme that Germany and the Netherlands have labour costs some 14 % above the average, whereas at the

other extreme the U.K. has labour costs 25 % below the average. One can wonder about the source of such discrepancies. In particular, the deviation from the average that is observed in Germany and the Netherlands seems rather large. For Germany, the explanation seems to be that human capital is used more intensively than in other countries. This is consistent with the observation that Germany has a trade surplus in human capital-intensive industries (see above). It is also borne out by the evidence, presented in Table 6, that in Germany the personnel involved in Research and Development (R&D) represent a significantly higher share in total employment than in the other European countries. Of course, the share of R&D personnel in total employment is only one proxy for the intensity of human capital. In particular, this proxy might not be very meaningful if the qualification of R&D personnel varies a great deal across countries. To assess this potential bias, Table 6 also reports the proportion of university graduates in R&D personnel. It turns out that this proportion does not vary much across countries and that Germany is characterised by a relatively high proportion. As a result, our measure of human capital does not seem to be sensitive to the composition of R&D personnel and Germany can probably be seen as having a large endowment of human capital.

<Insert Table 6 about here>

The relatively high share of R&D personnel in total employment observed in the UK (together with a high proportion of university graduates in R&D) also suggests that human capital is used intensively in the UK. At the same time, the hourly labour cost in the UK is below the average. This could indicate that the price of human capital is rather low in the UK and that

there is scope for specialization in industries intensive in human capital, where the net trade position of the UK is currently negative (see Table 4).

The differences in labour costs observed between the other Northern European countries do not seem to be closely related to the intensity of human capital. The question then arises of whether these remaining differences are of a magnitude such that a better exploitation of comparative advantages between Northern European countries can be reasonably expected after NTBs are removed. In other words, one can wonder whether the dispersion of labour costs that we observe in the North is not marginal. This matter is taken up further in the next section.

So far, the analysis confirms the earlier presumption that, as a result of the 92 programme, Greece and Portugal will further specialise in the production of labour-intensive commodities; and Spain could follow the same route. In addition, one concludes that the UK may concentrate more on human capital-intensive industries, with a potential specialization in chemicals, pharmaceuticals, mechanical and electrical machinery and transportation equipment.

#### 4. Removal of NTBs and specialization

In the previous Section, it was found that large potential comparative advantage were left unexploited between the North and the South of Europe, which could presumably be attributed to non-tariff barriers. In Section 4.2, I shall calibrate a small model which attempts to estimate the effect of removing the NTBs between the North and the South. Given that some countries outside the EC also have a comparative advantage in labour

intensive products, which could question the desirability of specialisation for Spain, Greece and Portugal, our estimation deals with various scenarios regarding the liberalisation of trade between the EC and the rest of the world. Before turning to this question, I shall first analyse further the relatively small difference in factor prices between Northern European countries.

#### 4.1 Factor prices and NTBs in Northern Europe

As mentioned above, it is not clear whether the differences in labour costs between Northern European countries are of a magnitude such that the removal of NTB can reasonably be expected to lead to more convergence. It is first interesting to notice that labour cost differences in the North have diminished a great deal since 1975. This is illustrated in Figure 1, where a high degree of convergence in hourly labour cost is observed<sup>9</sup>. Between 1978 and 1988, the standard deviation of the percentage differences in hourly labour cost across countries has actually fallen by more than 50% (from 0.308 to 0.14).

An appropriate benchmark by which the remaining labour cost differences between countries can also be assessed, is the dispersion of labour cost within countries. Such a comparison is possible with respect to monthly labour costs, in 1984 (Eurostat data). In that year, the standard deviation of the percentage differences in monthly labour costs between Northern European countries was equal to 0.115. In the same period, the standard

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9. The data presented in Figure 1 come from the Bureau of Labor statistics. They are not entirely comparable to the Eurostat data, discussed above. The main differences stem from the inclusion of workers with independent status in the BLS statistics.

deviation of the percentage differences in labour costs across regions was equal to 0.070 in Germany, 0.129 in France and 0.063 in the U.K. This comparison indicates that the dispersion of labour costs across countries is of the same order of magnitude as the dispersion within countries. As a result, one can wonder whether non-tariff barriers have much to do with remaining labour cost differences in the North. In order to assess this matter further, I tried to see whether differences in labour costs between pairs of countries could be correlated across industries with the level of NTBs. To proxy the non-tariff barriers, I used the variable presented in Neven and Röller (1989). This variable takes discrete values from 0 to 3, as the importance of NTBs increases <sup>10</sup>. The values that the variable takes on the 29 industries in our sample are presented in Table 7.

<Insert Table 7 about here>

The correlations between differences in remuneration and non-tariff barriers are presented in Table 8, for the four big European countries.

<Insert Table 8 about here>

From this Table 8, it appears that between Germany, France and Italy, differences in remuneration are quite unrelated to the level of non-tariff barriers. However, the difference in remuneration between the UK on the one hand and France and Germany on the other hand does seem related to non-tariff barriers. The UK industries where NTBs are high seem to be

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10. Details of the construction of this variable can be found in Neven and Röller (1989).

characterised by (marginally) lower remuneration than their continental counterparts. That is also to say that UK industries which have been prevented from exporting to the continent because of NTBs should be in a favourable position to increase their exports when these barriers are removed. The industries most concerned (i.e. where NTBs are highest) include beverages, foodstuff, metals, electrical and mechanical machinery and motor vehicles.

On the whole, one can thus conclude that remaining labour cost differences between Northern Continental countries are small, and do not seem to be related to the existence of non-tariff barriers. The benefits from removing these NTBs, in terms of a better exploitation of comparative advantages between continental Northern European countries should thus be very limited. Both the U.K. and the Continent should however benefit from a removal of NTBs to trade across the Channel.

The fact that remaining labour cost differences (and comparative advantages) across countries in the North tend to be very limited also has some implications with respect to the assessment of the potential benefits accruing from an increase in competition after the removal of NTBs. The reason is that the benefits from unexploited comparative advantages and the benefits from increased competition are likely to come together. Indeed, the persistence of large cost differences across countries trading with one another could only be accommodated by a fairly low degree of competition. In such case, the removal of NTBs would lead to some benefits from more intense competition as well as some benefits from the exploitation of comparative advantages. At the opposite, negligible cost differences across countries are a priori indicative of a high degree of competition. That is to say that the gains from more intense competition that one could anticipate in the North are also likely to be fairly limited.

#### 4.2 Factor prices, NTBs and specialization in Southern Europe

In this Section, I estimate how the removal of NTBs could affect the exploitation of comparative advantage between the South and the North of Europe. I shall concentrate on two industries, namely clothing and shoes. These are the two industries in our sample which are most labour-intensive, i.e. where the comparative advantage of Spain, Portugal and Greece could be most important. At the same time, these two industries are important for the Southern European countries, both in terms of output and in terms of exportables; together, they represent some 4-5% of industrial output in Portugal and Greece and slightly less than 3% in Spain. Net exports in those industries account for up to 80% of domestic production and those exports are directed primarily at the Northern European markets. I neglected the ceramics industry because ceramic products are not heavily traded. The electrical machinery industry was also neglected because the Southern European market is rather small for the Northern European countries. For example, exports of electrical machinery from Germany to Portugal and Greece together account for some 11% of the exports from Germany to Belgium. That is also to say that the benefits from specialisation should be much smaller in the North than in the south; the North is more important for the South than the South is important for the North, because the South is much smaller (in terms of output). Being smaller, the South will also appropriate a larger share of the benefits from specialisation (this is the well known "small country effect" of trade theorists).

To quantify the effect of removing NTBs, I calibrate a small model of imperfect competition. It assumes that two areas can be distinguished in Europe, namely the "North" and the "South", and that costs in the footwear

and clothing industries are lower in the South than the North, reflecting the comparative advantage of the South in those industries. I consider the rest of the world as an alternative supplier in those industries and I assume that the rest of the world also has a comparative advantage in labour intensive products with respect to the EC as a whole. The introduction of the rest of the world as an alternative source of supply is quite important to draw policy conclusions from the simulation. Indeed, a specialisation of the Southern European countries in labour intensive products might not be desirable if a trade liberalisation between the EC and the rest of the world would significantly jeopardize their competitiveness within the EC. A reduction in trade barriers between the EC and the rest of the world is also a reasonable scenario, at least for the clothing industry, given the progressive liberalisation of the multi-fiber agreements. I assume that firms sell a representative homogenous commodity and compete à la Cournot. According to the estimates of Pratten (1988) (and Smith and Venables, 1988), the absence of increasing returns to scale (except for possible economies of throughput) seems to be a fair description of the technology in clothing and footwear. Accordingly, I assume that marginal costs are constant. In the model, presented in appendix B, I derive the effects of a reduction in trade costs (i.e. a removal of NTBs) between European countries and/or between the EC and the rest of the world, on the market shares and output of the three suppliers, namely the North and the South of Europe and the rest of the world. I allow for different reductions in the trade costs respectively between the EC countries and between the EC and the rest of the world. The initial conditions of my simulation exercise are described in appendix B.

<Insert Table 9 about here>

It is however worth commenting briefly on one important element of the calibration, namely the estimation of cost differences; for this purpose, Table 9 presents the unit labour cost, as estimated by the labour's share in value added, in the production of clothing and shoes, for each of the Southern European countries, and for the Northern European countries taken together. Differences in cost between the North and the South appear to be in line with the difference in the price of labour and can be as high as 40%. Given that technology is fairly standard in the production of these commodities, I assume all countries have the same production function. Since one cannot rule out the possibility that capital is cheaper in the North, a lower estimate of unit cost differences seems appropriate, such that costs are some 20 to 30% lower in the South than in the North. Given these parameters and initial conditions, I assume, following the Commission' estimates, that the 92 programme leads to a reduction in trade costs amounting to 2.5% of shipments. With respect to trade liberalisation between the EC and the rest of the world, three scenarios are considered; the base case assumes that the reduction in trade costs between the rest of the world and the EC is equal to the reduction taking place within the EC. In addition, I consider two scenarios where the liberalisation with the rest of the world is respectively twice and four times as high as between the EC countries. Finally, it turns out that the results of my simulation are somewhat sensitive to the assumption which is made regarding the degree of competition in the market. In the model, the degree of competition depends on the number of firms in the market. As the number of firms increases, competition is more intense and profit margins tend to fall. Given that profit margins are difficult to estimate accurately and that the results depend on the actual degree of competition and associated margins, I shall consider three alternative assumptions; the base case is consistent with

profit margins of about 9%, whereas the high and low estimates correspond to margins of about 12 and 6%, respectively. My results for clothing and footwear are gathered in Table 10.

<Insert Table 10 about here>

Let us first concentrate on the base case, where the medium (M) estimate of the intensity of competition is used and where trade liberalisation with the rest of world proceeds at the same pace as the liberalisation within the EC. Sales of the Southern European countries in the North could then increase by as much as 16.0%, which amounts to an increase in output of about 14.4%. This would correspond to an increase in GNP of about 0.6% in Greece and Portugal and about 0.3% in Spain. The market share of the South in Northern markets could as a result increase by 3.7% points. In this scenario, the rest of the world would experience changes in market share and sales, which parallel those of the Southern European countries. Producers in the North would reduce sales by some 16% and their market share would drop by some 7% points. Finally, prices in the North could fall by some 2% and total imports in the North could increase by 0.3% to 0.5%.

These estimates indicate very clearly that trade liberalization could have a significant effect on output in the South. Given that footwear and clothing account for a much lower share of total output in the North, it will be affected to a lower extent. The footwear and clothing industries should still experience a significant decline. In regions where these industries are concentrated, a sizeable fall in output could still occur. Such areas would include Baden Württemberg in Germany, Nord-Pas-de-Calais in France, Oost-Vlaanderen in Belgium and East Midlands in the UK.

Let us now consider the alternative scenarios, with different degrees of competition and/or trade liberalisation with the rest of world. First, with respect to competition, one observes that as competition is more intense the changes in sales and market share tend to be larger; this accords with intuition, because an intensively competitive environment will favor the firms with relatively low costs.<sup>11</sup> As a result, a given fall in cost will translate into a stronger competitive advantage, and hence larger sales and market shares, the more intense is competition. The South will thus benefit more and the North will be more affected, the lower are the margins to start with. As indicated by the results of Table 10, the effect of competition can be significant, without however affecting the order of magnitude of the estimates.

Second, with respect to the degree of trade liberalisation between the EC and the rest of the world, one observes that a wider liberalisation would affect producers in Northern Europe much more than those in the South. In particular, even if the reduction in trade costs between the EC and the rest of the world is twice as high as the reduction within Europe, the Southern European countries would still experience an increase in sales of about 10%. Trade costs with the rest of world would actually have to fall by more than three times as much as in the EC to counteract the effect of the Internal Market on the sales and market share of the South. On the whole, the increase in market share and sales accruing to the ROW under these scenarios of wider liberalisation will take place mainly at the expense of producers in Northern Europe. As a result, it seems that there is a scope for

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11. At the extreme, i.e. in perfect competition, only the low cost firms can survive.

exploiting the (intra-EC) comparative advantage of the South, even if the trade with the ROW is progressively liberalised.

#### 4. Benefits from scale economies

As mentioned above, the benefits from a better exploitation of scale economies form a major part of the Commission's rhetoric on the 92 programme. The existence of such potential benefits has also been disputed; for example, Caballero and Lyons (1989) estimate production functions at the 2-digit level and conclude that there are significant external scale economies in Europe. Conversely, Kay (1988) argues that scale economies should not be overestimated; he points out that for almost all products, the minimum efficient scale of production does not exceed 10% of the European market. Both of these studies do however try to infer benefits from scale economies at an aggregate level, assuming that firms are symmetric. In what follows, I look at benefits from scale economies at the firm level.

Scale economies are notoriously difficult and costly to estimate. The most reliable method is the so called "engineering method", which proceeds by deriving the cost function from the underlying technology. To the best of my knowledge, there are about 65 products for which engineering estimates of scale economies have been performed. These estimates are presented in appendix C. Most of these are reported in Pratten (1988). For these industries, it is in principle a simple matter to estimate the extent to which scale economies are exhausted. Still, for reasons which have to do

with the way in which european data is aggregated and published<sup>12</sup>, such a comparison is only possible for a very limited number of industries. The results are reported in Table 11.

<Insert table 11 about here>

First, with respect to cement, we observe that Germany is the only country (for which data is available) to operate approximately at the efficient scale. All the other countries, including France and the UK have a collection of small firm, operating at the tail of the size distribution, which produce below the minimum efficient scale (MES). For bricks, I find that in all countries at least 1/2 of the production takes place at 1/2 the MES. In these two industries, one can thus conclude that large economies of scale are left unexhausted. This is not entirely surprising given that these products are costly to transport. In this context, it might not be optimal for firms to exhaust scale economies. Because of these transportation costs, the intra-EC trade in those products is also very limited. These industries are thus not particularly interesting for our purpose.

For soaps and detergents, paint and motor vehicles, the data for Northern Europe is not conclusive<sup>13</sup> and is not reported. For Portugal,

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12. Production in volume terms is reported at the product level. Yet, production in value terms and especially data on the size of enterprises is only reported at the industry level. Hence, it is only when a product exactly corresponds to a sub-industry that the necessary data sets can be matched.

13. The reason is that the industry classification does not perfectly match the products. The industry code includes some additional more specialised products, which are produced in small quantities, but presumably by a large number of producers. This would lead us overestimate the extend to which scale economies are left unexhausted.

Greece and Spain, we observe that the entire domestic production is close to the MES, whereas a large number of firms operate. Substantial gains could thus accrue, especially in the motor vehicle industry where the cost function is rather steep (unit cost at 1/2 the MES would be 15% - see appendix C). For paint and soaps, the potential benefit is smaller, given that the cost function is less steep (costs rise by respectively 4.5% and 2.5% at half the MES - see appendix C). For the footwear industry, the average output per firm is below the MES, but the cost function is very flat, so that little benefit can be expected.

The evidence presented so far is limited in scope and relates to a subset of industries which cannot be taken as representative of the whole manufacturing sector. As mentioned above, the lack of data prevents us from comparing actual firm sizes with MES on a more comprehensive basis. In order to complement this evidence, I analyse the available data on the distribution of firm size, at the industry level, throughout the Community. For the sake of comparison, I convert the data to the code that was used above. The objective of this analysis is to characterise how the distribution of firms' size varies across countries. Such comparison will give some insight as to the extent to which economies of scale are left unexhausted in the various European countries, relative to one another. Hence, even though this analysis will not enable us to assess the absolute value of the benefit, it will still provide some idea with respect to the distribution of these benefits.

There are only seven industries for which data on the size of firms is available on a fairly comprehensive basis, which include Northern as well as

Southern European countries.<sup>14</sup> In Table 12, we compare across countries the proportion of total (industry) employment which is accounted for by several categories of firm size, for these seven industries. The following emerges.

<Insert Table 12 about here>

First, the proportion of employment accounted by firms with over 20 employees does not vary much across France, Germany and the UK (the difference is usually smaller than 5%). More generally, we observe that for these countries the distribution of the firms size in all 7 industries is surprisingly similar. This suggests that these industries have reached some state of "equilibrium", presumably determined by cost and demand fundamentals. If anything, France, Germany and the UK should thus benefit to a similar extent from potential scale economies. This issue is taken up further below.

Second, the distribution of the size of firms varies across industries. In particular, large firms dominate in the production of electrical machinery and transportation equipment. This accords with intuition, given that scale economies are thought to be very large in those industries (see appendix C). At the opposite, the distribution of firms' size is rather flat in the production of medical and optical instruments, textile and metal products. There is no direct evidence on returns to scale in those industries (from appendix C) but intuition suggests that these industries are not operating under strong increasing returns to scale.

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14. There is simply no data on Greece. It is only for Germany and the UK that the data covers all industrial sectors.

Third, it is striking that the distribution of size of firms in Spain is biased towards small firms, by comparison with her Northern neighbours. Except for the transportation equipment industry, we observe that a significant proportion of Spanish output is still produced by firms with less than 20 employees (up to twice as much as in the Northern European countries). The same pattern emerges if one looks at the firms with less than 100 employees. Firms with intermediate number of employees, between 100 and 500, account for a share of output which is comparable the share observed in the Northern countries. At the same time, very large firms (more than 500 employees) account for an relatively low share of output. On the whole, if the structure of the Northern countries is taken as a benchmark, this suggests that the Spanish industry has not reached the same level of "maturity". There is thus scope for substantial restructuring of the Spanish industry; such restructuring will presumably shift the distribution, such that small firms will become relatively less important, while very large firms will become more prominent. Medium-size firms (between 100 and 500 employees) should maintain their relative importance.

If distribution of size of firms in Spain approaches the distribution observed in the North, the average size will increase. Moreover, it seems reasonable to assume that larger firms in the North have reached a lower level of costs: the "equilibrium" sizes that we observe have presumably emerged in response to the existence of scale economies. Hence, larger firms in Spain should thus lead to a better exploitation of scale economies.

Fourth, the situation of Portugal is also somewhat unexpected. I find that small firms in Portugal systematically account for a lower proportion of output than in Spain. With respect to the role of small firms, Portugal appears to be much closer to the Northern European countries. This might be explained by the fact that Portuguese industry has been more exposed to

export markets than its Spanish counterpart: the smaller size of Portugal meant that it was naturally more open. It might also be linked to a particularly protectionist policy during the Franco years: Spanish firms may not yet have restructured to the same extent as the Portuguese firms. Whatever the reason, the current state of affairs still indicates that benefits from scale economies are likely to be larger in Spain than in Portugal.

As indicated above, the distribution of firm size is very similar in the Northern European countries. To measure this similarity, I have computed for France, Germany and the UK an index of similarity; this index is defined, for any industry and pair of countries, as the share of the industry employment which is not accounted by firms of the same size<sup>15</sup> (firms belonging to the same class of size). I am able to compute this index for as many as 25 industries (given that the data for these countries is much more complete). Results are presented in Table 13.

<Insert Table 13 about here>

Between France, Germany and the UK, we observe that the average index (across industries) is around 0.12. That is to say that on average, some 12% of industry employment is not accounted by firms of the same size, across countries. Such a number seems surprisingly low. Still, in order to set a benchmark against which these values can be compared, it would have

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15. Formally, this index is defined in industry  $i$ , between country  $j$  and country  $k$ , as  $I_{ijk} = 1/2 \sum_{m=1}^n |S_{imj} - S_{imk}|$ , where  $S_{imj}$  is the share of industry  $i$ 's total employment which is accounted by firms belonging to the class of size  $m$  ( $n$  being the number of classes).

been desirable to compute the index between Northern and Southern European countries as well. As mentioned above, the data for Southern European countries is more sparse, so that a systematic comparison is not feasible. Yet, for the subset of industries for which comprehensive data can be gathered, I have computed the same similarity index between Germany and Spain, and for the sake of a direct comparison, between Germany and France<sup>16</sup>. The estimates (within brackets) are reported in Table 13. It turns out that this index is about 2.6 times as high between Germany and Spain as between Germany and France. One can thus conclude that indeed firms' size in the North of Europe does not vary much across countries, at least by comparison with the difference between Northern and Southern European firms. Industry structures in the North of Europe, at least in terms of the number and size of players, are surprisingly close. Hence, in assessing potential benefits from scale economies, it seems likely these benefits will be shared equally by the Northern European countries. Our prior should be that all countries in the North will benefit to the same extent from a better use of scale economies.

At the industry level, we still observe some limited variation, which is worth mentioning. UK firms tend to be bigger in foodstuffs, wooden furniture, printing, publishing and pharmaceuticals. German firms tend to be larger in chemicals. French firms are never larger than their UK or German counterparts. Hence, within the very limited variation in firm size among those countries, France tends to have smaller firms. If anything, the potential for gains from scale economies may be larger in France.

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16. The data covers 11 industries, at a higher level of aggregation than for the comparison between France, Germany and the UK.

## 5. Conclusions

The matter of how the gains from the 92 programme will be distributed can be approached from several angles. One can look at the distribution of the gains across factors of production, or across countries, or between producers and consumers. I have focused on trying to assess the distribution of the benefits across countries, while discussing in passing the implications for the real income of factors and for the allocation of surplus between consumers and producers.

As expected, we find that the Southern European countries are still characterised by some degree of inter-industry trade with Northern European countries. This is particularly pronounced for Portugal and Greece. Inter-industry trade arises mainly for clothing, footwear, and electrical machinery and to a lower extent for ceramics, wood and animal feed. Rather surprisingly, we find that Spain is similar to Northern European countries in terms of trade flows.

The "ex post" comparative advantage of the 12 EC countries which lead to these inter-industry trade flows (with respect to one another, and not with respect to the rest of the world) are also identified. Germany, and to a lesser extent France, have a comparative advantage in industries which are intensive in human capital. The strongest comparative advantage occurs for Portugal and Greece, with labour intensive industries. Looking at the price of labour, it appears that Spain also has a comparative advantage in labour-intensive industries, even though it has not specialized in the production of those commodities to the same extent as Portugal and Greece. Similarly, the UK seems to have a comparative advantage in human capital intensive industries which could be further exploited.

Otherwise, it is found that the comparative advantage which remains unexploited between Northern European countries should be negligible. Indeed, the dispersion of labour cost across countries in the North is of the same order of magnitude as the dispersion of labour costs across regions within countries. In addition, it does not seem that factor price differences can be related to the intensity of non-tariff barriers, at least on the continent. Benefits from unexploited comparative advantage between Northern European countries should thus be very limited. This also suggests that gains from more competition might be rather small in the North, given that gains from comparative advantage and gains from competition could, in the North, be expected to come together.

Still, the UK stand out as an exception. It is observed that in the UK remuneration per employee tend to be higher, by comparison with the continent, in industries where non-tariff barriers are high. The UK could thus be in a favourable position to increase exports to the continent, as non-tariff barriers are removed.

One can thus conclude that the UK is in a favourable position to gain from the Internal Market, and particularly so in industries intensive in human capital and/or where NTBs are high. Interestingly, this finding seem to be entirely consistent with the prediction of The Economist such that "there seems to be a general agreement that (for the UK) the pharmaceutical industry, the food products industry, and the precision and medical equipment industries, as well as large parts of the chemicals and electrical and electronics industries are competitive in the EC" (European Trends, The Economist Intelligence Unit, N° 3, 1989). The industries listed by The Economist overlap completely with the industries which according to my characterisation should benefit most from the Internal Market.

Whether it is feasible, and advisable, for the South to exploit its comparative advantage depends on the extent to which trade with labour abundant countries outside the EC is liberalised. Undertaking a small calibration exercise, it is found that if trade with the rest of the world is liberalised at the same pace as intra-EC trade, labour intensive production (clothing, footwear) in the South could increase by as much as 14%. At the same time, given that the Southern European countries are rather small by comparison with Northern Europe, the South should obtain most of the benefits from specialization. The increase of exports from the South would correspond to a deterioration of the balance of payments in the Northern European countries of about 0.5% and a boost in GNP in the South amounting to 0.6%. Even though the overall effect on the North would be limited, the areas in the North where clothing and footwear industries are concentrated, like Baden Württemberg, Oost-Vlaanderen, Nord-Pas-de-Calais or East Midlands, could experience a significant further decline. Next, one observes that a wider trade liberalisation between the EC and the rest of the world than between EC members would primarily affect Northern European countries. It seems that even under a scenario of wide liberalisation, the Southern European countries would benefit from exploiting their intra-EC comparative advantage.

The question might still arise as to whether, in the very long term, Southern European countries should indeed try to reap the benefits from specialization in labour intensive industries. Given that the comparative advantage of developing countries in labour intensive production will in the very long term be revealed, it is indeed likely that Southern European countries will at some point have to specialise in industries intensive in human and physical capital. The transition from an economy specialized in labour intensive commodities to an economy specialized in human and physical

capital might however be difficult to undertake because of external economies. As a result, human and physical capital will have to be accumulated, even though the return on those factors will originally be lower than in the rest of the Community. In other words, the "first-mover advantage" of the Northern European countries in human and physical capital intensive industries might have to be overcome, thereby justifying a period of low-return investments and a policy induced allocation of resources out of labour intensive industries. In a nutshell, at the European level, Portugal and Greece might find it beneficial to follow the Korea/Taiwan route,

With respect to the benefits from scale economies, I compared the actual size of firms with the minimum efficient scale. There are actually rather few industries where scale, firms' size and production data can be matched. First, I found that the cement and brick industries are characterised by large unexhausted scale economies even in France and the UK. For paints, detergents, and motor vehicles, the domestic production of Spain and Portugal is close to the minimum efficient scale, whereas a collection of firms operate. There is thus extensive scope for rationalisation in those industries. In the footwear industry, despite a very low degree of scale economies, I found that beneficial rationalization could still occur. Comparing the actual distribution of firm size for a larger number of industries (without explicit reference to the minimum efficient scale), I found that industries in the North of Europe have surprisingly similar distributions. They should benefit to a similar extent from potential unexhausted scale economies, if there are any. By contrast, Spanish industry is characterised by a larger proportion of small firms. Substantial benefits should accrue from rationalisation in this country. Surprisingly, Portugal seems to have a more concentrated industrial

structure than Spain, so that relatively smaller benefits can be expected there.

The main conclusion which emerges from this study is therefore that Northern European countries should expect relatively little benefits from the completion of the Internal Market. These countries seem to be already well integrated with one another. This is indicated by the fact that cost differences across countries do not appear to be significant and by the fact that firms tend to be fairly similar in terms of size. At the same time, the Northern European countries should have a relatively small share of the benefits accruing from a better exploitation of the comparative advantage between the North and the South of Europe. In the North, the UK stands out to gain most, being relatively less integrated. The main beneficiaries of the 92 programme are however likely to be the Southern European countries, both in terms of exploiting comparative advantage and in terms of exhausting scale economies.

## Appendix A

### Data source, clustering and factor intensities

The purpose of this appendix is to briefly describe (i) the data sources, (ii) the clustering procedure that was used to summarise the trade data and (iii) the criteria that were designed to sort out the industries according to factor intensities.

#### (i) Data sources

The data on trade flows was obtained from the OECD at the four digit ISIC level and was aggregated into the 29 industries under review (which correspond to the ISIC three digit level). This level of aggregation was selected in order to be able to match the trade data with the industry characteristics, which were used to identify the industries' factor intensities. Given that imports and exports are reported on a different basis (FOB versus CIF), we have used the imports data only (exports being reconstructed from imports data in the destination countries). The matrix of intra-industry indices that I obtain has 1 914 observations ((12 x 11 countries x 29 industries)/2). The list of industries is as follows.

List of Industries

ISIC Code	Industry
311	Foodstuff
312	Animal feed
313	Beverage
314	Tobacco
321	Textile
322	Clothing
323	Leather-fur
324	Footwear
331	Wood
332	Wood-furniture
341	Paper
342	Printing-publishing
351	Chemical
352	Pharmaceuticals
353	Oil refining
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	Medical, optical instruments
390	Other manufacturing

**(ii) Clustering procedure**

The procedure that we have used to summarise information creates clusters of countries by maximising an objective function defined over a set of variables. In our application, we have 29 x 12 variables, such that in each industry, the intra-industry trade index with country  $i$  ( $i=1, \dots, 12$ ) is a variable. The particular objective function that we use is to maximise the variance between clusters and minimise the variance within clusters (Ward criteria). This procedure should not be seen as a statistical tool but rather as a convenient method to summarise information.

**(iii) Classification according to factor intensities**

In order to compute the variables, presented in the text, which characterise the factor intensity, we have obtained data on output, investment, remuneration, value added and employment from the Statistical office of the European communities, at the NACE four digit level of aggregation. These data were first transferred into the ISIC three-digit codes.

For each country, we have sorted out the industries using the following procedure. First, we have created a specific category, for the industries which are intensive in natural resources (foodstuff, and wood). The other industries have been sorted out according to the following criteria; whenever an industry has a factor intensity which is higher than one standard deviation above the mean defined over all industries, it is considered to be highly intensive in this factor. Industries with a factor intensity within one standard deviation from the mean are considered to have an "average intensity" of the corresponding factor. The application of this

criteria would in principle define 6 categories of industries and any given industry could belong to several categories at the same time. Some combinations of categories did however not occur. In order to keep a manageable number of final categories, some combinations of categories were also consolidated with their closest group, if they had too few industries. This exercise was performed for each of the four big European countries. The final classification was very much the same in all four cases. We finally retained five groups; namely the highly capital intensive industries, the highly labour intensive industries, the industries characterised by average capital and labour intensity, the industries intensive in human capital and the industries intensive in natural resources.

## Appendix B

### A model of trade and imperfect competition

In this appendix, I briefly describe the model of imperfect competition, which is used to calibrate the effects of a reduction in trade costs on the market share and output of the Southern European countries. Consider  $n$  firms ( $i=1, \dots, n$ ) producing an homogeneous commodity. The aggregate (inverse) demand curve for this commodity in the North is given by:

$$P = A Q^{-\eta}$$

$$Q = \sum_{i=1}^n q_i$$

where  $q_i$  denotes the output sold by the  $i$ th firm, and  $P$  and  $Q$  denote respectively the price and total quantity sold in the market. Each firm has cost function,  $C_i(q_i)$ , which is given by :

$$C_i(q_i) = F + c_i q_i$$

Where  $F$  is a fixed cost and  $c_i$  is the marginal cost of firm  $i$ . Costs can thus vary across firms. The marginal cost of domestic firms will include their production costs only. For foreign firms, the cost level will be the sum of the production cost and the cost of exporting (trade costs, cost of overcoming the NTBs, ...). Each firm  $i$  is assumed to select output  $q_i$  independently so as to maximise the following profit function :

$$\Pi_i = P q_i - C_i(q_i).$$

We look for a Nash equilibrium in quantities, i.e. a vector of outputs

$$(q_1^*, \dots, q_n^*) \text{ s.t. } \Pi_i(q_1^*, \dots, q_n^*) \geq \Pi_i(q_1^*, \dots, q_i, \dots, q_n^*), \forall q_i, \forall i$$

Under these assumptions, it is easy to check that the Nash equilibrium exists and is unique and stable (see Novshek (1975)).

Routine calculations yield individual market shares ( $S_i$ ), as well as the price in equilibrium ( $P^*$ ):

$$P^* = \frac{n \bar{c}}{-\eta + n},$$

$$S_i = \frac{1}{-\eta} (1 - c_i / P^*)$$

where  $\bar{c}$  denote the average marginal cost (across firms).

Assume that there are  $n_1$  firms in the North,  $n_2$  firms in Southern Europe and  $n_3$  firms in the ROW. The initial trade configuration is such that the countries of the North (taken together) import some 50% of their apparent consumption of clothing and footwear (51% for clothing and 47% for footwear). About half of the imports originate from the Community. We assume that all firms have the same overall cost level. Given that the South has a production cost advantage of 20/30 %, and assuming that the countries outside Europe from which the North imports have the same cost advantage, this implies that trade costs exactly compensate for the production cost advantage of the South. This estimate is consistent with those of Smith and Venables (1988). It might overestimate the true value of NTBs to the extent that I do not allow for product differentiation. Differences in tastes across countries for products of different origins could indeed explain differences in market shares. This alternative explanation is ruled out in our model. With the assumption that all firms have the same overall cost level, the difference in market shares between the North, the South and the ROW will stem from differences in the number

of firms. As indicated above, the North has about 50%, whereas the South and the ROW share the other half. Accordingly, we assume that  $2n_1 = n_2 = n_3$ . We consider a change of  $(1-x)\%$  in trade costs within the EC and a change of  $(1-y)\%$  in trade costs between the EC and the rest of the world. At the new equilibrium, the market share of a firm in the North, in the South and in the ROW, denoted respectively  $S'_i$   $i=1, \dots, 3$ , will be given by :

$$S'_1 = \frac{1}{K} ( S_1 + (K - 1)/\eta )$$

$$S'_2 = \frac{1}{K} [ S_1 + (K - 1)/\eta - (x - 1) (-\eta + 4 n_2) / (4 n_2 \eta) ]$$

$$S'_3 = \frac{1}{K} [ S_1 + (K - 1)/\eta - (y - 1) (-\eta + 4 n_3) / (4 n_3 \eta) ]$$

$$\text{where } K = [ 1 + (x + y - 2)/4 ]$$

The changes in output can be derived in a similar fashion.

In order to calibrate these equations, I also need an estimate of elasticity of demand for clothing and footwear. Following the econometric estimates of Deaton (1975), we take a representative value of 0.8 for both products. Finally, I need an estimate of the average price cost margins, which, in the present model, is unambiguously related to the total number of firms. As mentioned above, we consider three estimates of the margins, namely 0.12, 0.9 and 0.6.

Appendix C

Survey of scale economies

Nace No.	Industry	Min. Efficient Scale (MES)	Unit Cost Increase		Year	Source	
			1/3 MES	1/2 MES			
140.1	Mineral Oil Refining	10 Million tons/Y	<5%		82	DIW	
		10 Million tons/Y		5%	69	Pratten	
		5.95 Million tons/Y		3%	67	Weiss	
		10 Million tons/Y	4.8%		65	Scherer	
221	Steel Integrated Plants	9.6-12 Milion tons/Y	>10%		82	DIW	
		4.1 Million tons/Y		8%	69	Pratten	
		3.6 Million tons/Y		10%	67	Weiss	
		3.6 Million tons/Y	11%		65	Scherer	
		0.7-0.8 Million tons/Y	10%			Muller et al	
241	Bricks	35 Million tons/Y	30%		82	Schwalbach	
		25 Million tons/Y		25%	69	Pratten	
242.1	Cement	1.3 Million tons/Y	39.9%		82	Schwalbach	
		1. Million tons/Y	38.2%		72	Schwalbach	
		2 Million tons/Y		9%	69	Pratten	
		1.2 Milion tons/Y	26%		65	Scherer	
		*1.3 Million tons/Y	>10%			Muller	
247.2	Glass Bottles	133,000 tons/Y	11%		65	Scherer	
		180,000 tons/Y	13%		82	Schwalbach	
251	Basic Ind. Chem.	*Ethylene	500,000 tons/Y	5-10%	82	DIW	
			500,000 tons/Y	19%	80	Muller & Owen	
		*Sulphuric Acid	350,000 tons/Y	5-10%	82	DIW	
			1 tons/Y		1%	69	Pratten
		*Ammonia	550,000 tons/Y	5-10%	82	DIW	
		*Synthetic Rubber	60,000 tons/Y		15%	69	Pratten
		*Synthetic Yarn	40,000 tons/Y		7%	69	Pratten
		*Synthetic Polymer	80,000 tons/Y		5%	69	Pratten
		*Dyes	no estimate		17%	69	Pratten
		*Titanium Dioxide	130,000 tons/Y		8-16%		Pankas Ghemawat
255	Paint	38 M litre/year	4.4%		65	Scherer	
258.1	Soap & Detergents	70,000 tons/Y		2.5%	69	Pratten	

260	Man-made fibres						
	*Acrylic	19,278 tons/Y		9.5%	67	Weiss	
	*Polyester	18,144 tons/Y		10%	67	Weiss	
		100,000 tons/Y		2.6%		R.W. & S.A. Shaw	
	*Nylon	50 Lbs		12%		Scherer	
	*Cellulosic	31,752 tons/Y		5%	67	Weiss	
311	Foundries						
	*Iron Castings	50,000 tons/Y		10%	69	Pratten	
	*Small Engineering	10,000 tons/Y		5%	69	Pratten	
321.1	Combine Harvesters	20,000 units/Y	10%		82	DIW	
		20,000 units/Y		7.7%	80	Muller & Owe	
321.2	Tractors	90,000 units/Y		6%	82	DIW	
322	Machine Tools	output @ 1 factory no estimate		3.5%		Boston Cons.Grou	
326	Transmission Equip. for Motive Power	800 employees	8-10%		80	Muller;Owen Scherer	
328	Diesel Engines	100,000 units/Y 5% of US Shipment 67		4% 10%	69 67	Pratten Weiss	
330	Electronic Typewrit.	500,000 unit/Y	5-10%		82	DIW	
342	Electrical Machinery						
	*Transformers						
	Distribution	2% of U.S. output 67		7%	67	Weiss	
	Small	6.9% U.S. output 67		7%	67	Weiss	
	Large	7.1% U.S. output 67		10%	67	Weiss	
	*Large Turbo-Gen.	design >= 4 units		5%	69	Pratten	
	*Electric Motors	60% of U.K. market 70		15%	69	Pratten	
343.2	Auto Batteries	1 M units/Y	4.6%		65	Scherer	
344	Telecom. Equipment						
	*Public Switches	500,000 lines/Y 500,000 lines/Y	5-10%			Muller & al J.Ehnes,M.Phil	
				4.5%			
345	T.V. sets	1.3-2.2	5%		82	DIW	
		1.1-1.2	15%		80	Muller & Owen	
	Elect. Cap. Goods	Output of a product 100% of UK market		8%	69	Pratten	

346	Fridges machines	1.5 Million/Y	12%		82	DIW
		1-1.2 Million/Y	6.5%		80	Muller & Owen
	500,000 units/Y		8%	69	Pratten	
	800,000 units/Y	6.5%		65	Scherer	
	Washing Machines	800,000 units/Y	7.5%		80	Muller & Owen
		500,000 units/Y		8%	69	Pratten
351	Cars	500,000 units/Y	15%		82	DIW
	Trucks	200,000 units/Y	12%		82	DIW
361	Marine Diesels	100,000 h.p./Y		8%	69	Pratten
363.1	Bicycles	100,000 units/Y		4%	69	Pratten
364	Aeroplanes	more than 50 of any model		20%	69	Pratten
411	Soybean Oil Mills	4.58% of US Shipments 75	4% @ 2/3			Connor
412	Meat Packing	.33% of US Shipments 75	5% @ 2/3			Connor
413	Dairy Products					
	*Butter	1.29% of US Shipments 75	2% @ 2/3			Connor
	*Cheese	.63% of US Shipments 75	2% @ 2/3			Connor
	*Milk Product	.40% of US Shipments 75	2% @ 2/3			Connor
414	Canned Fruit & Veg.	7.23% of US Shipments 75	5-12% @2/3			Connor
416	Grain Milling					
	*Flour	.74% of US Shipments 75	21% @ 2/3			Connor
	*Rice	5.15% of US Shipments 75	9% @ 2/3			Connor
420	Sugar	1.41% of US Shipments 75	8% @ 2/3			Connor
422	Animal Feed	.62% of US Shipments 75	8% @ 2/3			Connor
427.1	Beer Brewing	2.8 M hl/Y	18%		81	Schwalbach
		3 M HL/Y		7%	80	Cockerill
		2 M HL/Y	14%		74	Schwalbach
		1.6 M hl/Y		9%	69	Pratten
		2.4 M hl/Y		10%	67	Weiss
		5.3 M hl/Y	5%		65	Scherer
		2.3 M hl/Y	5-10%			Muller & al
429	Cigarettes	70 Billion units	<5%		82	DIW
		36 Billion units	2.2%		65	Scherer
438	Carpets Tufted	64,000 sq ft/Week		10%	67	Weiss

451	Footware	4,000 pairs/Week	1.5%		80	Mueller/Owen
	Leather Shoes	1 M pairs/Week	1.5%		65	Scherer
	Shoes	300,000 pairs/Year		2%	69	Pratten
471	Linerboard	850 tons/Day		8%	67	Weiss
	Kraft paper	896 tons/Day		13%	67	Weiss
	Printing paper	567 tons/Day		9%	67	Weiss
473	Book Printing					
	*Hardback	10,000		36%	69	Pratten
	*Paperback	100,000		20%	69	Pratten
481.1	Car Tyres	9 M units/Y	5-10%		82	DIW
		16,500 units/day		5%	67	Weiss

Table 1. Average Intra-Industry Trade Indices (%)

=====

	U.K.	Germany	Belgium	France	Netherl.	Italy	Danemark	Spain	Ireland	Portugal	Greece
U.K.	.	73	73	79	77	64	63	57	70	40	41
Germany	73	.	74	74	63	58	71	58	59	36	35
Belgium	73	74	.	72	77	54	55	59	50	40	36
France	79	74	72	.	63	63	50	63	48	39	37
Netherlands	77	63	77	63	.	41	67	53	52	39	44
Italy	64	58	54	63	41	.	46	60	47	47	31
Danemark	63	71	55	50	67	46	.	39	55	29	28
Spain	57	58	59	63	53	60	39	.	40	46	19
Ireland	70	59	50	48	52	47	55	40	.	25	25
Portugal	40	36	40	39	39	47	29	46	25	.	31
Greece	41	35	36	37	44	31	28	19	25	31	.

=====

Source : OECD/own computations

Table 2. Patterns of Trade

Results of Clustering Procedure

=====

	<u>2 Groups</u>		<u>3 Groups</u>
1	Portugal Greece	1	Greece
2	France Germany Belgium United Kingdom Netherlands Spain Italy Denmark	2    3	Spain Portugal Italy  France Germany Belgium United Kingdom Netherlands Denmark

=====

Table 3. Classification of Industries According to Factor Intensities

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Natural Resources	Average Capital and Average Labour Intensity	High Labour Intensity
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Foodstuff

Wood

Metallic Products

Printing

Leather

Wood Furniture

Non Ferrous Products

Printing

Rubber

Textile

Clothing

Shoes

Ceramic

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High Capital Intensity

High Human Capital Intensity

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Plastics

Glass

Other Mineral Products

Beverage

Paper

Steel

Chemicals

Pharmaceuticals

Mechanical Machinery

Electrical Machinery

Transportation Equipment

Medical/Optical Instrument

=====

Table 4. Revealed Comparative Advantages

Net Exports / Domestic Output

(Adjusted for overall trade balances)

=====

	Natural Resources	Av. Capital/ Av. Labour	High Labour	High Capital	High Human Capital
Belgium	0.075	0.084	-0.918	0.183	-0.103
Denmark	0.285	-0.116	-0.265	-0.091	N/A
France	0.017	-0.026	-0.098	0.002	0.014
Germany	-0.040	-0.004	-0.262	-0.200	0.058
Greece	-0.017	0.070	0.800	-0.013	-0.987
Ireland	0.165	-0.091	-0.613	-0.095	0.112
Italy	-0.149	0.061	0.361	0.031	-0.052
Netherlands	0.120	NA	-0.744	-0.172	-0.101
Portugal	0.122	0.044	0.794	0.102	-0.358
Spain	0.006	0.024	0.087	0.024	-0.066
U.K.	-0.008	0.010	-0.022	0.028	-0.048

=====

Source : OECD/Eurostat/own computations

Table 5. Hourly labor costs

=====

Belgium	13.40	(0.38)
Denmark	11.95	(0.23)
The Netherlands	13.68	(0.41)
France	12.37	(0.27)
Germany	14.24	(0.47)
The United Kingdom	9.04	(-0.07)
Italy	10.73	(-0.10)
Greece	4.08	(-0.58)
Spain	6.09	(-0.37)
Ireland	8.90	(-0.08)
Portugal	2.38	(-0.75)

\* Data for 1984, in ECUS, deviation from European average in brackets.

=====

Source: Eurostat/own computations.

Table 6. Proxy for Human Capital

=====

	<u>R&amp;D Personnel (%)</u>	<u>University Graduates (%)</u>
	Total employment	R&D Personnel
Belgium	5.29	33.1
Denmark	4.09	25.0
Netherlands	6.00	23.3
France	6.11	NA
Germany	9.87	34.0
UK	8.01	39.4
Italy	1.44	26.1
Greece	NA	NA
Spain	1.18	NA
Ireland	1.44	NA
Portugal	0.48	NA

=====

Note : Data refers to 1985 or closest available year.

Source: OECD/Eurostat/own computations.

Table 7. Estimates of Non-Tariff Barriers

=====

Foodstuff	3	Oil refining	0
Animal feed	1	Oil products	0
Beverage	3	Rubber	2
Tobacco	1	Plastic	2
Textile	2	Ceramic goods	2
Clothing	2	Glass & glassware	2
Leather-fur	1	Stone & minerals	2
Footwear	2	Steel	1
Wood	2	Non-ferrous metals	1
Wood-furniture	1	Tools & metal goods	3
Paper	1	Mechanical machinery	2
Printing-publishing	1	Electrical machinery	3
Chemicals	2	Motor vehicles	3
Pharmaceuticals	3	Medical, optical goods	3
Other manufacturing	2		

=====

Source: Neven and Roller (1989).

Table 8. Correlation between NTB and differences in remunerations

=====

	France	Germany	Italy	United Kingdom
France	--			
Germany	0.04	--		
Italy	0.08	0.07	--	
U.K.	0.24	0.49	0.07	—

=====

Table 9. Unit Labour Costs

Labor share in value added (1984)

=====

	Average Northern Europe <sup>*</sup>	Spain	Greece	Portugal	Italy
Clothing	0.80	0.64	0.53	0.57	0.75
Footwear	0.81	0.61	0.59	0.54	0.73

=====

\* Germany, Denmark, Belgium, The Netherlands, France, Ireland.

Source : Eurostat and own computations.

Table 10. Reduction in Trade Costs; Footwear and Clothing industries

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Reduction in trade costs with ROW                      2.5%                                      5.0%                                      10%

(within EC = 2.5%)

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		△ Market Share, %	% △ Sales	△ Market Share, %	% △ Sales	△ Market Share, %	% △ Sales
North. Europe	L:	-5.4	-9.9	-8.2	-15.1	-14.0	-26.1
	M:	-7.5	-14.1	-11.3	-22.4	-19.0	-36.3
	H:	-9.5	-18.2	-14.0	-26.9	-24.0	-46.6
South. Europe	L:	2.7	11.9	1.4	7.2	-1.4	-3.2
	M:	3.7	16.0	1.9	9.2	-1.9	-5.2
	H:	4.7	18.8	2.4	11.3	-2.4	-7.3
ROW	L:	2.7	11.9	6.8	29.1	15.3	65.3
	M:	3.7	16.0	9.4	39.7	20.9	88.3
	H:	4.7	16.8	11.9	49.9	26.6	111.7

-----

Table 11. Current Firm Size and Scale Economies

Direct Estimates

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Industry	Country	Scope for Rationalization
Cement	France	15% production below scale
	U.K.	25% production below scale
	Germany	small
	Spain, Portugal, Greece	large
Bricks	Germany, France, U.K.,	about 1/2 production at or less than
	Italy	1/2 MES
	Greece, Portugal, Spain	average size at or less than 1/2 MES
Detergents & Soaps	Greece, Portugal	domestic production below MES
	Spain	domestic production = 4-5 times MES
Paint	Portugal	domestic production below MES
	Spain	domestic production = MES
Motor vehicles	Portugal, Spain, Greece	average production much below MES
Footwear	Portugal, Spain, Greece	small degree of scale economies some scope for rationalisation

=====

Table 12. Distribution of Firms' Size

(% of total industry employment)

Country	< 20	20-99	100-499	> 500	> 20
<b>Industry = Textile</b>					
France	0.081	0.227	0.322	0.370	0.919
Germany	0.056	0.161	0.408	0.374	0.944
Ireland	0.732	.	.	.	0.927
Portugal	0.025	.	.	.	0.975
Spain	0.141	0.317	0.418	0.124	0.859
U.K.	0.074	0.182	.	.	0.926
<b>Industry = Metal Products</b>					
France	0.193	0.297	0.255	0.255	0.807
Germany	0.213	0.205	0.287	0.295	0.787
Ireland	0.318	.	.	.	0.682
Portugal	0.065	.	.	.	0.935
Spain	0.354	0.287	0.230	0.130	0.646
U.K.	0.176	0.258	0.299	0.267	0.824
<b>Industry = Machinery</b>					
France	0.134	0.215	0.295	0.356	0.866
Germany	0.053	.	.	.	0.947
Ireland	0.206	.	.	.	0.794
Portugal	0.056	.	.	.	0.944
Spain	0.243	0.320	0.323	0.113	0.757
U.K.	0.151	0.180	.	.	0.849
<b>Industry = Electrical Machinery</b>					
France	0.059	0.094	0.155	0.691	0.941
Germany	0.044	.	.	.	0.956
Ireland	0.067	.	.	.	0.933
Portugal	0.021	.	.	.	0.979
Spain	0.080	0.126	0.281	0.512	0.920
U.K.	0.053	0.082	0.224	0.641	0.947
<b>Industry = Transportation Equipment</b>					
France	0.021	0.040	0.088	0.850	0.979
Germany	0.018	0.021	0.062	0.899	0.981
Ireland	0.168	.	.	.	0.832
Portugal	0.025	.	.	.	0.975
Spain	0.028	0.062	0.140	0.770	0.972
U.K.	0.035	0.054	0.058	0.370	0.966

Industry = Medical/Optical Industry

France	0.342	0.230	0.219	0.209	0.658
Germany	0.313	0.197	0.185	0.305	0.687
Ireland	0.051	.	.	.	0.949
Portugal	0.042	.	.	.	0.958
Spain	0.212	0.342	0.190	0.257	0.788
U.K.	0.140	.	.	0.282	0.860

Industry = Other Manufacturing

France	0.350	0.239	0.283	0.129	0.650
Germany	0.284	0.249	0.316	0.151	0.716
Ireland	0.189	.	.	.	0.811
Portugal	0.109	.	.	.	0.891
Spain	0.309	0.350	.	.	0.691
U.K.	0.295	0.282	.	.	0.705

=====  
Source : Eurostat/own computations.

Table 13. Index of similarity in firms' size

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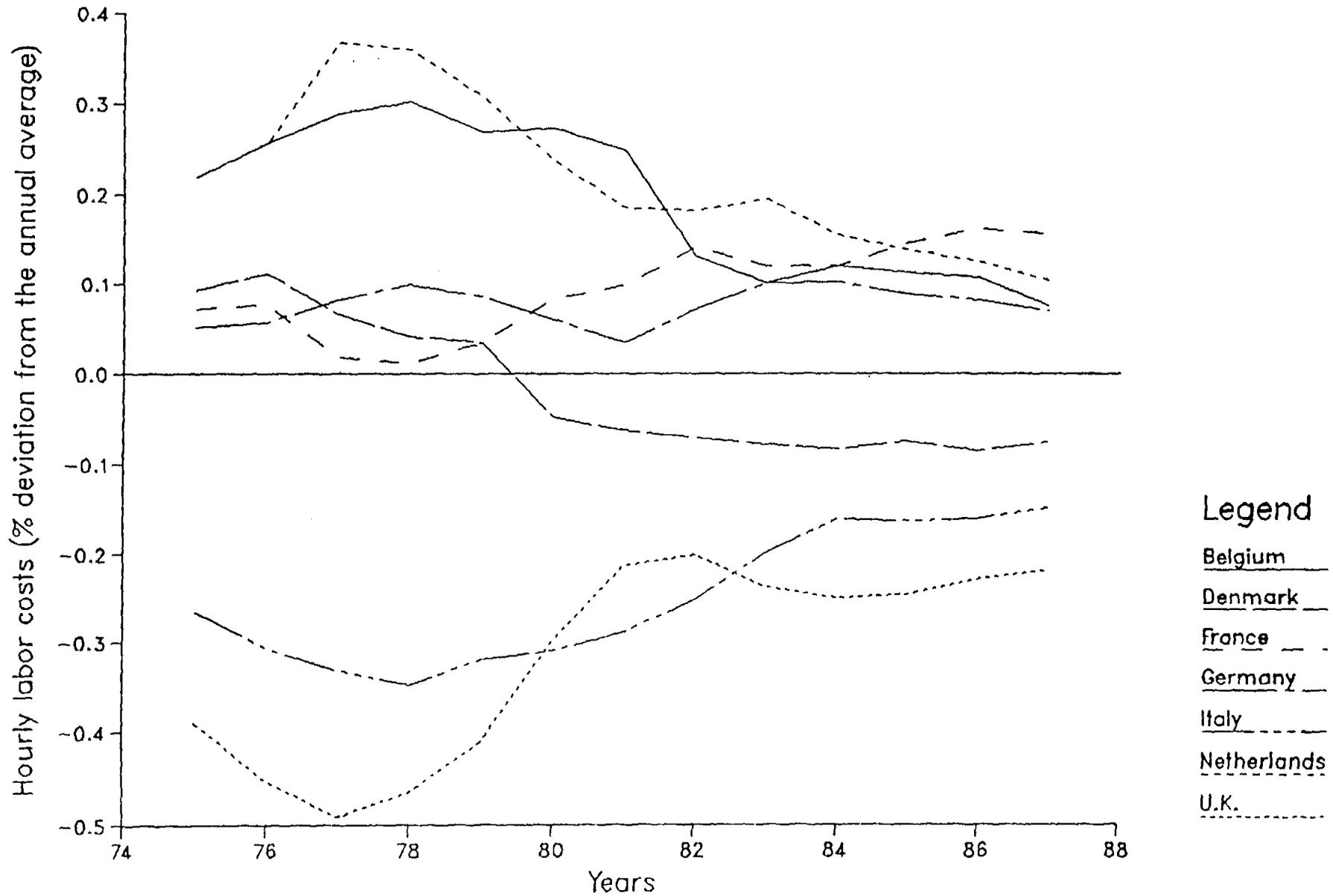
	France	Germany	UK	Spain
France	-	0.11 (0.084)	0.13	-
Germany		-	0.13	(0.224)

=====

Note : The indices in brackets are computed from a restricted data set (11 industries).

Source : Eurostat/own computations.

Figure 1: Hourly Labor Costs



Source: Bureau of Labour Statistics

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Data for figure 1

(deviation of hourly labour costs from the each year's average)

"Belgium"

75	0.219
76	0.258
77	0.289
78	0.302
79	0.269
80	0.274
81	0.249
82	0.131
83	0.101
84	0.120
85	0.113
86	0.108
87	0.076

"Denmark"

75	0.093
76	0.112
77	0.066
78	0.041
79	0.034
80	-0.048
81	-0.063
82	-0.071
83	-0.078
84	-0.084
85	-0.075
86	-0.086
87	-0.076

"France"

75	0.072
76	0.076
77	0.018
78	0.012
79	0.034
80	0.083
81	0.098
82	0.141
83	0.120
84	0.120
85	0.146

86	0.162
87	0.156

"Germany"

75	0.051
76	0.057
77	0.082
78	0.099
79	0.086
80	0.060
81	0.034
82	0.071
83	0.101
84	0.102
85	0.089
86	0.082
87	0.070

"Italy"

75	-0.264
76	-0.307
77	-0.332
78	-0.349
79	-0.320
80	-0.310
81	-0.289
82	-0.253
83	-0.200
84	-0.162
85	-0.165
86	-0.162
87	-0.151

"Netherlands"

75	0.219
76	0.258
77	0.368
78	0.360
79	0.308
80	0.238
81	0.185
82	0.182
83	0.195
84	0.155
85	0.138
86	0.126
87	0.104

"U.K."

75	-0.39
76	-0.453
77	-0.491
78	-0.465
79	-0.411
80	-0.298
81	-0.214
82	-0.202
83	-0.238
84	-0.251
85	-0.247
86	-0.230
87	-0.220

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