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**Trade and Employment:
Stylized Facts and Research Findings***Bernard Hoekman and L. Alan Winters*

Abstract

The substantial literature investigating the links between trade, trade policy, and labour market outcomes has generated a number of stylized facts, but many open questions remain. A common finding is that much of the shorter-run impacts of trade and reforms involve reallocation of labour or wage impacts *within* sectors. 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 recent decades. A priority area for future research is to study the employment effects of services trade and investment reforms.

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Trade and Employment: Stylized Facts and Research Findings¹

Bernard Hoekman and L. Alan Winters

This paper presents 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 labour implications of greater trade and trade liberalization. As is revealed by the long bibliography at the end of 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. In addition, there are numerous excellent literature surveys, many of which review the 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. 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 labour economics-oriented literature on labour 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.³

As noted by Goldberg and Pavcnik (2004), empirical research to date has offered no conclusive evidence on the effects of trade liberalization on employment and wages. In part, this is because it is hard to obtain a good measure of trade policy, even for Organization for Economic Cooperation and Development (OECD) countries, since action is mostly on non-tariff barriers (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, labour market concerns are one determinant of trade policy, and the factors affecting policy may affect the formation of wages. Moreover, it is increasingly recognized that trade is a channel for technology diffusion and 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).⁴ Therefore, there are numerous problems of endogeneity and simultaneity to be overcome before we can be confident that we understand the processes involved.

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- 1 This paper was written while Hoekman was a visiting professor at the Groupe d'Économie Mondiale, Institut d'Études Politiques, Paris. An earlier version of the paper, by Hoekman alone, was presented on January 30, 2005 at the IDRC/ECES expert group meeting on trade and employment, Egyptian Centre for Economic Studies, Cairo. We are grateful to Ahmed Galal, José Antonio Ocampo and participants in the UN DESA Development Forum on “Integrating economic and social policies to achieve the UN Development Agenda”, New York, 14-15 March, 2005, for comments on a previous draft.
 - 2 Surveys include Baldwin (1995), Cline (1997), Slaughter (1998), Johnson and Stafford (1999), Greenaway and Nelson (2001), Acemoglu (2002), Feenstra and Hanson (2004) and Goldberg and Pavcnik (2004).
 - 3 Income distributional effects extend, of course, beyond wages and employment to include the prices of produced outputs, non-wage income, transfers and income from assets and consumption prices—see, for example, Winters, McCulloch and McKay (2004).
 - 4 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 labour through greater incentives to adopt information technologies (computerization).

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

Setting the methodological problems aside, the literature on trade and labour markets (wages and employment) concentrates on the implications for relative rewards for and employment of different “types” of labour, as differentiated either by skill (education, etc.) or by industry or sector of employment. The focus is on the incidence of greater trade or trade liberalization episodes. In the case of developed countries, attention centres mainly on the effects of greater openness, as measured by trade-to-gross domestic product (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 labour (is China setting wages globally?)—but there is also a greater interest in tracing the employment effects of reforms. Because developing countries have dramatically reformed their trade regimes, the literature on these countries 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 and 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 labour (factors), we will 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 labour market related institutions, rather than trade and trade policy. In line with this view, therefore, trade policy reforms per se—i.e., policies aiming to increase integration—should not have a long-term impact on employment levels, although they may, of course, be accompanied by labour and other market reforms which should have, as was the case in Chile in the late 1970s.

Neoclassical economists 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.) as well as by trade shocks or major changes in trade policy, but they argue that, in the long run, the labour market will clear in the absence of distortions, the equilibrium wage being determined by the intersection of demand and supply. The role of labour 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 often 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.

In large part, this difference in approach reflects the specific simplifications associated with different modelling strategies, which in turn stem from different perceptions about which time period to denote. 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 short time periods where full adjustment has not occurred, and serves to remind us that, certainly for those affected, 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—otherwise, think of all the predictions that would be made for unemployed candle-makers, farmers, blacksmiths and railway engineers in Europe. Moreover, we would not have observed the structural changes of the last few decades in the developing countries that have advanced into global manufacturing markets as they have begun to trade more. Realistic policy-making should pay due 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, albeit not in any great depth. Among the theorists, 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 being smaller) and thus 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 liberalization. These are complex models with complex and ambiguous results, but at least they 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 size or numbers. IADB (2004), in a review of household data for ten countries, suggest that trade liberalization increased employment but left unemployment unchanged—i.e., it increased participation.

In a macroeconomic study, Kee and Hoon (2005) show that increasing openness lay behind much or all of the dramatic decline in the natural rate of unemployment in Singapore. Between 1966 and 2000, during which period the openness ratio— $(X+M)/GDP$ —increased from 224 per cent to 298 per cent, 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 labour (and hence, wages) in terms of non-tradables 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 whether either or both are exogenous or endogenous.⁵

Rodrik (1995), on the other hand, argues that the investment booms in the Republic of Korea (South Korea) and Taiwan Province of China were exogenous (government-led) and that these induced 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,

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

the importing of capital goods (and, subsequently, intermediates) would have been impossible, as would have been the huge growth of exportables' output, since 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 almost bound to be curtailed very quickly.⁶ 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 per cent 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 fuelled by agricultural reform, but kept running on manufactured exports, usually from export processing zones (EPZs). India had a fiscal boom in the late 1980s, but kept growing in the 1990s by way of further reforms in which trade figured strongly. To trade openness, Kee and Hoon (2005) add the benefits of openness to foreign direct investment (FDI), which introduces technology and forward and backward linkages.

Many studies indicate that absorptive capacity in the host country is crucial for obtaining significant spill-over benefits from trade or FDI. For example, using data from industrialized countries to 69 developing countries, Borensztein and others (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 shows that if a country's absorptive capacity (measured by its stock of human capital) remains unchanged, a switch to 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 labour turnover associated with greater competition are means of technology diffusion—in turn an important channel for growth. This suggests that a priority for any country is to pursue general policies that are complementary, 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 is true of restrictive labour market regulation—see, for example, 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 a tightening of foreign-exchange constraints that 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 in favour of pursuing more stable macroeconomic regimes, which experience has long suggested lie behind sustained expansions. It is also worth

6 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.

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; but in this case, 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 induced by reform 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 subsequent layoffs; the sectors experiencing the greatest liberalization were also the ones where unemployment was of the longest duration. (We will return to sectoral evidence later.)

Overall, however, there is surprisingly little evidence on the nature and extent of transitional unemployment in developing countries, at least in part owing to 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 in industrialized economies, Matusz and Tarr (1999) argue that the adjustment costs associated with transitional unemployment are not high and that unemployment duration is 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 show increasing employment after trade reform, while former centrally planned countries in transition to a market economy showed the opposite. The problem of attribution is immense with respect to the countries in transition, however, since so much else was happening at the same time. It should also be noted that most studies of trade and employment refer to manufacturing employment, with little indication of whether their results can be generalized to apply to agriculture or services, or indeed, to any area outside the formal sector. This is a major shortcoming, at least as much conceptual as it is practical.

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

A further unknown is whether those laid off following trade liberalization are disproportionately poor. In developed countries, Kletzer (2004) suggests that this is so, but for developing countries, we are far from certain. 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 may thus also inform us about the effects of trade liberalization. In fact, it probably offers an upper bound for the costs of liberalization, 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 per cent of their previous salary 15 months later (Rama and MacIsaac, 1999). In Ghana, Younger (1996) finds that most laid off civil servants were able to find new work, albeit at substantially lower income levels; nonetheless, the income levels and incidence of poverty among their households after job loss were not substantially different from the average for the whole country.

It is likely that the more protected the sector originally, the greater the adjustment costs, 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 when 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) 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 per cent of the local labour force, labour income in the town falls by 1.5 per cent. This is essentially a Keynesian multiplier effect. The hysteresis of the labour market would serve to deepen and prolong it further.

Economy-wide wage rates

In this section, we pursue an economy-wide analysis, but allow for the existence of several classes of labour, each of which is mobile across sectors. Assuming fixed employment of these labour forces, the research question relates to wages.

Most of the international economics literature on trade and employment or wages is based on general equilibrium analysis. In this regard, it differs from the labour economics approach, which tends to relate to partial equilibrium, focusing on labour demand and supply and the functioning of the labour market, with an emphasis on institutional factors such as minimum wages, existence of unions, incentives to pay efficiency wages, and so forth. In the labour economics 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 its 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.⁷

7 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 labour 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 liberalization operate through the effects of changes in the relative price of tradable goods as a result of liberalization or other changes that allow or expand trade. The basic result is that, once labour adjustment across industries has occurred, wage impacts depend only on the change in product prices induced by greater trade. The argument is as follows. Since OECD countries have a more educated and skilled labour force, they should specialize in products that use such factors relatively intensively. The relative prices of goods that use less skilled labour 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 labour-intensive activities are downsized and relative wages fall, there should be an expansion in the demand for such labour in all parts of the economy. Conversely, developing countries should specialize in goods that use less skilled labour more intensively, and liberalization should thus boost unskilled wages.

Embarrassingly, neither the product price effects nor the economy-wide expansion in unskilled labour intensity are observed in the data, suggesting that the observed rise in skill premia in OECD countries is not mainly due to cheaper unskilled-labour-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 labour demand or relative wages across industries.

The same is true of the early papers that estimate the demand for labour, a labour 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 loss and/or wage inequality, productivity growth being the main factor displacing labour in the short run. Thus, for example, Freeman and Katz (1991), Katz and Murphy (1992), Revenga (1992), Bernard and Jensen (1995) and Berman, Bound, and Griliches (1994, 1998)—all of them heavily cited papers—conclude that skill-biased technical change (SBTC) accounts for the lion’s share (e.g., on the basis of a strong positive association between research and development (R&D) expenditures and computerization, and a rise in the relative return to skilled labour).⁸ Thus, despite different methodologies, the labour and trade literatures have been in substantial agreement on the effect of trade on wages and employment: i.e., skill-biased technical change dominates.⁹

This does not mean, however, that trade can be completely ignored as a source of wage inequality within developed or developing countries. Researchers focusing on the labour 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 centres on the growth in the “effective” unskilled labour force that is implied by the greater imports of unskilled-labour-intensive products from developing countries. That is, estimates are made of the labour being displaced by a given amount of imports.

8 As discussed below, this literature suffers from problems of endogeneity. 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 labour, or relocation abroad of (unskilled) labour-intensive stages of the value chain. There is substantial evidence that firms improve productivity following greater competition from imports. Greenaway, Hine and Wright (1999), using an industry production function approach, find this to be important in the United Kingdom, as do Bernard and Jensen (1995) for the United States.

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

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 labour, thus lowering wages. The extent to which this “expansion” occurs is measured by the unskilled labour content embodied in the imports. Wood (1994, 1995) concludes that, with some “reasonable” assumptions, this can be quite significant. The assumptions, in addition to the standard Heckscher-Ohlin ones, are that many imports from developing countries are non-competing (i.e., are much more labour-intensive than developed country varieties ostensibly in the same sectors) and that much of the SBTC has been induced by the competitive effects of trade.¹⁰ Note, however, that as the same relative declines in unskilled labour returns are observed in developing countries, SBTC remains an important part of the equation even in these frameworks.

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 an estimation of labour demand or production functions; and Computable General Equilibrium (CGE)-based numerical methods, the latter often being used for *ex ante* assessments. Most of the literature on labour 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 OECD countries’ trade with developing countries, calculating the jobs “created” and “lost” through exports and imports. Given the small share 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—this 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 earnings) losses in nine unskilled-labour-intensive United States manufacturing sectors due to import competition were very small, with the exception of consumer electronics (e.g., radios, televisions), where employment was estimated to be some 70 per cent 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 labour market outcomes—as measured by intersectoral changes in employment—but that domestic factors (e.g. demand for skilled labour and SBTC) were much more important drivers of job losses in the developed countries studied (primarily the United States and Canada). In general, little impact of trade policy changes was observed on wages.

More recent work has suggested more mixed conclusions regarding the impact of trade and trade reforms on sectoral employment in developed countries. Kletzer (2000) find a relationship between trade and job displacement in sectors identified as import sensitive but not for other sectors. Conversely, Dewatripont, Sapir and Sekkat (1999) find essentially no effect of developing country trade on European labour markets. The evidence from plant-level panel data for OECD economies is also not uniform. Some studies find increased trade exposure is associated with more labour churning and, sometimes, negative net effects on employment.

¹⁰ The magnitude of the labour demand elasticities, input-output coefficients, etc., used by researchers in these exercises is important. Sachs and Shatz (1994, 1998), for example, use a factor content approach to find much lower effects than Wood.

Much of the work on developed countries has focused on the impact 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-level panel data to analyse how the pattern of gross job flows in the United States 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 variations of the real exchange rate induce changes in net employment, mainly through job destruction. In follow-on work, Klein, Schuh and Triest (2004) studied the joint impact of trade liberalization (the North American Free Trade Agreement (NAFTA)) and real exchange-rate changes in the United States. The way in which the reduction in tariffs impacted on job flows is similar to the effect of a trend appreciation of the currency. Other studies of this genre focusing on the United States include Gourinchas (1999a, 1999b), Goldberg and Campa (1998), Goldberg and Tracy (2001) and Revenga (1997).

Gourinchas examines the exchange-rate response of gross job flows at the 4-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 minor 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 to exchange-rate changes than is industry employment. 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 resulting from exchange-rate changes.

Insofar as currency appreciation affects the probability of job losses, whereas depreciation does not, differential effects may depend on whether industries or 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 United States, import-competing industries reduce employment overall during currency appreciations. All of these results suggest asymmetrical effects in the United States 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 rather limited, but diverging, effects of exchange-rate changes on job flows for a number of European countries. This may reflect differences in labour market institutions. Hence, Burgess and Knetter (1998) find that in countries with the most rigid labour institutions, such as Germany and Japan, employment is not sensitive to exchange rates, while in other countries, appreciation is associated with reductions in employment.

Studies on developing countries have tended to be much more explicitly motivated by trade reforms. An early discussion of trade and employment can be found in Krueger (1983), who argued that developing country trade liberalization 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 liberalizations and better data to consider and, although they show mixed results, the general tendency is that effects are still minor. For example, Rama (1994), applying a model of monopolistic competition to a panel of 39 sectors in Uruguay over the period 1979-1986, 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 per cent led to an employment reduction of between 0.4 and 0.5 per cent within the same year. Harrison and Hanson (1999) suggest that one implication is that, during the years concerned, the labour 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, whereas reductions in quotas were significant, but had a relatively weak impact on output and employment: a reduction in quota coverage from 90 per cent to 10 per cent of output was associated with a 4-6 per cent reduction in output and, in turn, a 2-3 per cent decline in employment. Tariff reductions did appear to affect wages, however, because, Reventa concludes, tariff liberalization eroded rents and thus had no effect on employment and output decisions. Similarly, minor 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 with regard to female labour producing clothes). Surprisingly, however, they also find 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), it owes its success to its institutions rather than to its trade policy. Hence, 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 labour) generally do not increase with import competition after controlling for demand shocks. This suggests that sectoral structure does not depend much on trade policy. Roberts and Tybout (1997) finds that more plants were exiting than were entering manufacturing 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 the reallocation 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 of trade reform episodes on labour across a number of developing countries. They conclude that the presumption that reforms will result in labour reallocation is not supported by the available data. Liberalization episodes are followed by a *reduction* in the extent of intersectoral labour shifts at the economy-wide 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 be of importance. Other reforms, such as domestic deregulation and privatization, are found to have greater effects on

intersectoral labour movements than trade reform in isolation. Their conclusion is, however, 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 sectors contracting—and net employment increasing.

Heterogeneity and imperfect competition

The results of Wacziarg and Wallack (2004) are also consistent with more recent findings for developed countries. Thus, using the United States Census of Manufactures, Bernard and others (2003) conclude that liberalization had a significant impact on aggregate trade, but that it was not accompanied by sectoral reallocations. Although Wacziarg & Wallack and other similar findings appear to discount large-scale *intersectoral* movements of labour, they do not preclude significant *intra-sectoral* effects. Indeed, microeconomic analyses using firm-level data find significant turnover of firms within industries. The implication is that intrasectoral firm heterogeneity may be more important for the effects of trade liberalization than intersectoral differences.

While there is a majority-held view that SBTC explains the lion's share of the observed reduction in the relative return to low-skilled labour—as well as 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 labour market outcomes are affected by international trade, although the channels through which this occurs are unclear (Greenaway and Nelson, 2001; Francois, 2004).¹¹ Recent papers increasingly conclude that the threat of competition drives enterprises to improve productivity and that output quality is likely to have an important role in determining labour market effects.

The simple Heckscher-Ohlin prediction that trade results in a redistribution of employment away from import substituting and towards export-oriented production assumes a world of homogenous firms and products, and inter-industry specialization and trade. In practice, most trade is of the intra-industry type, reflecting trade in intermediates or exchange of differentiated products between countries with very similar factor endowments. The Heckscher-Ohlin-Samuelson (HOS) prediction of intersectoral realloca-

11 Neary (2001) notes that it is not clear how compelling the SBTC finding is in explaining the stylized facts. He argues that in a competitive HOS type setting, it should disproportionately benefit the unskilled labour-intensive (import-competing) sector and reduce the skill premium, and this has not been observed. While detrimental to unskilled workers, SBTC should benefit sectors that employ such labour intensively, lowering their costs and thus their prices, and this has also not been observed. Moreover, it cannot 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 labour 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 itself in more intense competition. Thus, empirically disentangling the effects of trade and technology will always be difficult.

tion is partly driven by the assumption of homogeneity among producers within the same sector (Haltiwanger and others, 2004).

In principle, given that much trade involves the intra-industry trade of differentiated products, one might expect that much of the job and wage impacts of trade would also be intra-industry in nature (Jansen and Turrini, 2004). Although comparative advantage forces are likely to continue to imply that increased imports are associated with employment reductions and exports with increases, as noted by Greenaway, Hine and Wright (1999), this is not necessarily the case. First, output changes—positive or negative—occur within the same (similar) industry, so that the focus needs to be on establishing how trade impacts differently across industries depending on differences among them in the type of exposure they have to trade and the changes that have occurred. Firm-level heterogeneity will play an important role in driving job losses or creation within sectors. Second, there will be scope for reducing price-cost margins (mark-ups, rents, etc.) as well as opportunities to exploit economies of scale and to innovate (by upgrading quality, differentiating products, etc.).

Formal models have been developed recently explicitly incorporating 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), the 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 opening up trade improves the productivity of firms (Roberts and Tybout, Bernard and Jensen, among others).

Greenaway, Hine and Wright (1999) investigate the effects of trade on employment in the United Kingdom of Great Britain and Northern Ireland using a dynamic labour demand framework for a panel of 167 disaggregated manufacturing industries, motivated by the observation that most United Kingdom 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 labour demand. After disaggregating by origin of imports they find stronger effects related to trade with the European Union (EU) and the United States than to trade with East Asia. Given that much of this trade is intra-industry, they interpret this finding as evidence that trade affects *x*-inefficiency, with the strongest competition for United Kingdom manufacturers coming from producers in the EU and the United States. Freeman and Revenga (1999) report a similar result, Gaston and Trefler (1997) found significant employment responses to import competition in some sectors in Canada, and Gourinchas (1999a, 1999b) 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 United States, Bernard and Jensen (1999b) find that intra-industry reallocations to higher productivity exporters explain up to 20 per cent of productivity growth in United States manufacturing. For developing countries, Aw, Chung and Roberts (2000), among others, find that exposure to trade forces the exit of the least efficient producers in South Korea and Taiwan, while Pavcnik (2002) finds that market share reallocations contributed significantly to productivity growth following trade liberalization in Chile.

Exports, intermediates, FDI and global production sharing

Research focusing on the differential role of exports as opposed to imports as a source of effects on the labour market concludes that exports tend to positively affect labour employed in the sectors concerned, whereas imports affect it negatively. 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 and 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. What is more interesting is the relative effects on different types of labour.

Exporters in an industry tend to be more productive than non-exporting 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, 1997; 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, the productivity gap being larger the less developed the local market. Using a firm-level dataset to explore the sources of the greater productivity of exporting firms, 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. Hence, 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 (1997), among others, have analysed the effects of FDI and outsourcing, recognizing that trade increasingly entails 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—United States FDI in Mexico—on the demand for skilled non-production and unskilled labour in Mexico. For nine industries located across multiple regions in Mexico they find that the relative demand for skilled labour 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 labour. 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 labour 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 significantly on pass-through assumptions. They conclude that technical change explains about 35 per cent of the change in the skill premium, while outsourcing explains another 15 per cent. In subsequent work, Feenstra, Hanson and Swenson (2000) use production under the Offshore Assembly Provision of the United States tariff schedule as a measure of outsourcing. They find that outsourced production is intensive in unskilled labour relative to production in the United States, and that outsourcing is a function of the relative cost of production in the United States. The implication is that such outsourcing of part of the production chain reduces the relative demand for unskilled labour.¹²

12 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.

Labour market institutions, market structure and political economy

As we noted above, Revenga (1997) suggests that the small labour market response found in developing countries such as Mexico and Morocco may reflect restrictive labour market regulation. However, Harrison and Hanson (1999) argue that labour market imperfections do not explain the limited reallocation effects observed in the developing countries for which micro-empirical work has been done. 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, they suggest that imperfect product markets may be a more relevant factor underlying the limited impacts of trade liberalization on labour markets that have been observed.

Goldberg and Pavcnik (2005) focus on a short- to medium-run framework where the industry affiliation of workers is assumed to affect the way in which trade policy affects wages, as is the case, for example, in the specific factors model of trade. This differs from the focus above, and from much of the earlier empirical research, where the investigation centres 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 liberalization 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 an immobility of labour across sectors, for whatever reason, or by the existence of industry rents that are reduced by trade liberalization, which might basically be the same phenomenon. Their findings reinforce the earlier analysis that trade reforms could increase wage inequalities in developing countries, tariff reductions being proportionately larger in sectors employing a high fraction of less-skilled workers, and loss of rents thus affecting such workers disproportionately.

Overall, as noted by Rama (2003), these studies suggest there was substantial rent sharing between protected enterprises and their workers. The removal of trade barriers erodes these rents, and the incidence of the loss is 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 and others (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. The same was true for 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 Treffer's (1994) on the United States, is said to spring either from a general Stolpher-Samuelson result, whereby unskilled workers benefit from liberalization and happen to have been most protected prior to liberalization, or from an exaggerated productivity response to liberalization, whereby sectors with larger tariff cuts make larger productivity improvements and share them with labour.

Goldberg and Pavcnik (2005) control for the political economy determinants of tariff protection that may also affect industry wage premiums independently, inducing a 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 remained 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., findings similar to Revenga (1997), Currie and Harrison (1997) and Wacziarg and Wallack (2004), for instance. As the authors note, this is surprising given, for example, the existence of a large informal sector in Colombia that does not comply with labour market regulation and thus provides an additional margin of adjustment.

One possible explanation for this is that labour 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, that increase is entirely 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 intersectoral reallocation of labour. Whether this impact reflects industry rents or constraints on labour mobility—or other factors—remains to be determined. Goldberg and Pavcnik consider both hypotheses to be plausible.

Stylized facts and research agenda

This section attempts to consolidate our survey by noting some stylized facts as well as 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 labour 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 it is also, and more importantly, a result of the recognition that trade is both a direct and indirect channel for technological upgrading. 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 labour. 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 labour intensively. Thus, unskilled labour has seen its relative remuneration fall generally. Moreover, the skill premium has risen in *both* developing and OECD countries, and rising inequality between the skilled and unskilled has become a global phenomenon;¹³

13 This rising inequality is in the sense of falling relative returns to labour market participation for unskilled workers; it 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 labour relatively intensively. This is noteworthy from a trade theory perspective, as this goods price channel is the most obvious one through which greater trade and foreign competition should affect labour 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 SBTC is the primary culprit (Acemoglu, 2002);
- Whether the impacts of more open trade operate more or less through wages as opposed to employment depends significantly on labour market institutions, the efficiency of capital markets and social policies. The fact that the United States market has a more flexible labour market and a more efficient financial sector than most European countries helps to explain why wages bear a higher brunt of shocks in the United States than in the EU;
- In developing countries, it also appears that wage responses are greater than impacts on employment. 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 labour market rigidities and related distortions in developing countries that prevent labour reallocation in the short-to-medium run. However, it is also consistent with a dissipation of industry rents, which may in turn have been supported by the stance in trade policy;
- In general, the magnitude of globalization effects of greater trade in OECD countries on wages and inequality are small. Similarly, the recent literature analyzing the effects of trade reforms in developing countries 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 found no 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 a major impact of trade reforms is 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 firms expanding their market shares. Overall, total factor productivity increases more in industries that liberalize more;
- Correspondingly, the direct effects of trade reform on aggregate employment are muted. Different models imply different predictions for the long run, the neoclassical ‘no change’ model 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 they are generally not very large relative to total employment. These responses and strains are large, of course, to those who lose their jobs.

Turning to future research priorities, we would identify 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 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. An enigma highlighted by Harrison and Hanson (1999) is why these countries find it optimal to protect low-skill intensive sectors when this is their abundant factor.¹⁴ However, this finding may also be a function of the set of countries that have been analysed, 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. From the conclusions arrived at in the numerical literature on trade and poverty it arises that the poor would benefit from trade reforms because the structure of protection is biased against goods they consume and produce—for example, Hertel and Winters (2005). Clearly the need for a pertinent 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 (International Standard Industrial Classification of All Economic Activities)— 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 (2004) 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 productivity-adjusted labour costs would help identify sectors or firms that may be confronted with more serious adjustment costs after 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 Program (World Bank, 2005a) and *Doing Business* (World Bank, 2005b);
- *Intersectoral mobility, entry/exit across sectors.* Borjas and Ramey (1995) found that the effect of trade on the labour market depended on the market structure of industries. Barriers to entry and exit will clearly have a bearing on labour market responses to further trade and investment liberalization. Capital and financial market distortions or inefficiencies will affect the ability of firms to expand or enter. These variables may be more important than the labour market. To a large extent such factors have already been studied, but not perhaps from a labour 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 and wages, in both developing and developed countries. Most employment in both categories of countries is, however, in other sectors. In OECD countries services account for more than 70 per cent of turnover and employment, whereas agriculture and the informal and public sectors account for most of the employment in developing countries, especially the poorer among them. To a significant extent, services have become “tradable”, be it through cross-border exchange and telecom networks (the internet, etc.) or through international factor mobility (e.g., FDI, labour movement). Adjustment to agricultural price shocks and competition may be quite different from the type of adjustment that occurs in manufacturing, giving rise to greater intersectoral reallocations of labour with associated differences in social costs and implications;

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

- *Formal versus 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 labour market rigidities. A good understanding of labour 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 regard, one has to recognize that informality may be a rational choice for workers as well as for firms, not a consolation prize for those who cannot enter the formal sector. But this goes beyond labour market regulation: the tax system, access to credit, and so forth will also have potentially major effects on the ability of small entrepreneurial firms 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 post-reform sectoral reallocations observed in many developing countries are related to (dis)incentives to grow and/or enter into new markets;
- *Aggregate effects of trade opening in developing countries.* What happens to countries that start off with large-scale unemployment or underemployment? The cases of East Asian countries have been much studied and debated, and clearly trade openness has played an important role in the changes observed in the structure of these economies over the last 40 years. The same was true of OECD countries in the past. This is a reflection of the process of economic development and growth. Few studies exist, however, that analyse the longer-term effects of trade opening on the reduction of underemployment in the informal and rural sectors, as distinct from (or in conjunction with) other policies pursued by governments;
- *International labour mobility.* Migration, temporary or permanent, has not been discussed in this paper, but it is clearly an important issue in determining both labour market effects and responses to reforms in developing countries. International movement of people is not just an employment or labour 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 movements are both complex to assess ex ante and may take quite some time to materialize, but they 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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