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Globalisation, Employment, and Wage Rate:
What Does Literature Tell Us?

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ABSTRACT

This paper provides a literature review on the labor market outcome of international trade and outsourcing trends in developed countries, focusing on employment, wage rates, and wage dispersions. However, the literature offers ambiguous answers. International trade and outsourcing are examined not to be the determinant force of labour market movements. It tends to add to rising inequality and lowering the demand for low-skilled workers in Anglo-Saxon economies, while there is no clear-cut result for continental Europe. It induces skill-biased wage differentials and cross-sector change. Causality of globalisation effects on labour market and the inter-sectoral spill-over effects are underappreciated.

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I.   Introduction

The second globalisation wave has been marked by fast pacing international goods and services trade. Due to lower tariff rates on parts and components, technology progress, and sunk transportation cost, multinational firms have been fragmenting (Jones, Kierzkowski and Leonard, 2002) and unbundling (Baldwin, 2006) manufacturing processes into spatially independent procedures and reallocating those processes with less technology know-how to developing regions and countries. During this process, vertical specialisation emerges (Hummels, Ishii and Yi, 2001; Yi, 2003), which means industrialised economies are supposed to slice up global value chain by specialising in those production processes requiring more technology know-how and higher quality of human resources, while emerging economies specialise in those processes requiring less technology know-how but more demanding on lower labour cost and land rent. Multinational firms are using outside contractors (Abraham and Taylor, 1996; Feenstra and Spencer, 2005) to subcontract business activities, ranging from product design to assembly, from research and development to marketing, distribution and service. Thus, offshore outsourcing is transforming business model and our economy as a whole. As Grossman and Helpman (2005) put it: "We live in an age of outsourcing".

Media and public debate tend to take globalisation as one of the major forces moving jobs away from industrialised economies to the developing third world. Public debates on this job loss effect have been widespread, although economic research provides remarkably divided empirical results. In the US, the 1994 Perot-Gore debate of NAFTA was on whether low-labour-cost economies will pull jobs away from high-labour-cost advanced economies. Ross Perot protested that NAFTA would lead to a "great sucking round" in the US and the US workers were doomed because Mexican worker earned a wage one-fifth as high. Primed for that point and based on productivity differences, Gore argued that there was nothing to fear at all because Mexican workers were only one-fifth as productive as American workers. In recent years more intense debate on outsourcing and its job loss effect by politicians and journalists have aroused considerable stir in the public in many OECD countries. Fear of job loss is rambling about, even though many of these economies have been seeing improving employment records. So, the skeptics towards the job losing effect of globalisation deserve a serious examination.

Four arguments overshadow the widespread public opinion toward the negative effects of globalisation on labour market. First, although some literature does support the short-term job losing effect of globalisation, its long-term job creation benefit has been emerging as a new strand of research in recent years (Bhagwati, Panagariya and Srinivasan, 2004; Amiti and Wei, 2006). Secondly, increased trade with developing economies place diversified influence over skilled and unskilled workers in industrialised economies. As most industrialised economies are relative high-skilled labour intensive and industrialising low-skilled labour intensive, it is predicted that the demand for high-skilled labour in industrialised economies tend to rise due to

increased international trade with industrialising economies. So does the relative wage rate. A strand of empirical research examines this skill bias effect of globalisation on wage rates. Thirdly, trade and outsourcing also have sectoral effect on the demand for labour and cross-industry wage differentials. Fourthly, globalisation effects also diversify among industrialised economies and across time. In sum, these factor as on which country the study is inspecting[1], on which period the study is focusing, with whom the country is trading, and what kinds of products[2] are traded all matter for the empirical analysis of the globalisation effects on labour market.

This study is a literature review about the effects of globalisation – international trade and offshore outsourcing - on labour markets, namely employment, wage rates, skill bias and cross-sectoral differentials.

II.   Labour Market in Globalisation: Some Facts

Recent labour market development in most OECD economies is promising. As OECD Employment Outlook 2007 reported, the employment record improved significantly in 2006 in the OECD area as a whole. Employment growth accelerated -up from 1.1% in 2005 to 1.6% in 2006. This employment growth appeared to be especially strong in European OECD countries by outpacing labour force growth in most of these countries - leading to a fall in unemployment rates in 2006. Unemployment, as projected by OECD, tends to continue declining during 2008 in the OECD area, which may bring the unemployment rate down to 5.5% in average (OECD, 2007).

However, structural change is undergoing. Nonconformity does exist among the US, the UK, and continental European countries. Trade effects on labour market in continental European economies is more significantly embodied in the shifting structure of skilled-nonskilled employment ratio rather than the dispersing wage rates between skilled and unskilled-labour in the US and the UK (Strauss-Kahn, 2003; OECD, 2007). Because of price rigidities and strong roles of institution and regulations in continental European labour markets, the wage differentials between skilled and unskilled-labour are limited. However, in the US and the UK during 1970-1995, wage rates started becoming much more unequally distributed between skilled and unskilled-workers and among workers within same skill level (Feenstra and Hanson, 2001; Strauss-Kahn, 2003).

Wage moderation. Since the late 1970s, the wages of less-skilled US workers have fallen dramatically, both in real terms and relative to the wages of more-skilled US workers (Feenstra and Hanson, 1996, 2001). Somewhat similar situation has been seen in the UK while the skill premium fell from the 1950s to the late 1970s and then rose very sharply (Haskel and Slaughter, 1999). Regarding the OECD countries in average, despite lower unemployment rates, there were by far no significant upward pressures on real wage gains. Average real

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[1] Therefore, as Bhagwati and Srinivasan (2002) points out, the cross-country regression is a poor way to approach the question of globalisation effects on labour market.

[2] Here is meant that, either products in different industries, or products in different production stages, e.g. parts and components or final products.

compensation per employee in the business sector has risen from 0.6% in 2005 to 1.2% in 2006, but remains well below overall labour productivity growth – of around 1.5%. This growth rate is also on par with the average growth during the 1994-2004 period, a decade of wage moderation (OECD, 2007).

Deindustrialisation has been perceived in many OECD countries. Measured by the ratio of trade relative to merchandise value-added, the shares of the economies devoted to services rather than merchandise have been increasing. Manufacturing sector showed sluggish trend regarding the share in total GDP, the ratio of manufacturing sector imports to total GDP, and the ratio of manufacturing employment to total employment (Sachs and Shatz, 1994; Feenstra and Hanson, 2001). Therefore, decreasing labour demand in manufacturing sector could be, at least partly, due to deindustrialisation.

Due to vertical specialisation, increasing importance of parts and components trade may be instrumental in transferring the labour market structure. Between 1972 and 1990, imported intermediate inputs increased from 5.3% of material purchases to 11.6%[3]. Through the channels of price effect, productivity growth and reallocation of labour between skill groups, growing degree of vertical speiclaisation is to impose structural effects on labour market as well.

III. Theoretical Models

The examination of labour market structural changes normally embraces two approaches: supply shift and demand analysis. Early work in the 1970s emphasized the role of "exogenous" relative supply shifts from changing demographics and school completion rates (Freeman, 1979; Welch, 1979). However, since the later 1970s, demand analysis has been catching more attention. Industrial demand for labour rejects the assumption of stable factor demands; and, the important role of demand shifts for more-educated workers has been perceived. To put it specifically, the demand side shifts are induced by such factors as skill-biased technological change, non-neutral change in other input prices or supplies (e.g. capital-skill complementarity), product market shifts, and the forces of globalisation (Autor, Katz, and Krüger, 1998; Katz and Murphy, 1992; Murphy and Welch, 1992; Katz and Autor, 1998). Herein, this work keeps focused on the effect of globalisation[4] -international trade and outsourcing- on labour market.

Traditional trade theories examine the factors influencing the international trade flows. Factor endowment based Heckscher-Ohlin (H-O) theory is one of the most widely accepted. The H-O hypothesis is based on a two-good two-factor form. It says that, in free trade, countries will export products that use intensively their abundant factors of production and import products that use the countries' scarce factors. Therefore, relative endowments of the factors of production (land, labour and capital) determine a country's comparative advantages. Given

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[3] By the United Nations Broad Economic Categories classification, Hummels, Ishii and Yi (2001) finds that, intermediate share of total trade in OECD countries has been steadily declining since 1970. Yeats (1998) shows that, as a factor of intermediates trade, parts and components trade share in total trade has been increasing. This different trend induced the measure of vertical specialisation by Hummels, Ishii and Yi (2001).

[4] A bulk of literature is on the FDI effects on labour market as well. This work is concentrating on inspecting the impacts of trade and offshore outsourcing.

industrialised countries are abundant of skilled-labour while industrialising developing economies of less-skilled-labour, industrialised will tend to export more skilled-labour intensive products while developing economies tend to export more of less-skilled-labour intensive products.

Based on H-O framework, the so called "Factor Price Equalisation" (FPE) version of Heckscher-Ohlin-Samuelson (HOS) theorem specifies that, under identical constant-returns-to-scale production technologies, free trade in commodities will equalise relative factor prices through the equalisation of relative commodity prices, so long as both countries produce both goods. Put into the North-South trade scenario, the FPE theorem leads to the prediction that free trade with developing countries will drive the wages of unskilled-workers in industrialised economies down to those levels of unskilled-workers in developing economies. Critics of the FPE theorem argue that the FPE only holds under conditions of incomplete specialisation. Once countries become fully specialised, the strong links between international wages and product prices break down.

Stemming from H-O hypothesis, the Stolper-Samuelson theorem is on the price transmitting channel from commodities to factors used in producing exported goods. It says, if there are constant returns to scale and if both goods continue to be produced, a relative increase in the price of a commodity will increase the real return to the factor used intensively in the industry and reduce the real return to the other factor. It predicts that international trade will shift income toward the country's abundant factor.

However, either FPE or Stolper-Samuelson theorem is based on the hypothesis that there is an absence of trade barriers. An obvious fact demonstrating their failure is the result from trade liberalization in developing countries. Given industrialised economies are abundant in skilled-labour and industrialising in unskilled-labour, Stolper-Samuelson theorem says that international trade shall increase the real wage of the unskilled-labour in poor countries while lower the real income of the scarce factor – skilled-labour. But empirical results are not consistent with theories (Robbins, 1996; Sachs and Shatz, 1996; Davis, 1996; Davis and Mishra, 2004). Countries being labour-abundant in a global sense may see unskilled-labour wage decline in globalisation if these countries are capital-abundant in local sense (Davis, 1996; Davis and Mishra, 2004).

Similarly, comparative advantage theory, as another important strand of international trade theory, did not escape the fate being pointed to be likely to fail to decode how the second globalisation era has been changing the world economy. One important aspect of the modern reality is that the patterns of comparative advantage can and do change over time. Jagdish Bhagwati (1998) has labeled this phenomenon as "kaleidoscopic comparative advantage". Thus, questions are, how kalerdoscopic comparative advantage is or tends to be, what effects it will impose on labour markets in the industrialised economies, and what would be the influence over those in the emerging economies.

IV. Empirical Models

1. Is Trade Responsible for Labour Market Shifts?

Three basic facets of labour market are examined in the literature: employment, wage rates and skill bias. Have offshore outsourcing and increasing imports from low-wage countries been reducing employment opportunities in the industrialised countries? Is it the trade with emerging economies or the domestic economic structural change itself that has the power to explain wage moderation and skill bias occurring in labour markets? In the first place, competition from low wage countries may suggest a job loss effect in industrialised economies. However surprisingly, economic data do *not* suggest that globalisation has been a barrier to creating enough jobs to employ the available labour force.

Krugman and Lawrence (1993) demonstrates two essential phenomena: (i) the real compensation of the average US worker in 1991 was only 6 percent higher than it had been in 1973, which says effectively that the real wage rise is much less satisfactory than between the end of the second World War and the early 1970s; (ii) a growing skilled-unskilled worker compensation dispersion has been demonstrated by the rise of highly educated worker compensation coupled with the falling blue-collar worker real wage. The question is: is trade central to the US labour market performance? From the following three perspectives they give the answers: the role of international trade in the deindustrialisation of the US economy; the effects of global competition on the growth of US real compensation; and, the effects of trade on US income distribution.

First, the share of manufacturing in GDP fell 6.6 percent points between 1970 and 1990, while the trade balances in manufactures deteriorated by only 1.6 percentage of GDP during the same period. International trade can only explain a small part of the decline of the importance of US manufacturing sector[5]. Furthermore, if estimated on the basis of real consumption rather than on a value term, the share of manufactures consumption has not declined. It was the declining manufactures' prices, as the result of a more rapid productivity growth in manufacturing sector than in service sector, which explains the decreasing share of manufacturing in total value-added.

Secondly, they use a measurement of "command GNP"[6] to specify the reason of the stagnation of real compensation during 1973-90 being rather a result of the decline of productivity growth than of international competition. The US had experienced significant deterioration in its terms of trade over the 1970s and the 80s, but given import and export only accounted for 11.3% and 10% of the US GDP respectively, the impact of trade on the whole economy was less strikingly than expected. By comparing the real compensation, real GNP

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[5] They adopted the term of "leakage to service sector", which suggests even the impact of trade imbalance on manufacture value-added need to be scaled down to a factor of 0.6 due to the purchase of service inputs. That means, each dollar of trade deficit reduces value-added in US manufacturing by only US$0.6.

[6] Krugman and Lawrence (1993) adopted the measurement of "command GNP", in which the value of export is deflated by the import price index, but not by the export price. By using command GNP, one may screen out the terms of trade effect on GNP measurement. Thus, an adverse trend in the terms of trade should appear as a lag of command GNP behind real GNP.

and command GNP during the two periods: 1959-1973, and 1973-1990[7], they find the decline of command GNP growth can be explained by the decline of the growth of real GNP per worker – that means, by the purely domestic impact of the decline in productivity growth.

Thirdly, trade has not been the only force pushing down unskilled-labour wages. Should trade with low wage countries be the only force driving up skilled-labour wages while keeping unskilled-labour wages low, industries would have employed more skilled-labours. So, the skill-intensive industries would have been growing faster than others. However, industry data seem not to support this argument[8]. Furthermore, even in the 1990s, the competition from low wage countries was not severe because the average wage rate of the US trading partners (weighted by total bilateral trade) was quite high at 88 percent of the US level. However, in the 1960s when the traditional trading partners - e.g. Japan and most European countries – were low wage countries when compared with the US, the real wage rise was fairly satisfactory.

Based on the abovementioned three observations, Krugman and Lawrence (1993) reaches the conclusion: trade and international competition can explain merely a very limited part of the poor performance of the US economy and its larbour market during the period of 1973-1990. Trade is not responsible for labour market bias. So, trade is naïve.

2.　　　　　　Measurement of Globalisation and Offshore Outsourcing

Recent empirical studies adopted new methodologies to examine to what degree and by which means globalisation has been transforming labour market. In the first place, several measurements of globalisation, offshoring and outsourcing are most often used.

2.1 Material offshoring-outsourcing

Feenstra and Hanson (1996) defines outsourcing, based on the Census of Manufactures definition of manufactured materials, as including two types of intermediate inputs: (i) parts and components, and (ii) contract work done by others [9] . They measure material offshoring-outsourcing as the share of imported intermediate inputs in the total purchase of non-energy materials. The imported intermediate inputs for a given industry is estimated as the value of input purchases from each supplier industry times the ratio of imports to total consumption in the supplier industry, summed over all supplier industries.

2.2 Service offshoring

Amiti and Wei (2006) adopts the material offshore outsourcing measure (osm) in Feenstra and Hanson (1996), and further defines the offshore intensity of services as following:

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[7] The period of 1959-73 was marked by sustained growth of real compensation, faster growth of command GNP than real GNP per hour in the US; whereas over the course of 1973-90, the US had been seeing stagnated real compensation, slower command GNP growth compared with the growth of real GNP per hour. And during each period, the difference between command GNP growth and real GNP growth was actually minor.

[8] During 1979-89 when the real compensation of white-collar workers rose while blue-collar workers fell, all industries employed more while-collar workers. And, skill-intensive industries did not grow faster than others. These two facts suggest effectively that trade is not the only force driving up skilled-labour wages relative to unskilled-labour wages.

[9] "Contract work done by others" indicates goods produced entirely by subcontractors, whereas the US manufacture attaches its brand name to a finished product.

$$oss_i = \sum_j \left[\frac{\text{input purchases of service j by industry i, at time t}}{\text{total non-energy inputs used by industry i, at time t}} \right] \times \left[\frac{\text{imports of service j , at time t}}{\text{production}_j + \text{imports}_j - \text{exports}_j \text{ , at time t}} \right]$$

2.3 Import penetration

$$m_{ikt} = \frac{M_{ikt}}{Y_{ikt} + M_{ikt} - X_{ikt}}$$, where M refers to the value of imports of industry i by country k, X to the value of exports of industry i in country k and Y to gross product. Import penetration proxies an overall index of foreign competition in an industry.

2.4 Offshoring

$$O_{ikt} = \frac{\sum_{j=1}^{J} O_{ijkt}}{V_{ikt}}$$, OECD (2007) uses this function to number offshoring. Herein, O refers to the imports of intermediates from industry j by country i, and V refers to value-added in industry j.

2.5 Industry-specific real exchange rate

Industry-specific real exchange rate is a transformed indicator of trade effect in monetary sense.

$$x_{ikt} = \sum_{i=1}^{I} \sum_{l=1}^{L} m_{iklt=0} e_{klt} p_{lt} / p_{kt}$$, where m stands for the import share from country L in industry i of country K at the beginning of the sample t=0. The import weights vary across industries and countries but are constant over time. The parameter e refers to the nominal exchange rate between country K and L at time t, which suggests that e varies across countries and time, but not across industries. P refers to price level and is proxied by the GDP deflator (OECD, 2007)[10].

3.   Trade and Employment

Empirical results on the effect of trade on employment vary. So do the methodologies being employed. Recent empirical studies use panel data analysis based Input-Output (I/O) matrix. Regarding to different economies being examined, different levels of industry on which the study is focused, and different globalisation measurements being used, the empirical results of panel analyses diversify.

Amiti and Wei (2006) estimates the effects of both service and manufacture offshoring on productivity and employment in US manufacturing industries between 1992 and 2000. They

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[10] As suggested by Bertrand (2004), the industry-specific exchange rate is unlikely to be correlated with the unexplained components of changes in labour market outcomes, conditional on including time dummies. So, this measure may serve as a more appropriate proxy for the analysis of the impact of foreign competition on employment for its feature of being less subject to endogeneity bias. And compared with tariff, industry-specific exchange rates have another advantage of exhibiting greater variation across time.

based their study on the following production function for industry i:

$Y_i = A_i(oss_i, osm_i)F(L_i, K_i, M_i, S_i)$, which means output Y is the function of labor L, capital K, materials M, and service inputs S. The technology shifter A is the function of services offshoring oss and material inputs offshoring osm. Offshoring affects productivity through at least four channels: a static efficiency gain, restructuring, learning externalities and variety effects. Further on, because cost minimisation leads to the optimal demand for inputs for a given level of output Y, they take the conditional labor demand as a function of wage rate w, rental r, material input prices q^m, service input prices q^s, output Y, and offshoring oss_i, osm_i:

$$L_i = g(w_i, r_i, q^m, q^s, Y_i)/A_i(oss_i, osm_i).$$

Thus, offshoring is affecting labour demand through three channels: substitution effect through q^m and q^s, productivity improvement and scale effect. To allow for the scale effect, combining the above two equations, the labour demand was given by them as following:

$$L_i = g(w_i, r_i, q^m, q^s, p_i, oss_i, osm_i)/A_i(oss_i, ism_i),$$ where p_i is the price of the final output.

The conditional labour demand is estimated in first differences as a log-log specification as used in the former empirical literature (Hamermesh, 1993; Hanson, Mataloni and Slaughter, 2004). Wage is taken as exogenous to the industry, which suggests that labour is perfectly mobile and no industry specific rents existing. The estimation model is given as:

$$\Delta \ln l_{it} = \gamma_0 + \gamma_1 \Delta oss_{it} + \gamma_2 \Delta osm_{it} + \gamma_3 \ln \Delta w_{it} + \gamma_4 \Delta \ln p_{it} + \delta_t D_t + \delta_i D_i + \varepsilon_{it}.$$

Their final estimation results show that trade effect on employment is diversified regarding at which level the effect is to be examined. At finely disaggregated industry level at which 450 manufacturing industries are included, small negative effect of less than half a percent on employment was perceived. However, this negative effect disappears at a more aggregated industry level of 96 industries.

Geishecker (2002) uses German input-output matrix at 2-digits industry level for 23 manufacturing industries to analyse how international outsourcing has been affecting the relative demand for low-skilled workers in Germany during the 1990s. His model integrates high- and low-skilled-labour wage rates, fixed capital inputs, imported intermediate inputs, and technology change proxied by the share of research and development in total output. He suggests a significant negative impact of international outsourcing on German labour market, which can explain between 19% and 24% overall decline in the relative demand for low-skilled workers [11]. Although obviously he took the demand side analysis approach, concerning

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[11] From Geishecker's calculation, international outsourcing of German manufacturing sector increased by 9.74 percentage points between 1991 and 2000; while the low-skilled cost share in the total wage bill of manufacturing sector decreased by 4.06 percentage points. And his result also suggests a strong impact of skill biased technology shift on low-skilled labour demand in manufacturing sector.

German reunification during the period of the 1990s, the sudden increase of the relative abundance of unskilled-labour to skilled-labour may equally have significant effect on the share of low-skilled cost in total pay-roll.

The essential merit of Input-Output analysis is that I/O table provides detailed information of offshoring by industries. However, it is also not the only way to measure offshore, outsourcing and vertical specialisation. Especially, though I/O does show the extent of offshoring, it may not unveil the embedded information of vertical specialisation in international trade. For example, the imported computers of financial sector may not be further processed in financial sector but rather be for direct usages. Furthermore, another hypothesis of using I/O tables is all trading partners are identical concerning the traded goods' structures or the diversification is not to be considered.

Onaran (2007) is taking a different approach supplementing more information on vertical specialisation and different characteristics of trading partners. She estimates the impacts of imports of final products and imports of intermediates from the three groups of partners on Austrian manufacturing sector employment and wage during 1996-2005 [12]. She also differentiates Austria's trade partners into three groups - industrialised economies, Eastern European countries, and the rest of the world. In her model, outsourcing is proxied by "total trade intensity"[13]. The estimation results show that, final products imports from developed group of countries and intermediate imports from the rest of the world have negative impact on blue-collar labour employment in Austrian manufacturing sector, while final products imports from Eastern European countries has a one-period-lag negative effect. During the same course, imports from these three groups of partners all generate positive effects on the demand for while-collar in Austrian manufacturing sector. One unexpected result of her estimation is that wage is neutral to employment.

More or less, most of the studies focus rather on job effects at industry level. However, the existence and pervasion of spill-over effects of high-paying jobs to the whole labour market may be taken into consideration when inspecting the overall effects of outsourcing on labour market demand. Egger and Egger (2005) aims at revealing inter-sectoral spill-over effects of the impacts of globalisation on employment. In their empirical application for Austrian data on outsourcing to the Central and Eastern European countries, they find indirect spillover effects account for about 2/3 of the estimated impacts of international outsourcing on employment. Beaudry, Green and Sand (2007) highlights the spill-over effect of changes in job composition on wages, which were found to be "pervasive, persistent and large". Thus, they suggest a proper evaluation of the effects of increased international trade and outsourcing to be incorporating the potential spill-over effects on wages in other sectors.

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[12] As to Onaran (2007), in the last three decades, a dramatic change in income distribution has been ongoing with the wage share in total value added in non-agricultural sector declining from 72% in 1978 to 54.9% in 2005. During 1996-2005, Austria experienced a decline of 4.7% employment.

[13] Trade is specified by Onaran (2007) as "total trade intensity", formulated as: $\frac{exports}{output} + \frac{imports}{domestic\ consumption}$, because the high multicollinearity between imports and exports tends to bias the coefficients of imports and leads to shifts of signs in the coefficients.

4. Trade, Wage Rates and Skill Bias

The examination of wage structural changes normally has two approaches: supply shift and demand analysis. Early work examining US wage structural changes in the 1970s emphasized the role of "exogenous"[14] relative supply shifts from changing demographics and school completion rates as the driving forces behind relative wage changes (Freeman, 1979; Welch, 1979). However, since the later 1970s demand analysis has gained more shares. The trade effects on wage rates emerged as an important facet deserving more study (Borjas, Freeman and Katz, 1991; Autor, Katz, and Krüger, 1998; Katz and Murphy, 1992; Murphy and Welch, 1992)[15], although as Deardorff and Hakura (1994) pointed out, in this stream of work the wage equations themselves are not well motivated by theories.

Wage moderation and skilled-labour compensation premium have been recognized as essential phenomena dominating the period between 1973 and 1990. These two phenomena are equally critical for a better understanding of the trade impact on labour market during that period in the US and the UK[16]. Since the 1990s, literature has dealt extensively on the international trade and offshore outsourcing effects on wage rates and skill bias (Feenstra and Hanson, 1996, 1999, 2001; Loverly and Richardson, 1998; Anderton and Brenton, 1998; Greenway, Hine and Wright, 1999 etc.). Again, empirical results of the impact of trade on wage rates and skill bias exhibit no less diversification compared with those of the trade impact on employment.

Feenstra and Hanson (1996, 1999, 2001) estimates the correlations between outsourcing - the change in outsourcing and the change in the import share of consumption- and the non-production wage share and skill premium. Here, the share of non-production wage is proxied as the degree of trade and outsourcing's impact on wage. They find such semi-durable consumer goods industries as electric and electronic machinery, instruments and other industries (jewelry, toys and sports equipment) are amenable to outsourcing. The estimation results show, during the period 1979-90, both the change in outsourcing and the change in the import share are positively correlated with the change in the non-production wage share, and the correlation is highly statistically significant. Material outsourcing explained about 40 percent of the increase in the skill premium in the US in the 1980s.

As trade with developing economies has increased fairly fast since the 1980s, the labour

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[14] In particular, as Deardorff and Hakura (1994) have emphasized, the volume of trade is an endogenous variable which is simultaneously determined with wages.

[15] Industrial demand for labour rejects the assumption of stable factor demands, and important role of demand shifts for more-educated workers has been perceived. Literature started to examine the trade effect on the industrial demand for labour and henceforth the impacts on wage rate and skill bias. Borjas, Freeman and Katz (1991) finds that trade and immigration flows have substantial effects on wage rates and skill premium. The two factors caused about 30-50% of the 10% decline in the wage rates of high school dropouts during 1980-1988, and about 15-25% of the 11% rise in the earnings of college graduates relative to high school graduates during 1980-1985. Other studies by Autor, Katz, and Krüger (1998), Katz and Murphy (1992), Murphy and Welch (1992) show different results regarding the extent to which changes in relative wages can be attributed to international trade.

[16] By presenting a model of dynamic adjustment by workers to labour-demand shocks, Artuc, Chaudhuri and McLaren (2007) estimates the structural parameters and shows the implications for the distribution effects of trade liberalization in the US. Their estimate indicates an existing slow adjustment of the economy and sharp movements in wages in response to a trade shock. Simulations of an exemplary trade liberation indeed show gradual adjustment with sharp effects on wages; however, the liberalization is Pareto-improving.

market effect of the increasing imports from those relative low-wage economies caught attention. Grouping is introduced into the examination of the effects of imports from different source countries on the home country labour markets. Loverly and Richardson (1998) examined the effects of fragmentation[17] and intra-industry trade on US labour markets by dividing countries into three broad groups – industrialised countries, newly industrialised countries, and primary producers – on the basis of the different levels of industrialisation. They examined the relationships between trade, wages and rewards to skill for the US workers during the period 1981-92. North-North intra-industry trade is taken as happening in differentiated skill-intensive intermediate goods (horizontal exchange), whereas North-South intra-industry trade in intermediates for final goods (vertical exchange). The study finds that skilled-worker received higher compensation in those industries where the US was more dependent on two-way intra-industry trade with the newly industrialised economies. They conclude by saying that both with whom the US trades and what it trades matter for the US wage inequality.

Similarly, Anderton and Brenton (1998) and Greenway, Hine and Wright (1999) study the UK case. Following the methodology introduced by Feenstra and Hanson (1996), Anderton and Brenton (1998) assesses whether industry import shares have significant impact on within-industry relative wage shares of skill-unskilled labour in eleven ISIC sectors (six in textiles industry and five in the non-electrical machinery industry) over the period of 1970-86. Their result suggests the rising imports from low-wage countries have made a significant contribution to the decline of relative wages and employment of the less skilled in the UK, and may account for about 40 per cent of the rise in the wage bill share of skilled-workers.

Greenway, Hine and Wright (1999) inspects the trade effect – both import and export - on wages at industry level in the UK for a later period of 1979-91. Grouping is also used to examine different impact of trade by separating UK trade partners into two groups, namely the European Union (with whom the UK has more intra-industry trade) and the Asian Economies. By incorporating import and export intensity variables, they constructed the wage function as:

$LnW_{it} = \lambda_i + \beta_0 X_{it} + \beta_1 LnW_{i,t-1} + \mu_{it}$, where W denotes wage rates, X denotes explanatory variables which include foreign competition expressed through trade, the level of union density, labour productivity, human capital effects, and other labour market structural variables such as gender and the change of full-time or part-time workers employed. λ_i denotes industry specific fixed effect. Arellano-Bond (1991) generalized method of moments estimator is adopted. The data are constructed at 4 digits SIC level for 167 manufacturing industries. The result shows no inequality effect from trade on wage rates in general. However, the intra-industry trade with the European Union tends to affect the relatively high-skilled workers; but trade with the Asian Economies may have affected the wages of low-skilled workers.

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[17] Egger and Kreickemeire (2005) uses theoretical model showing that, if home production is skill intensive, international fragmentation mitigates the unemployment problem and at the same time reduces the skill premium. In particular, when lowering unemployment compensation leads the economy to move to a more labour intensive production-mix, such policy reforms may exhibit smaller employment effects under fragmented production than under integrated production.

Studies on continental European countries have been merging in recent years and sonly won popularity due to better dataset availability and new methodologies applied. The globalisation effect on wage rates in continental European countries seems to be more diversified than the studies on the US and the UK suggest. Continental European labour markets are traditionally taken as being institutionally different from the US and the UK in terms of labour market rigidity. Therefore, institutional factors play such important roles that examinations on these countries are expected to embrace institutional[18] and demographic variables into modeling.

Geishecker and Görg (2004) utilises German Socio Economic Panel for the years 1991 to 2000 for 22 manufacturing industries (NACE 15-36), analysing outsourcing impact on German manufacturing sector wage rates. Several control variables are employed: demographic control variables for age, marital status and geographic region; work characteristics related to size and ownership of the firm; education dummies; changing industry characteristics. General time dummies and industry specific time dummies are used to capture supply side effects. Two of the controlling variables for industry fixed effect and industry-time specific effects are taken as being eligible to solve distorted standard errors problem induced by contemporaneous correlation when combining individual and industry level data. The estimation results show a negative effect of outsourcing on the real wage for low-skilled workers and, at the same time, a strong evidence of high-skilled workers' gain in terms of higher wage rates. Similar to Geishecker (2002), they suggest a reunification effect which might provide an even more direct explanation to skill premium during the 1990s in Germany. Given the ratio of unskilled-worker to skilled-worker in Eastern Germany was much higher than in Western Germany, reunification in 1990 had been diluting the ratio of skilled to unskilled-labour, taking German labour market as a whole.

Furthermore, Geishecker, Görg and Munch (2008) adopted grouping into studies on the UK, German and Danish labour markets. The study is based on survey data for the UK and Germany, and on data from administrative registers for Denmark. Adjusted standard errors allowing for contemporaneous correlations are used to solve the downwards bias problem generated through estimating the effect of an aggregate industry level variable on wages of individual workers. They find no single answer to the question of whether outsourcing has positive effects on wage or rather negative. The labour market effects of outsourcing are different across home country and different concerning outsourcing partner countries. In the UK, both high-skilled and low-skilled worker wage rates are reduced by outsourcing to Central and Eastern European Countries (CEECs), whereas skilled-workers do benefit from the outsourcing to those developed non-CEECs. That means, outsourcing to CEECs has negative effect on wage rates in the UK. The estimation results of the Germany case are inconsistent with theories. Allowing the general believes that the CEECs are more labour-intensive than the non-CEEC European countries, trade with the CEECs shall increase high-skilled worker wage rates in Germany but keep low-skilled lower. However, their finding is opposite: high-skilled worker wage rates are negatively affected by outsourcing to the CEECs; however, low-skilled worker wage rates are reduced by outsourcing to the non-CEECs. In Denmark either high

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[18] Nickell, Nunziata and Ochel (2005) studies the features of unemployment in the OECD countries since the 1960s. They offer a though inspection of the institutional variables: overly generous benefits, trade union power, taxes, wage inflexibility, and coordination index.

skilled or low skilled is neutral to outsourcing.

The reasons of within-industry skilled-unskilled wage rate bias lie in such factors as globalisation, skill-biased technological change, and the changes in relative prices of non-labour inputs[19]. Some industries may benefit more from globalisation but others less, and some even lose. Inter-industry difference in globalisation effect may generate inter-industry differentials in employment and wage rates. Given scale effects in technology improvement and access to financial resources, the inter-industry difference of the impact of globalisation could be even larger.

5. Trade and Inter-Industry Differentials

Most of the studies on wage rates take the assumption that no wage rental existing across industries. Basically, inter-industry wage differentials are to be positively related to industries' productivity growth levels, total factor productivity growth rates, capital intensities and trade intensities (both import and export). However, some seminal studies find inter-industry wage differentials tend not to be solely explained by labour market competition among sectors. Due to globalisation, most industrialised economies have been witnessing increased international trade with less developed economies especially since the 1980s. Considering the industrial structural change triggered by the trade with less developed economies, trade is expected to have impacts on inter-industry wage differentials as well.

One of the main contributions in this field is Katz and Autor (1998). Focusing on the labour market situation in the US during the 1980s, they study the reasons of the inter-industry "non-competitive" wage differentials by analysing the relationship between labour market imperfection and trade policies. After controlling for the differences of the effects of labour unions, they find wage differentials for similar workers are substantial. This "non-competitive" wage differentials, which can't be equalised through competitive forces among industries, has been associated with increased export in those high wage US manufacturing industries. Therefore, wage differentials are to be taken as a positive major cause for the US to exploit extra gains from trade, which serves as a common feature of many industrialised economies, e.g. the US and Japan. While increased import competition has had its greatest impact on employment in low-wage parts of the US manufacturing sector, changing trade patterns have not disproportionately harm the high-wage portion of the US manufacturing sector, given the existence of undesirable structural changes in the US economy. They finally conclude that trade policies directed towards reducing imports are likely to have "extremely adverse" impacts on total economic welfare, whereas certain measures aimed at expanding employment in export sectors may increase welfare.

In contrast to Katz and Autor (1998) taking the non-competitive approach to study wage differentials, Egger, Pfaffermayr and Weber (2003) analyses short-run dynamics of the effect

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[19] When measuring the share of wages in total value-added, the price changes of other inputs, both the purchasing prices of material inputs and financial capital costs, are also determinants. Lawrence and Slaughter (1993) investigates the correlations between changes in wage premium and skilled-unskilled employment ratios with changes in product prices.

of trade and outsourcing on the transitional probability of employment between sectors[20] in Austria during the period of 1988-2001. Employment effect but not wage differential is examined in their dynamic multinomial logit fixed effect model which integrates the original state of employment, trade variables (terms of trade and outsourcing), technological progress (labour productivity) and age parameters. All industry variables, both trade and technology, are taken as exogenous because, as they argue, decisions taken by individuals are not likely influence industry characteristics. The result shows that international trade is important for labour market turnover. Increases in imports, terms of trade, and the share of outsourcing in total trade negatively affect the probability of workers' decision to stay in or change into the manufacturing industry.

Another underappreciated area of study is the cross-country inter-industry wage differentials. In Gittleman and Wolff (1993), they examine 14 OECD countries over the course of 1970-1985 and find that industrial wage dispersion has trended up in the US but shows quite mixed patterns in other countries. However, Labour unions do play an important role in explaining cross country differences.

V. Conclusion

No identical empirical result on the impacts of globalisation on labour markets is available. International trade and outsourcing are examined not to be the only determinant force of job loss in some sectors, wage moderation, skill bias and cross-industry wage differentials. Furthermore, globalsiation tends to add to rising inequality and low-skilled workers unemployment in Anglo-Saxon economies, while there is no clear-cut result for continental Europe. In sum, empirical results on globalisation impacts on employment, on wage rates, on skill bias, and on cross-industry wage differentials suggest effectively that one may not place too much credence on a general conclusion of the negative effect of globalisation on labour market development and its structural shift.

Most of the literature focuses much on the correlation rather than causality between globalisation – international trade and offshore outsourcing – and labour market structural changes. It does not demonstrate in the first place that trade is the cause of the labour market structural change. Therefore, even when various empirical evidences do support a linkage between trade and labour market shifts in employment, wage rates and inequality, they have not be sufficient enough to suggest a determinant role of trade on job loss, industry wage moderation and widening inequality.

Another common characteristic of most of the existing empirical panel data analyses is the less appreciated spill-over and long-term effect. Globalisation leads to restructuring. Both short-term and long-term effects may provide a broader spectrum to understand the globalisation effect. However, globalisation and offshore outsourcing may bring into positive productivity effect, which might suggest a long-run positive effect on labour market. Allowing

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[20] Egger, Pfaffermayr and Weber (2003) differentiates four sectors: comparative advantage manufacturing sectors, comparative disadvantage manufacturing sectors, service sector, sales sector. The transition probability of employment is the probability of workers' decision to stay in or changing into manufacturing sector. Another two kinds of status in labour market are considered: unemployment, out of work force.

the fact that some industries benefit while others lose, the spill-over effect from the industries which are gaining in globalisation to those losing may be suggestive to policy-making on how to make large use of globalisation. Inter-industry or inter-sectoral spill-over effects have to some extent been addressed in recent very seminal works; however, its power in explaining the impacts of globalisation on labour market adjustment is still an underappreciated field.

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