

TRADE AND EMPLOYMENT: STYLIZED FACTS AND RESEARCH FINDINGS*

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Abstract: The substantial literature investigating the links between trade, trade policy, and labor market outcomes—both returns to labor and employment—has generated a number of stylized facts, but many open questions remain. This paper surveys the subset of the literature focusing on trade policy and integration into the world economy. Although in the longer run trade opportunities can have a major impact in creating more productive and higher paying jobs, this literature tends to take employment as given. A common finding is that much of the shorter run impacts of trade and reforms involve reallocation of labor or wage impacts *within* sectors. This reflects a pattern of expansion of more productive firms—especially export-oriented or suppliers to exporters—and contraction/adjustment of less productive enterprises in sectors that become subject to greater import competition. Wage responses to trade and trade reforms are generally greater than employment impacts, but trade can only explain a small fraction of the general increase in wage inequality observed in both developed and developing countries in recent decades. A feature of the literature survey is that the focus is almost exclusively on industries producing goods. Given the importance of service industries as a source of employment and determinants of competitiveness, we argue that one priority area for future research is to study the employment effects of services trade and investment reforms.

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Introduction

This paper is a brief survey of the impact of international 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 liberalization. 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. Within this there are numerous excellent literature surveys, many of which review the underlying theory, empirical strategies, methodology, and techniques in some depth.¹ 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. Our emphasis is on the broad themes of the literature, with a view to deriving some stylized facts and a list of possible research questions. To keep the paper within reasonable bounds we 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 distribution.²

As noted by Goldberg and Pavcnik (2004), empirical research to date has offered mixed results regarding the direction and size of the effects of trade liberalization on employment and wages. There are a number of robust stylized facts in terms of outcomes, but debate continues on the impact of trade and trade policy. In part this is because it is hard to obtain a good measure of trade policy, even for OECD countries—the action is mostly on NTBs for which time series data are notoriously difficult to obtain. 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

¹ Surveys include Baldwin (1995), Cline (1997), Slaughter (1998), Johnson and Stafford (1999), Gaston and Nelson (2000), Greenaway and Nelson (2001), Acemoglu (2002), Feenstra and Hanson (2004), and Goldberg and Pavcnik (2004).

² Income distributional effects extend of course beyond wages/employment to include the prices of produced outputs, the non-wage income, transfers, income from assets and consumption prices—see, for example, Winters, McCulloch and McKay (2004).

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).³ Thus, there are numerous endogeneity and simultaneity problems to be overcome before we can be really confident that we understand the processes involved.

The rest of the paper comprises seven parts. The first six consider the literature on the effects of trade or trade liberalization on aggregate employment, economywide wages, sectoral employment, heterogeneity and imperfect competition, productivity and institutions and political economy. The final section collects up some stylized facts and proposes a few priorities for future research.

Setting the methodological problems aside, 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 liberalization episodes. In the case of developed countries attention centers 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 liberalization where the source of the shock can be clearly identified in time. This greatly facilitates the attribution of effects to trade, making the developing country-based literature more informative/robust in terms of its conclusions.

³ 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 indirect effect of trade on labor through greater incentives to adopt information technologies (computerization).

1. 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 neoclassical models of the economy, long-run levels of employment and unemployment are determined by macroeconomic variables and labor market-related institutions rather than trade and trade policy. Thus according to this view 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.⁴ Neoclassical analysts recognize that in the shorter run, the level of economic activity may be influenced both by macroeconomic policy and shocks (money supply, interest rates, fiscal policy, etc.), and by trade shocks or major changes in trade policy, but argue that 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.

The structuralist school, on the other hand, rejects Say’s Law that demand expands to absorb supply—see, for example, Ocampo and Taylor (1998). It postulates that trade and trade policy shocks can affect employment permanently by creating or destroying jobs with little or no adjustment in the sectors of the economy not directly affected by the shock or by any induced growth. An older literature dating back to Adam Smith also draws a link between trade opportunities and employment through the so-called ‘vent for surplus’ thesis. As characterized by Myint (1958), the idea is that trade (and actions to open the economy to trade) provides access to a large global market and thus allows an economy to productively employ “surplus” capacity, thereby stimulating economic growth. As argued by Fu and Balasubramanyan (2005) while

⁴ See Behrman (1999) and Johnson (2001) for a summary discussion of the determinants of differences in unemployment between developed and developing economies.

developed to explain the growth path of natural resource-based economies, the vent for surplus can help to explain the growth of a populous country with large reservoirs of surplus labor such as China.⁵

In large part the differences in approach reflect the specific simplifications entailed in different modeling strategies, which in turn stem from different perceptions about the appropriate time period. Neoclassical theory may proceed *as if* adjustment to general equilibrium is instantaneous, but does not seriously advance that view as a fact. It merely asserts that the important phenomena surrounding trade liberalization are the long-run developmental ones. Structuralism, on the other hand, focuses on time periods short enough that full adjustment has not occurred and (usefully) reminds us that, certainly for affected people, the adjustment path can be sufficiently long and painful to dominate their view of a policy reform. Structuralists do not seriously advance the view that adjustment *never* occurs—think of all the unemployed candle-makers, farmers, blacksmiths, and railway engineers that this would predict for Europe. Neither would we have observed the structural changes of the last few decades in the developing countries that have advanced into global manufacturing markets as they have started to trade more. Realistic policy-making should pay regard to both time horizons: while we believe that one should certainly pay attention to adjustment periods—see, for example, Winters (2002) or Winters, McCulloch and McKay (2004)—we also believe that a long-run focus is necessary for development and this entails adjustment.

Both theorists and empiricists have explored the long-run connection between trade policy and employment, but not in any great depth. Among the former, Stephen Matusz explores the connection by embedding theories of efficiency wages and job-search into trade models. Matusz (1994) finds that in the presence of wage rigidities trade liberalization could either raise or lower employment. Matusz (1996) argues that, in a world of monopolistic competition, if firms pay efficiency wages, trade liberalization 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 liberalization. These are complex models with complex and ambiguous results, but at least they

⁵ The standard paper analyzing the issue of development in economies with surplus labor is Lewis (1954).

admit the possibility that trade reform could have adverse long-run consequences for employment. Turning to the empirical evidence, however, there is no support for such a view. Marquez and Pages-Serra (1998) suggest that firm-level declines in employment per unit of output (increased efficiency) are offset by increases in firm sizes or numbers. IADB (2004), in a review of ten countries' household data, suggest that trade liberalization increased employment and left unemployment unchanged—i.e., increased participation.

In a macroeconomic study, Kee and Hoon (2005) show that increasing openness lay behind much or all of a dramatic decline in the natural rate of unemployment in Singapore. Between 1966 and 2000, over which period the openness ratio, $(X+M)/GDP$, increased from 224 percent to 298 percent, the relative prices of export goods increased and there was a rapid accumulation of capital in the export sector. Both phenomena increased the marginal product of labor (and hence the wage) in terms of nontradeables and expanded overall employment fourfold (as population doubled). The direct effects of the accumulation were larger than those of relative prices, although the latter, which is the natural consequence of trade liberalization, is probably the exogenous driver variable. Kee and Hoon show their results are robust to whether either or both are exogenous or endogenous.⁶ Rodrik (1995), on the other hand, argues for Korea and Taiwan that their investment booms were exogenous (government-led) and that these induced the export growth, the price changes being too small to produce such strong export growth themselves. Even if this is true, however, openness was still a critical component of the policy mix, for without openness the import of capital goods (and, subsequently, intermediates) would have been impossible, as would the huge growth of exportables output, for without access to world markets with huge potential demand, the expansion would have induced strongly declining prices.

These cases demonstrate strong macroeconomic links between trade policy and aggregate employment. Openness may or may not be sufficient to drive up employment, but, particularly in small and medium-sized economies, if booming sectors do not have access to supplies of inputs from abroad and to the large world market with its high elasticities of demand their growth is

⁶ Fields (2001) similarly argues that all four East Asian tigers show enhanced employment as their openness-induced growth has proceeded

almost bound to be curtailed very quickly.⁷ The potential employment creation following greater trade integration can be significant. Thus, in the case of Madagascar, employment in the textiles export industry grew from 47,000 to some 200,000 between 1997 and 2001, with workers earning a 40 percent premium over the average income earned in the informal sector (Nicita 2004). In fact, even giant economies benefit from large overseas markets. China's initial take-off was fueled by agricultural reform but kept running on manufactured exports usually from EPZs and township and village enterprises (Fu and Balasubramanyan 2005). India had a fiscal boom in the late 1980s, but kept growing in the 1990s via further reforms in which trade figured strongly. To trade openness, Kee and Hoon (2005) add the benefits of openness to foreign direct investment which brings technology and forward and backward linkages. As argued by Fu and Balasubramanyan (2005), inward FDI in China played an important role in generating demand for labor.

Many studies indicate that absorptive capacity in the host country is crucial for obtaining significant spillover benefits from trade or FDI. For example, using data from industrialized countries to sixty-nine developing countries Borensztein, De and Lee (1998) tested the effect of FDI on growth in host countries and found that FDI contributes *more* to domestic growth than domestic investment but this happens only when the host country has a minimum threshold stock of human capital. Similarly, Keller (1996) argues that access to foreign technologies alone does not increase growth rates of developing countries and he shows that if a country's absorptive capacity (measured by its stock of human capital) remains unchanged, a switch to an outward orientation may not lead to a higher growth rate. The ability of local firms to absorb new technologies is a determinant of whether better access to trade as well as the labor turnover associated with greater competition is a means of technology diffusion—in turn an important channel for growth. This suggests a priority for any country is to pursue general complementary policies such as education, efficient infrastructure and measures to reduce entry barriers for local firms into new activities. The latter is important for a number of reasons, including employment creation. To the extent that prevailing policies (e.g., taxes, restricted access to finance, etc.) discourage such investments, they should be reformed to encourage more innovation. The same

⁷ The elasticity of demand for exports is typically high even if foreign markets are restricted by tariffs. Tariffs cut sales, but not necessarily sensitivity to price changes.

is true of restrictive labor market regulation—see e.g., Besley and Burgess (2004) and Bolaky and Freund (2004).

Some commentators—e.g., Ocampo (1994)—worry that liberalization induces an increase in the marginal propensity to import, which in turn causes tightening foreign exchange constraints to curtail growth at an earlier phase in the business cycle than in less open economies. This, they argue, reduces long-run growth prospects. This view is essentially a Keynesian one whereby demand, in this case domestic demand, is the driver of growth. It ignores the potential supply-side benefits of a liberal trade regime and also the fact that the more rapid emergence of current account constraints may lead governments to rely less on domestic demand stimuli to induce growth and rather pursue more stable macroeconomic regimes, which experience has long suggested lie behind sustained expansions. It is also worth noting that even in Keynesian terms it is not inevitable that raising the average propensity to import (i.e., increasing openness) inevitably raises the marginal propensity, and that if it does exchange rate depreciation offers an antidote. It has long been understood that successful trade liberalizations typically require real depreciations—e.g., Thomas and Nash (1991)—which also have political economy benefits in terms of sustaining support for reforms as they reduce the pressure of imports on domestic competing sectors.

The employment story is rather different when we turn to the short run or adjustment period following trade liberalization, the period that structuralist models focus on. 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 liberalization a sector experienced and the extent of layoffs; the sectors experiencing the greatest liberalization 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 liberalization before 1985 (Papageorgiou, Michaely and Choksi 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 liberalization in the manufacturing sector—mostly industrialized economies—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 former centrally-planned countries in transition to a market economy showed the opposite. The attribution problem is huge for the latter countries, however, for so much else was going on. Most studies of trade and employment refer to manufacturing employment, with little indication of whether their results generalize to agriculture or services, or indeed anywhere outside the formal sector. This is a major shortcoming, at least as much conceptual as practical.

Particularly in poor economies it makes no sense to equate meaningful work with formal employment. Most employment is informal, even in manufacturing, and even formal jobs offer little by way of effective social protection or improved safety provisions. Firms and/or workers may consciously prefer informality (Maloney 2004), especially if doing so has tax or regulatory advantages, including remaining below the sights of corrupt officialdom. There is a concern that trade liberalization is associated with great informality. This is disputed—see below—but even where it is true one needs to go a great deal further before one can conclude that liberalization has reduced the overall welfare emanating from work.

A further mystery is whether those laid off following trade liberalization are disproportionately poor. In developed countries, Kletzer (2004) suggests ‘yes,’ but for developing countries we are far from sure. Enterprise surveys report the responses of firms to trade liberalization, 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 liberalization, 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 liberalization. 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 percent 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 labor markets, large losses of employment can have (negative) multiplier effects on income, and markets can become dysfunctional because even normal turnover ceases as incumbents dare not resign for fear of not finding a new job. Thus major reforms—e.g. economic 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) analyze 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 percent of the local labor force, labor income in the town falls by 1.5 percent. This is essentially a Keynesian multiplier effect. The hysteresis of the labor market would serve to deepen and prolong it further.

2. 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 their analysis, whereas such mobility is assumed to be impossible in most trade analyses. Indeed, trade studies often assume 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.⁸

The “standard” prediction from endowment based theories of comparative advantage (Heckscher-Ohlin) is that the distributional impacts of trade and trade liberalization operate through the effect of changes in the relative price of tradable goods as a result of liberalization 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 liberalization should boost unskilled wages.

⁸ 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 factor price equalization 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.

Embarrassingly, neither the product price effects nor the economywide expansion in unskilled labor intensity are observed in the data, suggesting that the observed rise in skill premia in OECD countries is not mainly due to cheaper unskilled-labor-intensive imports (trade). Lawrence and Slaughter (1993), Sachs and Shatz (1994), Robbins (1996), Desjonquieres, Machin and van Reenan (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) all of them heavily cited papers, conclude that skill-biased technical change (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).⁹ Thus, despite different methodologies, the labor and trade literatures have been in substantial agreement on the effect of trade on wages (employment): SBTC dominates.¹⁰

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, 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—

⁹ 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 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 (1995) for the USA.

¹⁰ See Acemoglu (2002) for an in depth survey of the literature on (the determinants of) skill biased technical change over the last 60 years.

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.¹¹ 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.

3. 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

¹¹ 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.

exception of consumer electronics (radio/television), where employment was estimated to be some 70 percent 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, Sapir and Sekkat (1999) finds 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, Schuh and Triest (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 related work, Klein et al. (2002) study the joint impact of trade liberalization (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 (1999a, b), Goldberg and Campa (1998), Goldberg and Tracy (2001) and Revenga (1992). Gourinchas examines the exchange rate response of gross job flows at the four-digit level over time and finds that appreciations are associated with substantial job churning, while periods of depreciation do not display such reallocation. Goldberg and Campa (1998) conclude that exchange rate

movements have a small effect on employment and that job destruction is not substantially affected. Goldberg and Tracy (2001) offer an explanation for the finding that industry wages are significantly more responsive than industry employment to exchange rate changes. They find that the main mechanism for exchange rate effects on wages occurs through job turnover and the strong consequences this has for the wages of workers undergoing such job transitions. Workers who remain with the same employer experience little if any wage impacts from exchange rate shocks. In addition, they find that the least educated workers -who also have the most frequent job changes - shoulder the largest adjustments to exchange rates.

Insofar as appreciations affect the probability of job losses, whereas depreciation does not, differential effects may depend on whether industries (firms) are exporters or import-competing. Losses from appreciation are more likely to be concentrated in import-competing sectors. Revenga (1992) 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 (1999b) 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 liberalization should boost labor-intensive output and increase employment. Her case studies showed that developing countries' manufactured exports were, indeed, labor-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 liberalizations 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 percent led to an employment reduction of between 0.4 and 0.5 percent 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 (1997), using plant-level data for Mexico, found a 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 percent to 10 percent of output was associated with a 4-6 percent reduction in output and, via that, a 2-3 percent decline in employment. Tariff reductions appeared to affect wages, however, because Reventa concludes, tariff liberalization 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 liberalization. After an initially adverse wage effect they find fairly strong long-run growth in wages and employment in the exportables sector (mainly of female labor 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 liberalization and, according to 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. Roberts and Tybout (1996) find 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. Liberalization episodes are followed by a *reduction* in the extent of intersectoral labor shifts at the economywide 1-digit level of disaggregation. Liberalization 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 liberalization 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 liberalization episodes. For example, the 19 studies collected in Papageorgiou, Michaely and Choksi (1991) did not reveal large employment or reallocation effects following trade reforms. An exception was Chile, where liberalization had a significant effect on employment in manufacturing, with export sectors expanding and import-competing contracting (and net employment increasing).

4. HETEROGENEITY AND IMPERFECT COMPETITION

Wacziarg and Wallack's results (2004) are also consistent with more recent findings for developed countries. Thus, Bernard et al. (2003), using the US Census of Manufactures, conclude that liberalization had a significant impact on aggregate trade, but that this was not accompanied with sectoral reallocations. Although Wacziarg and 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 liberalization.

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).¹² 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

¹² 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 HOS 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.

similar factor endowments, or trade in intermediates. The HOS 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. (2000) 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 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 leads to 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 (1996), Bernard and Jensen 1999, 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 explains up to 20 percent of productivity growth in US manufacturing. For developing countries, among other studies, Aw, Chung and Roberts (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 liberalization in Chile.

5. 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, Lach and Tybout (1998), Bernard and Jensen (1999a) and Aw, Chung and Roberts (2000). One reason is that there are generally large sunk costs associated with contesting an export market (see Roberts and Tybout, 1996; Bernard and Jensen, 1999b). Hallward-Driemeier, Iarossi and Sokoloff (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 relocating 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 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) introduce 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 percent of the change in the skill premium, while outsourcing explains another 15 percent. 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.¹³

¹³ Brainard and Riker (1997) find evidence of substitution between labor at home and labor abroad, the substitution being much higher between affiliates in countries at similar levels of development.

6. 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 be a more relevant factor underlying the observed limited impacts of trade liberalization 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 economywide returns to a specific worker characteristic (usually defined by skill level as measured by education). Goldberg and Pavcnik investigate the relationship between trade liberalization (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 liberalization. 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 liberalization 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 liberalization 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 Stolpher-Samuelson result whereby unskilled workers benefit from liberalization and happen to have been most protected prior to liberalization, or an exaggerated productivity response to liberalization 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, Goldberg and Pavcnik (2004) examine the response of sectoral employment shares to trade liberalization. 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 liberalization and sectoral employment—i.e., similar to what was found in, say, Revenga (1997), Currie and Harrison (1997) and Wacziarg and Wallack (2004). 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 liberalization 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.

7. STYLIZED FACTS AND RESEARCH AGENDA

This section attempts to pull our survey together by noting some stylized facts and some lacunae that future research should fill. 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 and services—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 “core” stylized facts that have both informed and emerged from research on the impact of trade on workers include the following.

- 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. Moreover, the skill premium has risen in *both* developing and OECD countries—rising inequality between the skilled and unskilled is a global phenomenon.¹⁴

¹⁴ 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.

- 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 liberalization (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. Thus, a number of papers have found that trade liberalization 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 magnitudes of the effects of greater trade in OECD countries (“globalization”) on wages and inequality are small. Similarly, the recent literature analyzing the effects of trade reforms in developing countries finds the impacts on industry wages are also generally small. Thus, despite the large trade liberalizations undertaken in many Latin American countries during the 1980s and 1990s, 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. Thus, 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.
- Correspondingly, the direct effects of trade reform on aggregate employment are muted. Different models imply different predictions for the long run with the neoclassical ‘no change’ being the frequently held view. The evidence is varied: it does not suggest long-run adverse effects and in some cases suggests long-run employment gains as accessing international markets with their high elasticities of demand permits expansion and accumulation in successful sectors without encountering large declines in prices. In the short run Keynesian employment responses and/or adjustment strains can be adverse, but are not generally very large relative to total employment.¹⁵

Turning to future research priorities, we would note the following questions:

- **Who/what is protected?** Some of the 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 by 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.¹⁶ However, this finding may also be a function of the set of countries that have been analyzed, which in turn has been limited by the availability of firm-level datasets. In fact, there is also evidence that countries tend to

¹⁵ They are large, of course, to those who lose their jobs.

¹⁶ 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).

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, the contributions in Hertel and Winters (2005). Clearly the need for a relatively comprehensive dataset is pressing.

- **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 2005a) 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. 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? The cases of East Asian countries have been much studied and debated, and clearly trade openness (integration) played an important role in the observed changes in the structure of these economies in the last 40 years. The same is true of OECD countries in the past. This is a reflection of the process of economic development and growth. Few studies exist, however, that analyze the longer-term effects of trade opening on reducing under-employment in the

informal and rural sectors, as distinct from (or in conjunction with) other policies pursued by governments.

- **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 in developing countries. International movement of people is not just an employment or labor market issue, but is a potential channel for technology transfer, and may have complementary effects on trade and FDI flows. The recent experience of India in developing a software and related services industry in Bangalore illustrates that effects and payoffs from such movement are both complex to assess ex ante, may take quite some time to materialize, but can be large. A policy challenge for developing countries is to facilitate temporary movement abroad and to encourage returnees to undertake local research and business development. The research challenge is to better understand the policies that will both facilitate and maximize the expected benefits from such movement.

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