

Trade and Employment: Stylized Facts and Research Findings¹

Bernard Hoekman
L. Alan Winters

Development Research Group
World Bank

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Introduction

This paper is a brief and selective survey of the impact of trade and trade reform on employment. It focuses mainly on empirical studies that have sought to establish the labor implications of greater trade and trade liberalisation. As is revealed by the long bibliography attached to this paper—which represents only a selection from the literature—a huge amount of research has been undertaken on the subject of the relationship between trade, wages and employment. A consequence of this state of affairs is that there are also numerous excellent literature surveys, many of which review underlying theory, empirical strategies, methodology, and techniques in some depth.² Thus we make no attempt to be comprehensive, and those seeking a more rigorous and detailed discussion of specific papers should refer to these surveys and the papers themselves. We also do not discuss labor economics-oriented literature on labor market institutions, regulation and distortions, the design and effectiveness of possible instruments to facilitate the movement of workers across sectors or employers within sectors, or issues related to the relationship between trade openness and income

¹ An earlier version of this paper, by Hoekman alone, was presented on January 30, 2005 at the IDRC/ECES expert group meeting on trade and employment, Egyptian Center for Economic Studies, Cairo.

² Surveys include Baldwin (1995), Cline (1997), Slaughter (1998), Johnson and Stafford (1999), Gaston and Nelson (2001), Greenaway and Nelson (2001), Acemoglu (2002), Feenstra and Hanson (2004), and Goldberg and Pavcnik (2004).

distribution.³ Rather, our emphasis is limited to the stylized facts that emerge from the literature and possible research questions.

As noted in a recent survey by Goldberg and Pavcnik (2004), empirical research to date has offered no conclusive evidence on the effects of trade liberalisation on employment and wages. In part this is because it is hard to obtain a good measure of trade policy, even for OECD countries. While information on most-favored-nation tariffs is readily available, this is not the case for ad valorem equivalents of specific duties, nontariff barriers of different types, or the trade effects of product regulation (such as health and safety standards).⁴ The weakness in the openness measures that confound the literature on trade and growth are equally problematic here. More fundamentally, trade policy is endogenous—among other things labor market concerns are one determinant of trade policy, and the factors affecting the latter may affect the formation of wages. Moreover, it is increasingly recognized that trade is a channel for technology diffusion/adoption, both directly—e.g., through imports of capital goods—and indirectly, e.g., by creating pressure to innovate (Wood, 1994, 1995; Richardson, 1995; Thoenig and Verdier, 2003).⁵ Thus, there are numerous endogeneity and simultaneity problems.

1. Some Stylized Facts

What are the “core” stylized facts that have informed and emerged from the research agenda revolving around the impact of trade on workers (employment and wages)?⁶

- There has been a significant increase in the relative reward for skilled labor. This wage premium has been accompanied by increases in the ratio of skilled to unskilled employment in *all* sectors, not just those that use skilled labor intensively. Thus, unskilled labor has seen its relative remuneration fall generally.

³ Income distributional effects extend of course beyond wages/employment and include non-wage income, transfers, income from assets (non-labor endowments), etc.

⁴ See IMF and World Bank (2005) for a recent attempt to quantify the effects of such policies.

⁵ For example, Abraham and Brock (2003) find that trade has induced changes in technology in the EU; Morrison Paul and Siegel (2001) conclude that there is an indirect effect of trade on labor through greater incentives to adopt information technologies (computerization).

⁶ See, for example, Desjonqueres et al. (1999), Neary (2001), Greenaway and Nelson (2001), and Goldberg and Pavcnik (2004).

Moreover, the skill premium has risen in *both* developing and OECD countries—increasing inequality between the skilled and unskilled is a global phenomenon.⁷

- At the same time there has not been a large decline in the relative price of goods that use low-skilled labor relatively intensively. This is noteworthy from a trade theory perspective, as this goods price channel is the most obvious one through which greater trade (foreign competition) should affect labor outcomes for those that are most dependent on production of competing goods.
- The implication of the foregoing is that trade and trade reforms can only explain a small fraction of the general increase in wage inequality observed in both developed and developing countries. The majority view in the literature is that skill-biased technical change (SBTC) is the primary culprit (Acemoglu, 2002).
- Whether the impacts of trade liberalisation (more trade/openness) operate more or less through wages as opposed to employment depends importantly on labor market institutions, the efficiency of capital markets and social policies. The fact that the US market has a more flexible labor market and more efficient financial sector than most European countries helps to explain why wages bear a higher brunt of shocks in the US than in the EU.
- In developing countries it also appears that wage responses are greater than employment impacts (in terms of adjustment). Thus, a number of papers have found that trade liberalisation decreased the industry wage premiums in those sectors that experienced the largest tariff reductions. This has been interpreted to be suggestive of labor market rigidities and related distortions in developing countries that prevent labor reallocation in the short/medium run. However, it is also consistent with a dissipation of industry rents, which may in turn have been supported by the trade policy stance.
- In general, the magnitude of the effects of greater trade in OECD countries (“globalization”) on wages and inequality are small. Interestingly, the recent literature analyzing the effects of trade reforms in developing countries on

⁷ In the sense of falling relative returns to labor market participation for unskilled workers. This does not mean these workers are worse off in an absolute sense. As noted by Bourguignon and Morrison (2002) the global distribution of income in terms of absolute poverty numbers has been improving rapidly in recent decades.

industry wages also concludes that these are generally small. Thus, despite the large trade liberalisations undertaken in many Latin American countries during the 1980s-90s, most of the research to date has not found evidence of large-scale reallocation of workers across sectors. Instead, the brunt of the impact appears to be concentrated within sectors. Studies using plant- or firm-level data conclude that major impacts of trade reforms are natural selection among firms and reductions in X-inefficiency: less efficient firms in a sector are forced to downsize, improve efficiency or exit, with more productive (efficient) firms expanding their market shares. Overall total factor productivity increases more in industries that liberalized more (Roberts and Tybout, 1997; Goldberg and Pavcnik, various).

- Correspondingly, the effects of trade reform on aggregate employment are muted. In the long run they are arguably zero, while in the short run Keynesian responses and/or adjustment strains are not generally very large relative to total employment.⁸

2. Trade and Labor—A (Very) Incomplete Survey

The literature on trade and labor markets (wages/employment) focuses on the implications for relative rewards to and employment of different “types” of labor, as differentiated by either skill (education, etc.) or by industry/sector of employment. The focus is on the incidence of greater trade or trade liberalisation episodes. In the case of developed countries the focus is mainly on the effects of greater openness, as measured by trade to GDP ratios or import penetration. Here the question of interest is generally whether “wages are set in Beijing” (Freeman, 1995). In the case of developing countries the same question arises—what happens to the relative wage of unskilled labor (is China setting wages globally?)—but there is a greater interest in tracing through the employment effects of reforms. Because developing countries have reformed their trade regimes strongly, the latter literature can focus on analyzing episodes of deep trade liberalisation where the source of the shock can be clearly identified in time. This greatly

⁸ They are large, of course, to those who lose their jobs.

facilitates the attribution of effects to trade, making the developing country-based literature more informative/robust in terms of its conclusions.

Aggregate Employment

Although the main impact of trade policy reforms and greater openness will generally be on the distribution of employment across sectors and the relative returns to different types of labor (factors), we start with the headline issue of total employment. In the long run, overall levels of employment and unemployment are determined by macroeconomic variables and labor market-related institutions rather than trade and trade policy. Thus trade policy reforms *per se*—policies aiming to increase integration—should not have a long term impact on employment levels although, of course, they may be accompanied by labor and other market reforms which should, as in Chile in the late 1970s. In the shorter run, the level of economic activity may be influenced by macroeconomic policy (money supply, interest rates, fiscal policy, etc.), and can also be affected temporarily by trade shocks or major changes in trade policy, but in the long run, the labor market will clear in the absence of distortions, with the equilibrium wage being determined by the intersection of demand and supply. The role of labor market institutions in determining this supply and demand is well established, and most analyses of trade reform take as given the long-run level of employment and consider its allocation across sectors. This is essentially the oft criticized ‘full employment’ assumption of trade theorists. It is more properly termed an ‘exogenous employment’ assumption, which merely asserts that in the long run employment returns to its initial level.

Stephen Matusz provides one stream of research that interacts labor market and trade reform or trade performance by embedding theories of efficiency wages and search into trade models. Matusz (1994) finds that in the presence of wage rigidities trade liberalisation could either raise or lower employment. Matusz (1996) argues that, in a world of monopolistic competition, if firms pay efficiency wages, trade liberalisation will increase employment (the efficiency premium is smaller) and so has greater benefits than in a competitive model. Davidson, Martin and Matusz (1999) bring search into the trade model and find that unemployment can go either way after a liberalisation. These are

complex models with complex and ambiguous results, but at least they admit the possibility that trade reform could have long-run consequences for employment. When we turn to the empirical evidence, however, there is no support for such a view. Marquez and Page (1998) suggest that firm-level declines in employment per unit of output (increased efficiency) are offset by increases in firm sizes or numbers. IADB (2003), in a review of ten countries' household data, suggest that trade liberalisation increased employment and left unemployment unchanged—i.e., increased participation.

The story is rather different when we turn to the short run or adjustment period following a trade liberalisation. The churning that reform induces could clearly reduce employment temporarily, as could conceivably a Keynesian shock emanating from increased import competition. In Chile, for instance, Edwards and Edwards (1996) find a positive association between the degree of liberalisation a sector experienced and the extent of layoffs; the sectors experiencing the greatest liberalisation were also the ones where the duration of unemployment was longest. (We return to sectoral evidence below.)

Overall, however, there is surprisingly little evidence on the nature and extent of transitional unemployment in developing countries, at least partly because of the difficulties of measuring or even defining the phenomenon in dualistic economies. A multi-country study of trade liberalisation before 1985 (Michael et al., 1991) argued that experiences varied from case to case, but that, on the whole, transitional unemployment was quite small. In a survey of more than fifty studies of the adjustment costs of trade liberalisation in the manufacturing sector, Matusz and Tarr (1999) argue that the adjustment costs associated with transitional unemployment are not high and that unemployment durations generally quite short. Indeed, in some cases employment appears to increase more or less instantly – as, for example, Harrison and Revenga (1998) report for Costa Rica, Peru and Uruguay. In their (non-random) sample, developing countries tended to display increasing employment after trade reform, while transitional economies showed the opposite. The attribution problem is huge for the latter countries, however for so much else was going on. Observe also that most studies refer to manufacturing employment, with little indication of whether similar points apply to

agriculture or services, or indeed anywhere outside the formal sector. This is a major shortcoming, at least as much conceptual as practical.

A further mystery is whether those laid off following trade liberalisation are disproportionately poor. In developed countries, Kletzer (2002, 2004) suggests ‘yes,’ but for developing countries we are far from sure. Enterprise surveys report the responses of firms to trade liberalisation, but typically give little information on the characteristics of their employees, while household surveys, which do provide this information, cannot easily be matched to enterprises. The latter do, however, generally suggest that, in many low income countries, very few of the poorest are employees in the formal manufacturing sector.

Evidence is available on the relationship between public sector job loss and poverty. Although this job loss is not a consequence of trade liberalisation, it does deal with transitional unemployment resulting from a shock to the formal sector, and so may inform us also about the effects of trade liberalisation. In fact, it probably offers an upper bound for the costs of the latter, because public sector employees are frequently the ones with the greatest insulation from market forces and the largest rents. Thus for example, in Ecuador, employees dismissed from the Central Bank earned on average only 55% of their previous salary 15 months later (Rama and MacIsaac, 1999). In Ghana, Younger (1996) finds that most retrenched civil servants were able to find new work, but at substantially lower income levels; nonetheless the income levels and incidence of poverty among their households were not substantially different after retrenchment from the average for the whole country.

It is likely that adjustment costs will be greater the more protected the sector was originally and the greater the shock. In local labour markets, large losses of employment can have (negative) multiplier effects on income, and markets can become dysfunctional because even normal turn-over ceases as incumbents dare not resign for fear of not finding a new job. Thus major reforms – e.g. transition or concentrated reforms such as closing the only plant in a town – seem likely to generate larger and longer-lived

transitional losses through unemployment than more diffuse reforms. Rama and Scott (1999) analyse the effects of retrenching the only plant in a series of one-plant towns in Kazakhstan. They estimate that for a reduction in the employment in the plant equal to 1% of the local labour force, labour income in the town falls by 1.5%. This is essentially a Keynesian multiplier effect. The hysteresis of the labour market would serve to deepen and prolong it further.

Economywide Wage Rates

In this section we persist with economywide analysis, but allow for the existence of several classes of labor, each of which is mobile across sectors. Assuming fixed employment of these labor forces, the research question concerns their wages.

Most of the international economics literature on trade and employment/wages is based on general equilibrium analysis. In this it differs from the labor economics approach, which tends to be partial equilibrium, focusing on labor demand/supply and the functioning of the labor market, with an emphasis on institutional factors such as minimum wages, existence of unions, incentives to pay efficiency wages, etc. In the latter literature unemployment is generally endogenous, whereas much of the trade literature assumes full employment or imposes an exogenous constraint such as a fixed minimum wage. It also differs from the trade literature by explicitly considering immigration in the analysis, whereas such mobility is assumed to be impossible in most trade analyzes. Indeed, the latter often assumes that trade in goods and factors of production are substitutes, in that under a set of (restrictive) assumptions free trade in goods is predicted to equalize the factor prices across countries.⁹

⁹ Lemieux (2003) is a recent investigation of whether the average wages for different classes of workers defined on the basis of their skills (education and experience) and other characteristics (gender in particular) in Canada and the United States have converged over the last two decades. He notes that aside from the restrictive conditions needed for FPE to be observed, it is not very reasonable to expect national wages to be identical across countries if they are not equalized across regions of the same country (where labor and capital mobility should be much more powerful in equalizing factor prices). Using regional wage dispersion in Canada and the United States as a benchmark for assessing “how different” the wage structures in the two countries are, and controlling for national and regional differences in worker characteristics, he concludes that there has been *divergence* between the wage structures in Canada and the United States over the last 20 years.

The “standard” prediction from endowment based theories of comparative advantage (Heckscher-Ohlin) is that the distributional impacts of trade and trade liberalisation operate through the effect of changes in the relative price of tradable goods as a result of liberalisation or other changes that allow trade or expand it. The basic result (prediction) is that once labor adjustment across industries has occurred, wage impacts depend only on the change in product prices induced by greater trade. The argument goes as follows. Since OECD countries have a more educated (skilled) labor force, they (should) specialize in products that use such factors relatively intensively. The relative price of goods that use less skilled labor more intensively should fall as trade is liberalized (and those of skilled goods increase), which in turn should reduce the relative wages of the factors used in producing these goods domestically. At the same time as unskilled labor-intensive activities are downsized and relative wages fall, there should be an expansion in the demand for such labor in all parts of the economy. Conversely, developing countries should specialize in goods that use less skilled labor more intensively and so liberalisation should boost unskilled wages.

Embarrassingly, neither the product price effects nor the economy-wide expansion in unskilled labor intensity are observed in the data. The first set of stylized facts mentioned above conflict with the view that the OECD rise in skill premia is mainly due to cheaper unskilled-labour-intensive imports (trade). Lawrence and Slaughter (1993), Sachs and Shatz (1994), Robbins (1996), Desjonquieres et al. (1999), and many others, using different methodologies “inspired” by the Heckscher-Ohlin type model, all find that trade has little explanatory effect on changes in labor demand/relative wages across industries. The same is true of the early papers that estimate the demand for labor, a labor cost function or decompose the sources of employment change into domestic demand, trade and productivity elements. They, too, generally found that trade factors played only a minor role in job losses/wage inequality—with productivity growth being the main factor displacing labor in the short run. Thus, e.g., Freeman and Katz (1991), Katz and Murphy (1992), Revenga (1992), Bernard and Jensen (1995) and Berman, Bound, and Griliches (1994, 1998), all heavily cited papers, conclude that SBTC accounts for the lion’s share of the action (e.g., on the basis of a strong positive association between R&D

expenditures/ computerization and a rise in the relative return to skilled labor).¹⁰ Thus, despite different methodologies, the labor and trade literatures have been in substantial agreement on the effect of trade on wages (employment): SBTC dominates.¹¹

This does not mean trade can be completely ignored, however, as a source of wage inequality within developed or developing countries. Researchers focusing on the labor content of trade (so-called factor content studies) obtained some of the largest estimates of the effects of imports on wages (e.g., Murphy and Welch, 1991; Borjas, *et al.*, 1992; Wood, 1994). The analysis in these papers centers on the growth in the “effective” unskilled labor force that is implied by the greater imports of unskilled-labor-intensive products from developing countries. That is, estimates are made of the labor being displaced by a given amount of imports. The premise of these papers—best explained and argued in Wood (1994, 1995)—is that greater trade with developing countries will adversely affect the low wage workers in industrialized nations by “effectively” expanding the stock of unskilled labor, thus lowering wages. The extent to which this “expansion” occurs is measured by the unskilled labor content embodied in the imports. Wood (1994, 1995) concludes that with some “reasonable” assumptions this can be quite significant. The assumptions are the standard Heckscher-Ohlin ones plus that many imports from developing countries are non-competing (i.e., are much more labor-intensive than developed country varieties in ostensibly the same sectors) and that much of the skill-based technical change has been induced by the competitive effects of trade.¹² Note, however, that as the same relative declines in unskilled labor returns are observed in developing countries, SBTC remains an important part of the story even in these frameworks.

¹⁰ As discussed below, this literature suffers from endogeneity problems. Thus, growth in imports may stimulate faster productivity growth. Trade-induced productivity growth may result from the pro-competitive impact of trade on *x*-efficiency; reduced rents and employment of unionized labor, or relocation abroad of (unskilled) labor-intensive stages of the value chain. There is substantial evidence [see Roberts and Tybout, etc.] that firms improve productivity following greater competition from imports. Greenaway et al (1999), using an industry production function approach, find this to be important in the UK, as do Bernard and Jensen for the USA.

¹¹ See Acemoglu (2002) for an in depth survey of the literature on (the determinants of) skill biased technical change over the last 60 years.

¹² The magnitude of the labor demand elasticities, input-output coefficients, etc. used by researchers in these exercises are important. Sachs and Shatz (1994, 1998), for example, use a factor content approach and find much lower effects than Wood.]

Sectoral Employment

Empirical approaches to assessing the impact of trade on sectoral employment are similar to those used to investigate the effects on relative wages. They include input-output based methodologies; regression-based methods that involve estimation of labor demand or production functions; and CGE-based numerical methods—the latter often used for *ex ante* assessments. Most of the literature on labor reallocation is based on country case studies; there are few cross-country empirical analyses of trade reforms—a recent example discussed below is Wacziarg and Wallack (2004). Many authors investigate the sectoral employment effects of trade with developing countries in OECD countries, calculating the jobs “created” and “lost” through exports and imports. Given the small shares of developing countries in OECD trade, the general finding that net employment effects are small is not surprising. A number of studies find the effect to be positive—which is in part a reflection of the expansion of export-oriented activities—discussed further below.

An early paper by Grossman (1987) found that job (or earning) losses in nine unskilled labor intensive US manufacturing sectors due to import competition were very small, with the exception of consumer electronics (radio/television), where employment was estimated to be some 70% lower than it would have been in the absence of import competition. Freeman and Katz (1991), Gaston and Trefler (1997) and Revenga (1992) are other early studies that conclude that trade does have effects on labor market outcomes—as measured by inter-sectoral changes in employment—but that domestic factors (demand for skilled labor, skill-biased technical change) were much more important drivers of job losses in the developed countries studied (mostly the US and Canada). In general, little impact of trade (policy changes) on wages was observed.

More recent work has suggested more mixed conclusions regarding the impact of trade (and trade reforms) on sectoral employment in developed countries. Kletzer (2000) found a relationship between trade and job displacement in sectors identified as import sensitive, but not for other sectors. Conversely, Dewatripont, *et al.*, (1999) find

essentially no effect of (developing country) trade on European labor markets. The evidence from plant-panel data for OECD economies is also not uniform. Some studies find increased trade exposure is associated with more labor churning and sometimes negative net effects on employment. Much of the work on developed countries has focused on the impacts of exchange rate changes as opposed to trade reforms, the former being a more important source of changes in the terms of trade.

Klein *et al.* (2003) use establishment panel data to analyze how the pattern of gross job flows in the US is affected by the path of the real exchange rate. They find that changes in the trend of the real exchange rate affect allocation but not net employment, whereas cyclical variation of the real exchange rate induces changes in net employment mainly via job destruction. In follow on work, Klein *et al.* (2004) study the joint impact of trade liberalisation (NAFTA) and real exchange rate changes in the US. The way in which the reduction in tariffs impacted upon job flows is similar to the effect of a trend appreciation of the currency. Other studies in this genre focusing on the US include Gourinchas (1998), Goldberg *et al.* (1999), and Revenga (1997). Gourinchas examines the exchange rate response of gross job flows at the four-digit industry level over time and finds that appreciations are associated with substantial job churning, while periods of depreciation do not display such reallocation. Goldberg *et al.* (1999) conclude that exchange rate movements have a small effect on employment and that job destruction is not substantially affected. Appreciations affect the probability of job losses, whereas depreciation does not. This suggests differential effects depending on whether industries (firms) are exporters or import-competing—further decomposition of their findings suggest the likely losses from appreciation are concentrated in import-competing sectors. Revenga finds that in the US import competing industries reduce employment overall during currency appreciations. All these results suggest asymmetrical effects in the USA between appreciations and depreciations. This probably reflects a persistent pressure towards job reductions in tradables (due, perhaps, to technology or competition), with the exchange rate acting as a trigger for inevitable adjustments.

Using French firm-level data, Gourinchas (1999) also finds that exchange rate appreciations reduce net employment growth, because of lower job creation and increased job destruction. Bentivogli and Pagano (1999) find for a number of European countries rather limited, but diverging effects of exchange rates changes on job flows. The latter may reflect differences in labor market institutions. Thus, Burgess and Knetter (1998) find in that in countries with the most rigid labor institutions, such as Germany and Japan, employment is not sensitive to exchange rates, while in other countries appreciations are associated with reductions in employment.

Work on developing countries has tended to be much more explicitly motivated by trade reforms. An early discussion of trade and employment was Krueger (1983), who argued that developing-country trade liberalisation should boost labour-intensive output and increase employment. Her case studies showed that developing countries' manufactured exports were, indeed, labour-intensive, but that the employment effects of liberal trade policies were generally rather muted. Calling for more research, she tentatively concluded that this was because of other distortions in factor markets.

More recent exercises have had more liberalisations to consider and better data, and although they show mixed results the general tendency is still towards small effects. For example, Rama (1994), applying a model of monopolistic competition to a panel of 39 sectors in Uruguay over 1979-86 found a significant positive relationship between protection and employment in manufacturing, but no significant effects on real wages. Reducing the protection rate within a sector by 1% led to an employment reduction of between 0.4 and 0.5% within the same year. Harrison and Hanson (1999) suggest that an implication is that during the years concerned the labor market in Uruguay was fairly competitive, with significant employment reallocation between sectors after the reforms.

Reventa (1994), using plant-level data for Mexico, found no reduction in overall firm-level employment following reductions in tariff levels, but that reductions in quotas had a significant but relatively small impact: a reduction in quota coverage from 90% to 10% of output was associated with a 4-6% reduction in output and, via that, a 2 to 3% decline in

employment. Tariff reductions appeared to affect wages, however, because Revenga concludes, tariff liberalisation eroded rents and thus had no effect on employment and output decisions. Similarly small employment effects elsewhere in Latin America are reported by, for example, Marquez and Pages-Serra (1998) for Latin America and the Caribbean in general, Levinsohn (1999) for Chile and Moreira and Najberg (2000) for Brazil.

Milner and Wright (1998) explore industry level data on Mauritius and find a slightly more encouraging response to liberalisation. After an initially adverse wage effect they find fairly strong long-run growth in wages and employment in the exportables sector (mainly of female labour producing clothes). But they also find, surprisingly, growth in the import-competing sector, which they attribute to Mauritius' overall strong economic performance. In fact, Mauritius opened up via export promotion rather than import liberalisation and, according to Rodrik (1997) and Subramanian (2001), owes its success to its institutions rather than its trade policy. Thus it is doubtful that its case is typical.

Case studies of developing countries in Roberts and Tybout (1996) also show that industry exit and entry (one indicator of intersectoral reallocation of labor) generally do not increase with import competition after controlling for demand shocks. This suggests that the sectoral structure does not depend much on trade policy. Tybout (1996) finds that more plants were exiting manufacturing than were entering in Chile during 1979–1982, despite the growth in productivity. The size of entrants tended to be larger than those exiting, however, so the overall impact on employment is unclear (Goldberg and Pavcnik, 2004). Overall, the research summarized above suggests that trade reforms induce limited reallocation of factors across manufacturing industries, and that much of this may be associated more with export sectors attracting investment (including FDI entry) than with substantial downsizing of import-competing sectors of the economy.

Wacziarg and Wallack (2004) is a recent cross-country study of the effects on labor of trade reform episodes across a number of developing countries. They conclude that the presumption that reforms will result in labor reallocation is not supported by the available

data. Liberalisation episodes are followed by a *reduction* in the extent of intersectoral labor shifts at the economy-wide 1-digit level of disaggregation. Liberalisation has a weak positive effect at the 3-digit level, but it is small in magnitude and not robust. There is no evidence of trade-induced structural change at the more disaggregated 4-digit industry level. Wacziarg and Wallack note that other (complementary) policies will matter. Other reforms such as domestic deregulation and privatization are found to have greater effects on intersectoral labor movements than trade reform in isolation. But their bottom line is that claims that trade liberalisation generally leads to the absolute decline of entire sectors (broadly defined) are not supported by the data.

These findings are consistent with earlier case studies of liberalisation episodes. For example, the 19 studies collected in Papageorgiou et al. (1991) did not reveal large employment or reallocation effects following trade reforms. An exception was Chile, where liberalisation had a significant effect on employment in manufacturing, with export sectors expanding and import-competing contracting (and net employment increasing).

Heterogeneity and Imperfect Competition

Wacziarg and Wallack's results are also consistent with more recent findings for developed countries. Thus, Bernard et al. (2003), using the US Census of Manufactures, conclude that liberalisation had a big impact on aggregate trade, but that this was not accompanied with sectoral reallocations. Although Wacziarg/Wallack and similar findings appear to discount large-scale intersectoral movements of labor, they do not preclude the existence of significant intrasectoral effects. Indeed, micro-econometric analyses that use firm-level data conclude that there is significant turnover of firms within industries. The implication is that intrasectoral firm heterogeneity may be more important than intersectoral differences when discussing the effects of trade liberalisation.

Although the majority view is that SBTC explains the lion's share of observed reduction in the relative return to low-skilled labor—and increases in unemployment in countries where wages are rigid—e.g., in Germany (Heitger and Stehn, 2003), the factor-content

studies noted above established a presumption that labor markets outcomes are affected by international trade, although it is left unclear what the channels are through which this occurs (Greenaway and Nelson, 2001; Francois, 2004).¹³

Recent papers increasingly conclude that (the threat of) competition drives enterprises to improve productivity and that quality of output is likely to have an important role in determining labor market effects. The simple Heckscher-Ohlin prediction that trade results in a redistribution of employment away from the import substituting towards export-oriented production assumes a world of homogenous firms/products and inter-industry specialization/trade. In practice most trade is of the intra-industry type, reflecting the exchange of differentiated products between countries with very similar factor endowments, or trade in intermediates. The Heckscher-Ohlin prediction of inter-sectoral reallocation is partly driven by the assumption of homogeneity among producers within the same sector (Haltiwanger et al. 2004). In principle, given that much trade involves the intra-industry trade of differentiated products, one might expect that much of the job/wage impacts of trade will also be intra-industry in nature (Jansen and Turrini, 2004). Although comparative advantage forces are likely to continue to imply that increased imports (exports) are associated with employment reductions (increases), as noted by Greenaway et al. (1999) there are differences. First, output changes—positive or negative—occur within the same (similar) industry, so that the focus needs to be on establishing how trade impacts differentially across industries depending upon differences between them in the type of exposure they have to trade and the changes that have occurred. Firm heterogeneity will play an important role in driving job

¹³ Neary (2001) notes that it is not clear how compelling the SBTC finding is either in explaining the stylized facts. He argues that in a competitive Heckscher-Ohlin type setting this should benefit disproportionately the unskilled labor-intensive (import competing) sector and reduce the skill premium, which is not observed. SBTC while detrimental to unskilled workers, should benefit sectors that employ such labor intensively, lowering their costs and thus their prices, which is also not observed. Nor can it be argued that SBTC is only important in skill-intensive sectors, as the skilled to unskilled employment ratios have risen in *all* sectors. The solution he offers is to consider the issue in an imperfectly competitive model where trade liberalization encourages both exporting and import-competing firms to invest and raise their productivity. Insofar as such investment requires relatively more skilled labour, trade openness raises the demand for skilled labor in *both* exporting and importing countries, independent of wages or changes in import volumes. He stresses that any change which intensifies the degree of competition in international markets—including technological progress itself—is likely to manifest themselves in more intense competition. Thus, empirically disentangling the effects of trade and technology will always be difficult.

losses/creation within sectors. Second, there will be scope to reduce price-cost margins (markups, rents) as well as opportunities to exploit economies scale and innovate (upgrade quality, differentiate products, etc.).

Formal models have been developed recently that explicitly incorporate firm-level heterogeneity. Melitz (2003) assumes that producers have heterogeneous productivity levels and models intra-industry reallocations among firms as a response to greater (foreign) competition. The latter induces changes in the relative performance of firms (assumed to be monopolistically competitive) as a result of intra-industry reallocations towards more productive firms. Eaton and Kortum (2002) obtain similar results in a different model. These models help provide a theoretical foundation for the empirical literature that finds that trade reform (opening up) improves productivity of firms (Roberts and Tybout, Bernard and Jensen, etc.).

Greenaway, Hine and Wright (1999) investigate the effects of trade on employment in the UK using a dynamic labor demand framework for a panel of 167 disaggregated manufacturing industries motivated by the observation that most of the UK's trade is intra-industry. They find that increases in trade volumes, both in terms of imports and exports, cause reductions in the level of derived labor demand. After disaggregating by origin of imports they find stronger effects of trade with the EU and US than for trade with East Asia. Given that much (most) of this trade is intra-industry, they interpret this finding as evidence that trade affects x -inefficiency, with the strongest competition for UK manufacturers coming from producers in the EU and US. Freeman and Revenga (1999) report a similar result for Europe, Gaston and Trefler (1997) found significant employment responses to import competition in some sectors in Canada, and Gourinchas (1999a,b) found a significant effect of exchange rate fluctuations on movements of jobs across and within sectors in France, using firm-level job creation and destruction data. In the case of the US, Bernard and Jensen (1999b) find that intra-industry reallocations to higher productivity exporters explain up to 20 percent of productivity growth in US manufacturing. For developing countries, among other studies, Aw *et al.* (2000) find that exposure to trade forces the exit of the least efficient producers in Korea and Taiwan,

while Pavcnik (2002) finds that market share reallocations contributed significantly to productivity growth following trade liberalisation in Chile.

Exports, intermediates, FDI and global production sharing:

Research that focuses on the differential role of exports as opposed to imports as a source of labor market effects concludes that exports tend to positively and imports negatively affect labor employed in the sectors concerned. Thus Davidson and Matusz (2003) find higher sectoral net exports to be associated with less job destruction and more job creation. Harrison and Hanson (1999), find that trade reforms result in employment expansion in export sectors/firms in Mexico, and Milner and Wright (1998) find the same for Mauritius. None of this is surprising of course, but it is important to bear in mind that greater imports have to be paid for, thus requiring and inducing output and employment in export sectors. More interesting is the relative effects on different types of labor.

Exporters in an industry tend to be more productive than other plants. This finding is by now very well established—e.g., Clerides *et al.* (1998), Bernard and Jensen (1999a) and Aw *et al.* (2000). One reason is that there are generally large sunk costs associated with contesting an export market (see Roberts and Tybout, 1997; Bernard and Jensen, 1999b). Hallward-Driemeier *et al.* (2002) find that in a sample of east Asian countries, both firms with foreign ownership and firms that export are significantly more productive, and the productivity gap is larger the less developed is the local market. Using a firm-level dataset to explore the sources of exporting firms' greater productivity, they argue that it is in aiming for export markets that firms make decisions that raise productivity. It is not simply that more-productive firms self-select into exporting, but that firms that explicitly target export markets consistently make different decisions regarding investment, training, technology and the selection of inputs, and thus raise their productivity. Thus, the “exporter selection” process is not necessarily driven by exogenous shocks such as trade reforms but reflects investments made by firms in anticipation of accessing foreign markets.

Feenstra and Hanson, among others, have analyzed the effects of FDI and outsourcing, recognizing that trade increasingly comprises slicing up the value chain. (The counterpart to outsourcing is often inward FDI in developing countries). Feenstra and Hanson (1997) focus on the effects of relocation of manufacturing activities to developing countries (US FDI into Mexico) on the demand for skilled (non-production) and unskilled labor in Mexico. For nine industries located across multiple regions in Mexico they find that the relative demand for skilled labor is positively correlated with the change in the number of foreign affiliate assembly plants, and that FDI increases the relative wage (share) of non-production workers relative to unskilled labor. The reason is that the techniques used by foreign investors, while less skill intensive in terms of home country endowments, are relatively skill intensive in terms of Mexico's labor endowment.

Feenstra and Hanson (1999) employ computer use as a measure of technical change and find that outsourcing plays a significant role in generating wage inequality, although they stress that this conclusion depends importantly on pass-through assumptions. They conclude technical change explains about 35% of the change in the skill premium, while outsourcing explains another 15%. In subsequent work, Feenstra, Hanson and Swenson (2000), use production under the Offshore Assembly Provision of the U.S. tariff as a measure of outsourcing. They find that outsourced production is intensive in unskilled labor relative to production in the US; and that outsourcing is a function of the relative cost of production in the US. The implication is that such outsourcing of part of the production chain reduces the relative demand for unskilled labor.¹⁴

Labor market institutions, market structure and political economy

As we noted above, Revenga (1997) suggests that the small labor market response found in developing countries such as Mexico and Morocco may reflect restrictive labor market regulation. However, Harrison and Hanson (1999) argue that labor market imperfections do not explain the limited reallocation effects observed in the developing countries for which micro empirical work has been done. They suggest imperfect product markets may

¹⁴ Brainard, Lael and Riker (1997) find evidence of substitution between labour at home and labour abroad, the substitution being much higher between affiliates in countries at similar levels of development.

be a more relevant factor underlying the observed limited impacts of trade liberalisation on labor markets, citing Currie and Harrison (1997), who showed that many firms adjusted to trade reform by reducing profit margins and raising productivity rather than laying off workers.

Goldberg and Pavcnik (2005) focus on a short to medium run framework where the industry affiliation of workers is assumed to affect how trade policy affects wages—e.g., as is the case in the specific factors model of trade. This differs from the focus above, and in much of the earlier empirical research, where the investigation centers on how trade policy affects wages by altering the economy-wide returns to a specific worker characteristic (usually defined by skill level as measured by education). Goldberg and Pavcnik investigate the relationship between trade liberalisation (protection) in Colombia and industry wage premiums. Controlling for unobserved time-invariant industry characteristics through fixed effects (interpreted as reflecting the prevailing mix of political economy forces), workers in protected sectors earn more than workers with similar observable characteristics in unprotected sectors. This positive relationship persists when they instrument for tariff changes. Their results could be explained by labor being immobile across sectors for some reason, or, which could be basically the same phenomenon, with the existence of industry rents that are reduced by trade liberalisation. Their findings reinforce the earlier analysis that trade reforms could increase wage inequalities in developing countries because tariff reductions were proportionately larger in sectors employing a high fraction of less-skilled workers, and so loss of rents would affect such workers disproportionately.

Overall, as noted by Rama (2003), these studies suggest there was substantial rent sharing between protected enterprises (capital owners) and their workers. The removal of trade barriers erodes these rents, with the incidence of the loss shared between the two factors, the precise shares depending on country-specific variables that remain indeterminate. Whatever the underlying reasons, the results point to the importance of both a good understanding of the institutional environment and the need to incorporate political economy considerations into the analysis.

A number of other papers have sought out the effect of trade liberalisation on industry wage premia. Pavcnik et al. (2004) suggest that for Brazil there is no relationship, despite a fairly major trade reform in the early 1990s. Feliciano (2001) also fails to find a significant relationship for Mexico, while, as noted above, Revenga (1997) finds a positive link. Likewise on India, while Mishra and Kumar (2005) suggest that premia are inversely related to tariffs—i.e., sectors with the greatest liberalisation have the largest increases in wages—Vasudeva-Dutta (2004), using different data, finds the opposite. The Mishra-Kumar result, which parallels Gaston and Trefler's (1994) on the USA, is said to spring from either a general Stolper-Samuelson result whereby unskilled workers benefit from liberalisation and happen to have been most protected prior to liberalisation, or an exaggerated productivity response to liberalisation whereby sectors with larger tariff cuts make larger productivity improvements and share them with labor.

Goldberg and Pavcnik (2005) control for the political economy determinants of tariff protection that may also affect industry wage premiums independently, inducing spurious correlation between industry protection and wages. In a related paper, Attanasio et al. (2004) examine the response of sectoral employment shares to trade liberalisation. Here again, notwithstanding, large scale trade reforms, sectors that experienced large reductions in nominal protection were not found to have been seriously affected in that sectoral employment shares are stable between the pre-and post reform period. Regressions of changes in sectoral employment shares on tariff changes fail to detect any relationship between trade liberalisation and sectoral employment—i.e., similar to what was found in, say, Revenga (1997) and Currie and Harrison (1997). As the authors note, this is surprising given the existence of a large informal sector in Colombia that does not comply with labor market regulation and thus provides an additional margin of adjustment.

One possible explanation for this is that labor is more mobile across the formal and informal sectors than across industries. However, Goldberg and Pavcnik (2005) fail to find any significant differences between the two sectors. In a related paper, Goldberg and

Pavcnik (2003) find that while the share of informal workers increased in Colombia in the aftermath of the trade reforms, the entire increase is accounted for by within-industry changes from the formal to the informal sector, rather than between industry shifts of informal workers. To summarize, it appears that trade liberalisation had a significant impact on relative wages in Colombia, but not on inter-sectoral reallocation of labor. Whether this impact reflects industry rents, constraints on labor mobility or other factors remains to be determined. Goldberg and Pavcnik consider both hypotheses to be plausible.

3. Research implications/questions

In writing this survey, we have been struck by the lacunae in our knowledge of this very important subject. Among future priorities, we would note:

- **Who/what is protected?** Some of micro-econometric research to date suggests that the most heavily protected sectors in many developing countries are sectors that employ a high proportion of unskilled workers who earn low wages. A corollary is that trade liberalization, especially when also accompanied with investment liberalization and inward FDI, has a negative impact on unskilled workers in the short- and medium-run—be it in the form of lower wages and/or unemployment. A puzzle stressed by Harrison and Hanson (1999) is why these countries find it optimal to protect low-skill intensive sectors when this is their abundant factor.¹⁵ However, this finding may also be a function of the set of countries that have been analyzed, which in turn have been limited by the availability of firm-level datasets. In fact, there is also evidence that countries tend to protect more capital or skill-intensive products. It arises from the conclusions in the numerical literature on trade and poverty that the poor would benefit from trade reforms because the structure of protection is biased against goods they consume/produce – for example, Harrison et al (2004) and Hertel and Winters (2005). Clearly the need for a relating comprehensive dataset is pressing.

¹⁵ Explanations could include political economy (along Anderson, 1992, lines) or the fact that it ignores the fact that countries such as China are even more unskilled-labor abundant than the developing countries on which research has centered (e.g., such as Morocco, Mexico, Chile, Colombia) – see Wood (1997).

- **Actual/potential impact of trade liberalization on wages.** The high levels of aggregation used in household surveys (2- or 3-digit ISIC) may not be fine enough to detect worker reallocation across firms within the same industry in response to trade liberalization. This leads Goldberg and Pavcnik to call for empirical firm/plant level studies that explore the income distributional effects of trade reforms by analyzing the impacts of reform on firms belonging to the same 3- or 4-digit ISIC sector, as reflected for example in the compositional changes of their output (quality upgrading or other forms of greater differentiation of their production). Information on relative (productivity-adjusted) labor costs would help identify sectors/firms that may be confronted with more serious adjustment costs post reforms. These exercises could also be augmented with information on additional operating costs related to the “quality” of the business environment, of the sort generated by the World Bank’s Investment Climate Research (World Bank, 2005) and *Doing Business* (World Bank, 2005b).
- **Inter-sectoral mobility, entry/exit across sectors.** Borjas and Ramey (1995) found that the effect of trade on the labor market depended on market structure of industries. Barriers to entry and exit will clearly have a bearing on labor market responses to further trade and investment liberalization. Capital/financial market distortions or inefficiencies will affect the ability of firms to expand/enter. These variables may be more important than the labor market. To a large extent such factors have already been studied, but perhaps not from a labor market adjustment perspective.
- **Beyond manufacturing.** The manufacturing sectors are the focus of the lion’s share of research on the effects of trade on employment/wages, in both developing and developed countries. However, most employment in both sets of countries is elsewhere. In OECD countries services account for 70+ percent of turnover and employment, whereas agriculture and the informal/public sectors account for most employment in developing countries, especially poorer ones. To a significant extent services have become “tradable”, be it through cross border exchange and telecom networks (internet etc.) or be it through international factor mobility (FDI, labor movement). Adjustment to agricultural price

shocks/competition may be quite different from the type of adjustment that occurs in manufacturing, giving rise to greater inter-sectoral reallocations of labor with associated differences in social costs/implications.

- **Formal vs. informal sector and responses to trade reform.** There is little evidence that trade reforms are associated with an increase in informal employment and a worsening of working conditions. To the extent that one finds such evidence, it seems to be relevant in settings characterized by severe labor market rigidities. A good understanding of labor market institutions and their interactions with trade policy would seem to be essential for understanding the (likely) effects of trade liberalization on employment. In this, one has to recognize that informality may be a rational choice for workers and for firms, not a consolation prize for those who can't go formal – Maloney (2002). But this goes beyond labor market regulation: the tax system, access to credit, etc. will also have potentially major effects on the ability (incentives) of small firms (entrepreneurs) to move from the informal to the formal sector to take advantage of opportunities that emerge after reforms. An interesting question that has not been studied in depth is the extent to which the limited sectoral reallocations post-reforms observed in many developing countries are related to (dis-) incentives to grow/enter into new markets.
- **Aggregate effects of opening in developing countries.** What happens to countries that start off with large scale unemployment/underemployment?
- **International labor mobility.** Migration, temporary or permanent, has not been discussed in this paper but is clearly an important issue both in determining labor market effects and responses to reforms.

4. Concluding Remarks

Recent research has offered some support for the conclusion that there is a greater role for trade in explaining labor outcomes than was suggested in the 1990s literature. This is in part a reflection of the changing nature of the globalization process—involving more trade in intermediates, including services, as well as ever higher trade/GDP ratios—but also, and more importantly, due to the recognition that trade is a channel for

technological upgrading, not just directly, but also indirectly. Developing country liberalization episodes offer the best prospects of identifying trade effects as trade liberalization is discrete and often significant. The micro evidence to date does not point to large trade effects for wages/employment in that it does not do much to change the structure of the economy. More evidence points to trade liberalization reducing x -inefficiency and putting pressure on firms to improve productivity, generating entry-exit within sectors—i.e., *intra*-sectoral adjustments.

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