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ABSTRACT

Relative Prices, Trade and Restructuring in European Industry*

This paper explores the link between trade and European labour markets by using evidence on relative commodity prices and intra-sectoral skill levels at the NACE three-digit level for the four large EC countries and for the period 1976–90. We find that if the relative import prices of unskilled labour intensive sectors have not fallen significantly over time, substantial and varied restructuring is observed in those sectors. Defensive restructuring, involving upgrading of skills and expansion, is about as common as the contraction of employment and wages predicted by the Hecksher-Ohlin principle.

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NON-TECHNICAL SUMMARY

This paper explores the link between trade and European labour markets by using evidence on relative commodity prices and intra-sectoral skill levels. We document the evolution of relative commodity prices imported from developing countries since the early 1970s and relate the evolution of prices to wages, employment and the level of skills.

We have assembled two pieces of evidence. The first is an overview of relative commodity prices, employment and skill intensities for around 85 NACE sectors and for the four large EC countries over the period 1986–90. This provides a mixed picture. There is no strong evidence that the relative price of unskilled labour intensive commodities fell significantly over the period. There is evidence of drastic restructuring in unskilled labour intensive industries, in terms of downsizing, but also in terms of the upgrading of skills. Our second piece of evidence is a simple econometric exercise in which we estimate a reduced form for industry wages and employment. From this we conclude that competition from developing countries affects as many industries as competition from developed countries, but that the adjustments taking place at the industry level are not as simple as those predicted by Hecksher-Ohlin.

These two pieces of evidence tend to reinforce one another; both uncover symptoms that can reasonably be traced to competition with developing countries and suggest that the effect of such competition is probably significant but almost certainly not overwhelming. Both also indicate rich patterns of restructuring at the industry level which involve substantial defensive innovation. Such defensive innovation is reflected in the upgrading of skills, increases in production prices relative to import prices, and positive wage and employment responses.

1. Introduction

This chapter explores the link between trade and European labour markets by using evidence on relative commodity prices and intra-sectoral skill levels. We document the evolution of relative (production and import) prices from developing countries since the early seventies and relate the evolution of prices to wages, employment and the level of skills.

In terms of principles, the presumption that wages can fall in developed countries as a consequence of trade liberalisation (relative to what would have happened in the absence of such liberalisation) is associated with the Hecksher-Ohlin theory of trade and with the Stopler-Samuelson theorem. The simplest version of this theorem can be outlined as follows: consider two factors of production (skilled and unskilled labour) and two countries which differ according to their factor endowments. One country is relatively well endowed in skilled labour and the other is relatively well endowed in unskilled labour. There are two commodities and the production of these commodities requires different mixes of factors. One commodity requires a relatively high unskilled labour input, whereas the other one requires a relatively high skilled labour input. Production technology is well behaved (with decreasing returns to scale) and identical in both countries. In the absence of trade, relative prices of the commodities will differ across countries, with the unskilled (skilled) labour intensive commodities being relatively expensive in the skilled (unskilled) labour rich country. In autarky, the relative price of skilled labour in the skill rich country will also be lower than in the unskilled labour rich country. As trade is liberalised, relative prices converge across countries, which leads to a reallocation of production within each country; the relative price of unskilled labour intensive commodities falls in the skill rich country, which then specialises in the skill intensive commodity. At the same time, the relative price of the unskilled labour intensive commodity increases in the unskilled labour rich country and its production increases. Trade liberalisation has therefore lead to a specialisation in production. However, it has also provoked a shift in the demand for factors; there is an increase in demand for skill (unskilled labour) in the skill (unskilled labour) rich country, so that the relative price of skill (unskilled labour) increases. To the extent that the relative prices of commodities have converged, technology being the same across countries, the relative prices of factors will also converge. The real price of unskilled labour (in terms of either commodity) will actually fall and the real price of skilled labour will increase in the skill rich country.

If Europe can be seen as a skill rich area relative to developing countries, what should we observe if the parable is at work (recalling that the parable assumes full employment, a particularly unpalatable hypothesis for Europe) ? . First, the relative price of unskilled labour intensive commodities should fall in Europe. Second, imports of unskilled labour intensive commodities should increase in Europe whereas exports of skilled labour intensive commodities should increase. Third, the price of standard (unqualified) labour should fall. Fourth, the skill labour ratio in the production of all commodities should *fall* in Europe (as relatively larger quantities of unskilled labour than skilled labour are reallocated from the production of unskilled labour intensive commodities). Finally, *in any given industry*, the capital labour ratio will converge across countries.

Indeed, it is the fall in the relative wage of unskilled labour which has motivated much of the work undertaken in the US. For instance, according to Freeman (1994) the wages for men with less than high school education have declined by 23% between 1972 and 1990, at a time when the wages of workers with high school education stayed constant. This evidence can be corroborated with observed changes in the income distribution ; according to Borjas (1995), workers at the 33rd percentile of the wage distribution experienced a 14 % drop in real wage throughout the 80s, whereas workers at the 66th percentile experienced only a 6% drop and those at the upper tail of the distribution obtained a wage increase.

According to Wood (1994, p 248), a similar rise in the relative earnings of college graduates can be observed in Northern EU countries. In particular, the relative wage of white collar workers rose steadily in Germany and in the UK since the early seventies. In other EU countries, the trend is however less clear (see Nickell and Bell, 1995, table 3). More importantly, unemployment rates among less educated workers increased markedly relative to those of more educated ones; in the 1980s, the largest rise in unemployment is observed among the less educated workers (those with no more than basic secondary education), so that for instance in France the rate of unemployment among low education workers in 1990 is more than four times a high (10.6) as the rate observed among high education ones (2.6).

Various approaches have been followed in the empirical validation of the Hecksher-Ohlin and Stolper-Samuelson principles and each method has concentrated on a different aspect of the parable. The first method focuses on trade flows and computes the factor content of imports less that of exports to evaluate the net impact of trade on the demand for factors and in particular on the demand for skilled and unskilled labour (see Wood, (1991, 1994), Sachs and Shatz (1994)). Others focus on the prediction that input mixes in production

should change as trade is liberalised and accordingly use evidence on input mixes at the industry level (see Lawrence and Slaughter (1993), Berman, Bound and Griliches (1994) and Machin (1994)). The third approach concentrates on prices and tracks down the evolution of relative commodity prices over time (see Leamer (1994), Lawrence and Slaughter (1993) and Lawrence (1994)).

Each of these methods suffers from significant shortcomings (see Wood, 1995, for a discussion). The main difficulty, which is common to all three methods, is to identify a reasonable counterfactual. Indeed, there are many other factors than trade which affects commodity and input prices. To name only a few: variations in factor supplies, including institutional changes which affect wage negotiations and labour costs; changes in demand related to evolving tastes or to trade integration; and most importantly, changes in both supply and demand prompted by technological progress. Separating out these factors is very difficult. In addition, there are some significant issues of simultaneity; for instance, changes in factor supplies (say human capital) can be themselves prompted by the anticipation of changes in factor prices.

Many of the effects that we want to look at can be related to technological progress as well as to trade. For instance, the widely documented decline in low-skilled labour employment and relative, (sometimes absolute real) wages may be the outcome of competition from developing countries; alternatively it may be related to technological progress shifting jobs towards higher skills. Worse, trade and technological progress are inter-related: trade competition spurs the development and diffusion of new technologies which, in turn, affect the pattern of trade. Whatever evidence will be gathered in this area will therefore be, at best, suggestive.

In this paper, we first gather evidence on relative commodity prices. As indicated by Leamer (1994), the advantage of this approach is that changes in relative commodity prices are necessary to bring about sector reallocations and changes in factor prices. By contrast, trade flows are less informative as trade can remain unaffected despite changes in commodity prices (as the import competing industry is striving to adjust, possibly by cutting wages). Appropriate price data are however difficult to gather. For most of the analysis, we have to resort the use of unit values, which make no adjustment for change in quality over time. In this context, one cannot disentangle changes in relative (standardised) commodity price from changes in relative qualities. This may matter to the extent that commodities intensive in unskilled labour may have less scope for quality improvement than others. Accordingly, observed falls in relative unit values for unskilled

labour intensive commodities could very well exaggerate the fall in relative (standardised) commodity prices.

Section 1 provides evidence on the evolution of import and production prices by sector and checks whether the relative price of unskilled labour intensive commodities has indeed fallen since 1975. We find little support in favour of the hypothesis that import prices have fallen in unskilled labour intensive sectors but we also find evidence of substantial specialisation and restructuring in those sectors as witnessed by a large drop in (relative) employment and a significant (relative) increase in the skill intensity. Section 2 goes one step further and estimates a simple econometric model of wage and employment setting at the industry level, in which trade pressure is measured by import prices. Aggregate effects are found to be small or negligible but significant, and surprising adjustments can be sometimes be found at the industry level. Some policy implications from the results are drawn in section 3.

1. Relative prices, specialisation and skill intensity : some hard facts

As indicated above, trade liberalisation with developing countries should lead to a reduction in the relative price of unskilled labour intensive commodities in Europe, an increase in imports of unskilled labour intensive commodities, a reduction in employment and output of those sectors and a decrease in skill intensity across all sectors. In what follows, we first document the changes in relative prices and subsequently turn to specialisation and skill intensity.

1.1. Relative import prices

In order to gather evidence on relative prices, we compute unit values of imports for all three digit NACE sectors[1], for the period 1975-1990 and for the four large EU countries (France, Germany, the UK and Italy). In order to better isolate the effects of competition with unskilled labour intensive countries, we also compute separate indices for imports from developing countries and those from the developed world. The primary data is drawn from the COMEXT database. As import values and volumes are not available by NACE sectors for the period 1975-1988, the primary data at the commodity level had to be aggregated into the NACE industry sectors (using a conversion table provided by EUROSTAT). Developed countries in the COMEXT database include the EFTA countries, the US, Canada, South Africa, Japan, Australia, New Zealand, the former

[1] There are about 100 Nace three digit sectors. We concentrate on about 80 sectors for which reliable data can be computed.

Yugoslavia, Turkey and minor European countries (Andorra, Malta..). Note that EU countries are not included in this definition, so that changes in import price from this set of countries may be a rather poor measure of competition from the industrialised world as a whole. All other countries, except for the former COMECON countries are included in the category of developing countries. Our measure of competition from developing countries, which can be presumed to trigger Hecksher-Ohlin type effects, is thus rather comprehensive and well focused.

In addition to import prices, we also gather evidence on relative production prices from the OECD STAN Database which provides data for a limited set of countries and SITC industries (unfortunately, the INDE Database from EUROSTAT has no information on prices). As proxy for the level of skill in an industry, we use the proportion of white collar workers. This variable, which is similar to that used in the US studies (production vs. non production workers[2]), is not ideal but it is the only proxy available at the industry level (from the INDE database).

Table 1. Change in import price (%, 75-90)

	Prices weighted by the share of white collar workers	Prices weighted by the share of blue collar workers
France		
Developing countries	104	108
Developed countries	121	133
Italy		
Developing countries	82	79
Developed countries	116	114
UK		
Developing countries	79	77
Developed countries	101	100
Germany		
Developing countries	80	76
Developed countries	97	87

Source: Comext, Inde, own calculations

[2] See Lawrence and Slaughter, 1994, footnote 32.

In order to verify whether the price of unskilled labour intensive commodities has fallen over time, several measures have been used in the literature. Lawrence and Slaughter compute a weighted index of prices changes at the industry level where the weights are given either by the share of all skilled workers or the share of all unskilled workers. If indeed, the relative price of less skill intensive commodities has fallen, one would expect the change in the former index to exceed that of the former. In addition to this measure, Sachs and Shatz (1994), also regress (across industries) the changes in prices on the level of skill. We first concentrate on these two measures.

The first piece of evidence focuses on weighted prices indices. The evolution of import prices presented in Table 1 does not seem to depend very much on the weight factors. This suggests that the change in relative commodity prices may have little to do with the level of skills. This evidence confirms the findings of Lawrence and Slaughter (1994) for the US and Germany. Similar conclusions can be reached from the second approach in which the change in import prices is regressed on the level of skills, proxied by the share of white collar workers. We expect to see a negative coefficient of partial correlation. As indicated by table 2, there is essentially no relation between these two variables: half of the times the sign is wrong and none of the estimated coefficient is significantly different from zero. This confirms the results of Sachs and Shatz (1994) for the US.

Table 2. Import prices and level of skills
(dependent variable is the % change in import price from developing countries, 76-90, OLS estimates)

	France	Germany	Italy	UK
constant	1.31	1.03	0.62	0.52
(t statistics)	(2.55)	(2.77)	(2.19)	(1.47)
Share of white	-1.52	-1.06	0.56	0.55
collar (1977)	(-1.01)	(-0.86)	(0.46)	(0.44)
R^2 (adjusted)	0.00	0.00	0.00	0.00
nbr observations	70	80	68	73

The measures adopted so far could however be rather coarse if the pattern of changes in price is complex and this may occur if changes in relative price result from various factors and not only from trade. For instance, a fall in the price of highly unskilled labour intensive commodities may be occulted by a concomitant fall in the price of highly skilled intensive commodities so that on average no relation is observed between changes in price and levels of skills. This possibility was acknowledged by Sachs and Shatz (1994) who

observe that imports prices are significantly related to the level of skills if a dummy is introduced for the computer industry (in which presumably technological progress account for much for the fall in relative price). Accordingly, we shall also adopt a more disaggregrate approach in which we compute the change in price for various groups of industries which differ according to their factor intensity in production[3].

In order to define homogenous group of industries in terms of factor intensity, we use the clustering procedure presented in Neven (1994): it groups industries according to their proximity in the space of four variables chosen to proxy for factor intensity. As proxy variables, we use the share of wages in value added, the level of investments as a percentage of value added, the average (total) compensation per worker and the share of blue collar workers in the total number of employees. Since some of these variables are flows intended to proxy the corresponding stock, we use the average flow for the years 1985-1990. A high level of investment as a percentage of value added is meant to represent a high capital intensity; a low average wage together with a high share of wages in value added is meant to pick up labour intensive industries. By contrast a high average wage, together with a high share of labour in value added is likely to be associated with industries intensive in human capital. The share of white collar worker is also a proxy for the intensity of skills (human capital).

Table 3. Industry groups according to factor intensities (Germany)

	Share of white collar workers	Average wage (million Ecus per year)	Wage bill/value added	Investment / Value added
1	0,48914	0,03177	0,77406	0,14573
2	0,35511	0,02581	0,79623	0,13388
3	0,22266	0,02269	0,85709	0,08042
4	0,24034	0,02281	0,75054	0,14676
5	0,37868	0,02808	0,64346	0,20981

Source : INDE, and own calculations

We have applied the clustering procedure, which groups the industrial sectors in a pre-determined number of homogenous classes, to the German data and subsequently checked whether clusters obtained for Germany would also provide an accurate description of the other three countries (see Neven (1994) for details). It turns out that industry clusters are

[3] Sachs and Shatz (1994) allocate industries by classes of skill intensity. The procedure adopted here is similar but controls for the level of capital.

remarkably stable across countries and easy to interpret [4]. Table 3 reports the average value taken by our proxies for factor intensities in Germany (averages over five years) when we allow for five clusters.

Group one is characterised by a high proportion of wages in value added, very high wages and a very high proportion of while collar workers. These are high tech industries intensive in human capital, like office machinery and data processing, telecommunication equipment, pharmaceuticals and aerospace. Among the four remaining group, we find two which are relatively intensive in unskilled labour and two that are relatively intensive in skilled labour (human capital) ; in each pair, there is one category which is relatively intensive in capital. The second cluster, which is intensive in human capital but uses little capital is characterised by a relatively low level of investment relative to value added, high wages and a high level of wages in value added. Industries like machine tools, machinery electrical engineering, domestic electrical appliances, photographic equipment, optical instruments belong to this cluster. The third group is intensive in unskilled labour and uses relatively little capital. These industries are characterised by low average wages, a high level of wages in value added and a low level of investment in value added. This cluster includes sectors like apparel, furniture, leather, footwear, shipbuilding and some metal products. The fourth cluster includes industries intensive in unskilled labour and capital (like carpets, heavy metal, steel, textile, glass, rubber and plastics). They feature a high level of investment, relatively low wages, a low proportion of while collar workers and an intermediate proportion of wages in value added. The final cluster includes mostly food processing industries, which are intensive in both human capital and physical capital. They feature high wages, an intermediate proportion of wages in value added a high level of investment and a high proportion of while collar workers.

Table 4 presents the weighted (%) change (from 76 to 1990) in import prices from developing and developed countries for each cluster, where the weights factor is the share of employment within the cluster (in 76). The aggregate weighted change in import price is also given (in this case the weight factor is the share of employment in manufacturing, also in 76).

[4]The list of industries in each cluster is presented in appendix 1.

Table 4. Weighted change in import price by cluster (%, 1975-1990)

Cluster	1	2	3	4	5	Average
Germany						
Developing count.	6	83	78	83	44	70
Developed count.	89	83	73	65	90	70
France						
Developing count.	52	66	109	123	101	103
Developed count.	57	174	170	105	116	128
UK						
Developing count.	30	131	69	56	85	77
Developed count.	145	131	78	92	84	100
Italy						
Developing count.	64	79	58	90	87	75
Developed count.	197	95	143	90	73	115

The observation of this table reveals that import prices of unskilled labour intensive commodities (cluster 3) have not decreased markedly relative to the average, at least in France, Germany and the UK. It is striking however that the relative import price of high tech commodities (cluster 1) has dramatically fallen over the period (in Germany nominal import prices have barely changed in 15 years). A closer look at the data reveals that this evolution is driven by the pattern of prices in electronics related sectors (like computers, office machinery and telecommunication equipment) from the newly industrialised countries of the Far East (Taiwan, Hong Kong, Korea). In turn, the observed fall in the relative price of these commodities could be associated with technological progress or with a misclassification of the industry. Such misclassification could arise from specialisation in different activities within the industry in Europe and the Far East, to the extent for instance that EU countries have specialised in human capital intensive activities (like research and development), and that countries in the Far East have specialised in the more unskilled labour intensive activities of mass production. If such a specialisation within industry has occurred, the observed fall in the import price of electronics related industry should be more appropriately seen as a fall in unskilled labour intensive commodities. However, on the basis of available data, it is hard to tell how much weight should be given to this interpretation (the observation that import prices from developed countries in those industries tend to increase faster than the average would however be consistent with the hypothesis of intra-industry specialisation).

The evidence gathered so far still tends to support the view that the relative price of unskilled labour intensive commodities has not fallen since 1975. Yet, much caution is required and some of the evidence could be interpreted otherwise. In order to inquire the issue further, we have analysed whether the evolution of domestic price, employment and skill intensity are consistent with the view that competition from developing countries had little effect on industry.

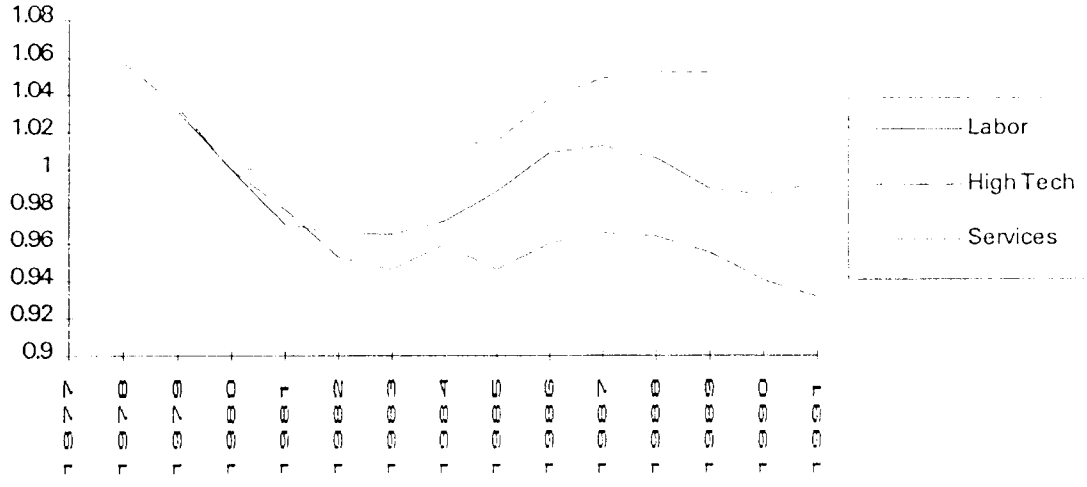
1.2. Domestic prices and specialisation

As indicated above, data on domestic production prices at the industry level are not available in the EU industry database (Inde). Some indices are however available from the OECD, STAN-ANBERD database, in particular for France. This database uses the UN industry classification (SITC) at the three digit level, so that the industry clusters defined above could not be used directly and we had to undertake a (somewhat imperfect) transposition. In what follows , the unskilled labour intensive sectors are the textile (3210), wearing apparel (3220), leather product (3230), footwear (3240), wood products (3310), furniture (3320), shipbuilding (3841) and railroad equipment (3842) sectors. High tech products cover drugs and medicines (3522), electrical machinery (3830), aircraft and aeronautics (3845), and professional goods (3850).

Figure 1 reports the evolution of relative production prices[5] for high tech and unskilled labour intensive commodities as well as services. The relative production price of high tech commodities falls, but by less than the relative import price observed above. This observation is consistent with the view that the fall in the import price could be due both to technological progress (which is reflected in the domestic production price) and intra-industry specialisation across countries. For unskilled labour intensive commodities, relative domestic production prices tend to fall rather more than import prices. Such discrepancy may suggest that domestic industries have felt the pressure from import competition and have adjusted more than what import prices indicate.

[5] The relative price in industry i is computed as the ratio of price deflator (itself computed as the ratio of nominal to real output) in industry i relative to the price deflator of the economy as a whole.

Figure 1. Relative production prices - France



The extent to which adjustment has taken place can be observed in table 5, which describes the changes in industry employment by cluster (from 1975 to 1990). It is striking to observe that employment in unskilled labour intensive industries has shrunk relative to other sectors by a wide margin (except in Italy). By contrast, employment in high tech industries has expanded in relative terms and in the case of France and Germany even in absolute numbers.

Table 5. Change in Employment by cluster (rate of change, 1976-90)

Cluster	1	2	3	4	5	Manufact.
Germany	0.147	0.057	-0.252	0.004	-0.052	-0.014
France	0.025	-0.190	-0.397	-0.215	-0.277	-0.231
UK	-0.106	-0.413	-0.442	-0.368	-0.377	-0.383
Italy	-0.221	-0.056	-0.179	-0.186	-0.107	-0.157

This evidence suggests that a significant specialisation has taken place, and the extent of this restructuring is somewhat surprising given the changes in relative import prices observed above.

1.3. Skill intensity

The mix of factors further helps detect signs of specialisation. In the presence of full employment, if EU countries specialise in skilled labour intensive commodities, the ratio of skilled to unskilled labour should fall (see Wood, 1995 for instance). The observed increase in the use of skilled labour in almost all industries in the US is taken as strong evidence, e.g., by Lawrence and Slaughter (1994), that trade has not had a significant effect of wages and employment. In the US the ratio of non production to production workers has increased by 10 percentage points between 1975 and 1990. For Europe, the evidence is different. Table 6 shows that the share of skilled workers in total industrial employment has increased by about 5% in France and 8 % in Germany. This is a modest increase relative to that observed in the US (less than half as large).

Table 6. Change in skill intensity (rate of change, 1975-90)
(weighted average by cluster)

Cluster	1	2	3	4	5	Manufact
Germany	0.145	0.068	0.134	0.053	0.032	0.082
France	0.070	0.066	0.027	0.080	-0.096	0.050

Following Sachs and Shatz (1994), indirect evidence on the extent of restructuring in unskilled labour intensive industries can be obtained by looking at the correlation between the change in skill intensity and the initial level of skill. If specialisation is taking place, one can expect a negative correlation : sectors that have a high proportion of unskilled labour should experience a bigger rise in skill intensity as competition from developing countries forces unskilled labour intensive activities to contract or to become more skill intensive by defensive innovation. In the US, the correlation is slightly positive. For France and Germany, we find a strong negative correlation, respectively -0.15 and -0.29. This result is also apparent in table 6, where we observe that the cluster including unskilled labour intensive sectors experiences a relatively high increase in skill intensity (at least in Germany).

Overall, this overview of relative prices, employment and skill intensities provide a mixed picture. There is no strong evidence that relative price of unskilled labour intensive commodities felt significantly over the period. However, there is evidence of drastic restructuring in unskilled labour intensive industries, in terms of downsizing and upgrading of skills. In this respect, the evidence for Europe is more favourable to the

hypothesis that trade had an effect on industry structures than the evidence reported for the US.

3. Direct Effects of Import Prices on Industrial Employment and Wages

In this section we directly look at the effect of trade on employment and wages. A number of studies (e.g., OECD, 1994) have already followed this approach but rely on trade data to measure the pressure from imports. The problem is that trade volumes may fail to capture the effect of a decline of world demand for domestically produced traded goods on the derived demand for factors. If, for example, domestic producers respond to lower world demand by cutting prices, the volume of imports may remain roughly unchanged; observation of volumes will not detect the impact of foreign competition. Looking at prices, rather than at quantities, avoids this difficulty. The channel through which foreign competition makes itself felt must be through import prices, independently of the reaction of domestic producers.

According to the principles of the Hecksher-Ohlin model, a reduction in relative commodity prices is supposed to trigger a fall in employment of the industry concerned and a fall in the wage of unskilled labour throughout the economy, at least if the process of specialisation induced by the change in price is significant at the aggregate level. Some deviations from this principle can still be expected if some of hypothesis underlying the Hecksher-Ohlin model are not valid. Two such deviations seem particularly significant.

First, the Hecksher-Ohlin model assumes perfect mobility of factors of production across domestic industries so that there is an economy-wide level of wage for unskilled workers. We would expect however that because of imperfect mobility, wages will to some extent be industry specific. Accordingly, as competition from developing countries increases, a reduction in industry specific wages can be expected even if the industry considered is small relative to the aggregate.

Second, the Hecksher-Ohlin model does not consider strategic behaviour by firms. Once this possibility is introduced, the development of trade with low cost countries can elicit a wide array of reactions.[6] Facing competition from developing countries, firms in developed countries often react by developing niches for more sophisticated products. This may result in higher wages as firms hire more skilled workers. Competition may also

[6] For an analysis along this line, see Oliveira-Martins (1993).

trigger some technological developments which enable firms to increase their market shares world-wide. Thus it is not even clear that unemployment must always decline.

Accordingly, in the presence of such strategic responses, a negative relation between import prices on the one hand and wages and employment on the other can be obtained. If such negative relation is found, it will indicate that the restructuring taking place at the industry level involves upgrades and technological improvement rather than the traditional Hecksher-Ohlin specialisation.

In what follows, we will also consider the effect of competition from developed countries. In principle, we have no prior regarding the effect of such competition on industry wages and employment. The specialisation within industries triggered by competition from developed countries could involve either expansion or contraction of the industry, depending on a white array of parameters including the type of competition taking place in industry (namely whether products are strategic substitutes or strategic complements).

3.1. The Model

To investigate these various aspects, we thus consider the joint behaviour of employment and wages, following the approach proposed by Grossman (1987) and also applied to the case of the US by Revenga (1992). It is simple yet general and fairly robust, derived from a standard demand and supply model. We consider a country with N industries producing traded goods with well behaved production functions (i.e., constant return to scale):

$$(1) \qquad Y_i(t) = A_i(t)\, F_i(K_i(t), L_i(t)) = A_i(t)\, L_i(t)\, f_i(K_i(t)/L_i(t))$$

where $A_i(t)$ measures exogenous technological progress in industry i. It is straightforward to derive the industry's demand for labour:

$$(2) \qquad W_i/P_i = A_i(t)\, g_i(K_i(t)/L_i(t)), \qquad \text{where } g(k) = f(k) - k\, f'(k)$$

The supply of labour can be modelled in a number of ways. From perfect competition subject to a reservation wage corresponding to welfare support (minimum wage, poverty alleviation schemes) to a monopolist trade union, a fairly general formulation is:

$$(3) \qquad L_i(t) = G_i(W_i/P, .. W_j/P_{..}, B_i(t)) \qquad j=1, N, j \neq i$$

where P is the national aggregate price index and $B_i(t)$ is meant to catch a preference for leisure, trade union power, the reservation wage, etc.

Finally, good i is assumed to be an imperfect substitute for both other domestically produced goods and imported goods produced by the same industry abroad and selling domestically at the tariff-inclusive price P_i^*:

$$(4) \qquad Y_i(t) = D_i(P_i^*/P_i, P/P_i, Y)$$

where Y is national income.

This system of 4N equations can be solved to yield reduced form equations for each sector[7]:

$$(5) \qquad L_i(t) = L_i(A_i(t), B_i(t), P(t), K(t)/L(t), L(t), P_i^*(t), Y(t))$$

$$(6) \qquad W_i(t) = L_i(A_i(t), B_i(t), P(t), K(t)/L(t), L(t), P_i^*(t), Y(t))$$

These are the two equations estimated below. All the right hand-side variables are considered exogenous and the terms $A_i(t)$ and $B_i(t)$ will be approximated by a time trend. The import price variable raises a difficulty as it could easily be modelled as endogenous, for example with imperfect competition and intra-industry trade. Revenga (1992) accordingly uses instruments to correct for this eventuality. This is one step that we intend to take in future work. On the other side, in contrast to Grossman (1987) and Revenga (1992), we take into account the fact that residuals in these two equations are likely to be correlated.

3.2. Data and Sample

We need to have data at the industry level on employment and wages as well as the prices of imported goods. For information regarding domestic industries, we use the INDE database from EUROSTAT presented above and focus on France, Germany, Italy, and the UK (which have reasonably complete series). Unit values indices of imports are the same as those discussed above. We focus on about 80 industries for which a reliable data set can

[7]See Grossman (1987) for a discussion of the signs to be expected for the partial derivatives. Our formulation differs slightly from Grossman's (allowing for a labor supply function and ignoring the cost of energy) but the estimating equations are identical.

be gathered (excluding, in particular, those industries for which unit value indices are very volatile, suggesting important changes in commodity composition over time).

The rest of the data are country-wide aggregates and therefore standard. The only difficulty concerns the capital-labour ratio. It is approximated by the ratio of machinery investment to industrial employment (source: OECD *Main Economic Indicators* on diskette). Aggregate output and the overall price level are measured either by the GDP and GDP deflator (source: *International Financial Statistics*, CD-ROM) or by the index of industrial production and the wholesale price index or the producer price and index (sources: *International Financial Statistics*, CD-ROM or OECD *Main Economic Indicators*) depending on availability. The period covered is 1976-1987, imposed by data availability.

3.3. Estimations With Constrained Imports Elasticities

The equations to be estimated are a log-linearized transformation of (5) and (6):

(5') $$\log L_i(t) = cte + \alpha_{i1}\, t + \beta_{i1} \log[K(t)/L(t)] + \gamma_{i1} \log L(t) + \lambda_{i1} \log P(t) + \mu_{i1} \log Y(t) + \varphi_{i1} \log P_i^*(t) + \varepsilon_{i1}(t)$$

(6') $$\log W_i(t) = cte + \alpha_{i2}\, t + \beta_{i2} \log[K(t)/L(t)] + \gamma_{i2} \log L(t) + \lambda_{i2} \log P(t) + \mu_{i2} \log Y(t) + \varphi_{i2} \log P_i^*(t) + \varepsilon_{i2}(t)$$

Given that data are available only for 11 years, we performed pooled cross-section time-series estimations. To take into account a the possibility that the innovations to employment and wages $\varepsilon_{i1}(t)$ and $\varepsilon_{i2}(t)$ are correlated, we resorted to the SUR (Zellner's seemingly unrelated regression) method.

A crucial question is how much constraint we impose across industries. Given the limited number of observations per industry, we had to be extremely parsimonious. We have assumed the same elasticity of industry-level employment and wages to all aggregate variables, i.e.:

$$\alpha_{ik} = \alpha_{jk},\quad \beta_{ik} = \beta_{jk},\quad \gamma_{ik} = \gamma_{jk},\quad \lambda_{ik} = \lambda_{jk},\quad \mu_{ik} = \mu_{jk},\ \text{for all i,j and k} = 1,2$$

In this section we report the results of regressions performed assuming also that the only industry-specificity is captured by a fixed effect captured by a constant dummy, i.e., we also impose the following restrictions:

$$\varphi_{ik} = \varphi_{jk} = \varphi_k, \qquad k = 1, 2$$

Finally, the estimated equation must allow for dynamics. Again, for reason of parsimony we present below results obtained by using as a regressor the dependent variable lagged once. We have experimented with various other lag structures and are reassured that the substance of the results reported below is quite robust to this specification. For the same reason, we conduct our estimation for variables expressed in levels, as Grossman (1987), rather than first-differences as Revenga (1992).[8]

The coefficients of interest are the elasticities of employment and of wages to changes in import prices, φ_1 and φ_2. As noted above, in order to better isolate the effect of competition from developing countries, the import price variable $P_j^*(t)$ is decomposed into two different series: prices of imports from developed countries and prices of imports from developing countries.

Table 7. Effect of Import Prices on Employment and Wages (Constrained Estimates)

	Dependent variable: employment				Dependent variable: wage			
	France	Germany	Italy	UK	France	Germany	Italy	UK
Import Prices developed countries	0.007 (1.01)	0.034** (2.72)	0.005 (0.36)	0.008 (0.98)	-0.006* (-2.56)	0.003* (2.27)	0.017* (2.53)	0.001 (0.26)
Import Prices developing countries	-0.011* (2.44)	0.008 (1.05)	0.004 (0.36)	-0.011 (-1.47)	-0.003* (-2.16)	0.003** (3.04)	-0.011* (-2.50)	-0.004* (-2.00)
Lagged dependent	0.86** (59.87)	0.71** (33.68)	0.77** (40.97)	0.82** (63.66)	0.0.63** (28.42)	0.04** (6.50)	0.21** (7.25)	0.65** (31.25)

See text for sources and detailed explanations. t-Statistics in parentheses. **: significant at the 1% confidence level. *: significant at the 5% confidence level.
1976-1987. Number of observations: France: 1229; Germany: 1155; Italy: 142; UK: 1262.

[8] In addition, like Revenga (and unlike Grossman) we use prices and wages deflated by the GDP implict price level.

The results are not very conclusive, much as is the case in other studies on the US. A positive sign indicates that import competition pressure (a decline in import prices) pushes employment and wages down. Positive estimates are found most often in the case of import competition from the developed countries area. For imports from developing countries, some of the coefficients are either not significantly different from zero or negative, suggesting either no effect on the labour market or a favourable effect. The exception is Germany which seems to be sensitive in terms of wage. Interestingly, Germany seems also sensitive to import pressures from industrialised world both in terms of wages and employment. The opposite is true for France whose labour markets appear to benefit from import competition.

3.4. Industry-Specific Responses

In this section we lift the restriction that the elasticities of employment and wages to import prices are identical across industries i.e. we do not impose that $\varphi_{i1} = \varphi_{j1}$ in (5') and that $\varphi_{i2} = \varphi_{j2}$ in (6') for any pair of industries i and j. As we deal with more than 80 sectors we cannot report on all the detailed results in each of the four countries and we present instead a synthesis[9]. Table 8 presents the share of industries within each cluster and for the whole sample for which import prices are significant (at the 10 % level), by country, by dependent variable (employment and wages) and according to the sign of the coefficient. Focusing first on the results for the whole sample, we find that some 10 to 20 % (depending on the country and dependent variable) of the industries are affected by an import price . Importantly, it appears that the number of industries affected by competition from developing countries is similar to the number of industries affected by competition from the developed world. This indicates that despite the relatively low share of imports from developing countries in total imports, their effect on industry in Europe is, *by this measure*, similar to the effect of competition from developed countries. This evidence confirms that trade flows may indeed be a misleading indicator of competitive pressure and gives an indication that competition from developing countries may be at least as significant as competition from developed countries.

As indicated above, if we have no prior regarding the effect of competition from developed countries, we would expect competition from developing countries to reduce employment and wages. Simply counting the number of positive and negative signs associated with both

[9] A summary of the results (in which all significant coefficients are reported) is presented in appendix 2.

import prices does however not reveal any clear pattern ; there are 39 pluses and 43 minuses for developing countries, compared with 54 pluses and 48 minuses for developed countries.

Focusing on the effect of developing countries, we observe a dispersion of signs in all countries regarding employment. For wages, we observe that Germany is in most cases negatively affected (featuring a dominance of positive signs), whereas Italy and the UK tend to positively affected (with no clear pattern for France). In principle, one would have expected a somewhat more focused pattern with a clear dominance of positive signs in all countries, suggesting that a process of inter-industry specialisation was at work during the period. This evidence may however indicate that the effect of competition from developing countries may be more complex and involve important defensive innovation. Of course, it may also be that the pattern observed on average across sectors conceals important differences across different types of industries. Accordingly, table 8 also reports the effects on import pressure by cluster.

As indicated above, the third cluster is a priori most sensitive to import competition from developing countries, being intensive in unskilled labour and requiring relatively little capital. Comparing the effect of competition in this cluster with the average is at first glance somewhat disappointing. It is only in France that sectors intensive in unskilled labour appear to be significantly more affected than the average (in particular in terms of employment). The pattern of sign is however more encouraging : in France, Italy and the UK, the response of employment is more in line (than the average) with the prior that import competition from developing countries should be associated with a contraction of the industry. In the case of Germany, the evidence supports the presumption that competition from developing countries should lead to lower wages.

Another way of assessing whether unskilled labour intensive sectors are more or less affected than the average is to identify the sectors that are never (in any country) found to be affected. We find that whereas one third of unskilled labour intensive sectors are never affected by competition from developing countries, as much of 42 % of the other sectors are never affected. Such difference give a mild support to the view that Hecksher-Ohlin type effects are more significant in unskilled labour intensive sectors.

Table 8. Sensitive industries (%,by cluster)

	Employment				Wages			
	Developed		Developing		Developed		Developing	
	+	-	+	-	+	-	+	-
France								
1	0	0	10	0	10	0	10	0
2	11	5	0	11	0	0	0	0
3	21	7	14	7	0	43	7	7
4	8	4	4	8	8	21	4	0
5	15	8	8	8	23	15	8	8
Average	11	6	7	10	9	17	5	9
Germany								
1	29	0	14	0	0	0	0	0
2	5	10	0	5	0	5	5	0
3	13	0	0	7	0	13	13	0
4	0	0	0	3	3	17	17	3
5	25	8	8	8	8	0	17	0
Average	11	4	6	5	2	11	13	0
UK								
1	0	11	0	0	33	0	0	11
2	0	17	6	0	0	0	6	6
3	0	7	14	0	14	0	0	14
4	7	7	3	3	3	3	3	10
5	42	0	8	17	8	25	8	8
Average	7	8	6	4	9	5	4	11
Italy								
1	11	0	0	11	22	0	0	22
2	0	0	6	0	6	0	0	6
3	0	6	6	0	6	6	0	6
4	3	7	3	0	10	3	0	3
5	11	0	0	11	11	0	11	11
Average	4	5	5	4	11	2	1	10

Overall, it seems fair to conclude that this evidence fails to uncover an important effect of trade with developing countries along the lines of the Hecksher-Ohlin principles. It seems that if competition from developing countries may be of the same order of magnitude as competition from the developed world (when competition is measured by the number of industries being affected), the adjustments taking place at the industry level are not a simple of those predicted by Hecksher-Ohlin. The pattern of adjustment that we observe is certainly consistent with substantial defensive innovation.

Finally, the differences across the four countries of our sample are worth noticing. It is in Germany that industry is more clearly affected by competitive pressure, with a clear domination of an adverse impact of imports from developing countries on wages and on employment from imports from developed countries. In Italy and the UK, the effect on wages seem to be more frequently favourable for imports from developing countries, and adverse for imports from developed countries. France is in an intermediate position.

It is far from clear why countries which are part of the same free trade area with common protection exhibit so different outcomes. One possibility is that institutions matter, especially on the labour markets. This is a conclusion commonly reached in the labour economics literature, which is illustrated again in the present case. More detailed work is required to elucidate the forces at work here; ranging from trade union behaviour to minimum wage legislation and to state intervention.

4. Conclusion

We have tried to evaluate whether competition from developing countries has had an effect on wages en employment in Europe. Testing such a general proposition is bound to be fraught with difficulties, mainly serious identification and simultaneity problems and conclusions can only be tentative.

We have assembled two pieces of evidence. The first one is an overview of relative commodity prices, employment and skill intensities and it provide a mixed picture. There is no strong evidence that relative price of unskilled labour intensive commodities felt significantly over the period. However, there is evidence of drastic restructuring in unskilled labour intensive industries, in terms of downsizing but also in terms upgrading of skills. Our second piece of evidence is a simple econometric exercise in which we estimate a reduced form for industry wages and employment. From this second exercise we conclude that competition from developing countries affects a important of industries.

about as many as competition from the developed world, but that the adjustments taking place at the industry level are not as simple as those predicted by Hecksher-Ohlin.

These two pieces of evidence tend to reinforce one another; both uncover symptoms that can reasonably be traced to competition with developing countries and suggest that the effect of such competition is probably significant and almost certainly not overwhelming. Both also indicate rich patterns of restructuring at the industry level which involve substantial defensive innovation. Such defensive innovation is reflected in upgrading of skills, increase in production prices relative to import prices and positive wage and employment response.

Of course, it may be that pattern of restructuring that we observe has little to do with trade and it may be associated with purely exogenous technological shocks. At this point, it is hard to separate the two hypotheses. We suspect, in line with work on the US, that both effects have been at work over the sample period. Ascribing responsibility to each of them is clearly an area for further research.

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Appendix 1. Industry clusters

1	2500	*chemical industry*
1	2510	*manufacture of basic industrial chemicals*
1	2550	*manufacture of paint, varnish and printig ink*
1	2560	*manufacture of other chemical products, mainly for industrial and agricultural purposes*
1	2570	*manufacture of pharmaceutical products*
1	2580	*manufacture of soap, synthetic detergents, perfume and toilet preparations*
1	2590	*manufacture of other chemical products, chiefly for household and office use*
1	2601	*chemical and man-made fibres*
1	3300	*manufacture of office machinery and data processing machinery*
1	3440	*manufacture of telecommunications equipment, electrical and electronic measuring and recording equipment and electro-medical equipment*
1	3450	*manufacture of radio and television receiving sets, sound reproducing and recording equipment and of electronic equipment and apparatus, manufacture of gramophone records and pre-recorded magnetic tapes*
1	3640	*aerospace equipment manufacturing and repairing*
2	2430	*manufacture of concrete, cement of plaster products for constructional purposes*
2	2460	*production of gridstones and other abrasive products*
2	3200	*mechanical engineering*
2	3220	*manufacture of machine-tools for working metal, and of other tools and equipment for use with machines*
2	3230	*manufacture of textile machinery and accessories; manufacture of sewing machines*
2	3240	*manufacture of machinery for the food, chemical and related industries*
2	3250	*manufacture of plant for mines, the iron and steel industry and foundries, civil engineering and the building trade; manufacture of mechanic handling equipment*
2	3270	*manufacture of other machinery and equipment for use in specific branches of industry*
2	3280	*manufacture of other machinery and equipment*
2	3400	*electrical engineering*
2	3420	*manufacture of electrical machinery*
2	3460	*manufacture of domestic type electrical appliances*
2	3480	*assembly and installation of electrical equipment*
2	3600	*manufacture of other means of transport*
2	3700	*instrument engineering*
2	3710	*manufacture of measuring, checking and precision instruments and apparatus*
2	3720	*manufacture of medical and surgical equipment and orthopaedic appliances*
2	3730	*manufacture of optical instruments and photographic equipment*

2	4110	*manufacture of vegetable and animals oils and fats*
2	4150	*processing and preserving of fish and other sea foods fit for human consumption*
2	4170	*manufacture of spaghetti, macaroni etc.*
2	4190	*manufacture of bread and flour confectionery*
2	4290	*manufacture of tobacco products*
2	4380	*manufacture of carpets, linoleum and other floor coverings, including leathercloth and similar supported synthetic sheeting*
2	4930	*photographic and cinematographic laboratories*
3	2220	*manufacture of steel tubes*
3	2480	*manufacture of ceramic goods*
3	3110	*foundries*
3	3140	*manufacture of structural metal products*
3	3150	*boilermaking, manufacture of reservoirs, tanks and other sheet-metal containers*
3	3210	*manufacture of agricultural machinery and tractors*
3	3520	*manufacture of bodies for motor vehicles and of motor-drawn trailers and caravan*
3	3610	*shipbuilding*
3	3620	*manufacture of standard and narrow-gauge railway and tramway rolling stock*
3	3740	*manufacture of clocks and watches and parts thereof*
3	4350	*jute industry*
3	4360	*knitting industry*
3	4400	*leather and leather goods industry*
3	4420	*manufacture of products from leather and leather substitutes*
3	4500	*footwear and clothing industry*
3	4510	*manufacture of mass-produced industry*
3	4530	*manufacture of ready-made clothing and accessories*
3	4560	*manufacture of furs and of fur goods*
3	4630	*manufacture of carpentry and of joinery components and of parquet flooring*
3	4670	*manufacture of wooden furniture*
3	4920	*manufacture of musical instruments*
3	5000	*building and civil engineering*
3	5010	*construction of flats, office blocks, hospitals and other buildings, both residential and non-residential*
3	5020	*civil engineering, construction of road, bridges, railway...*
3	5030	*installation*
3	5040	*building completion work*
3	5100	*building and civil engineering without specialization*
4	2200	*production and preliminary processing of metals*
4	2210	*iron and steel industry excluding integrated coke ovens*
4	2230	*drawing, cold rolling and cold folding of steel*
4	2240	*production and preliminary processing of non-ferrous metals*
4	2400	*manufacture of non-metallic mineral products*
4	2410	*manufacture of clay products for constructional purposes*

4	2440	*manufacture of articles of asbestos*
4	2450	*working of stone and of non-metallic mineral products*
4	2470	*manufacture of glass and glassware*
4	3100	*manufacture of metal articles (except for mechanical, electrical and instrument engineering and vehicles)*
4	3120	*forging, clossed-died forging, pressing and stamping*
4	3130	*secondary transformation, treatment and coating of metals*
4	3160	*manufacture of tools and finished metal goods, except electrical equipment*
4	3190	*other mechanical workshops not elsewhere specified*
4	3260	*manufacture of transmission equipment for motive power*
4	3470	*manufacture of electric lamps and other electric lightning equipment*
4	3500	*manufacture of motor vehicles and of motor vehicles parts and accessories*
4	3510	*manufacture and assembly of motor vehicles manufacture of motor vehicles engines*
4	3530	*manufacture of parts and accessories for motor vehicles*
4	3630	*manufacture of cycles and motor-cycles and parts and accessories thereof*
4	3650	*manufacture of transport equipment not elsewhere specified*
4	4120	*slaughtering, preparing and preserving of meat*
4	4210	*manufacture of cocoa, chocolate and sugar confection*
4	4300	*textile industry*
4	4320	*cotton industry*
4	4330	*silk industry*
4	4370	*textile finishing*
4	4390	*miscellaneous textile industries*
4	4410	*tanning and dressing of leather*
4	4550	*manufacture of household textiles other make-up textile goods*
4	4600	*timber and wooden furniture industries*
4	4610	*sawing and processing of wood*
4	4620	*manufacture of semi-finished wood products*
4	4640	*manufacture of wooden containers*
4	4650	*other wood manufacture*
4	4660	*manufacture of articles of cork and articles of straw and other plainting materials, manufacture of brushes and brooms*
4	4720	*processing of paper and boars*
4	4730	*printing and allied industries*
4	4800	*processing of rubber and plastics*
4	4810	*manufacture of rubber products*
4	4830	*processing of plastics*
4	4900	*other manufacturing industries*
4	4910	*manufacture of articles of jewellry and goldsmiths' and silversmiths' wares*
4	4940	*manufacture of toys and sports goods*
4	4950	*miscellaneous manufacturing industries*
5	2300	*extraction of minerals other than metalliferous and energy-producing minerals; peat extraction*
5	2420	*manufacture of cement, lime and plaster*
5	4100	*food, drink and tobacco industry*
5	4130	*manufacture of dairy products*

5	4140	*processing and preserving of fruits and vegetables*
5	4160	*grain milling*
5	4180	*manufacture of starch and starch products*
5	4200	*sugar manufacturing and refining*
5	4220	*manufacture of animals and poultry food*
5	4230	*manufacture of other food products*
5	4240	*distilling of ethyl alcohol from fermented materials; spirit distilling and compounding*
5	4250	*manufacture of wine of fresh grapes and of beverages based thereon*
5	4270	*brewing and malting*
5	4280	*manufacture of soft drinks, including the bottling of natural spa water*
5	4700	*manufacture of paper and paper products; printing and publishing*
5	4710	*manufacture of pulp, paper and board*

Appendix 2. Significant industry responses

France

Nace Code	Industry	Employ. Developed	Employ. Developing	Wages Developed	Wages Developing
221	Steel	+		+	
222	Steel tubes			-	
223	Steel rolling			-	
224	Fisrt transformation of metals			+	-
231	Extraction for construction	-		+	
232	Potassium and phosphorous	+	-	+	-
242	Cement			-	
243	Construction equipment		+		-
244	Asbestos	+	-		
245	Stone works		-		-
256	Chemicals for Agriculture		+		+
260	Synthetic fibers			+	
311	Iron works			-	+
312	Casting			-	
314	Metallic construction		+	-	
315	Boilers and reservoirs	+		-	
352	Automotive bodies	+		-	
361	Ship building	-	+	-	
363	Cycles and motorcycles	-	+		
371	Measure an control equipment	+	-		
411	Fats (animal and vegetal)	-			
414	Fruit and vegetable canning			+	-
417	Pastas				
418		+	-	-	+
420	Sugar			-	
422	Food for animals		+		
425	Wine			+	
427	Beer			+	
438	Carpets and rugs	+	-		
439	Other textiles			-	
456	Leather and furs	+	-		-
482	Tires		-	-	-
495	Other manufacturing			-	+
Total:		9+; 5-	6+; 8-	8+; 14-	4+; 7-

Germany

Nace Code	Industry	Employ. Developed	Employ. Developing	Wages Developed	Wages Developing
221	Steel	+	-		
222	Steel tubes		+		
243	Construction equipment		+		
257	Pharmaceuticals	+			
258	Detergents				
259	Other Chemicals for home usage		+		
344	Telecom.and measur. equipment	+			
361	Ship building	+			
363	Cycles and motorcycles			-	+
365	Other transport equipment		-	-	+
371	Measure an control equipment			-	+
372	Medical equipment	-	+		
411	Fats (animal and vegetal)	+			
415	Fish canning			-	+
416	Seeds		+		
417	Pastas	-			
418	Starch	+	-		
422	Food for animals			+	+
425	Wine	-			
427	Beer	+			
439	Other textiles			-	+
453	Clothing			-	+
456	Leather and furs	+	-		
462	Wood unfinished products			+	-
467	Wooden furniture			-	+
471	Paper and pulp	+			+
481	Rubber			-	+
495	Other manufacturing			-	+
Total:		9 +; 3 -	5 +; 4 -	2+; 9-	11+;

Italy

Nace Code	Industry	Employ. Developed	Employ. Developing	Wages Developed	Wages Developing
212	Mineral extraction	+	-		
242	Cement			+	
243	Construction equipment			+	-
245	Stone works			+	-
326	Transmissions			+	-
330	Office equipment	+	-	+	-
344	Telecom.and measur equipment			+	-
351	Automobiles			+	-
361	Ship building			+	-
412	Livestock		+		
420	Sugar	+	-		+
421	Confectionary	-	+		
424	Alcohol beverages			+	-
453	Clothing			-	
455	Other textiles			-	
456	Leather and furs	-	+		
482	Tires	-			
494	Toys and sport equipment	-	+		
Total:		3 +; 4 -	4 +; 3 -	9 +; 2 -	1 +; 8 -

United Kingdom

Nace Code	Industry	Employ. Developed	Employ. Developing	Wages Developed	Wages Developing
222	Steel tubes				-
241	Materials for construction			-	
242	Cement	+		-	-
244	Asbestos	-			
245	Stone works	-			
246	abrasives	-			
255	Paints and inks			+	
256	Chemicals for Agriculture				-
257	Pharmaceuticals			+	
260	Synthetic fibers	-		+	
314	Metallic construction			+	
315	Boilers and reservoirs		+		
323	Equipemnet for textile industry	-			
361	Ship building			+	
363	Cycles and motorcycles				-
365	Aircrafts	+	-		-
412	Livestock		+		-
413	Milk	+	-		
414	Fruit and vegetable canning	+	-	+	
415	Fish canning	-	+		+
419	Bakery				-
423	Various food	+	+		
425	Wine				
427	Beer			-	+
426	Hosiery				-
463	Wooden framing and floors	-	+		
464	Wood packaging	+			
465	Other wooden products				+
471	Paper and pulp				-
Total:		6 +; 7 -	5 +; 3 -	7 +; 4 -	3 +;