FINAL PROGRESS REPORT (24 MONTHS)

Contract n°: SOE2-CT97-3062

Project n°:

Title: GLOBALISATION AND SOCIAL EXCLUSION

Project coordinator: PROFESSOR JOHN WHALLEY
UNIVERSITY OF WARWICK, UK

Partners: CEPS, BELGIUM
UNIVERSIDADE DO MINHO, PORTUGAL
KIEL INSTITUTE OF WORLD ECONOMICS, GERMANY
STOCKHOLM

Reference period: from 01.04.99 **to** 31.03.01

Starting date: 01.04.98 **Duration:** 24 months

Date of issue of this report: 04.07.01

Project financed within the TSER Programme

Abstract

This project has sought to analyse the links between globalisation and social exclusion in EU countries using new data analyses, econometric techniques, and general equilibrium modelling. Globalisation is taken to refer to greater interdependence generally among economies, including lower trade barriers, increased trade particularly with lower income countries, and increased cross-border investment. Social exclusion is taken to refer to changes in economic inequality, particularly as reflected in the relative wages of skilled and unskilled workers.

The data analyses from the project produce some striking findings. One is that effects from new trade surges often have more pronounced effects within rather than across sectors; i.e. import surges of one type of apparel product tend to affect other apparel subsectors more so than the whole economy. These findings are also borne out by econometric analyses. General equilibrium modelling confirms findings found elsewhere in the literature that technical change rather than increased trade tends to be the main source of the increased wage inequality often attributed to globalisation.

1. *Executive Summary*

The work on the project was divided up into a series of work packages, and we report the main project results and methodology used in obtaining these here, organised around the central project themes. These correspond to the deliverables itemised in the proposal.

The work that has been executed on the project has involved data analyses, econometric analyses, case studies, and general equilibrium analysis.

1.1 Data Analyses

Data Collection and Processing

The project has obtained detailed bilateral trade data, in both value and volume terms, for a sufficient number of years to permit econometric estimation and allow conversion of these these data from the original trade classifications to an industry classification. We have converted from over 1200 product categories in the trade classification (5 digit Standard International Trade Classification (SITC)) to 82 industrial sectors (4 digit International Standard Industrial Classification (ISIC)). This conversion was necessary to permit the use of the trade data with the industry and labour market data in the data analysis, econometric and general equilibrium modelling work.

In the process we have generated data for 9 EU importing countries: Belgium-Luxembourg, France, Germany, Italy, Netherlands, Portugal, Spain, UK and Sweden. These data cover all the large EU members but also some small relatively open countries. There is also a variety of coverage in terms of income levels within the current EU. The data cover the years 1970 to 1995 (an exception is Sweden where the final year is 1994). For each of these nine countries imports from each of the following 27 partner countries[1] or regions have

[1] These are Austria (AU), Belgium-Luxembourg (BE), Denmark (DE), Finland (FI), France (FR), Germany (GE), Greece (GR), Ireland (IR), Italy (IT), Netherlands (NE), Portugal (PO), Spain (SP), Sweden (SW), UK (UK)
Canada (CA), Japan (JA), USA (US), China (CH), India (IN), Mexico (ME), Turkey (TU)
Africa (AF), Asia (AS), NICS (NI) - Hong Kong + South Korea + Singapore + Taiwan, Latin and South America (SA)
OECD (OE) - excluding recent members Mexico, Korea, Poland, Czech Rep, Hungary
Rest of World (RO), - Non-OECD

been generated.[1]

For each bilateral country pair, flow data are provided on the value and volume of imports at a 5 digit level SITC level and the value and volume of imports at a 4 digit ISIC level. Also presented are unit values (value per unit of volume (metric tonnes)) for the ISIC classification. These are an important element of the project data since in common with most other studies unit values are used as a proxies for prices for bilateral trade flows. This data set represents the most comprehensive current information on bilateral trade flows at the industry level for EU countries. As such they have provided the basis for the detailed and original data analysis and econometric studies that have been undertaken in this project.

Data Analysis

These data have been used to compare movements in the price of traded low-skilled labour intensive products relative to the price of traded high-skilled labour intensive products. A rise in the relative price of high-skilled labour intensive products lies at the heart of most standard analyses of the impact of globalisation upon domestic labour markets in European countries. We find strong consistent evidence across most EU countries, that in the 1980s, but not in the 1970s, the relative traded price of high skilled products increased. This is consistent with globalisation having had an adverse impact upon low-skilled workers in the EU countries.

This analysis has also been extended in the project to provide a comprehensive evaluation of what the information contained in trade prices contributes to our understanding of the impact of globalisation. Brenton and Pinna (2000, 2001) look within movements in import and export unit values of two principal skilled-intensive sectors (electrical and non-electrical machinery) and three key unskilled intensive sectors (textiles, clothing and footwear). They utilise data, covering the period 1976-1994, at the most detailed (tariff-line) level of disaggregation for five European countries (UK, France, Germany, Belgium-Luxembourg and Italy). For each of these importing countries they consider trade with five regions: OECD, Central Eastern European Countries, the NICs, other Asian countries and the rest of the world. The basic hypothesis they seek to assess is that if globalisation has had a

[1] All the countries mentioned in the original work proposal have been covered with the exception of 'ex-comecon'. The reason for this omission was the view that this grouping was no longer useful. It was felt to be desirable to distinguish between the Central and Eastern European countries and the states of the ex-Soviet Union.

significant impact upon labour markets in industrial countries this should be apparent in movements in prices for finely defined categories of traded products.

A key feature of their work is that they split out the extent of quality upgrading within sectors by using standard index number techniques to decompose movements in unit values into two components: pure changes in prices and variations across time in the bundle of goods. This approach also allows some consideration of the nature of the response to more intense international competition, as reflected in falling relative pure prices and upgrading of the quality of imports, in terms of changes to the price and composition of the bundle of goods exported.

Their work yields three key conclusions. First, with respect to the issue of relative prices the analysis reveals important differences between the 1970s and the 1980s in the impact on European countries of trade with low-wage countries. When looking at relative import prices, the 1980s seem to be the decade when the price of unskilled intensive goods fell relative to that of skilled intensive goods. In the period 1981-87 the analysis of pure price changes suggest a fall in the relative price of imports of textiles and clothing, particularly from the NICs and the rest of Asia regions. Furthermore, results reveal significant differences in behaviour across the unskilled-intensive sectors and across regions. Footwear shows different trends to textiles and clothing, for instance.

Second, pure price movements in the imported bundles have generally been accompanied by price movements in the same direction in the exported bundle of the same sector. A positive association is also apparent between the upgrading of the quality of imports and changes in the quality of exports. In other words, import price competition seems to be associated more with movements in the price rather than the quality of exports. Along the same lines, when and where imports have been characterised by quality upgrading there has been also upgrading of the quality of exports.

Third, considerable heterogeneity among unskilled intensive sectors is revealed by results. The impact of trade with low-wage countries on relative import prices is not common across all unskilled intensive sectors. Behaviour in the footwear sector appears to be quite different from that in the textiles and clothing sectors.

1.2 Econometric Analysis

The range of econometric analyses undertaken in this study can be broadly classified under two headings; those which are undertaken in the context of the standard textbook Heckscher-Ohlin model of trade and those which adopt an alternative approach based upon the notion of outsourcing. The emphasis of the former lies upon between sector adjustments in the face of more intense global competition, whilst the outsourcing approach focuses upon within sector adjustments and is able to explain the increase in wage inequality that has been observed within sectors.

Studies Using a Heckscher-Ohlin Approach to International Trade

Lücke (2000) considers sectoral specialisation in a cross section of OECD countries. Previous econometric research had used the Stolper-Samuelson theorem as its point of departure whereby changes in the relative wage of high-skilled compared to low-skilled workers reflect changes in the prices of high-skill-intensive relative to low-skill-intensive goods. One possible problem with this approach is that domestic value added prices (which are the conceptually correct measure of goods prices) may not be a good measure of the impact of international trade on labour demand because they may be partly endogenous.

Lücke analyses the evolution of net trade patterns of OECD countries to see whether countries specialised increasingly in human-capital-intensive industries during the 1980s. This would be expected if the entry of developing countries into the international division of labour had a substantial effect on OECD country trade patterns and, by extension, on their labour markets. Regression results indicate that this has only been the case for a few smaller European countries while the majority of countries showed widely diverging patterns of specialisation. While these diverging patterns could not be explained fully within the confines of this study, national investment in human capital formation is one likely cause. A conclusion that may be drawn, however, is that *trade patterns across European countries did not undergo the sort of uniform shift that would be expected if growing trade with low-income countries had a major impact on European labour markets*.

Interactions between wage and employment adjustments in response to external shocks have also been studied for Sweden (Oscarsson 2000), where a compressed wage structure renders this issue particularly relevant. Wage inequality decreased during the 1970's up to the early 1980's when it started to expand moderately. Looking at education differentials, the standardised relative wage of labour with 16 years of education relative to 12 years of education was 1.80 in 1968, 1.22 in 1984 and increased to 1.31 in 1991

(Holmlund 1997). Unemployment was low during 1970-91 varying between 1.5 and 3.5 per cent. However, the unemployment rate was higher among the unskilled than the skilled. The unemployment rate was about 1 per cent for labour with more than 12 years of schooling compared to 2-4 per cent for labour with 9 years of schooling during this period (Oscarsson 1997).

Oscarsson analyses the effects of international trade on the wages of skilled and unskilled labour in Sweden during the period 1968-91. Using Stolper-Samuelson type equations, predicted growth rates in total average wages are consistent with the actual growth rate. However, this cannot explain observed relative wage trends when labour is categorised as skilled and unskilled. Estimated wage changes implied an increase in the relative wage of skilled labour, but the actual relative wage decreased; suggesting that the impact of international price changes and TFP growth on the wages of these different skill groups must have been counteracted by other factors. Research under the project has also relaxed the assumption of exogenous prices and allowed labour supply changes to impact upon factor returns. During the early 1970s, Sweden experienced fast growth in the relative supply of skilled labour.

If relative wages in Sweden did not adjust according to the predictions of the Heckscher-Ohlin model, one might expect that employment did. With an inflexible wage structure, import competition from low-wage countries depresses profitability and leads to structural change. Indeed project research by Oscarsson shows that adjustment to changes in import competition took place in this case by employment changes rather than by wage changes. This result is in line with the structure of the Swedish labour market with low wage flexibility and an active labour market policy to support structural change. Results also indicate that non-production workers were more mobile than production workers. One possible explanation for this might be that non-production workers have less industry specific skills, which facilitates employment in other sectors. Technological change had a significant negative effect on the employment for both labour groups (equal in magnitude) and a positive effect on the real wage for non-production workers.

Analysis Based Upon Outsourcing

Outsourcing occurs when firms take advantage of low-wage costs in labour abundant countries by moving the low-skill intensive parts of the production process abroad, but continue to carry out the high-skill activities themselves in the domestic economy. Trade with low-wage countries via this route shifts employment away from less-skilled workers in

industrial countries and puts downward pressure on the relative wages and employment of less-skilled workers within industries.

Anderton and Brenton (1999) empirically assess the impact of outsourcing on the relative wages and employment of the low-skilled in the UK. A distinguishing feature of the research is that, in contrast to previous studies, they explicitly identify trade with low-wage countries and include this as a variable explaining changes in relative wages and employment for the low-skilled for each sub-sector within the textiles and non-electronics machinery industries. Two closely related hypotheses are also investigated. First whether the degree of outsourcing differs across industries and second, whether the large appreciations of sterling in the early 1980s had a disproportionate impact on outsourcing due to factors such as switching costs.

Their results suggest that UK imports from low-wage countries made a significant contribution to the decline in the relative wages and employment of the less-skilled in the UK. The estimates imply that *around 40 per cent of the increase in the wage-bill share of skilled workers and one third of the increase in their employment share in the textiles sector may be due to outsourcing* to low-wage economies. Thus, *when assessing the impact of trade on labour markets in Europe the source of trade matters*. In addition, their work finds some evidence that low-skill sectors, such as, textiles are more likely to be influenced by outsourcing than higher skill sectors, such as machinery. Also, large currency appreciations may have a disproportionately large impact upon the fortunes of the unskilled.

Anderton and Brenton (1998) provides a similar analysis for the US with again the separate identification of imports from low-wage countries distinguishing the study from previous research on the US. The results for the US can be summarised as follows. An increase in US imports from low-wage countries encouraged by the large appreciation of the dollar in the early 1980s, seems to explain some of the rise in US inequality in low-skill-intensive sectors. Rapid technological change does not seem to be an important determinant of inequality in these sectors - which is not surprising given the low-technology nature of these industries. Technological change seems to be strongly positively correlated with the rise in US inequality in high-skill-intensive sectors. However, given that the timing of the sudden rise in US R&D expenditure corresponds with the appreciation of the dollar, it may be the case that the deterioration in US trade competitiveness during this period contributed to the rapid increase in the rate of US technological change via mechanisms such as ‘defensive innovation’. Hence one might also argue that the technology-based explanation for the rise in

US inequality could actually a trade-based explanation, but this remains a tentative claim as more research is required regarding the links between increased competition with low-wage countries and defensive innovation.

In both of these studies the impact of outsourcing is captured through changes in import penetration measured in value terms whilst measures of relative prices were not found to be significant in the case of the UK. Further work in Anderton, Brenton and Oscarsson (2001) for Sweden finds that in contrast to previous studies of that country, trade with low-wage countries may have contributed to the rise in inequality in Swedish manufacturing. Here this effect is apparent through changes in relative import prices and through changes in import penetration measured in volume terms. Changes in import penetration measured in value terms, which have been used in previous studies, are not found to be significant. In addition imports seem to have had a larger effect on inequality in high-skill intensive sectors rather than the low-skill sectors. The empirical results also suggest that the increased use of technology also played a role in creating greater inequality between skilled and unskilled workers in Sweden with the magnitude of this impact increasing in the 1990s. Hence, *whilst outsourcing is found to be important in a range of countries there is a degree of heterogeneity in the mechanisms by which this phenomenon influences domestic labour markets and the sectors which are primarily affected*.

This conclusion is reinforced by a study of Italy by Brenton and Pinna (2001). This study also introduces a measure of the variance of trade prices from different sources in order to capture the idea that over time production has become more and more internationally footloose and this has undermined unskilled employment in countries such as Italy. The results show that international competition had a significant effect on the relative demand for blue-collar workers in Italy in skilled intensive sectors. The measures of trade variability were also found to be strongly linked to the phenomena of skill upgrading in the high-skilled sectors. In unskilled intensive sectors, such as textiles and clothing, where the impact of imports from low-wage countries might be expected to be more pronounced, no significant effect from imports was found but rather that the most important role has been played by technological change. The result is in line with previous studies that indicate that Italian textile and clothing firms have remained internationally competitive by increasingly switching to high quality segments of the industry.

A slightly different approach to the measurement of outsourcing in adopted by Diehl (1999) in a study of German manufacturing industries. In a fully-fledged production-

theoretic framework he uses information on the prices of all inputs in the production chain. Two key findings emerge from this research. First, imported intermediate inputs were a substitute for low-skilled workers. This supports the hypothesis that outsourcing of intermediate inputs productions to low-wage countries has contributed to the decline of low-skilled employment in the manufacturing sector. However, only in a few industries can a sizeable share of the actual change of the employment structure be attributed to changing import prices during the observation period (1970-1993). Second, technical progress is found to be still the most important determinant of the downward trend in the share of low-skilled workers in total manufacturing employment, although this effect was statistically reduced by the inclusion of outsourcing as an explanatory factor. This finding seems to support the hypothesis that technical progress is more important than globalisation.

Finally, additional work in the project has compared trends between countries, using comparable data sets, focusing in particular on Portugal and Spain. While Portugal has retained its traditional export specialisation, with low-wages as the basis for international competitiveness, Spain has, in recent years, shifted from traditional sectors to semi-skilled and high-skilled products, bringing its export composition closest to that of the other EU countries and engaging mostly in intra-industry trade, rather than inter-industry trade.

In Portugal international trade has contributed to sustain the wages and the employment shares of low-wage, low-skilled workers, driving part of the compression which took place at the bottom half of the wage distribution and generating low unemployment levels. Also some institutional arrangements, such as the minimum wage, and collective bargaining contributed to such compression. However, these factors did not counterbalance the wage premium for high-skilled workers resulting from modernisation and technological upgrading. As a result, wage inequality has increased since the early 1980s.

In Spain, demand of low-skilled workers decreased sharply because of technological change and the reduction of traditional sectors, which when combined with a fairly rigid labour market resulted in high unemployment. Collective bargaining and other labour market institutions also increased wages at the bottom of the distribution and, hence, also unemployment of low-skilled workers. In the first half of the eighties, wage inequality was reduced because of the labour market institutional environment. Only since the mid-eighties after the liberalisation of fixed-term contracts, has increased wage inequality become more noticeable, although the bottom tail of the wage distribution continues to be compressed by unemployment of the least productive workers.

The econometric analysis for Portugal aimed at detecting whether international trade could have played a role in sustaining the very low unemployment rate in the country. Indeed, the unemployment rate, declining from 9% in 1985 to 5% in 1999, is in Portugal one of the lowest in the European Union, in sharp contrast with neighbouring Spain. The contrast between the two countries could result from a different pace of economic restructuring – labour costs increased slowly in Portugal, as opposed to Spain, while traditional industries such as the textiles kept a major role in Portuguese employment, output and exports.

Could the Portuguese international specialisation have contributed to sustain the employment of certain groups of workers? Did the conditions in international product markets help sustain the employment of the low skilled? Can any lessons be drawn from what has been presented as a *success story* concerning the reduction of unemployment? The study explored the dynamics of job flows across skills at the firm level in Portugal, searching for their determinants, to analyse in particular the role of international trade against alternative explanations. Results on Portugal could provide insight into the trends for other middle-income countries, where a-priori the impact of trade on the labour market is unclear. In fact, as trade with European countries increased, the relevance of the New Industrialised economies as Portuguese trade partners decreased. When compared to most European Union Countries, Portugal is an economy relatively abundant in unskilled labour and according to trade theory, the increased openness could therefore have led to growing specialisation in goods intensive in low-skilled labour, increasing the demand for unskilled labour. However, incentives to the modernisation of the productive structure followed accession to the EU, and a boom in foreign direct investment took place. As a result, the endowments of the country underwent slight change, with capital reinforcing its role in the productive process.

Job flows suggest that the Portuguese labour market is very dynamic, as large flows of job creation coexist with large flows of job destruction. Between 1985 and 1997, the Portuguese economy was dynamic, creating jobs on both ends of the skill spectrum - unskilled workers, as well as professionals and the highly skilled. However, job destruction was particularly severe for the unskilled. As a result, net job creation achieved highest rates for professionals and highly skilled workers, while the unskilled labour force barely kept in 1997 its employment level of mid-eighties. This contrast across skill groups got increasingly wider after the 1993 recession. Among the major exporting industries, different trends can be detected. Job growth in the clothing industry favoured the most skilled, while the size of the unskilled labour force remained stable. Employment growth in the footwear industry

favoured as well workers with the highest skills, but net job creation took place for skilled and unskilled personnel as well. The textiles have been destroying jobs at the bottom of the qualification ladder, while sustaining the employment of professionals and the highly skilled, in every case with relatively low rates of job reallocation. A similar trend was followed by machinery, with intermediate levels of job reallocation. The transport equipment industry has been a net job destroyer throughout the skill spectrum. Footwear is the only major exporting industry that expanded the size of its unskilled labour force. The idea of exporting industries as major absorbers of unskilled labour thus finds little support in the empirical evidence.

Results suggest that technology indicators are more relevant determinants of job flows than conditions in international product markets. Indeed, firms in technologically more advanced industries have expanded job opportunities for the skilled labour force, as job creation took place at a faster pace than job destruction. For unskilled workers, on the other hand, a higher technological level in the industry is associated with higher reallocation, but job creation and job destruction offset each other.

The major impact of international trade on the Portuguese labour market occurred via exports. Higher export prices increase job creation and destruction for the unskilled, thus increasing turnover, but with no impact on net employment growth. For the skilled labour force, rising export prices results in rising job creation and unchanged job destruction, pointing to a certain upgrading in the quality of Portuguese exports.

On the other hand, the impact of import prices on job creation and job destruction for the unskilled is negligible, just like their impact on job creation for skilled workers. Rising foreign competition in the form of declining import prices just reduces job destruction for the skilled labour force. The trade results therefore point to an economy slowly increasing its specialisation in skilled labour.

1.3 Case Studies

The project has executed case studies focusing on footwear, textiles and apparel, and electronics, analysing the labour market adjustments in response to trade increases in each case.

Footwear

Footwear is usually treated as a low-skill intensive sector where, over the years, comparative advantage has shifted decisively to labour abundant low-wage developing countries. The case study on footwear (Brenton, Pinna and Vancauteren (2000a and b) documents the rapid decline in employment and output of footwear in the EU since the 1970s. Over the same period it is apparent that there has been a substantial increase in import penetration of the EU market, and of each individual country's market, by low-wage developing economies. However, an important feature of the European footwear industry is that the decline of the sector is not common across countries. Some European countries such as Italy and Portugal have been able to maintain output and employment in the face of increasing import penetration. This suggests that there are different modes of response to globalisation within the same industry. It is this issue which forms the focus of this project case study.

One of its main findings is that there are a number of features of the performance of the sector in Europe which cast doubt over the applicability of the standard trade model, which has typically been used to assess the impacts of globalisation on wage inequality. These characteristics also undermine a number of common perceptions of low-skilled labour intensive industries. Firstly, the trade data clearly demonstrate that as import penetration has increased so have export to output ratios. This is inconsistent with a view of the footwear sector producing homogeneous products, and suggests that adjustment to more intense import competition in footwear does not necessarily require the movement of resources into other sectors. Successful adjustment should entail the movement of resources into the production of higher quality differentiated fashion shoes. Italy now exports around 90 per cent of domestic output. Those countries which have suffered the largest falls in output, France, Germany and the UK in Europe and the US, exhibit much lower export to output ratios than the other two European countries. Thus, this simple analysis would suggest that a proper assessment of the impact of globalisation on specific sectors should cover not just changes in imports in industrial countries but also developments in their exports.

Secondly, the process of making footwear can be broken down into distinct stages of production. Accordingly, this division of production stages has brought about a division of labour, which requires a variety of skills from within the unskilled labour force, a group which is usually associated with production workers. The cutting of the leather, in which the varying texture of the material must be taken into consideration, is the most highly skilled and best paid job within the group of production workers in the factory. Thus, for footwear it is clear that the group of production or unskilled workers is far from homogeneous, as is often assumed in discussions of the impact of globalisation. This is apparent from data which show different levels of wages for the different groups of unskilled workers within the footwear industry in Belgium and Italy.

It is also apparent in the dynamics of labour adjustment to globalisation. Most previous studies of the impact of globalisation concentrate upon the impact of trade upon relative wages and relative levels of unemployment for skilled and unskilled workers in Europe and ignore other dynamic aspects of adjustment which are important in affecting social exclusion. Data for Belgium, used in the case study, show that manual workers tend to suffer longer periods of unemployment than non-manual workers. However, it is interesting that within the group of manual footwear workers, it is those with the higher level of skills which tend to have a higher duration of unemployment. The proportion of the least skilled footwear workers who are long-term unemployed in Belgium is less than that of the most skilled cutters.

Thirdly, for footwear it is apparent that technological change has not been pervasive. Information regarding two new technologies, computer-aided design (CAD) and computer-aided stitching (CAS) shows widely varying rates of application across countries. The use of CAD, which is related to the design of the product, is far more widespread than the more production related technology, CAS. In general, CAD and CAS are applied more widely in France, Germany and the UK than in Italy and Portugal, perhaps reflecting the nature of the sector in these locations; a large number of small firms and the preponderance of fashion-oriented leather-uppered footwear.

On the basis of the available data we find that those countries which had the lowest levels of labour productivity in footwear at the start of the period in 1970 experienced the sharpest falls in employment in footwear. It is these countries which have more widely adopted the most recent technological advances that are relevant to the sector. It is concluded

that technological change may have been an important factor in particular countries but has not been a general feature of the sector as a whole.

Thus, the case study highlights that, even for a sector which is usually taken to be straightforward for the analysis of globalisation, there is a high degree of heterogeneity in the nature of the sector in different countries and in the adjustment process to globalisation. For those countries where employment loss has been greatest, technological upgrading, international outsourcing and overseas investment have been of more importance. In other countries where historically firms have been smaller, the dominant response has been one of increasing local flexibility in terms the formation and growth of industrial districts, as in Italy, and the concentration upon high quality, design intensive, fashion footwear with a very large proportion of output being exported.

This variety of response suggests that the design of a coherent EU-wide policy to assist adjustment to globalisation would be very difficult. What is apparent is that a result of this process of adjustment can be the social exclusion of the workers involved. This is not just for unemployed workers. The increased flexibility of firms in industrial districts can lead to problems of social exclusion for workers classified as employed. Flexible organisation leads to the greater use of temporary, part-time and cottage workers. The lack of employment stability for these workers can be reflected in rising wage differentials compared to skilled workers with higher job stability. In addition, these are workers who can miss the social safety net which is in place for permanent, full-time workers.

Textiles and Apparel

For the past twenty years the textile and clothing (T&C) sector in industrialised countries has been shielded from low cost imports by protective trade agreements. Nevertheless it is generally accepted that large adjustments have taken place. This case study examines the adjustment experience and future prospects of the T&C industry in the two European Union countries - Italy and the United Kingdom. The analysis focuses on the changes in employment and other social related effects of long-term restructuring in the industry, and the role played by trade in them. We also provide indications about future trends in adjustment in view of further forthcoming trade liberalisation.

Since the 70s all higher income countries suffered substantial employment declines in the T&C sector. The European Union countries experienced much greater percentage losses than group, major producer in the “G7” like USA and Japan. Furthermore, this is not only a

recent phenomenon; between 1963 and 1973/4 T&C employment as a percentage of labour force has already fallen from 16% to 12%, due in particular to declines in UK, FRG and Netherlands.

It is difficult to isolate the determinants of these adjustments over such a long period of time considering that variations, as we will see, can be found at country and sub-sector level. Peaks have been recorded during recovery from overall economic downturns and declines have been more severe during the recessions 1973, 1983, and 1990/1994 when both consumption and output declined. The fall in employment has exceeded output decline while recovery in demand and output had little effect on employment. The production index for textiles in 1987 (1980=100, EC-12) had recovered to 98,6 while employment in the sector has continued to fall to 73.2.

All European countries possess a T&C industry but there are variations in the sector as a whole and different weights for sub-sectors and segments. The major employer countries are respectively Italy, United Kingdom France and Germany. Over the post-war years we observe a reversal in the hierarchy of major producers with FRG and UK suffering the greatest losses, respectively 58,1% and 55% in combined TFC employment.

The UK, once having the largest textile industry, has suffered greater losses in this sub-sector relative to clothing in the past two decades, having its textile work force reduced to one third in the 1970/90 period, while clothing employment fell by half its 1970 level. For Germany the opposite is true; starting from a lower level textile employment has fallen by half at around the same level of UK. German clothing sector has shown instead the worst performance in employment terms since 1972/73. In Italy the sectoral trends are more marked with substantial adjustment in textiles being concentrated in the 1972/3-1983 period. Clothing declines at a lower rate in recessionary periods. The former staged an upsurge in 1993/95 the latter in 1990/92.

In France employment trends by sector show an adjustment in clothing from mid 60s to mid 70s; textiles sees a downward trend from 1972/73. In the 1980s decline in both absolute and percent terms are slightly higher for clothing but losses in textiles are still remarkable relative to other major European partners, accounting for the worst performance among the major European producers. In the 90s both Germany and France continue to experience a constant decline in both sectors, though textiles show a far worst performance in

the latter from1985 and appears particularly hit by the 1990-1991/93 recession. Italian and UK clothing stabilise.

These adjustments have been strongly influenced by the structure of the industry, size of enterprises and relationship along the production-distribution chain, and the typology of the national market. European T&C manufacturers had a low level of internalisation at the beginning of the period, catering mostly for their national country. Lately the integration process in the EC has led many enterprises to consider the Community as their main market, though continuing to have a prime interest in those segments which they cater most at home. British textiles have seen a state-sponsored process of concentration leading to progressive downsizing and rationalisation. Losses in employment has been reflected high rates of enterprise closures for technological obsolescence.

The prominent role of distribution over manufacturing, coupled with high levels of concentration in the sector, have been disadvantages in dealing with the changes in competitive environment brought about by trade liberalisation.

Clothing has had sustained demand due to low prices. Large chain stores has dominated the market favouring national producers, keeping prices growing at a lower rate than the continent. Concentration on standardised items and delocalisation to informal sector has allowed costs to align with distribution pricing policy.

A major issue in the country has been the large chain stores downplaying local producers in an attempt to regain competitiveness by lowering prices. Strong market power deriving from the control of brand names and the management of the key marketing and distribution functions can leave manufacturers cut off from end users' market. The threat of chain stores to go abroad for a greater share of its purchases produces a chain reaction of downsizing and rationalisation.

French textiles have lived through the same experience as Britain in this regard; century-old industrial districts have been advised to achieve greater concentration. It seems that advantages from economies of scale and greater financial resources have been offset by a loss of flexibility and entrepreneurial skills. While the EU has maintained a surplus in textile trade flow France shows a growing deficit. The main exporters are high quality producers like Italy and W. Germany, but supplies from developing countries has been growing, in particular from former Mediterranean colonies, Tunisia and Morocco.

Looking at the relative success of the clothing industry compared to textiles, one might deduce that clothing manufacturers have switched to foreign supplies for both basic and high quality fabrics. But given the high export orientation of textiles as opposed to clothing it seems that advantages from trade have not compensated for weakening in the strategic partnership between textiles and clothing in the textile segments of the industry. Growing import competition clearly plays a great role in re-orienting enterprise strategies. Labour market rigidities, unlike in the UK, and magnified by the greater size of enterprises, as opposed to in W. Germany and Italy, has oriented towards labour saving innovations and outsourcing.

Germany is now the major European exporter in the world market for textiles, second only to Italy for clothing, and also the largest market for textile and clothing goods. This implies that an outstanding performance has been achieved on this front in a highly competitive environment both at home and abroad. German consumers are more responsive to quality/fashion appeal than British, but more conscious about quality/price relationship than Italians are. Changes in the quality structure of output reveal the effort of the T&C industry to reorient itself towards the highest segments of the market. In 1990, relative to 1980, the share of output in the high range had doubled to more than 10%, 60% was to be found in the medium range while the lowest ones had either reduced or disappeared.

The successful performance of German **t**extiles has been achieved by undertaking major adjustment through investments in technological innovation. The structure of the industry has remained unchanged and continues to rely on SME, though with greater concentration than in Italy. In order to reduce costs textiles have also invested consistently abroad, FDI in textiles and outward processing in clothing, mainly served by German export fabrics, has emerged since the late 80s as a strategic factor offsetting growing costs. The internationalisation of production slowed in the 80s due to difficulties in matching the need of the highly demanding fashion market with redeployment to distant and often low quality producer countries.

The EU clothing industry, no less than textiles, has tried to improve productivity by using the latest technology. The high labour content of some stages of production, especially sewing, and the need to shed less profitable segments of the market in light of growing competition have made internationalisation, mostly through outward processing, inevitable for the textiles and clothing industry. European countries have come to look abroad only later in the decade, notably the UK and Italy; so that already in 1990 50% of German clothing

imports could be attributed to outward processing or other agreements. The opening up of the EU countries economies has offered industry the industrial space for its outsourcing policy.

The experience of adjustment in the Italian T&C industry is, in contrast, a success story even though the social costs should not be downplayed. Italy accounts for about one third of European total turnover, employment and export in the industry. In its external trade Italy is the fourth biggest exporter, second only to Germany among OECD countries, and the second biggest exporter in clothing after China. It ranks in the top ten for imports as well, though in a lower position and below all the other European major countries.

Restructuring in textiles with substantial job losses was seen in Italy in the 60s, though in both absolute and relative terms to that experienced in other European countries. Technological innovation was an important feature of the industry success, sustaining the continuous upgrading of quality. A tight relationship with related industries and between suppliers/customers in the districts was a feature of this sector.

The more labour intensive clothing sector was less affected by downsizing until 1985. The competitive advantage of Italian clothing relied heavily on the flexibility of its highly fragmented structure, and an unusual (for Western Europe) growth of subcontracting to the informal sector. The relative cheap labour and greater flexibility of the work force was a feature of the sector until the end of the 70s. From then on, the pursuit of high quality /high fashion has induced a shift in size to cope with the high investments required, and labour costs began to grow consistently.

A divide appeared among enterprises, networks and districts according to this position in the value chain and the market segment. Larger enterprises concentrated on product/process innovation, design and branding focusing on the control of the end users' market. The most intensive stages of production process were outsourced through subcontracting. SMEs have nevertheless attracted attention for their ability to combine the traditional advantages of flexible small businesses with the technological and know-how capabilities required by a sophisticated and volatile market.

The competitiveness of Italian clothing at home, seen against falling demand and rising imports, has been maintained by a fragmented distribution system and a restrictive trade policy. Like other "cheap" European manufacturers, Italy has taken advantage of restrictions on imports from LDCs to its major export markets. A weak currency helped to

keep local costs down for exporters and to maintain a competitive edge relative to other quality producers as well as to face LDC competition in the medium-low range.

Electronics

The electronics industry (not including computers) was chosen for a project case study, because of the observation that import penetration from low wage countries has been high and is still increasing, at least in certain subsegments, and creating adjustment pressures. In addition, the project sought to provide case studies both on low-skill-intensive industries (footwear, textiles and clothing) and skill-intensive industries (electrical industry).

In this case study, the development of employment and production in the European Union has been analysed and broad trends in the globalisation of production have been identified. The share of the electrical industry in value added of the total manufacturing sector has increased over the last two decades, except in the UK. In addition, labour productivity in the industry increased above the average rate for the total manufacturing sector in all countries and employment decreased in absolute terms, particularly so in the UK. Increasing capital intensity of production (e.g., due to automated assembly) was probably the major determinant of this development. However, the reason behind this could also have been either exogenous technical progress or globalisation pressure.

The locational pattern of world production in the electronics industry has changed significantly, with the share of EU countries in world exports of electrical machinery decreasing significantly over the last two decades. Moreover, worldwide foreign direct investment in the electronics industry increased significantly. However, EU investments were largely directed to high-income countries, in contrast to FDI of Japanese and US producers. In addition, some EU countries received significant FDI inflows from Asian producers. This shift has been particularly strong in the consumer electronics segment in which the share in total employment of the EU electrical industry decreased over the last two decades. This is in line with the high and increasing import market penetration ratios of low-income countries in this segment.

The consequences of the increasing globalisation in the electronics industry were not identical for the major EU countries. For example, the share of low-skilled workers in total employment decreased in France, the UK and Germany, whereas it increased in Italy. Moreover, the relative wage of low-skilled workers decreased only in the UK, whereas it was relatively stable in France, Germany and Italy. Different trends in the R&D intensity can be

used to explain these differences. Since 1985, R&D efforts in the electrical industry decreased in the UK, stagnated in Italy and increased in Germany and France. This supports the hypothesis that product and process innovations can compensate for globalisation pressures. By contrast, labour market rigidities apparently played only a minor role in the different employment trends.

The case of Germany has been studied in the case study in some detail. Results show that the share of relatively skill-intensive segments (telecommunications equipment, measuring and control instruments) in production and employment of the electrical industry has increased. This can be interpreted as the result of intra-sectoral specialisation according to the comparative advantage of German producers. Moreover, subsegments of the consumer electronics segments were analysed, and it was shown that the price of imports from low-wage countries has decreased relative to German producer prices in the case of radios and telephones whereas it increased in the case of TV sets. This supports the hypothesis that specialisation matters even within small subsegments.

In conclusion, total employment in this industry was stabilised by structural change within and between subsegments. Moreover, the decreasing share of unskilled labour was related to process innovations and to the increasing import competition from low-wage countries. Finally, R&D efforts can explain the different performance of the electrical industry within the EU.

1.4 General Equilibrium Analysis

Other work on the project looks at the three most common explanations of growing wage inequality in advanced countries - a world price shock, sector-biased and factor-biased technical change - from a non general equilibrium angle. This component of the project activity begins by looking at these issues using the standard 2-good 2-factor Heckscher-Ohlin trade model of a small open economy. World prices and sector-biased technical progress both affect incomes mostly through indirect effects in this model: by altering the structure of industrial production. Income inequality increases if there is a shift in production towards more skill-intensive industries. But, due to costs in moving factors and other reasons, a country's industrial structure will not shift as quickly or as completely towards these industries as changes in comparative advantage (whether due to world price shocks or sector-

biased technical progress) would indicate. Most of the change in inequality does not occur until this production shift takes place.

Project model analyses show that, when factor immobility is taken into account, trade-based models look much more realistic. In particular, the large changes in specialisation associated with Heckscher-Ohlin models in some earlier CGE simulations are difficult to reconcile with observed changes, and long-run effects and the medium-term effects on output and trade may be closer to those actually observed.

To show this, the project has fitted a two-good two-factor Heckscher-Ohlin general equilibrium model to UK data for 1979 and 1995 using a dual calibration method. This is followed by simulations to determine the relative importance of trade and technological factors. Our results for this model framework, using two alternative production side elasticities of substitution, suggest that the observed changes in production and income distribution can be explained by a combination of a world price shock and factor-biased technical progress, and that the sector bias of technical progress is negligible. In the short run, depending on elasticities of substitution assumed, world price shock accounts for 30-100 % of the increased inequality observed (despite an offsetting effect from changed workforce composition). In the longer term, assuming much greater factor mobility, the effects of the already-observed upskilling of the workforce means that the economy is likely to specialise completely in skill-intensive goods, with the result that, depending on the order in which shocks are calculated, it may be only factor-biased technological progress (which has been significant) in the skill-intensive industry which will matter, at least in two-good framework.

Model analyses also suggest different dynamics for adjustment of industrial structure in different countries to price and sector-biased technical shocks, and this may explain much of the differences in experience of changing income distribution to date between the Anglo-Saxon countries, which have seen large increases in inequality, and Continental Europe, which have not. The former countries have experienced a faster restructuring of their economies away from manufacturing. Also, the dynamics of structural adjustment make it easier to link the effects of trade and technology shifts in the 1970s to much more recent and ongoing changes in income distribution, a relationship which Leamer speculates upon but does not spell out in detail.

The project also examines the role of labour market imperfections using general equilibrium methods. Earlier literature tries to examine the contribution of changes in labour

market institutions in wage inequality. This literature suggests that institutional changes - defined basically as changes in the degree of labour market flexibility - have in fact played an important role in increased wage inequality. Existing econometric-based studies try either to decompose observed changes in wage inequality into separate components due to increased trade, technological change and changes in labour market institutions or test the relationship between changes in wage dispersion and changes in institutions. Here, we compare an economy's response to trade and technology shocks under given, alternative labour market institutional frameworks.

The project employs a version of the differentiated goods model first set out in de Melo and Robinson (1989), and used for trade-wages decomposition in Abrego and Whalley (1999). This is a two-factor, two-produced-goods model, incorporating imperfect substitution in preferences between domestic and imported goods. This structure is modified to introduce wage bargaining between trade unions and firms in the market for unskilled labour.

This model is calibrated this model to 1990 UK data on production, consumption, trade and factor use. The impact of trade and technology shocks that occurred in the UK over the period 1976-90 are simulated, both in the presence and absence of labour market imperfections. To perform the decomposition exercises, we follow a methodology set out in Abrego and Whalley, and compute separate equilibria for trade, technology, and combined shocks.

In a differentiated-goods model with perfectly competitive labour markets, increased wage inequality is basically the result of technological change, with trade playing only a minor role. However, project results show here we find that the presence of imperfections in the market for unskilled labour significantly change this decomposition, increasing the relative contribution of trade. This change is only quantitative since for the model parameterisations considered, technological change is always the main force behind increased wage inequality.

The conclusion is that institutional arrangements in labour markets can have an important bearing on the outcome of wage inequality decompositions. Given the fact that a number of industrialised economies still present varying degrees of labour market imperfections, they should probably be explicitly incorporated in models trying to decompose relative wage changes for them.

Other project activity focuses on recent trade and wages literature on trade and wages in homogeneous goods trade models. In earlier literature, no attention has been paid to demand side considerations. These become potentially important as the assumption of goods homogeneity is relaxed. This project activity uses a heterogeneous goods trade model of the Armington type to capture demand side effects, and presents some results of decompositions of total wage change into trade and technology components using UK. It shows how trade shocks affect the price of unskilled-intensive goods and how these can be absorbed on the demand side, with little or no impact on relative wage rates. No wage impact occurs if the elasticity of substitution in preferences between imports and import substitutes is one. As this elasticity increases, trade plays an ever larger role in explaining wage inequality changes, and as the elasticity goes below one the sign of the effect changes. The results suggest that since many Armington and import demand elasticity estimates are in the neighbourhood of one, there is a prima facie case that the introduction of demand side considerations further lowers the significance of trade as an explanation of recent trends in OECD wage inequality, i.e. beyond that reported in recent literature.

The methodology for decomposing wage inequality changes into trade and technology constituent parts developed and applied originally to the UK, has also been applied to the Netherlands. The model structure used is calibrated to 1995 Dutch data on production, trade and factor use, and decomposition experiments are then conducted. Modelling results are qualitatively similar to those for the UK. In effect, the pure Heckscher-Ohlin structure proves unsatisfactory for conducting decomposition experiments of observed changes in wage inequality due to the near linearity of the transformation frontier moving the economy towards full specialisation, following small changes (representing only a fraction of those observed) in relative prices. The ambiguities in decomposition for UK data for the small price and technology shocks that the Heckscher-Ohlin structure can be solve for are also present in the Netherland's case.

As in the UK case, the use of models where imports and domestic goods are no longer perfect substitutes solves these two difficulties, but generates a new problem - the trade shock is almost entirely accommodated by changes in imports (or demand) rather than output. The result of that is that trade-related factors end up playing only a minor role in the wage inequality surge. Thus, the conclusion that the exploration of alternative structural models rather than reduced forms may be the way forward to more satisfactorily sort out trade and technology effects on wage dispersion in industrialised economies still remains.

2. Background and Objectives

2.1 Objectives

The objectives of this project were:

(i) to determine the role played by international trade in influencing the employment and relative wages of unskilled workers in Europe. To use a combination of data analysis, econometrics, case studies and simulation modelling. To take account of differences in industrial structures, social policies and technological chance and labour markets and labour market policies in individual EU member states.

(ii) to investigate how firms and industries in Europe have responded and adjusted to increased international competition from low wage economics, and to assess what form future responses might take.

(iii) to assess the policy implications of the above research and to design strategies for responding to future supply surges of low-skill products onto European markets from low-wage economics.

These objectives directly address the issues of Area III.2 of the TSER programme. The aim is to evaluate the impact of globalisation and changes in the international division of labour on the low qualified segment of the labour force in Europe after taking into account the role of other factors such as technology and labour market regulation.

A central hypothesis tested in this research, and one derived from analyses previously undertaken by several of the partners, is whether adjustments *within* broad industrial sectors in response to increased trade are more important than the *inter-sectoral* adjustments that have been the focus of previous research on the labour market impact of trade. In short, a central initial research issue was whether international specialisation is driven by more trade in low wage goods is increasingly becoming defined by specialisation within, rather than across, industrial categories.

The wider scientific, technical, economic and social significance of the project relates to the role of increasing globalization of industrial production and resulting changes in the international division of labour. Whether these have been key factors in the decline in relative employment and wages of the low-skilled in Europe in the 1990s has been widely discussed. Substantial emphasis was placed upon the assertion that the increased supply on world markets of products embodying primarily low-skilled labour from low wage economies, particularly products manufactured in Asia and Central and Eastern Europe, is a main cause of both the high and persistent level of unemployment for unskilled workers in the EU and the increase in the wages of skilled workers relative to the unskilled in some European countries. Given that a new wave of low wage economies, including Russia and the Ukraine, are set to increase their trade with the EU over the next decade, it is important that the impact of these trends be assessed and consideration be given to how to design effective policy responses.

2.2 Changes During Lifetime

No substantive changes made.

3. Scientific description of the project results and methodology

3.1 Data Assembly

Trade Data

One task for the data collection exercise in the project has been to obtain detailed bilateral trade data, in both value and volume terms, for a sufficient number of years to permit econometric estimation and to convert these data from the original trade classifications to an industry classification. In this part of the project, we convert from over 1200 product categories in the trade classification (5 digit Standard International Trade Classification (SITC)) to 82 industrial sectors (4 digit International Standard Industrial Classification (ISIC)) This conversion was necessary to permit the use of the trade data with the industry and labour market data in the data analysis, econometric and general equilibrium modelling work.

Belgium-Luxembourg (BE),
Denmark (DE),
Finland (FI),
France (FR),
Germany (GE)
Greece (GR)
Ireland (IR)
Italy (IT)
Netherlands (NE)
Portugal (PO)
Spain (SP)
Sweden (SW)
UK (UK)

Canada (CA)
Japan (JA)
USA (US)

China (CH)
India (IN)
Mexico (ME)
Turkey (TU)

Africa (AF)
Asia (AS)
NICS (NI) – Hong Kong + South Korea + Singapore + Taiwan
Latin and South America (SA)

OECD (OE) - excluding recent members Mexico, Korea, Poland, Czech Rep, Hungary
Rest of World (RO) - Non-OECD

For each bilateral flow data are now available for the value and volume of imports at a 5 digit SITC level, with the value and volume of imports at 4 digit ISIC level. Data are also presented with unit values (value per unit of volume (metric tonnes)) for the ISIC classification. In common with most other studies, unit values are used as a proxy for the price of bilateral trade flows.

The original source of this trade data was the OECD trade database. To obtain data for a sufficient time period 3 separate series had to be used:

1. Data for the period 1970 to 1977 according to Revision 1 of the SITC. These data were provided in large ASCII files and which were accessed via simple FORTRAN programs.
2. Data for the period 1978 to 1987 according to Revision 2 of the SITC. These data were provided in a database and were accessed via the accompanying retrieval system.
3. Data for the period 1988 to 1995 (1994 for Sweden) in the same database format and with the same retrieval system as for 2. However, the OECD has transformed these data from Revision 3 of the SITC to Revision 2. In this project some adjustments were made to these post-1988 data to provide for a better concordance with the ISIC classification and so to ensure a consistent series over time of trade data according to the industrial classification.

The initial task, after the retrieval of the relevant data, was to provide the data according to the trade (product) classification on a consistent basis over time. We converted all the data from 1978 to 1995 to the Revision 1 of the SITC since less information would be lost than when converting the earlier data to the second revision of the SITC. The original source of the concordance between Revision 1 and Revision 2 of the SITC was the OECD. The trade data were then converted to the industrial classification, ISIC, again using a concordance provided by the OECD.

For previous work the OECD assembled bilateral trade data according to the ISIC for the years 1970 to 1985 (for trade values only). We have compared the data derived here with that of the OECD (which is available on the NBER trade database). For over 88 per cent of the sectors we obtain a direct match for a small sample of bilateral flows investigated. For about 10 sectors, however, we find differences from the OECD data either before 1978 or after 1978 (never both). These differences arise because we have, in some cases, amended the concordance between Revision 1 and Revision 2 of the SITC to provide a more consistent series over time of data according the industrial classification. The problem arises when two 5 digit SITC groups from Revision 1 are amalgamated into a single 5 digit group under

Revision 2 and the initial two 5 digit groups are allocated to different ISIC industries.[1] Under the OECD approach after 1978 the value of trade is allocated to either one or the other of the ISIC industries. We decided, however, to reallocate the post-1978 data to both of the Revision 1 groups on the basis of 1977 shares.

This data resource was made available to all partners on CD-ROM and has been extensively used in this project, and indeed has played a fundamental role in much of the analysis that has been undertaken. The trade database contains the most extensive compilation of trade data according, and consistent with, the standard international industrial classification. This has allowed for the detailed analysis of the impact of trade upon industrial sectors and labour market outcomes. Crucially the database contains information on trade volumes as well as trade values, which in turn is used to compute unit values which are a proxy for the price of traded goods. This has allowed for detailed investigation of the mechanisms by which trade can affect domestic outcomes, via values, quantities or prices. A feature of the econometric results which are discussed in more detail below is that being able to make this distinction matters and that the importance of prices, quantities or values differs across countries. In other words concentrating only upon trade values can led to incorrect deductions that trade has played an insignificant role in influencing domestic industries when the principal mechanism has been via trade prices or quantities. The resource is also available to other researchers in Europe.

Outsourcing Data

Outsourcing indicators (shares of imported intermediate inputs in gross value of industrial output) have been calculated by the project for selected industrial countries. Comparing these with other commonly used indicators based on FDI data, these indicators have the advantage that they capture only some forms of globalisation, but ignore FDI undertaken with the aim of penetrating domestic markets in third countries.

The project analyses reveal that outsourcing is a common phenomenon in industrial countries, especially since the late 1980s. An exception is Japan, where the indicator is relatively low and did not increase significantly. One possible explanation is high inter-industry trade within the European common market, measured as outsourcing, whereas

[1] In cases where two 5-digit groups under Revision 1 were combined under Revision 2 but both of the initial groups were allocated to the same ISIC sector we took no action. Thus, it should be noted that for the more detailed trade data there are some 5 digit (Revision 1) groups where a consistent series over time are not provided (for some codes there are zero entries after 1977)

comparable activities within Japan are only measured as vertical disintegration. Another possible explanation is the prevalence of large price differences between similar domestic and imported intermediate inputs which cause an underestimation of outsourcing since values (not quantities) are used to calculate the indicator. A third possible explanation is relocation of production processes to third countries in a more prominent way for Japan than for other industrial countries.

We have collected data for German manufacturing industries (output quantities, prices, investment, employment by skill levels, wages by skill levels) at a disaggregated level from various national sources; official industry statistics and from panels. This activity has been aimed at providing the maximum information possible, but these data cannot always be further elaborated on in ways consistent with information from other countries.

Manufacturing Data

Data for manufacturing industries have been collected for USA, UK, Sweden and Finland (i.e., domestic prices and domestic production) as part of project activities as well as patent activity and R&D data for 15 OECD countries.

Employment and Wage Data

Data on employment and wages for unskilled and skilled workers as well on unit value of imports have been collected for Sweden, and used in econometric analyses.

The effects of import competition on wages and employment for skilled and unskilled labour within manufacturing in Sweden have been analysed within an econometric framework. In the study reduced-form wage and unemployment equations are estimated by sector. Using the original set-up with unskilled labour only, the preliminary results show significant negative effects of import competition (in terms of import prices measured as unit values) on employment in some, but not all, sectors. Examples are “food, beverages and tobacco”, “textiles, apparel and leather”, and “fabricated metal products” (ISIC 31, 32 and 38: 4 digit industries pooled together up to 2 digits). The import price elasticities for the wages in these sectors are positive but less in magnitude. The effect of technological change is captured by a simple time trend (Hicks neutral technological change). The estimates show a significant negative effect of technological change on both employment and wages in nearly all sectors (4 digit industries pooled up to 2 digit ISIC industries).

When the model is extended to incorporate unskilled and skilled labour, the results show that the negative effect on employment is larger for unskilled labour than for skilled

labour in ISIC 31 and 38, while in ISIC 32 the effect is larger for skilled labour. The effecgs of import competition on the wages are significantly negative and more severe for skilled workers in these three sectors. this might be a result of “compensating” effects from the solidarity wage policy conducted by the trade unions during the first half of the period studies. The effect of technological change is negative when significant but without a clear pattern.

3.2 Data Analysis

The main conclusion from existing empirical studies of movements in relative prices is that although inequality between skilled and unskilled labour started to increase during the early 1980s, the domestic prices of unskilled-labour intensive products have shown no clear decline relative to those of skilled intensive products (Slaughter, 1998). Movements in producer prices in the US, on the contrary, highlight the 1970s as the Stolper-Samuelson decade (Leamer (1996)). The evidence for European countries (Lawrence, 1996; Lucke, 1997; Anderton and Brenton, 1998) suggests that producer prices of unskilled-labour-intensive goods did not decline by more than those of skilled-labour-intensive products in neither the 1970s nor the 1980s.

One possible explanation for these results is that sectoral producer prices are unable to capture the relevant trade shock faced by the industrialised economies because they are too aggregated. Wood (1997, 1998), for example, argues that heterogeneity of goods in standard statistical definitions of sectors and changes in quality over time (which maybe correlated with the skill intensity of production) could engender substantial errors into available producer price series. If sub-sectors within industries are different, in terms of requiring different amounts of skilled and unskilled labour, then more open trade may reduce the prices of some goods but raise the prices of others, leaving the industry aggregate price unchanged. Ideally, one would use highly disaggregated series on producer prices to address this issue, but unfortunately they are not available.

In addition, countries such as the NICs and other Asian economies, which initially emerged into the international context by penetrating unskilled-labour-intensive sectors, have recently diversified their production into unskilled-labour-intensive activities across a range of unskilled and skilled intensive industries. Some countries (primarily the NICs) have also been able to shift into skilled-intensive activities. The use of producer price measures at the industry level will not enable such within industry adjustments to be discerned.

Wood points instead to changes in the prices of imports and exports, which do suggest a rising relative price of skilled-intensive products in the 1980s (but not in the 1970s). However, issues of measurement pertain to import and export prices, just as to producer prices. In particular, the problems of aggregating over sub-categories and of quality upgrading remain. For example, the rising relative trade price of skilled-intensive goods could reflect quality upgrading within this group of products relative to unskilled-labour

intensive goods. Here, however, further analysis is possible since highly detailed trade data are readily available.

Brenton and Pinna (2000 and 2001a) evaluate more carefully the information contained in trade prices and to assess what this contributes to our understanding of the impact of globalisation. Trade prices are the conduit by which globalisation affects domestic labour markets. They look at movements in import and export unit values (which as usual are used to proxy import and export prices) within two skilled-intensive sectors (electrical and non-electrical machinery) and three key unskilled intensive sectors (textiles, clothing and footwear). Machinery is typically taken as a skilled intensive sector in which OECD countries possess a comparative advantage. Textiles, clothing and footwear are more traditional manufacturing sectors where the intensity of unskilled labour in production is higher and it is generally accepted that comparative advantage has shifted to the labour-abundant developing countries. Textiles, clothing and footwear are generally those sectors expected to be most affected by increased competition from low-wage countries.

They utilise data, covering the period 1976-1994, at the most detailed (tariff-line) level of disaggregation for five European countries (UK, France, Germany, Belgium-Luxembourg and Italy) and consider trade with five regions: OECD, Central and Eastern European Countries, the NICs, other Asian countries and the rest of the world. If globalisation has had a significant impact upon labour markets in industrial countries this should be apparent in movements in prices for finely defined categories of traded products.

A key feature of this work is the allowance for quality upgrading within sectors by using fairly standard index number techniques to decompose movements in unit values into two components: pure changes in prices and variations across time in the bundle of goods. Brenton and Pinna make two main contributions. Firstly, they assess the extent to which the pure prices of unskilled-labour intensive products have changed relative to the pure prices of skilled intensive products. In other words they take the bundle of goods in each sector imported at the start of the period as fixed and investigate the extent to which the price of this bundle has changed relative to the price of the fixed bundle for the other sectors.

As mentioned above, the issue of the impact of globalisation would ideally be analysed using detailed data on domestic output prices. The second contribution this work is, in the absence of such disaggregated information on domestic prices, they look to see whether responses to globalisation by domestic firms can be identified from changes in the

price and composition of the bundle of goods exported. It is here that detailed product specific data are available. In particular, they look to see if increasing import competition is associated with a response by domestic firms to raise the quality of the output they produce. The concept of defensive innovation, discussed by Wood (1994, 1998), explains the intra-industry skill upgrading of employment as a defensive strategy against increased competition in international markets. In this situation we should observe quality upgrading of domestic production and exports precisely in those sectors characterised by greater competition in international markets. They check for this by seeing whether there has been a tendency for import prices to be correlated with upgrading of the bundle of goods exported.

Thus this work delves into sectoral import and export prices to separate out changes due to pure price movements for a given bundle of goods and changes due to adjustments to the bundle of goods imported or exported. This is useful in attempting to identify more clearly whether the prices of unskilled intensive activities have fallen relative to that of skilled intensive activities. It also allows consider the nature of the response to more intense international competition, as reflected in falling relative pure prices and upgrading of the quality of imports, to be considered in terms of changes to the price and composition of the bundle of goods exported.

Three key conclusions from this analysis of the data are found:

1. With respect to the issue of relative prices the analysis reveals important differences between the 1970s and the 1980s in the impact of trade with low-wage countries on European economies. The analysis of changes in pure import prices suggests that the 1980s are the Stolper-Samuelson decade, when the price of unskilled intensive products fell relative to that of skilled intensive goods. Relative prices of unskilled compared to skilled intensive goods changed little in the 1976-81 period. However, in the period 1981-94 we observe a drastic fall in the pure price of imports of textiles and clothing from low-wage regions relative to the pure price of imports of engineering products from the OECD countries.

2. Pure price movements in the imported bundles have generally been accompanied by price movements in the same direction in the exported bundle of the same sector. A positive association is also apparent between upgrading of the quality of imports and improvements in the quality of exports. In other words, import price competition seems to be associated more with movements in the price rather than the quality of

exports. Along the same lines, when imports have been characterised by quality upgrading there has also tended to be upgrading of the quality of exports.

3. Considerable heterogeneity among unskilled intensive sectors is revealed. The impact of trade with low-wage countries on relative import prices is not common across all unskilled intensive sectors. We find behaviour in the footwear sector to be quite different to that in the textiles and clothing sectors.

In general, these results support the view that using relative import prices identifies more clearly an impact of globalisation in Europe. An issue for further reflection is why these changes in import prices do not show up in changes in relative domestic output prices; is it simply a matter of data or does it reflect the nature of production and distribution in European countries?

This work does not link directly changes in relative import prices to developments in domestic factor markets in Europe. However, the analysis would suggest caution in rejecting globalisation as a significant factor in explaining the outcomes for unskilled workers in European countries over the past 20 years. Substantial movements in relative prices revealed by the import data are consistent with trade having played a significant role in affecting the fortunes of unskilled workers in Europe.

3.3 Econometric Analysis

3.3.1 Studies based upon the Traditional Hechscher-Ohlin Approach to Trade

To provide a broad European perspective, existing OECD databases covering industrial and trade data have been also drawn upon for econometric analyses of the effects of globalisation on low-skilled workers through changes in sectoral value added prices (in line with the Stolper Samuelson Theorem) and through changing patterns of specialisation in international trade in manufactures. The underlying rationale is that if globalisation has contributed to the social exclusion of low-skilled workers, this may have happened, first, through lower prices for the products of low-skill-intensive industries; second, by replacing domestically produced low-skill-intensive goods by imports.

Trends in domestic value added prices and total factor productivity since 1970 have been analysed on the basis of a panel dataset covering approximately 13 manufacturing industries in each of 12 OECD countries (including the US and Japan for possible comparison with the EU member countries). Four key findings emerge from this research.

First, as expected, TFP growth was negatively correlated with product (value added) price changes. However, the pass-through of TFP growth into product prices was not nearly complete.

Second, TFP growth was negatively related to the value added share of human capital during the 1970s put positively during the 1980s. With incomplete passthrough of TFP growth into product prices, this finding suggests that the change in the sector bias of technological change around 1980 contributed to the reversal in the trend in earnings inequality at around the same time.

Third, a similar effect (in line with the Stolper Samuelson theorem) is not found for the full model when value added prices are regressed on both the human and the physical capital income shares. At the same time, however, the simple correlation between value added price changes and the human capital share on its own is positive. Since the full model is the appropriate point of reference, this discrepancy serves to underline the importance of accounting for the role of physical capital in this type of analysis.

Fourth, value added price changes were negatively correlated with the value added share of physical capital. This finding implies that during the 1970s and 1980s, the user cost of physical capital should have declined relative to the low-skilled wage. In fact, the real prices of capital goods did decline while the financial component of the user costs of physical capital fluctuated widely without a well-defined trend.

These findings are compatible with the view that the complementarity of physical capital and skills increased markedly when microelectronic-related innovations began to be introduced on a large scale during the 1980s. While the decline in the user cost of physical capital can explain the growth in the capital stock per worker throughout the 1970s and 1980s, it cannot explain why earnings and employment inequality increased markedly only from around 1980.

One possible problem with this approach is that domestic value added prices may not be a good measure of the impact of international trade on labour demand because they may be partly endogenous. We have dealt with this criticism in two ways. First, we have investigated trends in the international prices of selected low-skill vs high-skill intensive goods. The key finding is that during the 1980s, relative prices of some key low-skill-intensive product groups declined relative to important high-skill-intensive products. This effect is seemingly apparently not strong enough to be reflected in domestic product prices.

Second, we have analysed the evolution of net trade patterns of OECD countries to see whether countries specialised increasingly in human-capital-intensive industries during the 1980s. . This would be expected if the entry of developing countries into the international division of labour had a substantial effect on OECD country trade patterns and, by extension, on their labour markets. Regression results indicate that this has only been the case for a few smaller European countries while the majority of countries showed widely diverging patterns of specialisation. The conclusion drawn, however, is that trade patterns across European countries did not undergo the sort of uniform shift that would be expected if growing trade with low-income countries had a major impact on European labour markets.

The rationale underlying these industry-level studies is that, if international trade was important in shifting labour demand against low-skilled workers, then that shift should be more pronounced in sectors that were particularly exposed to international trade, or it should coincide with increases in exposure to international trade. However, analyses of the data for most European countries shows that an important feature of the increasing inequality of wage and employment opportunities of low-skilled workers in the UK is that this feature has primarily occurred within industries. Attempts to explain this feature are described below in the section on outsourcing.

The interaction between wage and employment adjustments in response to external shocks is studied on the basis of employment equations for Sweden (Oscarsson 2000) where a compressed wage structure renders this issue particularly relevant. In fact, wage dispersion in Sweden was only about half as high as in the U.S. in 1984 (Davis 1992; Edin and Holmlund 1991). Wage inequality decreased during the 1970's up to the early 1980's when it started to expand moderately. Looking at education differentials, the standardised relative wage between labour with 16 years of education in relation to labour with 12 years of education was 1.80 in 1968, 1.22 in 1984 and increased to 1.31 in 1991 (Holmlund 1997). Unemployment was low during 1970-91 varying between 1.5 and 3.5 per cent. However, the unemployment rate was higher among the unskilled than among the skilled. The unemployment rate was about 1 per cent for labour with more than 12 years of schooling compared to 2-4 per cent for labour with 9 years of schooling during this period.

An early study (Oscarsson 1997) analysed the effects of international trade on the wages of skilled and unskilled labour in Sweden during 1968-91. Using the Stolper-Samuelson equations, the model's prediction of the growth rate in total average wages was consistent with the actual growth rate. However, the model could not explain observed relative wage

trends when labour was categorised by educational levels into skilled and unskilled labour. The estimated mandated wage changes implied an increase in the relative wage for skilled labour but the actual relative wage decreased. This finding suggested that the impact of international price changes and TFP growth on the wages for these different skill groups have been counteracted by other factors.

Research under the current project has relaxed the assumption of exogenous prices so that labour supply changes may impact upon factor returns. Especially during the early 1970's, Sweden experienced fast growth in the relative supply of skilled labour. Another force that may have worked to compensate the effects from trade and technology was the solidarity wage policy conducted by labour unions in Sweden.

Since relative wages in Sweden did not adjust according to the predictions of the Heckscher-Ohlin model, one can expect that employment did. With an inflexible wage structure, import competition from low-wage countries depresses profitability and leads to structural change. Our research (Oscarsson 2000) follows the approach of Grossman (1986, 1987) and Revenga (1992) in estimating reduced-form wage and employment equations on time-series data by sector. Imported and domestically produced goods are assumed to be imperfect substitutes within each sector, and labour is imperfectly mobile between sectors. Oscarsson (2000) advances on existing work in this area by extending the model to two types of labour, skilled and unskilled, and by using highly disaggregated trade, wage and employment data.

For a panel of 63 industries on the 4 digit ISIC code level within Swedish manufacturing for the period 1975-93, the results show that import competition had a significant negative effect on the employment of both non-production (skilled) and production (unskilled) workers. Non-production worker real wages were not affected at all by import competition, while it had a negative effect on production worker real wages. Since the effect on real wages was less in magnitude than the effects on employment, and even insignificant for non-production workers, the results indicate that labour was mobile across sectors in Sweden during this period.

Adjustment to changes in import competition took place by employment changes rather than by wage changes. This result is in line with the structure of the Swedish labour market with low wage flexibility and an active labour market policy to support structural change. The estimates also indicate that non-production workers were more mobile than production workers. One possible explanation could be that non-production workers have less industry

specific skills, which facilitates employment in other sectors. Technological change had a significant negative effect on the employment for both labour groups (equal in magnitude) and a positive effect on the real wage for non-production workers.

3.3.2 Studies of Outsourcing

Studies based upon the traditional neo-classical trade theory have tended to conclude that the increase in imports from low-wage countries has played, at most, a minor role in the decline in the relative economic fortunes of unskilled workers in various countries over the past two decades. In this project a range of empirical works based on the concept of outsourcing finds that trade has had a significant impact on labour market inequality in a wide variety of countries such as the UK, Sweden, Italy and the USA. O*utsourcing* occurs when firms reduce costs by moving low-skill-intensive production activities to low-wage countries.

Outsourcing can explain rising inequality *within* industries. Our analysis shows how the empirical measurement of outsourcing (or trade variables) may have had an important and potentially misleading impact on the results of many other studies which investigate the impact of trade on inequality. We have argued in this project that more accurate proxies for outsourcing can be obtained by using highly disaggregated bilateral trade data (preferably expressed in volume terms). The empirical results - based on bilateral trade data disaggregated to the 4-digit ISIC level - which show that imports from low-wage countries (ie, our proxy for outsourcing) have made a significant contribution to the decline in the wage-bill share and relative employment of the less-skilled in the majority of the aforementioned countries. Such disaggregated data also reveal how outsourcing can lead to quite different inequality outcomes in different countries. However, in line with previous work, the studies carried out in this part of the project also find that technology has played an important role in causing the increase in inequality in many countries. Nevertheless, we also argue raise the issue of whether much of the rapid increase in technology in recent decades may have been partly trade-induced.

Traditional trade theories primarily explain movements in relative wages *across* industries, whereas what also needs to be explained is the dramatic fall in the relative wages and employment of unskilled workers *within* sectors. Indeed, the observed shift away from the use of unskilled labour within industries is in contradiction with trade being the cause of rising inequality in the traditional model. If trade with low-wage countries has reduced the relative wage of unskilled labour then firms within all sectors have an incentive to use

relatively more of this now cheaper factor. This has led a number of authors to conclude by deduction that biased technological change must be the principal cause of the shift away from the use of unskilled labour. However, the impact of globalisation appears to be more complicated than is allowed for within the confines of standard factor proportions trade theory. We need to look more carefully at how firms within sectors respond to the more intense competition provided by increased imports from low-wage countries.

One explanation of how trade with low-wage countries may push down the relative wages and employment of unskilled workers *within* industries is provided by the notion of 'outsourcing'. Outsourcing occurs where firms take advantage of both the low-wage costs of relatively labour abundant countries and modern production techniques - whereby the process of manufacturing a product can be broken-down into a number of discrete activities - by moving the low-skill-intensive parts of production abroad, but continue to carry out the high-skill-intensive activities themselves.[i] Once the low-skill activities have been performed the goods are then imported back from the low-wage countries and either used as intermediate inputs or sold as finished goods. Hence, trade with the low-wage countries via this route will shift demand away from less-skilled towards skilled workers in advanced industrialised countries, and put downward pressure on the relative wages and employment of low-skilled workers *within* industries.

Our approach has been to econometrically estimate the impact of outsourcing using imported goods as a proxy variable for outsourcing using a similar approach to Feenstra and Hanson (1996). However, Feenstra and Hanson (1996) proxy outsourcing by the share of imports in total USA consumption from *all* countries, which implicitly captures the outsourcing of USA production to advanced industrialised countries as well as to the low-wage countries. However, there is no obvious reason why firms would outsource *low-skill-intensive* activities, which is a key mechanism by which outsourcing may affect the demand for the less-skilled, to advanced industrialised countries which are relatively abundant in skilled labour. Hence we disaggregate imports according to individual supplier countries and construct an import share term for different groups of countries - ie, industrialised and low-wage countries - for each 4-digit manufacturing industry. Thus, we explicitly identify imports *solely from low-wage countries* and use this as a variable for explaining changes in

the relative wages and employment of the low-skilled, and thereby more accurately proxy outsourcing to low-wage countries when compared to previous studies. [1]

Another potentially important measurement issue is whether the import share term is specified in *nominal* or *real* terms. Most studies testing for trade impacts on inequality specify the import penetration variable as the *value* of imports divided by the value of domestic sales plus imports. Hence, an increase in import penetration is deemed to reflect greater competitive pressure from external suppliers. However, the sign of the parameter for such a term when import prices are declining will depend upon the value of the demand elasticities. In addition, if domestic producers respond to greater import competition by increasing the quality of their products, then it is feasible that greater import competition could be accompanied by a fall in import penetration in value terms. By contrast, import penetration measured in volume terms does not suffer from these problems: a fall in import prices will generally lead to an increase in import penetration. Here we include an index of import penetration in volume terms in our estimating equations as an alternative to import penetration variables expressed in terms of values.

Ostensibly, one might think that outsourcing to low-wage countries - due to their abundance of low-skill labour - would be more prevalent in low-skill-intensive sectors, rather than high-skill-intensive industries, in high-wage countries. This expectation seems reasonable if firms can substitute low-skilled workers with outsourcing by simply importing the necessary semi- or finished products from low-wage countries. Firms can easily do this regardless of whether they are low-skill/low-profit or high-skill/high-profit. By contrast, if outsourcing requires foreign direct investment in low-wage countries – involving the manufacture of specific components/products possibly requiring supervision and technical expertise from the investing company - then this may only be possible for high-skill/high-profit firms. In other words, only high-skill/high-profit firms may have the ability to outsource - hence, under these circumstances, outsourcing could be more important for high-skill sectors rather than low-skill-intensive sectors. In addition, the scope for outsourcing partly depends upon the degree to which production of the final product can be fragmented into discreet stages which embody substantially different factor intensity ratios. This, in turn, will be determined by technological conditions in the industry - hence whether outsourcing is most appropriate high or low-skill-intensive sectors is an empirical question.

[1] Virtually all other empirical studies on the 'trade and inequality debate' do not distinguish between imports from high and low-wage countries.

Thus, in summary, although the incentive to outsource will be greater in low-skill intensive sectors where low-skilled workers comprise a substantial portion of total production costs, the capacity and ability to outsource may be greater in high technology, skill intensive sectors, depending upon a variety of factors.

With regard to the methodology used, we start from a variable cost function in translog form and assume capital to be a fixed factor of production (see Anderton and Brenton (1999)) for more specific details) and derive separate equations for the wage and employment share of low skill workers. These equations include standard measures of output and capital as well as proxies for technology and for outsourcing. We justify the inclusion of the import penetration term (our proxy for outsourcing) by arguing that merely including the factors derived from a traditional translog production function will not capture other factors - such as outsourcing - which may influence a firm's demand for skilled labour. Given that outsourcing to low-wage countries is claimed to push the range of activities performed by domestic industry away from low-skill towards high-skill tasks, the import penetration term can be interpreted as representing a reduced-form relationship between outsourcing and a firm's unit input requirement for skilled labour.

We use highly disaggregated wage, employment and production data and define non-production workers as skilled and production workers as less skilled. We experiment with two alternative proxy variables for technological change: R&D expenditure and patenting activity. Trade, production, wage and employment data are all disaggregated to the 4-digit ISIC level (hence all variables are on an ISIC basis and further details of the 4-digit sectors used in the analysis are given in the data appendix). In order to provide enough observations for 'panel estimation', we pool the data across 4-digit ISIC sectors using annual data (imposing, in effect, the same parameters across the different 4-digit sectors).

The study on the UK pools data across eleven UK ISIC sectors at the 4-digit industry level using annual data over the period 1970 to 1986 (see Anderton and Brenton, 1999). The data cover six 4-digit sectors within the textiles industry (usually defined as low-skill-intensive) and five 4-digit sectors within the broader category of non-electrical machinery (high-skill-intensive). The paper examines whether the source of imports matters by distinguishing between imports from high and low-wage countries for each 4-digit industry. The empirical results show a significant impact of imports from low-wage countries on the

wage bill shares of both broad sectors, while terms representing total import penetration and imports from higher wage countries were not significant, similar results were found for the employment shares. Dummy variable tests also showed that the import penetration parameter was much smaller for the higher-skill non-electrical machinery sectors relative to the low-skill-intensive textiles sectors, suggesting that the higher-skill-intensive industry has been far less prone to outsourcing.

We also investigated the impact of relative import prices - ie, the price of UK imports relative to the UK domestic price again disaggregated to the 4-digit industry level and distinguishing between different import suppliers. Further dummy variable tests revealed that these terms were again only significant for LWC import suppliers for the low-skill-intensive textiles industry, particularly during the early 1980s when import price competition was further intensified by the high level of sterling. Moreover, the relative price terms were included along with the import penetration variables, hence their impact is in addition to the effects of any actual increase in import penetration. Accordingly, the relative price terms might be interpreted as capturing the 'threat' of increased competition from low-wage countries (and the associated 'threat' of increased opportunities for reducing labour costs via outsourcing). Using only the import penetration parameters, it seems that outsourcing accounted for around 40% of the increase in the wage bill share of skilled workers and approximately one third of their employment share in the UK textiles industry. In addition, we find some limited evidence that the impact of trade between the UK and low-wage countries differs across industries and that large currency appreciations may have a disproportionately large impact on the economic fortunes of the less-skilled, partly by creating an increased 'threat' of imports from low-wage countries.

The study on the USA uses data for forty manufacturing sectors disaggregated to the 4-digit ISIC level, but also distinguishes between high and low-skill sectors given the heterogeneous outcomes of these different industries (see Anderton and Brenton, 1998). The main conclusions from this study were that

1. A dramatic and temporary appreciation of the dollar in the early 1980s was associated with a substantial deterioration in the economic fortunes of the less-skilled in the USA. The effects were wide ranging (i.e, throughout the manufacturing sector), but the mechanisms through which the low-skilled were affected differ according to the skill-intensity of the sector in which they were employed.

2. An increase in US imports from low-wage countries, encouraged by the large appreciation of the dollar in the early 1980s, seems to explain some of the rise in US inequality in low-skill-intensive sectors. Rapid technological change does not seem to be an important determinant of inequality in these sectors - which is not surprising given the low-technology nature of these industries.

3. Technological change - proxied by R&D expenditure - seems to be strongly positively correlated with the rise in US inequality in our sample of high-skill-intensive sectors. However, given that the timing of the sudden rise in US R&D expenditure corresponds with the appreciation of the dollar, it may be the case that the deterioration in US trade competitiveness during this period contributed to the rapid increase in the rate of US technological change via mechanisms such as 'defensive innovation'. In other words, the loss of price competitiveness and increasing competition from low-wage countries may have encouraged US manufacturers to '*innovate defensively'* by upgrading the quality of their manufactures via 'product innovation' which, in turn, is achieved by spending more on R&D. Hence one might also argue that the technology-based explanation for the rise in US inequality could actually a trade-based explanation, but more research is required regarding the links between increased competition with low-wage countries and defensive innovation.

4. Both R&D expenditure and imports from low-wage countries increased substantially during the rapid appreciation of the dollar, but both remained high even when the dollar depreciated back to its previous level. The work for the UK also showed similar changes during the temporary appreciation of sterling in the early 1980s which was associated with a permanen*t* increase in inequality in the UK. These findings are consistent with hysteresis theories of the permanent impact of temporary shocks.

Sweden is an interesting case since it is much smaller and more open than the US and the UK and it has implemented fundamentally different labour market policies than these two countries, which are typically held up as paragons of flexible labour markets. Nevertheless, these countries have all experienced a shift away from unskilled towards skilled workers within the manufacturing sector. The skill upgrading was particularly evident in the high-skill sectors such as Machinery and equipment (ISIC 382), Electrical machinery, apparatus appliances and supplies (ISIC 383) and Instruments and photo equipment (ISIC 385) as well as in the lower-skill sector of Textile, wearing apparel and leather (ISIC 32).

The non-production worker share of employment increased from 27 to 35 percent between 1970 and 1993, with a sharp increase from around 1990 onwards (when Sweden experienced a deep recession). The share of the total manufacturing wage-bill for non-production workers increased from 36 to 43 percent during the same period. The large proportionate change in the employment share compared to the wage-bill share of skilled workers suggests that the increase in inequality between skilled and unskilled workers in Sweden has arisen primarily in terms of employment opportunities rather than in the form of greater disparities in wages. This is confirmed by data which show that, in contrast to the US and the UK, the relative wage of non-production to production workers remained constant (with a premium of about 50 per cent) throughout the 1970s and 1980s and actually fell during the recession of the early 1990s. On the other hand the ratio of non-production to production workers employed increased steadily from around 38 per cent in the mid 1970s to 45 per cent at the end of the 1980s with a big increase to 55 per cent in the early 1990s recession.

Structural labour market rigidities may explain why most of the adjustment took place on the employment side, while relative wages remained stable. For example, the Swedish labour market is characterised by 'strong' trade unions (around 80 percent of employees were union members in 1991; see Edin and Holmlund, 1995). As is well known, wage bargaining in Sweden was highly centralised during a considerable part of our sample period. Such an institutional framework tends to compress wage-differentials between skill groups, with the result that a decrease in the relative demand for the less-skilled will be reflected in a fall in relative employment rather than relative wages - which is consistent with labour market outcomes in Sweden.

In the results for Sweden for the employment share of skilled workers (similar results hold for the wage bill share equations) a key point is that import penetration measured in **value** terms was not statistically significant in any of our regressions. This is consistent with previous studies of the impact of globalisation in Sweden. By contrast, import penetration measured in **volume** terms, or the relative **price** of imports, tended to be statistically significant throughout our analysis, but, again, only for imports from low-wage countries. The relative price of imports from high-wage OECD countries was not statistically significant when separately included whilst, interestingly, import penetration in volume terms by OECD countries was estimated to have a negative effect on the share of skilled workers in employment and total remuneration. Hence, it would appear that skilled workers in Sweden

are in direct competition with other skilled workers in OECD countries, whilst what matters for unskilled workers are imports from emerging economies. In the data used in this exercise there is a very low correlation (-0.09) between the proportionate change in relative import prices for low-wage countries and the proportionate change in import penetration measured in value terms. On the other hand, the correlation between changes in relative import prices and changes in import penetration measured in volume terms is much higher (-0.54).

The results also suggest a much stronger impact of technology on inequality during the recession years of 1990-93. Given that this period was extremely unusual, in that after years of stable unemployment the number of people without jobs increased dramatically, it seems likely that this was an opportunity for a substantial restructuring of production, probably associated with an increase in the intensity of competition between firms as they attempted to sustain demand for their products in a shrinking domestic market. An alternative interpretation might be that this was simply a compositional effect within sectors whereby the severe recession and increased competition resulted in the survival of the 'better' firms, which in this case are high-tech/high R&D/high-skill-intensive firms, while the low-tech/low R&D/low-skill-intensive firms simply went out of business. Under such a scenario, the rise in R&D expenditure during 1990-1993 would also be associated with an increase in the wage-bill and employment shares of the higher skilled.

Another interesting result of the Swedish econometric analysis was that the impact of trade with low-wage countries on Swedish inequality is **larger** for high-skill sectors compared to low-skill sectors. Ostensibly, this seems a somewhat surprising result as one might expect low-skill sectors to be more affected than high-skill sectors by relatively lower-priced goods from low-wage countries. This expectation seems reasonable if firms can substitute low-skilled workers with outsourcing by importing the necessary semi- or finished products from low-wage countries. Firms can easily do this regardless of whether they are low-skill/low-profit or high-skill/high-profit. By contrast, if outsourcing requires foreign direct investment in low-wage countries - involving the manufacture of specific components/products possibly requiring supervision and technical expertise from the investing company - then this may only be possible for high-skill/high-profit firms. In other words, under these circumstances, only high-skill/high-profit firms have the ability to outsource - which is consistent with the larger parameter for relative import prices for the high-skill sectors.

In addition, the scope for outsourcing depends upon the degree to which production of the final product can be fragmented into discreet stages with substantially different factor intensity ratios. This will be determined by technological conditions in the industry. Thus, although the incentive to outsource will be greater in low-skill intensive sectors where low-skilled workers comprise a substantial portion of total production costs, the capacity and ability to outsource may be greater in high technology, skill intensive sectors.

Finally, whilst we do find that trade with low-wage countries has been an important determinant of rising inequality in Swedish manufacturing sectors, our results also demonstrate that technological change, as proxied by patenting activity and expenditures on R and D in the 1990s, also played a major role. Our results suggest that outsourcing to low-wage countries accounted for around 25 per cent of the average sectoral increase in the wage share of skilled workers in Sweden and for around 15 per cent of the increase in the employment share. Technological change on the other hand was the dominant factor accounting for well over half of the average increase in wage and employment inequality in Sweden.

Again a key feature of the analysis of Italy compared to previous studies of that country is that the model of outsourcing is applied to highly disaggregated industrial data and the impact of trade is more precisely measured through the separate identification of import flows from low-wage labour abundant countries and those from EU and other OECD partners. A further innovqtive feature of the Italian study is that a measure of the variance of trade prices from different sources is introduced to capture the idea that over time production has become more and more internationally footloose and this has undermined unskilled employment in countries such as Italy.

The results for Italy show firstly that economic variables played little or no role in determining the relative demand for unskilled workers in the 1970s in Italy. This reflects the nature of Italian labour market institutions in the period. Subsequently, in the 1980s and 1990s, following some labour market reforms, we find that international competition had a significant effect on the relative demand for blue-collar workers in Italy but as in the case of Sweden this effect is significant only in skilled intensive sectors. Interestingly, our measures of trade variability are also found to be strongly linked to the phenomena of skill upgrading in the high-skilled sectors. In unskilled intensive sectors, such as textiles and clothing, where the impact of imports from low-wage countries might be expected to be more pronounced, we do not find a significant effect from imports but rather that the most important role has

been played by technological change. The result is consistent with previous studies that indicate that Italian textile and clothing firms have remained internationally competitive by increasingly switching to high quality segments of the industry.

A major finding of our econometric analysis of outsourcing is that at the detailed industry level trade with low-wage countries appears to have played a significant role in determining the extent of within-sector inequality between skilled and unskilled workers. This is a major departure from previous econometric work on the impact of trade on labour market outcomes for unskilled workers. However, this impact is far from homogeneous across countries. For the UK and the US trade with low-wage countries had the most pronounced effect on inequality in low-skill-intensive sectors. On the other hand, in the case of Sweden and Italy, outsourcing has had the greatest impact on the relative employment and relative wage of unskilled labour in skilled intensive sectors, with no significant impact upon unskilled intensive sectors.

The econometric results also show that technology played an important role in explaining within sector outcomes for unskilled workers. However, our analysis has raised the possibility that some of the technological upgrading that has taken place in European industry has in part been a response to increasing international competition. Here again our results question some typical assumptions that are commonly adopted and highlight important differences across countries. For example, it appears that technological advancement has been a major factor in the adjustment of Italian sectors which are normally classed as low-skill intensive whilst technology has played at best a minor role in these sectors in the US.

The policy implications of the above results are that

1. Exchange rate-induced recessions, combined with the increasing globalisation of international trade, may result in irreversibilities which can fundamentally change the nature of economies. Of course, all advanced industrialised countries are experiencing the increasing globalisation of international trade, but perhaps in a much more gradual fashion than the USA and UK where the sheer rapidity of change may not have provided sufficient time for workers and firms to adjust in an optimal fashion. Although increased trade is generally believed to be 'good' - in terms of increasing welfare by reducing excess rents and encouraging production according to comparative advantage, etc - the *speed* of this process may partly determine the

magnitude of these benefits and their distribution. Policy-makers should therefore be alarmed at the possible permanent effects of large but temporary appreciations, particularly those considering or committed to membership of the European single currency, since entering at too high a rate may result in social exclusion as well as causing deterioration in competitiveness.

2. When considering policies to combat inequality, does it matter whether trade or technology is the cause of the decline in demand for the less-skilled? Regardless of the cause, the policy response centres around improving the aggregate skill level of the workforce by concentrating in particular on those at the lowest level so as to provide greater adaptability to the higher degree of technological change in skill-intensive sectors, and to ensure that workers can successfully move to new industries as mature industries increasingly become the domain of low-wage countries. Such changes in aggregate skill levels would enable economies in Europe to cushion themselves more effectively from rapid changes in world demand for their products by moving into areas in which qualitative attributes outweigh the apparent labour cost disadvantages as globalisation increases.

3. It is important to establish why skill-biased technological change has been so rapid as this will help us judge whether this trend will continue in the future (an associated question is whether firms would find 'skill-neutral' technological change to be as effective as 'skill-biased' technological change - in which case policies to encourage the former would solve the problems caused by the decline in demand for less-skilled workers). Conversely, if increased trade with low-wage countries increases inequality both directly and indirectly through skill-biased technological change via defensive innovation, then we know that inequalities will continue to widen as globalisation increases - unless there is an appropriate policy response.

3.3.2.1 An Input-Output Approach to Outsourcing – A Study of Germany

An econometric study for Germany analyses the outsourcing of labour-intensive activities from the production chain in a production-theoretic framework (Diehl 1999). In Germany, the substitution of imported low-skill-intensive components for domestic production could be expected *a priori* to be particularly important because of the geographical proximity of low-wage countries in Central and Eastern Europe. Such substitution could also artificially overstate conventionally measured TFP growth and thus distort empirical results.

Information derived from input-output-tables of Germany as well as several other high-income countries shows that the cost share of imported material inputs in total material inputs for the manufacturing sector increased between the mid-1970s and the early 1990s. In previous empirical studies, this international outsourcing was found to have only a small impact on the skill structure of employment. However, these studies had used volume indicators (e.g., import penetration ratios) although the underlying cost function framework would suggest the use of price indicators.

Therefore, production functions with six inputs (capital, skilled labour, unskilled labour, energy, imported and domestic non-energy intermediate inputs) are estimated from time-series data for several manufacturing industries in West Germany. The relative price of the two non-energy intermediate inputs is used to assess the role of international outsourcing. Two key findings emerge from this research:

First, imported intermediate inputs were a substitute for low-skilled workers. This supports the hypothesis that outsourcing of intermediate inputs productions to low-wage countries has contributed to the decline of low-skilled employment in the manufacturing sector. However, only in a few industries can a sizeable share of the actual change of the employment structure be attributed to changing import prices during the observation period (1970-1993).

Second, technical progress (proxied by a time trend) is found to be still the most important determinant of the downward trend in the share of low-skilled workers in total manufacturing employment, although the explanatory power of the time trend was reduced by the inclusion of the outsourcing indicator. This finding seems to support the hypothesis that technical progress is more important than globalisation. However, this conclusion might be too strong, given that technical progress is only proxied by a time trend.

3.32.2 Studies of Spain and Portugal

Trends in international trade and wage dispersion and the statistical analysis of the links between international trade and wage dispersion have also been studied. Interaction with Spanish researchers working on a related issue in a distinct project enabled some comparisons between the trends in both countries, using comparable data sets. Project studies concluded that "while Portugal retained its traditional export specialization, with low-wages as the basis for international competitiveness, Spain shifted from traditional sectors to semi-skilled and high-skilled products, being its export composition closest to that of the

other EU countries and engaging mostly in intra-industry trade, rather than inter-industry trade. Thus, in Portugal international trade contributed to sustain the wages and the employment shares of low-wage, low-skilled workers, driving part of the compression which took place at the bottom half of the wage distribution and generating low unemployment levels. Also some institutional arrangements, such as the minimum wage, and the action of collective bargaining, contributed to such compression. However, this effect did not counterbalance the increasing wage premium for high-skilled workers resulting from modernisation and technological upgrading and, as a result, wage inequality increased since the early 1980s. In Spain, demand of low-skilled workers decreased sharply because of technological changes and the reduction of traditional sectors, which combined with a fairly rigid labour market, resulted in high unemployment. Collective bargaining and other labour market institutions also contributed to increase wages at the bottom of the distribution and, hence, to increase unemployment of low-skilled workers. In the first half of the eighties, wage inequality was reduced because of the labour market institutional environment. Only since the mid-eighties, after the liberalisation of fixed-term contracts, the increase in wage inequality is more noticeable, although the bottom tail of the wage distribution continues to be compressed by unemployment of the least productive workers.

The econometric analysis for Portugal relies on very detailed longitudinal data at the firm level, to analyse job creation and job destruction for skilled and unskilled workers. The skill of the worker was evaluated using a direct measure of the degree of complexity and responsibility of the job performed and the type of knowledge required. The study aimed at detecting whether international trade could have played a role in sustaining the very low unemployment rate in the country. It explored the dynamics of job flows across skills at the firm level, searching for their determinants, to analyse in particular the role of international trade against alternative explanations.

A seemingly unrelated regression model was estimated to explain firm level job flows - job creation and job destruction - separately for skilled and unskilled workers. The impact of the following forces has been evaluated: conditions in international product markets, technological conditions, and firm attributes that can capture institutional factors, such as the type of ownership of the company, its age, size and location.

Job flows suggest that the Portuguese labour market is very dynamic, as large flows of job creation coexist with large flows of job destruction. Between 1985 and 1997, the Portuguese economy was particularly dynamic at creating jobs on both ends of the skill

spectrum unskilled workers, as well as professionals and the highly skilled. However, job destruction was particularly severe for the unskilled. This contrast across skill groups got increasingly wider after the 1993 recession. An analysis by industry reveals that exporting industries were not the major absorbers of unskilled labour.

Results suggest that technology indicators are more relevant determinants of job flows than conditions in international product markets. Indeed, firms in technologically more advanced industries have expanded job opportunities for the skilled labour force, as job creation took place at a faster pace than job destruction. For unskilled workers, on the other hand, a higher technological level in the industry is associated with higher reallocation, but job creation and job destruction offset each other.

The major impact of international trade on the Portuguese labour market occurred via exports. Higher export prices increase job creation and destruction for the unskilled, thus increasing turnover, but with no impact on net employment growth. For the skilled labour force, rising export prices results in rising job creation and unchanged job destruction, pointing to a certain upgrading in the quality of Portuguese exports.

On the other hand, the impact of import prices on job creation and job destruction for the unskilled is negligible, just like their impact on job creation for skilled workers. Rising foreign competition in the form of declining import prices just reduces job destruction for the skilled labour force. The trade results therefore point to an economy slowly increasing its specialisation in skilled labour.

Briefly put, the econometric studies at the level of individual industries tend to find a negative impact of trade exposure on the employment and relative wages of low-skilled workers. It is well established in the literature that the employment share of low-skilled workers has declined across a wide range of economic sectors. Project results imply that low-skilled workers in those tradable goods industries that experienced especially large imports from non-OECD countries were affected overproportionately. Hence, an observed decrease in the employment share of low-skilled workers reflected not only low-skill-saving technological change, although some of the results suggest that this was still the dominant factor. Lower employment of low-skilled workers also resulted from intra-sectoral structural change such as international outsourcing of labour-intensive components.

In contrast, econometric studies based on general-equilibrium approaches find no evidence that trade has depressed the relative equilibrium wage of low-skilled workers. It is

impossible to know whether this reflects a lack of precision that is corrected for by the industry-level studies, or whether the industry-level studies pick up negative effects on small groups of low-skilled workers that dissipate at the level of the economy at large.

3.4 Case Studies

Case studies help to either corroborate or refute the findings from the various empirical approaches used in the project.

3.4.1 Footwear

Footwear is usually treated as a typical low-skill intensive sector where, over the years, comparative advantage has shifted decisively to labour abundant low-wage developing countries. The case study on footwear documents the rapid decline in employment and output of footwear in the EU since the 1970s. Over the same period it is apparent that there has been a substantial increase in import penetration of the EU market, and of each individual country's market, by low-wage developing economies. However, an important feature of the European footwear industry is that the decline of the sector is not common across countries. Some European countries such as Italy and Portugal have been able to maintain output and employment in the face of increasing import penetration. This suggests that there are different modes of response to globalisation within the same industry. It is this issue which forms the focus of this project case study.

One of the main findings is that there are a number of features of the performance of the sector in Europe which cast doubt over the applicability of the standard trade model, which has typically been used to assess the impact of globalisation. These characteristics also undermine a number of common perceptions regarding low-skilled labour intensive industries. Firstly, the trade data clearly demonstrate that as import penetration has increased so have export to output ratios. This is inconsistent with a view of the footwear sector producing homogeneous products, and suggests that adjustment to more intense import competition in footwear does not necessarily require the movement of resources into other sectors. Successful adjustment should entail the movement of resources into the production of higher quality differentiated fashion shoes. Italy now exports around 90 per cent of domestic output. Those countries which have suffered the largest falls in output, France, Germany and the UK in Europe and the US, exhibit much lower export to output ratios than the other two European countries. Thus, this simple analysis would suggest that a proper assessment of the impact of globalisation on specific sectors should cover not just changes in imports in industrial countries but also developments in their exports.

Secondly, the process of making footwear can be broken down into distinct stages of production. Accordingly, this division of production stages has brought about a division of labour, which requires a variety of skills from within the unskilled labour force, a group

which is usually associated with production workers. The cutting of the leather, in which the varying texture of the material must be taken into consideration, is the most highly skilled and best paid job within the group of production workers in the factory. Thus, for footwear it is clear that the group of production or unskilled workers is far from homogeneous, as is often assumed in discussions of the impact of globalisation. This is apparent from data which show different levels of wages for the different groups of unskilled workers within the footwear industry in Belgium and Italy.

It is also apparent in the dynamics of labour adjustment to globalisation. Most previous studies of the impact of globalisation concentrate upon the impact of trade upon relative wages and relative levels of unemployment for skilled and unskilled workers in Europe and ignore other dynamic aspects of adjustment which are important in affecting social exclusion. Data for Belgium, used in the case study, show that manual workers tend to suffer longer periods of unemployment than non-manual workers. However, it is interesting that within the group of manual footwear workers, it is those with the higher level of skills which tend to have a higher duration of unemployment. The proportion of the least skilled footwear workers who are long-term unemployed in Belgium is less than that of the most skilled cutters.

Thirdly, for footwear it is apparent that technological change has not been pervasive. Information regarding two new technologies, computer-aided design (CAD) and computer-aided stitching (CAS) shows widely varying rates of application across countries. The use of CAD, which is related to the design of the product, is far more widespread than the more production related technology, CAS. In general, CAD and CAS are applied more widely in France, Germany and the UK than in Italy and Portugal, perhaps reflecting the nature of the sector in these locations; a large number of small firms and the preponderance of fashion-oriented leather-uppered footwear.

On the basis of the available data we find that those countries which had the lowest levels of labour productivity in footwear at the start of the period in 1970 experienced the sharpest falls in employment in footwear. It is these countries which have more widely adopted the most recent technological advances that are relevant to the sector. It is concluded that technological change may have been an important factor in particular countries but has not been a general feature of the sector as a whole.

Thus, the case study highlights that, even for a sector which is usually taken to be straightforward for the analysis of globalisation, there is a high degree of heterogeneity in the nature of the sector in different countries and in the adjustment process to globalisation. For those countries where employment loss has been greatest, technological upgrading, international outsourcing and overseas investment have been of more importance. In other countries where historically firms have been smaller, the dominant response has been one of increasing local flexibility in terms the formation and growth of industrial districts, as in Italy, and the concentration upon high quality, design intensive, fashion footwear with a very large proportion of output being exported.

This variety of response suggests that the design of a coherent EU-wide policy to assist adjustment to globalisation would be very difficult. What is apparent is that a result of this process of adjustment can be the social exclusion of the workers involved. This is not just for unemployed workers. The increased flexibility of firms in industrial districts can lead to problems of social exclusion for workers classified as employed. Flexible organisation leads to the greater use of temporary, part-time and cottage workers. The lack of employment stability for these workers can be reflected in rising wage differentials compared to skilled workers with higher job stability. In addition, these are workers who can miss the social safety net which is in place for permanent, full-time workers.

3.4.2 Textiles and Apparel

For the past twenty years the textile and clothing (T&C) sector in industrialised countries has been shielded from low cost imports by protective trade agreements. Nevertheless it is generally accepted that large adjustments have taken place. This case study examines the adjustment experience and future prospects for the T&C industry in the two European Union countries - Italy and the United Kingdom. The analysis focuses on the changes in employment and other social related effects of long-term restructuring in the industry, and the role played by trade in them. It also provides indications as to future trends in adjustment in view of further forthcoming trade liberalisation.

Since the 70s all higher income countries suffered substantial employment declines in the T&C sector. The European Union countries experienced much greater percentage losses than group, major producer in the “G7” like USA and Japan. Furthermore, this is not only a recent phenomenon; between 1963 and 1973/4 T&C employment as a percentage of labour

force has already fallen from 16% to 12%, due in particular to declines in UK, FRG and Netherlands.

It is difficult to isolate the determinants of these adjustments over such a long period of time considering that variations can be found at country and sub-sector level. Nevertheless some major causes, other than conjectural downturns, were identified and their relative weight analysed in this study. Declines have been recorded along with overall economic downturns and declines have been more severe during the recessions 1973, 1983, and 1990/1994 when both consumption and output declined. Falls in employment exceeded output declines while the recovery in demand and output had little effect on employment. The EU production index for textiles in 1987 (1980=100, EC-12) had recovered to 98,6 while employment in the sector has continued to fall to 73.2.

All European countries have a T&C industry but there are variations in the size of the sector as a whole and different weights for sub-sectors and segments. The major employer countries are respectively Italy, United Kingdom France and Germany. For the entire period considered by the study, there is a clear reversal in the hierarchy of major producers with FRG and UK suffering the greatest losses in combined TFC employment, respectively 58,1% and 55%.

The UK, once having the largest textile industry, has suffered greater losses in this sub-sector relative to clothing in the past two decades, with its textile work force reduced to one third in the 1970/90 period, while clothing employment fell by half its 1970 level. For Germany the opposite is true. Starting from a lower level textile employment has fallen by half at around the same level of UK. German clothing has shown instead the worst sectoral performance in employment terms since 1972/73. In Italy the sectoral trends are more marked with substantial adjustment in textiles being concentrated in the 1972/3-1983 period. Clothing declines at a lower rate in recessionary periods. The former staged an upsurge in 1993/95 the latter in 1990/92.

Employment trends by sector in France show adjustment in clothing earlier, from mid 60s to mid 70s. Textiles shows a downward trend from 1972/73. In the 1980s decline in both absolute and percent terms are slightly higher for clothing, but losses in textiles are still large relative to other major European partners, accounting for the worst performance among the major European producers. In the 90s both Germany and France continue to experience a decline in both sectors, though textiles show a far worst performance in the latter from 1985,

and appears particularly hard hit by the 1990-1991/93 recession. Italian and UK clothing stabilise.

These adjustment experiences have been influenced by the structure of the industry, size of enterprises and relationship along the production-distribution chain, and the structure of the national market. European T&C manufacturers had a low level of internalisation at the beginning of the period, catering mostly for their national country. Lately the integration process in the EC has led many enterprises to consider the Community as their main market, while continuing to have a prime interest in those segments which they cater most to at home. British textiles experienced a state-sponsored process of concentration leading to progressive downsizing and rationalisation. Apart from large enterprises, loss in employment has been reflected high rates of enterprise closures reflecting technological obsolescence.

Clothing has benefited from sustained demand being met by to low prices. Large chain stores has dominated the market favouring national producers, keeping prices growing at a lower rate than the continent. Concentration on standardised items and delocalisation to informal sector has allowed costs to align with distribution pricing policy. The prominent role of distribution over manufacturing, coupled with high levels of concentration in the sector, became disadvantages in dealing with the changes in competitive environment brought about by trade liberalisation.

A major issue in the UK is the role of the larger chain store companies in downplaying local producers in an attempt to regain competitiveness by lowering prices. Its strong market power derives from the control of brand names and the management of the key marketing and distribution functions cut off from end users' market. The threat of chain stores to go abroad for a greater share of its purchases produces a chain reaction of downsizing and rationalisation.

French textiles have lived through the same experience as Britain in this regard; century-old industrial districts have been advised to achieve greater concentration. It seems that advantages from economies of scale and greater financial resources have been offset by a loss of flexibility and entrepreneurial skills. While the EU has maintained a surplus in textile trade flow France shows a growing deficit. The main exporters are high quality producers like Italy and W. Germany, but supplies from developing countries have been growing, in particular from former Mediterranean colonies, Tunisia and Morocco.

Looking at the relative success of the clothing industry compared to textiles, one might deduce that clothing manufacturers have switched to foreign supplies for both basic and high quality fabrics. But given the high export orientation of textiles, as opposed to clothing, it seems that advantages from trade have not compensated for the loss of strategic partnerships between textiles and clothing in the textile segments of the industry. Growing import competition also plays a great role in re-orienting enterprise strategies. Labour market rigidities, unlike in the UK, and magnified by the greater size of enterprises, as opposed to in Germany and Italy, has generated labour saving innovations and outsourcing.

Germany is now the major European exporter in the world market for textiles, second only to Italy for clothing, and also the largest market for textile and clothing goods. This implies that a strong performance has been achieved on this front in a highly competitive environment both at home and abroad. German consumers are more responsive to quality/fashion appeal than British, but more conscious about quality/price relationships than are Italians. Changes in the quality structure of output reveal the effort of the T&C industry to reorient itself towards the highest segments of the market. In 1990, relative to 1980, the share of output in the high range had doubled to more than 10%, 60% was to be found in the medium range while the lowest ones had either reduced or disappeared.

The successful performance of German **t**extiles has been achieved through major adjustments through investments in technological innovation. The structure of the industry has remained unchanged and continues to rely on SMEs, though with greater concentration than in Italy. In order to reduce costs textiles have also invested consistently abroad, FDI in textiles and outward processing in clothing, mainly served by German export fabrics, has emerged since the late 80s as a key component of strategies to offset growing costs. The internationalisation of production slowed in the 80s due to difficulties in matching the need of the highly demanding fashion market with redeployment to distant and often low quality producer countries.

The EU clothing industry, no less than textiles, has also tried to improve productivity by using the latest technology. The high labour content of some stages of production, especially sewing, and the need to shed less profitable segments of the market in light of growing competition have made internationalisation, mostly through outward processing, inevitable for the textiles and clothing industry. European countries have come to look abroad only later in the decade, notably the UK and Italy; so that already in 1990 50% of German clothing imports could be attributed to outward processing or other agreements. The

opening up of the EU countries economies has offered industry the industrial space for its outsourcing policy.

The experience of adjustment in the Italian T&C industry is, in contrast, a success story even though the social costs should not be downplayed. Italy accounts for about one third of European total turnover, employment and export in the industry. In its external trade Italy is the fourth biggest exporter, second only to Germany among OECD countries, and the second biggest exporter in clothing after China. It ranks in the top ten for imports as well, though in a lower position and below all the other European major countries.

Restructuring in textiles with substantial job losses was seen in Italy in the 60s, though in both absolute and relative terms to that experienced in other European countries. Technological innovation was an important feature of the industry success, sustaining the continuous upgrading of quality. A tight relationship with related industries and between suppliers/customers in the districts was a feature of this sector.

The more labour intensive clothing sector was less affected by downsizing until 1985. The competitive advantage of Italian clothing relied heavily on the flexibility of its highly fragmented structure, and an unusual (for Western Europe) growth of subcontracting to the informal sector. The relative cheap labour and greater flexibility of the work force was a feature of the sector until the end of the 70s. From then on, the pursuit of high quality /high fashion has induced a shift in size to cope with the high investments required, and labour costs began to grow consistently.

A divide appeared among enterprises, networks and districts according to their position in the value chain and the market segment. Larger enterprises concentrated on product/process innovation, design and branding focusing on the control of the end users' market. The most intensive stages of production process were outsourced through subcontracting. SMEs have nevertheless attracted attention for their ability to combine the traditional advantages of flexible small businesses with the technological and know-how capabilities required by a sophisticated and volatile market.

The competitiveness of Italian clothing at home, seen against falling demand and rising imports, has been maintained by a fragmented distribution system and a restrictive trade policy. Like other "cheap" European manufacturers, Italy has taken advantage of restrictions on imports from LDCs to its major export markets. A weak currency helped to

keep local costs down for exporters and to maintain a competitive edge relative to other quality producers as well as to face LDC competition in the medium-low range.

3.4.3 Electrical Industry

The electrical industry (not including computers) was chosen for another case study (Diehl 2000). This was motivated by the observation that import penetration from low wage countries seems to be high and increasing, at least in certain market subsegments. In addition, it was thought useful to provide case studies both on low-skill-intensive industries (footwear, textiles and clothing) and skill-intensive industries (electrical industry). However, it has to be noted that the electrical industry is relatively heterogeneous. Whereas the skill intensity of the aggregate electrical industry is only slightly higher than the manufacturing average, certain subsegments of the industry produce high-technology products with highly skilled workers. Hence, subsegments of the electrical industry have been analysed, whenever possible.

The development of employment and production in the European Union is analysed and broad trends in the globalisation of production are identified. The share of the aggregate electrical industry in value added of the total manufacturing sector increased over the last two decades, except for the UK. This indicates that most EU countries still have a comparative advantage in the manufacturing of electrical machinery. In addition, the labour productivity in the electrical industry increased above the average rate for the total manufacturing sector in all countries. Almost by definition, this coincides with a decrease of aggregate employment in absolute terms, particularly strong in the UK. At the same time, the share of low-skilled workers in total employment decreased in France, the UK and Germany whereas it increased in Italy. By contrast, the relative wage of low-skilled workers decreased only in the UK whereas it was relatively stable in France, Germany and Italy. The increasing capital intensity of production (e. g., due to automated assembly) was probably the major determinant of this development. However, the reason behind the ‘capital deepening’ could have been either exogenous technical progress or globalisation pressure. For example, job losses have been particularly strong in the consumer electronics segment in which the share in total employment of the EU electrical industry decreased over the last two decades. This is in line with the high and increasing import market penetration ratios of low-income countries in this segment.

The locational pattern of world production in the electrical industry has changed sharply over the last two decades, with the share of EU countries in world exports of

electrical machinery and electronic products decreasing significantly. Import market penetration rations have increased significantly, but developing countries accounted for only half of this increase. At the same time, export shares in EU countries' domestic production of electrical machinery and electronic products increased in a similar order of magnitude. Moreover, EU investments were largely directed to high-income countries, in contrast to FDI of Japanese and US producers. In addition, some EU countries received significant FDI inflows from Asian producers. This supports the hypothesis that EU producers have adjusted to globalisation pressures by shifting into higher value added segments rather than by relocating production to low-wage countries.

Three key findings emerged from the case study with respect to sectoral adjustment strategies:

First, relative import unit value indices (average value of imports per metric ton in per cent of the average value of exports per metric ton) have been analysed for the subsector producing consumer electronics. Accordingly, a decline of the value of this indicator could be interpreted either as stronger price competitiveness of imports or as a shift of exports towards products with a relatively high value added share. The results indicate a gap between relatively cheap imports and sophisticated exports (and probably also domestic sales), most clearly in the case of radios and telecommunications equipment. In other cases, for example in the case of TV sets, the results indicate a similar composition of imports and exports. However, in virtually all cases the indicator showed no clear trend, contrary to the expectations that relatively cheap imports have gained in importance. The large cyclical swing of the US$ exchange rate during the 1980s had no impact on relative import unit values although Asian exports were largely tied to the US$. This leads to the conclusion that EU producers have taken the opportunity to increase their export prices in national currency. However, these windfall profits in the first half of the 1980s have probably delayed the sectoral adjustment to globalisation pressures, leading to more intensive restructuring efforts in the second half of the 1980s when the US$ returned to its previous level.

Second, international sourcing of components and globalisation of assembly are prominent in the consumer electronics industry since components make up a large part of the production costs. Labour cost is quite important at the low end of the market in the assembly stage but it is becoming increasing less so due to automation. Noteworthy is the trend towards reducing the number of parts and components, thanks to the greater integration of functions into single components and to miniaturisation, thus increasing productivity in the assembly

phase. This could be a motive to keep the assembly phase within high-income countries. Firm level evidence from Europe indeed suggests that international sourcing is not a one-way street towards low-income countries. Whereas there was a clear trend in the 1970s and early 1980s to shift the production of components and even the assembling to East Asia, anecdotal evidence suggests that this trend has slowed down in the 1990s. Political developments have contributed to this development, i. e. EU protectionism against imports from Asia, leading to 'defensive investments' of Asian firms, and the opening-up of the former centrally planned economies in Central and Eastern Europe.

Third, different trends in the R&D intensity can be used to explain the observed differences in the development of sectoral employment in major EU producers. Since 1985, R&D efforts in the electrical industry decreased in the UK, stagnated in Italy and increased in Germany and France. This supports the hypothesis that product and process innovations have partly compensated for globalisation pressures. Moreover, some notable differences between EU countries are revealed. For instance, the consumer electronics subsector is significantly less R&D intensive in Italy and the remaining electrical industry is significantly more R&D intensive in the UK, compared to the respective subsector in other EU countries.

The case of Germany (1980 to 1994) was studied in more detail. Results show that the share of relatively skill-intensive segments (telecommunications equipment, measuring and control instruments) in production and employment of the electrical industry has increased. This can be interpreted as the result of intra-sectoral specialisation according to the comparative advantage of German producers. Moreover, the above mentioned hypothesis about the relative importance of adjustment strategies is confirmed by a recent sample survey in the German electrical industry (based on about 300 questionnaires). Accordingly, quality improvement and process innovations ranked higher in the priority list of managers than investment abroad.

Clear bias against manual workers prevailed in all subsectors of the German electrical industry. In terms of employment, this decline was strongest in telecommunication equipment and consumer electronics whereas it was only moderate in the other subsectors. In terms of relative wages of the two worker categories, however, a different picture emerges. The wage of manual workers relative to that of non-manual workers decreased in all subsectors, except for the production of consumer electronics. This supports the hypothesis that process innovations in the latter subsector have led to relatively higher productivity growth of manual workers. However, the quality and skill intensity of products is relatively heterogeneous even

in a small subsector like consumer electronics. This is shown by the results of the analysis of relative import unit values. Accordingly, the price of imports from low-wage countries has decreased relative to those from high-income countries (and probably German producer prices) in the case of radios and telephones whereas it increased in the case of TV sets. Hence, changes in the product mix may have contributed to the skill upgrading in this subsector.

In conclusion, this case study shows that total employment in this industry was stabilised by structural change within and between subsegments. The direct effect of increased import competition from low-wage countries (i.e., specialisation on other industries) seems to be small, except for the consumer electronics segment. Moreover, export ratios have increased in the same order as import penetration ratios, indicating the importance of intra-industry trade. However, other adjustment strategies which were indirectly induced by globalisation pressures probably had a large skill bias, basically as a result of capital-skill complementarity. Long-run trends in international outsourcing, investment in machinery and R&D activities are broadly in line with the observed trends in employment by skill.

3.5 General Equilibrium Analysis

The modelling work and analysis carried out under this part of the project has focused on the decomposition of observed wage inequality changes in a number of European countries over the last two decades. These changes have been characterised as a deterioration of unskilled workers wages relative to those of their skilled counterparts, and have been documented for OECD countries, most notably the UK and the US (see, for example, Davis, 1992; Gottschalk and Smeeding, 1997).

A general equilibrium based methodology for decomposing relative wage changes into various constituent parts is developed. The analysis takes into consideration the major factors discussed in recent literature in connection with the surge in wage inequality in a number OECD countries - increased trade with low-wage countries and skill-biased technical change. It also tries to assess the role played by other factors which have figured less prominently in this literature, such as labour market institutions, changes in factor endowments, and other forms of technical change (sector-specific, as opposed to factor-specific technical change, for example). Some of the work developed under this project

component also examines employment effects associated with changes in trade and technology, providing also decomposition analysis of changes in unemployment.

A variety of multi-sector, calibrated general equilibrium models has been developed to perform wage inequality and unemployment decomposition. These are all based on international trade analytical structures for small open economies, to which various labour market structures have added, depending on the specific issues being analysed. The trade structures used here are variants to different degrees of the conventional Heckscher-Ohlin model (HOM) with homogeneous goods and constant returns to scale, which has been widely used for wage inequality decomposition in recent literature. One variant of the HOM considered allows for imperfect substitutability between domestic and foreign goods. This in fact generalises the conventional Heckscher-Ohlin structure, to which it reverts as the elasticity of substitution between domestic and foreign goods becomes sufficiently large.

A second variant of the traditional HOM that we have used introduces imperfect factor mobility across sectors, and follows conceptually the trade structures presented in Mayer (1974) and Neary (1978). A different piece of work under this project component uses Ricardo-Viner trade structure, which also departs both from full factor mobility - by allowing for a sector-specific, fixed factor - and from the constant returns to scale assumption. These imperfect factor mobility versions examine factor markets in more, detail and move away from the assumption of perfectly competitive labour markets - one of the them by introducing firing/hiring costs, and the other by considering the presence of trade unions which jointly set wages with employers through a bargaining process where unemployment is a possible outcome.

Applied general equilibrium models are traditionally calibrated to a single, base year (Shoven and Whalley, 1992). Parts of this project component follow this practice, while others depart from it by developing and/or applying a new technique to calibrate to more than one time period. This has a number of advantages over conventional single period calibration, including the ability to properly do ex post counterfactual analysis, and exact model fit from initial to terminal period. Unlike other decomposition techniques used by economists in the past, multi-period calibration also makes possible the measurement of technical change in a non-residual and model-consistent fashion. The technique is used here both for single and multi-country analysis.

3.5.1 Wage Inequality Decomposition with Alternative Structural Models

Using general equilibrium analysis to analyse the contribution of globalisation to widening social inequality involves the prior development of a satisfactory conceptual and methodological framework. This project component develops both Heckscher-Ohlin and differentiated goods trade models incorporating skilled and unskilled labour as substitute factor inputs. In the formulation used here, changes in world prices are used to simulate increased openness and more trade, while factor and sector specific productivity changes can be incorporated into technology. The focus is n the price-taking small open economy case, and the relative importance of each contributing factor to increased wage inequality is assessed.

We initially worked with a Heckscher-Ohlin structure, and analysed the two-factor, two-good (importable/exportable) case. Data for the UK and the Netherlands' economies were initially used in model calibration, and examine the effects of trade and technology shocks both jointly and separately. We have used 1976 on wages and product price as well as 1990 data on production, trade, consumption and factor use for the UK economy. The corresponding years for the Dutch economy model are 1980 and 1995.

3.5.2 Wage Inequality Decomposition for the UK

The starting point is to note that, despite the large volume of literature in the trade and wages debate, the empirical basis for various conclusions rests basically on different kinds of reduced-form-model regressions. Using the Heckscher-Ohlin structure outlined above, it is shown that observed reduced-form data on wage inequality is compatible with more than one structural model, each attributing very different weights to trade technology (Abrego and Whalley, 2000a). This gives rise to a fundamental ambiguity as to the contribution of each factor since for some structural models, the dominant factor in a given change in wage inequality is trade, while for others it turns out to be technology.

Although the degree of ambiguity can be reduced by, for example, limiting the value of some key model parameters (elasticities of substitution between skilled and unskilled labour) to the estimated range in the literature (e.g. Hamermesh, 1993), it cannot be eliminated if reduced-form models are used. The inability of these models to discriminate between alternative structures implies that only limited inference can be made as to the relative weight of trade and technology from their analyses. The conclusion is that structural models are needed for a meaningful decomposition of observed changes in wage inequality into trade and technology effects.

An additional problem that arises within Heckscher-Ohlin structures is their tendency to produce outcomes where the economy is driven towards full specialisation when relative price changes accompanying trade shock occur - even if these changes are relatively small. This is the result of the transformation frontier associated with the Heckscher-Ohlin structure being close to linear for production functions based on any convenient functional forms. In the case of the UK economy at least, the result is that the model cannot be solved for the relative price changes actually observed, and thus no decomposition exercise can be carried out with actual data for product price changes. The problems associated with a linear transformation frontier also manifest themselves in large wage changes occurring from relatively small goods price changes. The outcome of this is that changes in goods prices that constitute only a small fraction of the actual change over the period we examine here generate wage effects stronger than those actually observed.

Given the difficulties associated with simple Heckscher-Ohlin structures, an alternative differentiated goods model of which the HOM model is a special case is considered (Abrego and Whalley 2000a,b). In this model, imported goods and non-exportable domestic products are imperfect substitutes in demand, and as the substitution elasticity between domestic products and imports approaches infinity the model reverts to a more classical Heckscher-Ohlin form. For finite substitution elasticities, this model weakens, and typically removes the specialisation properties of simple Heckscher-Ohlin models, allowing actual joint technology and wage changes to be decomposed into constituent parts. It also incorporates endogenous domestic price determination in response to world price changes with imperfect pass through of world price changes onto prices of domestically produced goods (in simple Heckscher-Ohlin models all external shocks fully impact domestic goods prices). The structure also allows for direct model calibration to import demand elasticity estimates, something that in simple Heckscher-Ohlin is considerably more difficult.

The differentiated goods model is calibrated to the UK data set referred to above, and used it to carry out similar decomposition experiments. Results are strikingly different in comparison to those from Heckscher-Ohlin - specialisation problems recede and the examination of the impact of large relative price changes is possible, and the range of decomposition results for given joint trade and technology changes is substantially narrowed. The latter reflect the fact that the trade shocks can now be absorbed on the import demand side of the model without full transmission to domestic producer prices. Furthermore, the increase in inequality attributed to trade changes can change sign depending upon whether

the demand side substitution elasticity between domestic and foreign goods is greater or less than one. The contribution of trade to increased to inequality turns out to be consistently small relative to that of technology, and the demand side effects end up playing a key role in decompositions results.

These results show how alternative structural models with different properties can be built for decomposition analysis, each consistent with the same joint shock, but with sharply different results. Using a simple Heckscher-Ohlin type model, close to what is found in some of the trade and wages literature, only small changes can be analysed and these, in turn, offer a wide range of decompositions from alternative data consistent parameterisations. With a product differentiation model, large changes can be analysed and across alternative parameterisations decomposition results are relatively robust, but with demand side effects entering the model the contribution of trade to inequality is much reduced. It is suggested that exploration of alternative structural models rather than reduced forms may be the way forward to more satisfactorily sort out trade and technology effects on wage dispersion in EU countries.

3.5.3 The Netherlands' Case

The model and methodology for decomposing wage inequality changes into trade and technology constituent parts developed in Abrego and Whalley (2000a) and applied originally to the UK, has also been applied to the Netherlands (Rot, 2000). The model structure used in Abrego and Whalley is calibrated to 1995 Dutch data on production, trade and factor use, and to wage and price changes over the period 1980-95, and decomposition experiments are then conducted. Modelling results are qualitatively very similar to those for the UK. In effect, the pure Heckscher-Ohlin structure proves unsatisfactory for conducting decomposition experiments of observed changes in wage inequality due to the near linearity of the transformation frontier moving the economy towards full specialisation, following small changes (representing only a fraction of those observed) in relative prices. The ambiguity in decomposition reported in Abrego and Whalley (using UK data) for the small price and technology shocks that the Heckscher-Ohlin structure can be solve for is also present in the Netherlands' case.

As in the UK case, the use of models where imports and domestic goods are no longer perfect substitutes solves these two difficulties, but generates a new problem - the trade shock is almost entirely accommodated by changes in imports (or demand) rather than output. The result of that is that trade-related factors end up playing only a minor role in the wage

inequality surge. Thus, the conclusion of Abrego and Whalley (2000a) that the exploration of alternative structural models rather than reduced forms may be the way forward to more satisfactorily sort out trade and technology effects on wage dispersion in industrialised economies still remains.

3.5.4 Modelling of Labour Market Imperfections

We look at the three most common explanations of growing wage inequality in advanced countries - a world price shock, sector-biased and factor-biased technical change - but from a slightly different angle. We modify the standard 2-good 2-factor Heckscher-Ohlin trade model of a small open economy used in Abrego and Whalley (2000a) to take account of time-lags in adjustment of the economy, using Mayer's (1974) and Neary's (1978) distinction between short-run and long-run effects.

We show that world prices and sector-biased technical progress both affect incomes mostly through an indirect effect: by altering the structure of industrial production. Income inequality increases if there is a shift in production towards more skill-intensive industries. But, due to costs in moving factors and other reasons, a country's industrial structure will not shift as quickly or as completely towards these industries as changes in comparative advantage (whether due to world price shocks or sector-biased technical progress) would indicate. Most of the change in inequality does not occur until this production shift takes place.

If we assume that the observed response to price and technology shocks to date is essentially a short-run response, and that factors and output have not adjusted fully, decomposition analysis of the causes of the observed increases in inequality is substantially changed. First, the near-linearity of the production frontier, as observed by Abrego and Whalley (2000a) is not observed in the short run. This means that the observed fall in relative traded prices of unskilled-intensive goods (using data from Abrego and Whalley (2000a), which is, in turn, based on estimates by Neven and Wyplosz, 1999) would not produce the same dramatic switch in output and relative incomes as in the full factor mobility model. In fact, the major effect of trade prices on incomes predicted by Stolper-Samuelson is the magnification effect (as Neary refers to it) which occurs when both factors can move: the effect on relative wages when only one factor can move. Since we are treating technical progress as essentially a residual, its magnitude and sign will be significantly affected when the estimated effect of trade is altered.

To demonstrate this, we fit a two-good two-factor Heckscher-Ohlin general equilibrium model to UK data for 1979 and 1995 using a dual calibration method. This is followed by simulations to determine the relative importance of trade and technological factors. Our results using two alternative production side elasticities of substitution, suggest that, contrary to Haskel and Slaughter (1998), the observed changes in production and income distribution can be explained by a combination of a world price shock and factor-biased technical progress, and that the sector bias of technical progress is negligible. In the short run, depending on elasticities of substitution assumed, the world price shock accounts for 30-100 % of the increased inequality observed (despite an offsetting effect from changed workforce composition). In the longer term, assuming much greater factor mobility, the effects of the already-observed upskilling of the workforce means that the economy is likely to specialise completely in skill-intensive goods, with the result that, depending on the order in which shocks are calculated, it may be only factor-biased technological progress (which has been significant) in the skill-intensive industry which will matter, at least in our rather simple two-good framework.

On a wider note, the analysis suggests that the different dynamics of adjustment of industrial structure in different countries to price and sector-biased technical shocks may explain much of the differences in experience of changing income distribution to date between the Anglo-Saxon countries, which have seen large increases in inequality, and Continental Europe, which largely has not. We note that the former countries have experienced a faster restructuring of their economies away from manufacturing. Also, the dynamics of structural adjustment make it easier to link the effects of trade and technology shifts in the 1970s to much more recent and ongoing changes in income distribution, a relationship which Leamer (1998) speculates upon but does not spell out in detail.

3.5.5 Trade Union Bargaining

There has been some literature trying to examine the contribution of changes in labour market institutions in observed wage inequality surges. This literature suggests that institutional changes - defined basically as changes in the degree of labour market flexibility - have in fact played an important role in increased wage inequality. We have also examined (Abrego, 2000) the role of labour market institutions in wage inequality outcomes, but follow a different approach from that found in the empirical literature. Existing econometric-based studies try either to decompose observed changes in wage inequality into separate components due to increased trade, technological change and changes in labour market

institutions or test the relationship between changes in wage dispersion and changes in institutions. Here, we compare an economy's response to trade and technology shocks under given, alternative labour market institutional frameworks.

We employ a version of the differentiated goods model first set out in de Melo and Robinson (1989), and recently used for trade-wages decomposition in Abrego and Whalley (2000b). This is a two-factor, two-produced-goods model, incorporating imperfect substitution in preferences between domestic and imported goods. We modify this structure to introduce wage bargaining between trade unions and firms in the market for unskilled labour.

We calibrate this model to UK 1990 data on production, consumption, trade and factor use. We then simulate the impact of trade and technology shocks that occurred in the UK over the period 1976-90, both in the presence and absence of labour market imperfections. To perform the decomposition exercises, we follow a methodology set out in Abrego and Whalley (2000a,b), and compute separate equilibria for trade, technology, and combined shocks.

As shown in Abrego and Whalley (2000b), in a differentiated-goods model with perfectly competitive labour markets, increased wage inequality is basically the result of technological change, with trade playing only a minor role. However, in Abrego (2000) is found that the presence of imperfections in the market for unskilled labour significantly change this decomposition, increasing the relative contribution of trade. This change is, however, only quantitative: for the model parameterisations onsidered, technological change is always the main force behind increased wage inequality.

The conclusion in this paper is that institutional arrangements in labour markets can have an important bearing in the outcome of wage inequality decompositions. Given the fact that a number of industrialised economies still present varying degrees of labour market imperfections, the paper suggests that they should probably be explicitly incorporated in models trying to decompose relative wage changes for them.

3.5.6 Wage Inequality Decomposition Using Double Calibration Techniques

Abrego and Whalley (2000) and Edwards and Whalley (2000) have also developed a double calibration general-equilibrium methodology to decompose observed economic outcomes generated by multiple sources into components associated with each source, and apply it to the trade-technology debate on the causes of increased OECD wage inequality. In the

applied general equilibrium literature (see Shoven and Whalley, 1992) how to decompose observed economic outcomes has been little studied. Models have, instead, largely been used for counterfactual exercises of ex-ante (or anticipated) policy changes whose final outcome has yet to be observed.

These analyses depart from traditional applied general equilibrium exercises in two ways. First, they seek to decompose an observed (ex post) economic outcome into component influences, rather compute ex ante counterfactual equilibria. Second, they base their analysis on a multiple-period rather than a single calibration, since we want model parameterisations to be as consistent as possible with changes over time, not just a base year observation. They call this procedure, which can be either exact or inexact, double calibration. Previous decomposition analysis (such as Abrego and Whalley, 2000) uses single-period calibration and extrapolation to capture only the changes in individual key variables across periods (such as changes in relative wages). Here, they are able to fit our model to both initial and terminal period data via calibration, and to take into consideration in a theory-consistent fashion a broader range of factors potentially responsible for the outcome being analysed. Their calibration to initial and terminal year data may be either exact or inexact, depending on the restrictions imposed on calibration.

The technique is applied first to the decomposition of the sources of recent increases in the UK over the period 1979-1995. As indicated earlier, the literature on recent increases in wage inequality has concentrated on two main contributing factors - trade with low wage countries, and technological change. Most literature concludes that technological change is the main source of this increased inequality, rather than trade (Bound and Johnson, 1992; Baldwin and Cain, 1997; Feenstra and Hanson, 1999) The model and the techniques we present here suggest that, within a general equilibrium setting, other factors, such as changes in endowments and a wider variety of technical change (including sector-biased technical change), also enter the picture and can play a significant role, and the procedure used allows for direct consideration of them.

The model structure they use is a specific-factors (or Ricardo-Viner) trade model. This differs from a more standard Heckscher-Ohlin-type structure in that it assumes the presence of specific factors that are immobile across sectors, and hence yields decreasing returns to scale to mobile factors.

Their reasons for using this structure are twofold. First, the traditional Heckscher-Ohlin model with fully mobile factors and constant returns to scale, when used with conventional functional forms (such as CES), cannot accommodate relative product price changes of the magnitude that have been observed in some countries along with increased wage inequality, such as the US or the UK (see OECD, 1997; Abrego and Whalley, 2000). This is due to the near linearity of the transformation frontier associated with this model structure, and the ensuing problems of full specialisation documented some years ago by Johnson (1966). A second reason is the feature that, in the small open economy case, the standard Heckscher-Ohlin model is unable to accommodate factor-biased technical change as a source of relative wage change (Leamer, 1998; Krugman, 2000). This is unsatisfactory since the bulk of the available empirical evidence seems to support the hypothesis that factor-biased technical change has been the main source of recent increased wage inequality in the OECD. A fixed-factor model produces relative wage changes under factor-biased technical change.

The technique involves calibrating a general equilibrium structure to two or more observations, and consistently estimating parameter values reflecting the effects of various exogenous changes contributing to the outcome being decomposed.

In calculations performed using UK data, they find that the role of factor-biased technological change in increased inequality is larger than suggested in previous literature. Their estimate for the contribution of increased trade is, in turn, small, and consistent with earlier literature. They also find that changes in factor endowments have played a substantial role in partially reversing the pressures towards increased inequality associated with trade and factor-biased technological change - a feature that has received little attention in existing literature.

4. Conclusions and policy implications

4.1 Background and Overview of Project Results.

This project has contributed an in depth analysis of the role that globalisation, as reflected in greater trade flows, particularly between low-wage and high-wage countries, has played in influencing social exclusion. Unemployment, particularly long-term unemployment, is generally seen as the major factor leading to social exclusion. However, "the very fact of holding a job at a particular time does not necessarily protect people from the risk of social exclusion…between 20 and 40% of the population live on the margins of the poverty line and experience spells of low income over a period of 3-6 years, particularly as a result of repeated periods of unemployment".[1] Therefore, from the perspective of social exclusion, the quality of work, in terms of its duration, stability and income, are important.

A key factor underlying social exclusion in Europe and North America, which has been the focus of the analysis in this project, has been the increasing inequality between unskilled and skilled workers in terms of incomes and/or employment opportunities. These developments prevent significant groups of society from being able to fully participate in the basic social structures and activities enjoyed by the rest of the population. Wage and income inequality is often linked to exclusion from suitable housing, transport, health, education and training. At the root of these changes appears to be a substantial fall in the relative demand for unskilled workers during the 1980s and 1990s. What is contentious, however, are the reasons for this slackening of the demand for unskilled workers. This project has sought to carefully assess the role that globalisation has played in this process.

Everyday experience suggests that globalisation, as reflected in the increasing availability of cheap imports from low-wage countries, could lie at the heart of the recent adverse developments in European and North American labour markets. Our review of the relevant economic theory, conducted early in the project supports this notion. Economists strongly believe that trade and capital flow liberalisation bring overall gains to an economy. However, the theory demonstrates that there are distributional consequences of globalisation, such that in industrial countries unskilled workers may suffer permanent income losses. Those workers who successfully retrain or move to find alternative employment will tend to experience temporary loss of income.

[1] CEC (2000), p. 6.

But globalisation is not the only potential source of the changes in industrial country labour markets. Technological progress may have led to the automation of many of the tasks previously undertaken by unskilled workers in the industrial countries. The main issue that has concentrated the minds of analysts has been the relative extent to which globalisation and technological change are to blame for increasing social exclusion of groups of unskilled workers in industrial countries.

Much of the research on globalisation has been undertaken in, and has focussed upon, the United States. This project has sought to make a major contribution to the degree of understanding of the role of globalisation in influencing labour markets and social exclusion in Europe. The output of the project suggests that trade may have had a significant impact, particular on within-sector adjustments, whilst the role of technological change may have been relatively even more important in influencing the wage and employment prospects of unskilled workers in Europe. Analyses in the project derived from an approach which recognises the importance of outsourcing have demonstrated that in certain sectors (for example, the textiles sector in the UK) globalisation may have contributed to as much as 40 per cent of the observed increase in inequality between skilled and unskilled workers. Whilst we identify important effects within sectors, the general equilibrium modelling tends to suggest that at the aggregate level it is technological change which underlies most of the increase in inequality. Thus, we can conclude that trade could have been an important factor behind rising inequality within certain sectors, but that the precise magnitude of the overall impact of trade and capital flows is uncertain but is probably small relative to that of technological advancement.

4.2 Implications for Policy in the EU

If trade and capital flows have contributed significantly to the increase in wage and employment inequality for unskilled workers in industrial countries what is the appropriate response from governments in these countries. An impulsive reaction might entail stopping those factors that are perceived as contributing to social exclusion with restrictions on imports and outflows of capital. In Europe should the Commission consider imposing restrictions on the inflow of goods from, and the outflow of capital to, the developing countries? The analysis of this project shows that from an economic point of view the answer to this question is clearly negative. Even if globalisation were the principal factor behind rising inequality, trade barriers and restrictions on long-term capital flows are inappropriate responses to the problems of social exclusion. The reason being that trade and capital

movements bring benefits to the economy and there are policies that can address the issue of inequality whilst preserving the gains from trade.

Given the array of domestic policies available in modern industrial countries, *intervention that constrains trade will be one of the least effective mechanisms in addressing inequality*. In essence, trade brings benefits as well as difficulties and those benefits are strongly expected to significantly exceed any costs that arise. Thus, the more effective policies will be those that tackle the problems of permanent income loss and temporary adjustment problems without removing the gains from trade. In other words, policy should seek to address as directly as possible the problems of social exclusion without making matters worse elsewhere, as trade barriers would do. To date there has not been an extensive public discussion of how governments should respond to widening wage and employment inequality in Europe and what are the most relevant means of redistribution?

It is useful to distinguish between the permanent effects on the distribution of income and the short-term costs that arise from constraints on the adjustment process. With regard to the former, the EU could introduce trade barriers on imports from developing countries to try and reverse the increase in wage inequality. The extent to which such a policy would be successful in raising the relative returns to unskilled labour is unclear given the lack of certainty concerning the precise role of trade, relative to technology, in generating inequality.[1] Nevertheless, there will always be other policies that could achieve the same reversal of inequality but at a lower cost elsewhere in the economy. For example, the government could use tax (targeted towards those who have gained from globalisation) and social spending policies to mitigate the effects of rising inequality. So, even if trade was the root cause of rising inequality and social exclusion, then trade restrictions are not the appropriate response because better policies for redistribution are available.

Along similar lines, if it were convincingly demonstrated that technological advancement was the main factor behind rising wage and employment inequality in Europe, would it really be sensible to restrict the development and application of new technologies? Most people would accept that even if new technology does cause inequality it brings other

[1] Such a policy would have important implications for the developing countries and could undermine other policy objectives of the EU such as those related to development. In addition, there would be the likelihood of retaliation by developing countries which would further reduce welfare in the EU and elsewhere. This prospect explains why some authors feel that the current level of economic integration and welfare is far from secure and that a repetition of the policies that ended the last wave of globalisation in the early decades of the twentieth century, with disastrous economic and human consequences, cannot be ruled out. This is why a full and public discussion of the appropriate policy responses to globalisation is essential.

substantial benefits that are not worth losing. Again, better policies for redistribution exist than curtailing technical progress. *Those who advocate restricting trade but are unwilling to contemplate constraining technology are unlikely to be taking account of the full benefits of trade.*

Given the uncertainty concerning the precise roles of trade and technology in generating inequality, trade restrictions would be even more foolhardy since the direct effect on alleviating inequality could be small. More importantly, if technology were the primary cause but trade restrictions were implemented, then the scope for additional redistribution would be constrained since some of the increase in overall income from more open trade would be foregone.

Deardorff (1998) has argued, on the basis of the point discussed above, that from the point of view of policy response it does not matter whether the main source of rising wage and unemployment inequality is trade or technology. The appropriate intervention, in the form of policies for redistribution via taxes on skilled labour or on skilled labour-intensive products, will be the same whichever is the primary cause. Of course, there are already extensive policies of redistribution in all EU countries. We expect that studies, such as this one, of the impact of globalisation are important since a good understanding of the underlying causes of the recent changes in inequality is an essential part of the public policy debate and is necessary for explaining broadly why policies of redistribution are required.

Thus, there is clearly a need in Europe for a fuller and wider discussion of the recent changes in income distribution and in unemployment propensities for different groups in society and the causes of those changes. In addition, there is probably a case for a broad debate on the complete effects of trade, and globalisation in general, and in particular a better picture of the benefits that are provided. With such a background there would then be scope for a well-founded appraisal of appropriate policies for re-distribution and the case for and rationale behind such interventions in Europe.

It is worth noting that trade policy (for goods) is in the unique competence of the EU whilst the principal means of redistribution between different social groups remain in the hands of national authorities. Hence there is a need for a debate that involves both national governments and the EU institutions. The EU, through the structural funds, does implement policies that seek to reduce inequalities between different regions and, to a very limited

extent, social groups. However, the rationale behind these interventions is not linked to trade or to technological change per se, which is sensible in the light of the discussion above. In addition the vast majority of funds (86 per cent of the budget allocated to structural operations during the planning period 2000-2006) are directed towards regional development.

There is little scope for the EU to intervene to compensate those who suffer permanent income loss due to globalisation and technological progress. As we shall discuss, EU social policy is almost entirely dedicated to employment and adjustment issues, based on the perception that unemployment is the principal factor underlying social exclusion. EU policy does not seek to directly address problems arising from increased wage inequality for those in employment. This remains entirely in the domain of national authorities.

With regard to alleviating the short-term costs of adjustment to globalisation, there are no policies in the EU that are *specifically* targeted at trade-affected sectors or trade-displaced workers. This differs from the situation in the US where there is a dedicated programme for trade-affected workers. The Trade Adjustment Assistance (TAA) programme, established in the early 1960s, initially offered unemployment compensation and re-employment adjustment services to workers who had lost their jobs due to increased import competition. In the 1980s the programme rules were changed to shift the emphasis from compensation to training. As we will discuss further below, this reflects a general desire in OECD countries to move from passive to active labour market policies. In the 1990s an additional programme has been added (NAFTA-TAA) to provide assistance to those negatively affected by imports from Canada or Mexico, or total or partial plant relocation to these countries, following the implementation of the North American Free Trade Agreement.

These trade adjustment assistance programmes in the US are relatively small scale. Sapir (2000) reports that on average less than 4,000 workers per month have been receiving assistance under the two schemes compared with a total number of long-term unemployed of 175,000 per month. So less than 2.5 per cent of unemployed workers have received trade adjustment assistance. Samuel et al. (2000) report that in 1997 the cost of the two schemes was $300 million, of which $120 million was dedicated to training and the rest to income support. The latter is typically available for one year after unemployment benefits, which is usually provided for 26 weeks, cease. Thus, trade adjustment assistance in the US amounts to a tiny fraction of GDP, less than 0.01 per cent.

Despite these trade adjustment schemes it is clear that there is considerable resistance amongst organised labour in the US to further trade liberalisation, apparently much more so than in EU countries. Sapir (2000) suggests that this is because the increase in trade with low-wage countries in the 1980s and 1990s has led to permanent income losses as well as temporary adjustment costs for groups of US workers. The small-scale TAA programmes, which are geared primarily to adjustment, have remained the only response.[1] Burtless et al. (1998) have argued that explicit compensation for trade-displaced workers should accompany training programmes. They advocate a wage insurance scheme whereby displaced workers would be compensated for half of the loss of earnings between previous and new jobs for a period of two to three years.

In Europe, displaced workers are generally caught by a much more extensive welfare system than exists in the US, which has cushioned the impact of trade (and technology) on income inequality and poverty. These welfare systems are almost entirely administered and funded at the national level and there are some important variations in the nature and extent of provisions between different EU member states. But, in the main, EU social protection systems are designed much more from an equity rather than an efficiency perspective, relative to the US approach (Sapir (2000)). Hence, whilst the increase in income inequality has been much less in Europe than in the US, the level of unemployment in Europe has remained persistently higher. Even so there are no mechanisms in EU countries to directly identify and compensate trade-displaced workers who find re-employment on less advantageous terms and therefore suffer permanent income losses.

National policies concerning taxes and transfers, including unemployment benefits, play a major role in reducing the extent of poverty in OECD countries. In the mid-1990s the pre-tax and transfer poverty rate[2] for the working-age population was about 23 per cent in Belgium, 25 per cent in France, 14 per cent in Germany and 23 and 24 per cent respectively in Sweden and the UK. However, the post-tax and transfer poverty rates for the working population were around 6 per cent in Belgium, 7 per cent in France, 9 per cent in Germany and 7 per cent and 12 per cent in Sweden and the UK respectively (Forster (2000)). In general the effectiveness of tax and transfer systems in OECD countries has increased in the period of globalisation. In a number of countries (Australia, Canada, Denmark, Ireland and the US)

[1] Ruggie (1997) reports the desire of the Clinton administration to abolish the TAA schemes entirely and replace them with alternative retraining schemes.

[2] Proportion of persons in households with less than 50 per cent of median disposable income.

pre-tax and transfer poverty rates increased between the mid-1980s and the mid-1990s whilst post-tax and transfer rates fell. For most other countries post-tax and transfer poverty rates increased by less than pre-tax and transfer poverty rates, the exceptions being Germany and the Netherlands. So in most countries the redistributive impact of the tax-transfer system increased in the late 1980s and 1990s.

EU policy was redefined by the extraordinary Luxembourg Summit on employment which took place at the end of 1997. Agreement was reached on a coordinated employment strategy (the Luxembourg Process) whereby each year the Commission submits a proposal for Employment Guidelines. Member States are obliged to take account of these guidelines in setting their employment policies and make annual reports on their implementation. The guidelines are developed around four pillars: employability, entrepreneurship, adaptability and equal opportunities. In the main the guidelines relate to active polices to increase the rate of employment and remove discrimination. Targets have been set for raising the employment rate to 70 per cent by 2010, from 62.2 per cent in 1999. Member states are also required to develop strategies with regard to the acquisition of skills to allow adjustment to economic changes. The guidelines also mention reform of tax and benefit systems although to date little progress has been made on this front. The Joint Employment Report for 2000 concludes that "the development of comprehensive reforms addressing the combined incentive impact of tax and benefit schemes remains, therefore, a priority for most Member States".[1]

The effectiveness of many active labour market policies in unclear, partly because few rigorous evaluations have been carried out in European countries, at least until recently. For example, training programmes have a very mixed record of success. The current state of knowledge demonstrates that such programmes tend to be successful for certain groups, such as adult women, but are generally unsuccessful for other groups, such as youths. However, it is not at all clear why this is the case (Martin (1998)). More generally, there is a need to consider carefully how passive and active labour market interventions interact, both in terms of the impact on the individual and from the overall policy perspective.

4.3 Globalisation and the End of the Welfare State

To date neither the US nor the EU has resorted to widespread trade protection in the face of globalisation, although this abstinence from trade measures is far from guaranteed. Social

[1] Joint Employment Report 2000, COM (2000), 551 final, 6.9.2000.

policies and the safety net provided by the welfare state are clearly a fundamental foundation in all European countries and play an integral role in cushioning the impact of economic changes resulting from globalisation as well as rapid technological change. These interventions are superior to trade restrictions in alleviating inequality and at the same time may be important in preserving the social consensus behind liberal trade policies.

However, a further fear arising from globalisation is that the effectiveness of policies to deal with social exclusion will be eroded as, in the face of increasing mobility of some factors (primarily capital but also highly skilled labour to some extent), the ability to raise taxes to fund social programmes will be compromised. To maintain social spending, taxes on internationally immobile factors, i.e. most types of labour, will have to be continually increased. In this way Rodrik (1997) has argued that governments in industrial economies face a dilemma: globalisation generates rising demand for social protection but at the same time limits the ability of the state to fulfil that role. The argument is taken further to suggest that this process will erode the social consensus underpinning open markets such that there is a real possibility of a re-emergence of the extensive protectionism that undermined economic welfare in the 1930s.

Rodrik (1997) provides some statistical evidence to suggest that openness to trade together with free movement of capital is associated with reductions in government activity in industrial countries. However, there are a number of problems with this analysis. First, government expenditures on welfare and other programmes have been under review in many countries for reasons totally divorced from globalisation. Starting before the onset of the current wave of globalisation there has been a comprehensive and legitimate debate concerning how to reduce the burden of taxation in EU countries, often in the context of how to raise the rate of employment creation in Europe.

Secondly, Rodrik relates openness, as measured by the share of imports plus exports in GDP, to two measures of government activity, social spending and government consumption, both divided by GDP. Thus, there is no attempt to distinguish trade with industrial countries from trade with developing countries. Further, Rodrik's sample starts from the mid-1960s and captures, particularly for EU countries, a considerable expansion, until the 1980s, of trade between the industrial countries. This trade was primarily of an intra-industry nature, the two-way exchange of goods within the same industrial sector, and adjustment costs were fairly limited. Hence, in the initial period with trade and GDP rising and little pressure on social policies it is not surprising that rising openness was associated

with a fall in the share of expenditure on social protection in total income. Next came the 1980s which saw a period of rapidly rising unemployment and a slowdown in the expansion of trade as a share of GDP. The average rate of unemployment in the EU-15 in the 1980s was 8.9 per cent compared with only 4 per cent in the 1970s. In the 1970s the share of total imports of goods and services in EU-15 GDP increased by 6 percentage points. In the 1980s import penetration rose by less than 3 percentage points, although this decade was marked by the rising importance of imports from developing countries. Hence, social expenditures increased rapidly whilst the growth of overall trade ratios slowed.

So, it was only really in the 1980s and 1990s that trade between industrial with developing countries, which is more likely than intra-industrial country trade to generate permanent costs and temporary adjustment problems, has increased. Martin (1998) reports OECD data which show that government spending on labour market measures increased on average in industrial countries from 2 per cent of GDP in 1985 to 3 per cent of GDP in 1995. This spending covers both what are termed passive measures, e.g. unemployment and related social benefits and early retirement benefits, as well as active labour market policies such as training, employment services and so on. With regard to the claim that globalisation has reduced the level of individual social protection for those suffering adverse employment developments, Martin concludes that "few OECD countries have taken steps to roll back the generosity of their benefit systems in recent years in terms of cutting benefit levels and/or reducing the average duration of benefit payments".

In addition, recent trends suggest that industrial countries are not facing overwhelming difficulties in raising revenues to finance the welfare state and social protection systems. The level of taxes in GDP has continued to rise in most OECD countries (*Financial Times*, 3/11/00), with tax reform and attention to tax loopholes generating a greater amount of taxation. Other studies have produced results that contradict those of Rodrik. For example, Swank (1998) finds that international capital mobility is not related to the general retrenchment of the welfare state or to a movement towards a minimal system of social protection.

Although globalisation may not, to date, have led to any substantial deterioration in the welfare state, it could be argued that the inexorable integration of the global economy will sooner or later compromise current levels of social protection in OECD countries.[1] But how

[1] In an interesting paper Ludema and Wooton (2000) show that in the presence of forces for agglomeration of economic activity there will be a U-shaped relationship between trade liberalisation and taxes. This suggests that

much further has the process of globalisation to go? Will we eventually reach a state of perfectly integrated global markets? There are a number of reasons to believe that this integration will be constrained. Empirical applications of models that assume away constraints upon trade (such as the Heckscher-Ohlin model) vastly over-predict the amount of trade that actually takes place. This could be because there is a range of natural barriers to trade which imply that international commerce will be limited even if all man-made barriers to trade could be eliminated, which is quite unlikely. These natural barriers include distance and something that economists have identified as "home bias".

Home bias implies that, other things being equal (mainly prices), consumers will still have a preference towards the purchase of domestically produced goods. To some extent this reflects history and culture but it appears to go much deeper than this. In a study of trade amongst Canadian provinces and between those provinces and US states, McCallum (1995) found that, after controlling for distance and economic factors such as size, trade between two provinces is typically 20 times more intensive than trade between a province and similar state on the other side of the border. This is perhaps strange given the apparent high level of economic integration and cultural similarity of Canada and the US. In this way as McCallum concludes, national borders still matter. Further, Wolf (1997) finds evidence of home bias in trade amongst US states. So even when all trade policy variables are removed there remains a preference for products that are locally produced. This suggests that a borderless world comprising a set of perfectly integrated national markets will not materialise. There are effective constraints upon the level of integration and upon the international division of labour. Nitsch (2000) and Brenton and Vancauteren (2001) find evidence of considerable border effects in Europe even after the creation of the Single Market in 1992.

Why then do borders continue to matter? One of the main reasons is that movement across a national frontier, even those in the EU where, with the Single Market, there are no border formalities and only empty border posts, entails movements into a different legal, regulatory and cultural jurisdiction. These borders 'proscribe, adjudicate and enforce a wide range of norms, rules, habits, networks and the like' (Thompson (2000)), which differentiate one geographical area from another, in terms of both consumers preferences and the legal and institutional environment for doing business. It is most unlikely that globalisation will lead to

---

if there is a problem with funding the welfare state the answer may be further economic integration! This is consistent with Kerchgassner and Pommerehe (1996) who find no evidence of tax competition amongst the cantons of Switzerland, where there is fiscal autonomy and mobility of high-skilled workers.

the harmonisation of tastes across the world. For many modern quality-differentiated products, proximity to the market remains a crucial aspect of effective supply.

On the supply side Rauch (1999) has argued that differentiated manufactured products are often produced in an environment in which complex networks of contacts interact to establish markets and set prices, which usually involves extensive search costs. This can be compared to more standardised products, such as primary products which are traded on organised exchanges or intermediate products, such as chemicals, where trade is based upon 'references prices' quoted in specialist publications. Rauch suggests that trade rises much more slowly with production for the differentiated manufactured products relative to the standardised products. In addition, trade in standardised products has been declining in importance, so that differentiated manufactured products, where network costs are particularly important, are becoming increasingly dominant, but where growth is slower and trade may be ultimately constrained.

Similar arguments also pertain to international capital flows. Investors tend to hold a much smaller number of securities from other countries than one might expect in a well diversified portfolio. Again, investors appear to exhibit home bias and imperfect information and transaction costs remain a barrier to cross-country investment flows. In addition, the amount of long-term capital outflow from a typical OECD country is small relative to the amount of domestic investment, around 3 to 4 per cent (Brenton and Di Mauro (1998)), although the ratio of outward FDI to domestic investment is much higher in countries such as Sweden and the UK. It is worth remembering that the vast majority of long-term capital flows still take place from one OECD country to another. Most of the outward investment by EU countries goes to other EU countries and the US. A very small share of the stock of foreign direct investment by firms in industrial countries is held in developing countries, with most of that having been invested in China, primarily for means of access to an enormous domestic market.

Thus, whilst globalisation will continue, the rate and ultimate level of integration will be constrained. A borderless world in which national governments are hamstrung in their ability to implement independent policies, and in particular are unable to provide current levels of social protection is not a realistic possibility. The choice of the scope and level of social protection will to all intents and purposes remain a national prerogative. However, the key problems facing national welfare systems are, in fact, internal rather than external in

origin. The factor that is proving to be the greatest threat is the ageing structure of western populations and the way in which the pension system in most OECD countries is funded.

Nevertheless, more intense trade and capital flows, together with technological progress, will place some further demands on social protection systems. There is clearly a need to monitor these developments and to improve the effectiveness of tax and transfer systems in alleviating poverty and of active labour market policies in facilitating the return to work. A difficult question that has not received a great deal of public debate is *what is the most appropriate balance between active and passive labour market policies?*

On the one hand if too much attention is given to active labour market policies and fewer resources are devoted to compensation in the form of transfers, then the consensus behind open international markets could be undermined. This in turn would lead to a reduction in the overall level of income if a spell of protectionism were applied in response. In addition, if the emphasis is placed upon education and retraining, then it is clear that those who are helped by such schemes will benefit from the higher wages that are paid to skilled workers. However, those who are unable to benefit from such schemes will be relatively worse off. Thus, in this way retraining and educational schemes can be regressive in the sense that funds are targeted towards those who will become better off. On the other hand, if the emphasis is placed too heavily on compensation then the incentive to retrain, for those who are able to, is diminished. This in turn will reduce the amounts available for redistribution by constraining the number of skilled workers contributing to tax revenues.

4.4 Conclusions on Policy Implications

Whilst it is impossible to reject the assertion that globalisation has had a major impact on wage and employment inequality in Europe and therefore upon social exclusion it is possible to dismiss trade protection and controls on long-term capital flows as an appropriate response. This does not imply that governments should do nothing about the interests of low-skilled workers but that more effective policies for redistribution are available. The analysis above together with the results of the case studies undertaken in this project suggests that adjustment to *globalisation in Europe may have led to the social exclusion* of certain groups of workers and *not just those made unemployed*. Low-skilled workers in certain sectors have faced increased wage differentials and greater employment instability. The increasing use of temporary, part-time and cottage workers has also been the result of the increased flexibility

that firms have adopted in response to greater international competition from low-wage sources of supply.

To date social protection systems in Europe have sought to catch displaced workers regardless of whether they have been affected by globalisation or by technological advance. This is consistent with the view that the magnitude of the impact of trade relative to technology is irrelevant to the policy response, given that both trade and technology bring benefits to an economy which suitable policies for redistribution should seek to preserve. Our analysis suggests strongly that *policy in Europe should not be focussed only upon those who have lost their jobs as a result of globalisation and technological change but should allow for a broader approach which recognises that the employment conditions of unskilled workers may also have been adversely affected.*

Finally, the fear that globalisation will undermine current social protection systems appears excessive. There is no strong evidence to suggest that to date governments have been dismantling welfare systems in the face of globalisation. In addition, there are a number of reasons to believe that borders will always matter and that the seamless world foreseen by some in which all scope for independent action by national governments is removed is most unlikely to materialise.

5. Dissemination and/or exploitation

Our dissemination process in the project has been focused on distribution of working papers, presentation of work at conferences, and interactions with government officials and journalists[1]. We have achieved substantial dissemination through papers, as well as impacat on the policy process.

Papers from the project have appeared in the following working papers series.

Centre for European Policy Studies (CEPS) (Brussels) Working Documents series, and CEPS webpage

Centre for the Study of Globalisation and Regionalisation (CSGR) Working Paper Series

Centre for Research in Economic Development and International Trade (CREDIT) Discussion Papers Series

Department of Economics, Stockholm University, Working Papers in Economics

NBER (USA) Working Papers Series

Papers from the project have been presented at the following conferences:

10th Anniversary Conference, CREDIT, University of Nottingham, September 1998

Mid West International Economics Meetings, Michigan USA, October 1998

Royal Economic Society Annual Conference, University of Warwick, 1998

European Economic Association Conference, Berlin, September 1998

German Economic Association Annual Meeting, Rostock, October 1998

Conference on Trade and Labour Market Adjustment, Centre for Research on Globalisation and Global Markets, Nottingham, 27-29 April 1999

Royal Institute for International Affairs, London, March 1999

Royal Economic Society Annual Conference, University of Nottingham, 1999

Conference of the European Trade Study Group, Rotterdam, 24-26 September 1999 Annual Meetings of the European Economic Association and the German Economic Association, 1999

World Congress of the International Economic Association, Buenos Aires, August 1999

[1] The material suggested for table form in the guidelines for the report is here presented in text, so as to convey more information.

Workshop on International Competition, Productivity and the Labour Market, University of Orebro, 22-24 September 2000

40th European Congress of the Regional Science Association, Barcelona, 30 August-2 September 2000

Congress of the International Economic Society, Munich, 2000

NOITS Annual Workshop on Economics, Helsinki, 5-7 May 2000

The final project conference at the Centre for European Policy Studies (CEPS), Brussels, 1-2 December 2000, was chaired by André Louis Dramais, Acting Director of the Economic Studies and Research Directorate, DGECFIN and Head of the Econometric Model and Medium Term Analyses Unit (ECFIN-A-1). This was attended by around 50 Commission staff researchers, and others who discussed project work and findings.

A special symposium issue of the leading trade policy journal, *World Economy*, is now under way. This will include 5 project papers, and will be specially edited by Paul Brenton on behalf of the project. The focus of the symposium will be globalisation and inequality in Europe, and will draw solely on the papers from the TSER project.Discussions have also been held with Routledge about a further volume of project papers which will include the industry case studies on footwear, the electrical industry, and textiles. this will appear under the Globalisation Studies heading that Routledge carries on behalf of the Centre for the Study of Globalisation and Regionalisation (CSGR) at Warwick.

6. Acknowledgements and References

Berman, E., Bound, J. and Griliches, Z. (1994). Changes in demand for skilled labor within U.S. manufacturing: evidence from the Annual Survey of Manufactures. *Quarterly Journal of Economics* 109, 2, 367-397.

Brenton, P. (2000). Globalisation and Social Exclusion in the EU, CEPS Paperback, Brussels, forthcoming.

Brenton, P.A. and F. Di Mauro (1998). The Potential Magnitude and Impact of FDI Flows to CEECs, CEPS Working Document No. 116, Brussels.

Burtless, G., R. Lawrence, R Litan, and R. Shapiro (1998). Globaphobia: Confronting Fears About Open Trade, Brookings Institute, Washington, D.C.

CEC (2000). Communication from the Commission: Building an Inclusive Europe, COM (2000) 79 final, Commission of the European Communities, Brussels.

Davis, S.J. (1992). Cross-country patterns of change in relative wages. NBER Macroeconomics Annual.

Deardorff, A. (1998), Technology, Trade and Increasing Inequality: Does the Cause Matter for the Cure?' Discussion Paper No. 428, Research Seminar in International Economics, University of Michigan, Michigan (http://www.spp.umich.edu/rsie/workingpapers/wp.html).

de Melo, J, and Robinson, S. (1989). Product differentiation and the treatment of foreign trade in Computable General Equilibrium models of small economies. *Journal of International Economics* 27, 47-67.

Edin, P.-A. and B. Holmlund (1995). The Swedish wage structure: the rise and fall of solidarity wage policy? In Freeman, R. and Katz, L. (eds), *Differences and Changes in Wage Structures*, University of Chicago Press and NBER..

Forster, M. (2000). Trends and Driving Factors in Income Distribution and Poverty in the OECD Area Labour Market and Social Policy, Occasional Paper No. 42, OECD, Paris.

Gottschalk, P. and Smeeding, T. (1997). Cross national comparisons of earnings and income inequality," *Journal of Economic Literature* 35, 633-87.

Grossman, G.M. (1986). Imports as a cause of injury: the case of the U.S. steel industry. *Journal of International Economics* 20, 202-223.

Grossman, G.M. (1987). The employment and wage effects of import competition in the United States. *Journal of International Economic Integration*, 2(1), 1-23.

Hamermesh, D.S. (1993). *Labor Demand*. Princeton: Princeton University Press.

Haskel, J. and Slaughter, M.J. (1998). Does the sector bias of skill-biased technical change explain changing wage inequality? NBER Working Paper No.6565, May.

Holmlund, B. (1997). Löneskillnader och arbetslöshet (*Wage differences and unemployment*). In V. Bergström (ed), *Arbetsmarknad och Tillväxt* (*Labor Market and Growth*). Stockholm: Ekerlids Förlag.

Kerchgassner, G. and W Pommerehe (1996). Tax Harmonisation and Tax Competition in the European Union: Lessons from Switzerland. Journal of Public Economics, 60, pp. 351-371.

Leamer, E. (1996). In search of Stolper-Samuelson linkages between international trade and lower wages in *Imports,Exports and the American Worker*. Washington DC: Brookings Institution Press.

Ludema, R and I. Wooton (2000). Economic Geography and the Fiscal Effects of Regional Integration. *Journal of International Economics*, 52, pp. 331-357.

McCallum, J. (1995). National Borders Matter: Canada-US Regional Trade Patterns *American Economic Review*, 85, pp. 615-623.

Martin, J. (1998). What Works Among Active Labour Market Policies: Evidence from OECD Countries' Experience. Labour Market and Social Policy, Occasional Paper 35, OECD, Paris.

Mayer, W. (1974). Short-run and long-run equilibrium in a small open economy. *Journal of Political Economy* 82, 955-967.

Neary, P. (1978). Short run capital specificity and the pure theory of international trade. *Economic Journal* 88, 488-510.

Neven, D. and Wyplosz, C. (1999). Relative prices, trade and restructuring in European industry. In M. Dewatripont, A. Sapir and K. Sekket (eds), *Trade and Jobs in Europe. Much Ado About Nothing?*. Oxford: Oxford University Press, pp.60-78.

OECD (1997). *Employment Outlook* 15, OECD Publication No.49351, Paris.

Oscarsson, E. (1997). Trade and relative wages in Sweden 1968-91. Research Papers in Economics, Stockholm University.

Rauch, J.E. (1999), "Networks versus Markets in International Trade. *Journal of International Economics*, 48, pp. 7-35.

Revenga, A.L. (1992). Exporting jobs? The impact of import competition on employment and wages in U.s. manufacturing. *Quarterly Journal of Economics*, 92, 225-286.

Rodrik, D. (1997). Has International Economic Integration Gone Too Far?, Institute for International Economics, Washington, D.C.

Ruggie, J.G. (1997). Globalization and the Embedded Liberalism Compromise: The End of an Era?, Working Paper No. 97/1, Max Planck Institute.
Http://www.mpi-fg-koeln.mpg.de/publikation/working_papers/wp97-1/wp97-a.html

Samuel, H.D., L. Chimerine and M. Fooks (2000), "Strengthening Trade Adjustment Assistance" (http://www.econstrat.org/taa.htm).

Sapir, A. (2000). Who is afraid of globalization? The Challenge of Domestic Adjustment in Europe and America. Paper presented at the Conference on Efficiency, Equity and Legitimacy: The Multilateral Trading System at the Millennium at Harvard University, June.

Shoven, J. and Whalley, J. (1992). *Applying General Equilibrium*. Cambridge: Cambridge University Press.

Swank, D. (1998). Funding the Welfare State: Globalisation and the Taxation of Business in Advanced Market Economies, *Political Studies*.

Thompson, G. (2000). Taking Economic Borders Seriously. Paper prepared for the workshop on 'Methodologies for Boundaries', University of Surrey, May, http://www.surrey.ac.uk/LIS/MNP/may2000/Thompsonedited.htm

Wolf, H. (1997). Patterns of Intra- and Inter-State Trade. Working Paper 5939, NBER, Cambridge, MA.

7. Annexes

List of publications

Abrego, L. and Whalley, J. (2000). The choice of structural model in trade-wages decompositions. *Review of International Economics* 8, 3,462-477.

Anderton, R. and Brenton, P. (1999). Outsourcing and low-skilled workers in the UK. *Bulletin of Economic Research* 51, 4, 267-85.

Anderton, R. and Brenton, P. (1999?). The dollar, trade, technology and wage inequality in the USA. *National Institute Economic Review* No.

List of papers

Abrego, L. (1999). "Labour market institutions and decomposition of wage equality outcomes", University of Warwick, December, mimeo

Abrego, L. and Whalley, J. (2000), "Goods market responses to trade shocks and trade and wages decompositions", University of Warwick, March, mimeo

Abrego, L. and Whalley, J. (2000), "Decomposing wage inequality change using General Equilibrium models", University of Warwick, September, mimeo.

Anderton, R. and Brenton, P. (1999) "Outsourcing and Low-Skilled Workers in the UK", *Bulletin of Economic Research*, 51, 267-286 initially available as,Anderton, R. and Brenton, P. (1998) "Outsourcing and Low-Skilled Workers in the UK", Working Paper 12/98, Centre for the Study of Globalisation and Regionalisation, University of Warwick

Anderton, R, Brenton, P and Oscarsson, E (2001) "What's Trade got to do with it? Relative Demand for Skills within Swedish Manufacturing", Working Document 162, CEPS, Brussels, submitted for publication to the Scandinavian Journal of Economics

Brenton, P (2000) "Globalisation and Social Exclusion in the EU: Policy Implications", Working Document 159, CEPS, Brussels

Brenton, P (2001) *Globalisation and Social Exclusion in the EU*, CEPS, Brussels, forthcoming

Brenton, P and Pinna, AM (2000) "Trends in Disaggregated Import and Export Prices in Europe: Implications for the Trade and Wages Debate", Working Document 141, CEPS, Brussels a revised veriosn of this paper is now

Brenton, P and Pinna, AM (2001a) "Trends in Disaggregated Import and Export Prices in Europe: Implications for the Trade and Wages Debate", accepted for publication in the *Scottish Journal of Political Economy*,

Brenton, P and Pinna, AM (2001b) “The Declining Use of Unskilled Labour in Italian Manufacturing: is Globalisation to Blame?”, forthcoming as Working Document, CEPS, Brussels

Brenton, P, Pinna, AM and Vancauteren, M (2000) “Globalisation and Social Exclusion: a Study of the Footwear Industry in Europe”, mimeo, Centre for European Policy Studies (this paper has been requested by the WTO and is now available in the WTO library) This is the comprehensive report a more condensed version is available as

Brenton, P, Pinna, A and Vancauteren, M (2000) “Adjustment to Globalisation: A Study of the Footwear Industry in Europe”, Working Document 151, CEPS Brussels

Diehl, M. (1999), “The impact of outsourcing on the skill structure of employment: empirical evidence from German manufacturing”, Kiel Working Paper No.946, Kiel Institute of World Economics, September 1999.

Diehl, M. (2000), “Globalisation and employment in the EU electrical industry: a case study with emphasis on Germany”, Kiel Working Paper No.1005, Kiel Institute of World Economics, October 2000.

Jimeno, J,F., Cantó, **Cardoso, A.R.**, Izquierdo, M. & Rodriques, C.F. (2000),” Integration and inequality: lessons from the accessions of Portugal and Spain to the EU”, Documento de Trabajo FEDEA 2000-10, Madrid: Fundacion de Estudios de Economia Aplicada.

Lücke, M. (1999). Sectoral value-added prices, TFP growth, and low-skilled wage in high-income countries. Kiel Working Paper No.923, April.

Oscarsson, E. (2000), “Trade, Employment and Wages in Sweden, 1970-93”, Working Papers in Economics 2000:8, Department of Economics, Stockholm University.

Conference presentations

1998

Lisandro Abrego and John Whalley: “General Equilibrium Analysis and the Trade and Wages Debate”. Presented at Stanford University, USA, November 1998, by John Whalley.

Lisandro Abrego and John Whalley: "Ambiguity Enhancing Calculations and the Trade and Wages Debate". Presented at 10th Anniversary Conference, CREDIT, University of Nottingham, September 17th 1998 and at the Mid West International Economics Meetings, Michigan, October 1998.

Bob Anderton and Paul Brenton: "Outsourcing and low-skilled workers in the UK". Presented at the 1998 Royal Economic Society Annual Conference at the University of Warwick.

Matthias Lücke: "Searching for the Cause of Declining Low-Skilled Wages and Employment: Sectoral Value Added Prices in 11 OECD Countries Since 1970" Annual

Congress, European Economic Association, Berlin, September 1998; Annual Meeting, Verein für Socialpolitik (German Economic Association), Rostock, October 1998.

1999

Lisandro Abrego and John Whalley: "The Choice of Structural Model in Trade and Wages Decompositions". Presented at the Conference on Trade and Labour Market Adjustment, Center for Research on Globalisation and Global Markets, University of Nottingham, April 27-29 1999.

Bob Anderton: "European Unemployment and Globalisation". Presented at Royal Institute for International Affairs', March 10th 1999.

Bob Anderton and Paul Brenton: "The dollar, trade, technology and wage inequality in theUSA". Presented at the 1999 Royal Economic Society Annual Conference at the University of Nottingham.

Paul Brenton and Anna-Maria Pinna: "Trade and wages: what can disaggregated import and export price data tell us". Presented at the Conference of the European Trade Study Group, Rotterdam, 24-26 September 1999.

Markus Diehl: "The impact of outsourcing on the skill structure of employment: empirical evidence from German manufacturing". Presented at the Annual Conference of the European Economic Association, Santiago de Compostela, September 1999 and at the Annual Meeting of the Verein fuer Socialpolitik (German Economic Association), Mainz, October 1999.

Matthias Lücke: "Sectoral Value Added prices, TFP growth, and the low-skilled wage in high income countries". Presented at theWorld Congress of the International Economic Association, Buenos Aires, August 1999, and at the Inaugural Conference of the European Trade Study Group, Rotterdam, September 1999.

2000

Bob Anderton, Paul Brenton and Eva Oscarsson: "What's trade got to do with it? Relative demand for skills within Swedish manufacturing". Presented at a workshop on International Competition, Productivity and the Labour Market, University of Orebro, 22-24 September 2000.

Paul Brenton, Anna Maria Pinna and Marc Vancauteren: "Adjustment to Globalisation: a study of the footwear industry in Europe". Presented at the 40th European Congress of the Regional Science Association, Barcelona, 30 August-2 Septembe 2000.

Cardoso, Ana Rute: "Trade and jobs in Portugal". Presented at the conference on Globalisation and Social Exclusion: The Impact of Trade with Low-Wage Countries on European Labour Markets, Brussels, 1-2 December 200.

Markus Diehl: "The impact of outsourcing on the skill structure of employment: empirical evidence from German manufacturing". Presented at a seminar at Hamburg University, April 2000.

Matthias Lücke: "Sectoral value added prices, TFP growth, and the low-skilled wage in high income countries". Presented at an IMF staff seminar, April 2000.

Matthias Lücke: "Evolving patterns of trade specialisation and demand for low-skilled workers in high-income countries. Presented at the Congress of the International Atlantic Economic Society, Munich.

Eva Oscarsson: "Trade, employment and wages in Sweden, 1975-19993". Presented at the NOITS Annual Workshop on Economics, Helsinki, 5-7 May 2000
John Whalley: "Decomposing the effects of trade and technology on wage inequality": Presented (by Paul Brenton) at the conference on Globalisation and Social Exclusion: The Impact of Trade with Low-Wage Countries on European Labour Markets, Brussels, 1-2 December 200.