

E DISTRIBUTIONAL CONSEQUENCES OF TRADE

Countries liberalize trade because they expect gains for their economy. Previous sections have provided detailed descriptions of the different mechanisms that allow countries to reap such gains from trade and have shown that the gains are likely to be significant. Why is it then that countries sometimes hesitate to reduce trade barriers and why is it that outright opposition to liberalization can sometimes be observed? This section provides some answers to these questions by focusing on the distribution of the gains from trade within countries.¹ Not all individuals within an economy necessarily become better off with trade liberalization and this section will pay particular attention to those individuals that may lose from trade liberalization, either temporarily or permanently. The last sub-section analyzes how to ensure that the most vulnerable individuals in an economy, i.e. the poor, are among those gaining from liberalization.

1. TRADE AND INEQUALITY

(a) What do trade models say about the distributional changes resulting from trade liberalization?

Trade liberalization provides new commercial opportunities for companies that are able to export and provides consumers, through imports, with access to cheaper and different goods. Those imports, however, may be in competition with local production and the relevant local producers may suffer from the new competitive pressure. New export opportunities and the increased competition from imports will lead to the expansion of some activities and the reduction of others and – as is often the case with changes resulting from policy reform – some individuals may gain and others may lose in this process. Since individuals do not necessarily know in advance whether they will be among the losers or winners, they may fear liberalization because of the uncertainty it brings. Others will focus on possible difficulties in the short term. For instance, they may be afraid of having to change jobs, even though they are likely to become better-off in the long term.

Regarding the long-term distributional consequences of trade reform, an important question is whether the relatively well-off or the not so well-off gain from

trade liberalization, i.e. whether trade liberalization is likely to increase or decrease inequality in societies. Economists today consider the answer to this question to be highly situation-specific, and economic thinking on this question has undergone certain changes over time.

The classical link between trade and income inequality is based on the Stolper-Samuelson Theorem developed in a traditional trade model (Heckscher-Ohlin) that assumed full employment. In this model, trade flows are determined by comparative advantage and the latter, in turn, depends on each country's resources.² As developing countries are typically well endowed with low-skilled labour relative to developed countries, the former were expected to start exporting low-skill labour-intensive goods to the industrialized world. Relative demand for low-skill workers would increase in developing countries and decrease in industrialized countries and the theorem predicted that inequality between high-skill and low-skill workers would probably increase in industrialized countries as a consequence of trade with developing countries.³ Along the same lines, inequality would be expected to decline in developing countries.

A similar argument could be made with respect to the gains of capital compared with labour. If industrialized countries are considered to be relatively rich in capital, capital-labour inequality would increase in industrialized countries as a result of trade and decrease in developing countries. The Stolper-Samuelson Theorem thus predicted that trade would lead to changes in rewards that were factor specific. Certain factors were expected to gain, independent of whether they were employed in exporting or importing sectors, or companies, while others were expected to lose, again independent of their employment. The theorem applies to trade among rather different countries – for example, industrialized versus developing countries – and predicts that relative rewards move in opposite directions as a consequence of trade.

Traditional theory is less useful for predicting the distributional effects of trade among similar countries. This is a potentially important question since industrialized countries trade more with other industrialized countries than with developing countries. The predictions of traditional theory also

appear to be in conflict with the evidence from firm-level data indicating that companies differ significantly within sectors, that only a subset of companies within a given sector exports and that those companies tend to pay higher wages than non-exporting companies (Bernard and Jensen, 1999).

More recent contributions to the economic literature have analyzed how trade among similar countries, i.e. among industrialized countries, may affect factor prices. Matsuyama (2007) argues that the act of engaging in international trade may require the services of skilled labour, meaning labour with expertise in areas such as international business, language skills and maritime insurance. As a result, increases in trade can lead to a worldwide increase in the relative price of skilled labour. Epifani and Gancia (2006) argue instead that trade can benefit skilled workers because they can better take advantage of larger markets. They show that skilled workers, in any country, tend to constitute a minority of the labour force and tend to be employed in sectors with high plant-level fixed costs that produce highly differentiated goods that are gross substitutes for less skill-intensive products. In such a situation, trade will lead to a rise of the relative output of sectors characterized by economies of scale, i.e. the skill-intensive sectors. As a result, the relative demand for skilled workers goes up.

Another set of models, in which fixed costs also play a role, allow for differences between firms and a so-called continuous distribution of skills among workers (Manasse and Turrini, 2001; Yeaple, 2005). In these models there is no clear line of separation between “high skill” or “low skill” workers, but rather a large variety of workers with different skill levels. In both models, the highest-skilled workers will end up by working in exporting companies after trade reform and in Yeaple (2005) those companies use more productive technologies. Therefore, only skilled workers can take advantage of the increased opportunities provided by trade, and the difference between their wages and those working in other, non-exporting companies increases as a consequence of trade reform. This mechanism would not only work for trade between very different countries but also for trade among similar, for example, industrialized countries. It also predicts increased inequality in all countries participating in trade. The prediction that exporting firms pay higher wages than non-exporting firms also corresponds to the firm-level evidence mentioned above.

Yeaple’s model uses a “new new” trade theory framework based on the so-called Melitz model discussed above.⁴ Davis and Harrigan (2007) use this to build a model that allows them to explain why, in the opinion of the public, globalization threatens “good jobs at good wages”. In their model, firms differ in two aspects that determine their competitiveness: their productivity and their ability to monitor workers. Firms with a lower ability to monitor workers have to pay higher wages to prevent workers from underperforming. The authors consider jobs at these companies to be “good jobs” since they are better remunerated than the economy-wide average for identical workers. Yet the fact that firms with a lower monitoring ability have to pay higher wages also renders them less competitive compared with other firms with similar productivity levels. Trade liberalization triggers the selection effect known from the Melitz framework, but implies in Davis and Harrigan’s (2007) model that particular pressure is put on what are considered to be “good jobs”. While trade tends to raise the real average wage, it leads to a loss of many “good jobs” and a steady state increase in unemployment.

The increased practice of international outsourcing of services inputs has led to an increased interest in the distributional effects of offshoring. Outsourcing is expected to affect wages through potentially three channels (Baldwin and Robert-Nicoud, 2007; Grossman and Rossi-Hansberg, 2006b).⁵

First, the outsourcing of tasks will lead to cost savings that have positive repercussions for all domestic wages. Second, the fact that tasks are outsourced will allow workers to look for jobs elsewhere. In the relevant literature, this effect is sometimes called the “labour supply effect” and tends to have a negative effect on the wages of workers performing tasks that are being outsourced. Third, offshoring may affect the terms of trade in large countries with repercussions for wages. If, for instance, a country is a net exporter of high skill-intensive products, and outsourcing takes place in the low skill-intensive sector, the expansion of production in the low skill-intensive sector will improve the country’s terms of trade, with positive effects on high-skill wages and negative effects on low-skill wages. In these circumstances, two of the three channels could thus have a negative effect on low-skill wages, while the third channel, i.e. the productivity channel, has a positive effect on low-skill wages. The overall effect is ambiguous, but is

more likely to be positive for low-skilled workers the larger the cost savings (or productivity) effect generated by offshoring in the sectors in which low-skilled workers are intensively used.⁶

The wage effects of offshoring will also to a large extent depend on which type of jobs will actually be offshored. Much of the empirical literature on offshoring has focused on this question. In particular, it has been argued that “routine jobs” can be more easily offshored than “non-routine” jobs. Some studies indicate that routine jobs are often medium skilled. This may explain why contributions to the empirical literature on globalization and labour markets in industrialized countries have increasingly moved away from the distinction between two types of workers – high- versus low-skilled – and include a group of medium-skilled workers in the analysis or even a higher level of differentiation. The relevant literature will be discussed in more detail in the next sub-section.

With respect to the short-term consequences of trade, models based on recent theories also lead to different predictions from the more traditional approaches. In the above-mentioned Heckscher-Ohlin model, production factors are supposed to be able to change employers and, in particular, sectors instantaneously. In reality, this is not the case, as it takes time for production factors to adjust to a policy reform. This is taken into account in the so-called “specific factor model” that is also based on traditional modelling approaches. This model assumes that, in each sector, there is one factor that is sector-specific and cannot change the sector of employment. In this model the sector-specific factor in the import-competing sector will lose from trade liberalization. This model has been interpreted as reflecting the short-term distributional impacts of trade reform.

Krugman and Obstfeld (2006) give the following example. Assume that a country produces food and textiles with the production factors of land and labour. Assume also that the country finishes by importing textiles and exporting food after trade liberalization. In the long term, this is good news for landowners and bad news for workers. However, in the short term, the owners of the land that is currently being used for textile production may suffer, while workers who are currently producing food may gain. Such short-term gains and losses often seem to determine political positions in debates over trade policy.

In this traditional approach, who wins and who loses from trade reform in the short-term is expected to depend on the sector of employment. The “new-new” trade theory has challenged this prediction. It predicts that both net-exporting and net-importing sectors will be characterized by expanding high-productivity firms and shrinking low-productivity firms (Bernard et al. 2007b). As a result, this approach predicts that trade reform will trigger job creation and job destruction in all sectors. For policy-makers, this implies that significant reshuffling of jobs takes place within sectors.⁷ This may be good news, since it is generally expected that it is more difficult for workers to move across sectors than for firms to change within the same sector. A move across sectors may, for instance, imply higher retraining costs for workers and longer search periods. On the other hand, the fact that adjustment occurs in all sectors implies that a wider range of jobs are at risk. While traditional trade models would suggest that policy-makers who wish to assist workers focus on so-called comparative disadvantage sectors, i.e. those that can be identified as import-competing sectors, more recent research suggests that such targeted intervention is not necessarily effective.

(b) Empirical evidence on trade and inequality

Although trade models differ widely in their predictions about how precisely the gains from trade will be distributed, they all predict that those gains will not be distributed equally within an economy. This is not necessarily a cause for concern. Given that trade leads to gains for the economy as a whole, everybody can be made better off if appropriate domestic policies are put into place. Nevertheless, the fact that trade may in some circumstances lead to increased inequality has received much attention in the public debate and also in the empirical trade literature.

In the context of increasing inequality in most regions of the world (see Table 15), a large amount of relevant empirical trade literature in the 1980s and 1990s focused on the question of whether trade is one of the main drivers of changes in inequality or only one among many others. Towards the end of the 1990s this literature converged to the view that international influences only contributed to about 20 per cent of rising wage inequality (see Box 16). Very recent literature reaffirms that other forces –

Table 15
Evolution of Gini coefficients by region, 1970-2000

Years	OECD	LAC	EAP	SAS	AFR	ECE
1970	0.352	0.561	0.444	0.380	0.649	0.298
1980	0.339	0.556	0.489	0.384	0.631	0.301
1990	0.353	0.552	0.485	0.381	0.651	0.307
2000	0.368	0.572	0.520	0.334	0.668	0.428

Note: LAC: Latin America and the Caribbean; EAP: East Asia; SAS: South Asia; AFR: Africa; ECE: East and Central Europe.
 Source: Dikhanov (2005) "Trends In Global Income Distribution, 1970-2000, and Scenarios For 2015", Human Development Report 2005.

such as technological and institutional innovations, demographical changes and cyclical fluctuations – are more important than trade in driving changes in income distribution (Lawrence, 2008). This section focuses on two other issues that still leave economists puzzled.

The first issue relates to the relationship between trade and inequality in developing countries. It was originally expected that trade would lead to decreases in inequality in developing countries. This was good news because trade was therefore expected to reduce poverty through two mechanisms: its positive impact on growth and its favourable impact on income distribution. Empirical research has, however, shown that the second mechanism has not always been triggered by trade reform and numerous studies have examined why this has been the case.

The second issue concerns the question of who is likely to suffer from trade liberalization in industrialized countries, either in relative or in absolute terms. The focus of the debate on this question has changed quite significantly over time. Whereas the question was posed in terms of “high-skilled” versus “low-skilled” workers in the 1980s and 1990s, more recent studies make a distinction between “high-”, “medium-” and “low-skilled” workers, reflecting some concern about the evolution of wages of medium-skilled workers. Other studies try to make even more nuanced distinctions between different types of skills. There has also been an increased interest in the evolution of the relative income of the “super rich” and in the evolution of the labour – as opposed to capital – share of income.

i) Has trade led to decreased inequality in developing countries?

Traditional trade theory predicted that North South trade leads to increased inequality in the North (capital and skilled labour gain, while unskilled labour loses) and decreased inequality in the South. In particular, it was expected that globalization would help the less skilled, who were presumed to be the locally relatively abundant factor in developing countries.

Empirical research has used different measures for inequality, as described in Box 16. Studies analyzing the link between trade and wage inequality in developing economies have produced mixed results. Most of the empirical evidence from early liberalizers in East Asia confirms the predictions of traditional trade models, while in Latin America, evidence suggests that trade liberalization has often coincided with an increase in both income inequality and wage inequality between high- and low-skilled workers. The same observation has been made for India after its liberalization measures in 1991 (Goldberg and Pavcnik, 2007). A large body of empirical literature has tried to explain this phenomenon and finds that the timing of trade liberalization, the tariff schedules in place before liberalization and technological change are some of the elements which explain why certain developing countries have experienced an increase in inequality after trade liberalization.

Box 16

Measuring inequality

Different measures of inequality have been used in the empirical literature analyzing the distributional effects of trade reform.

Wage inequality between high-skilled and low-skilled labour

Much of the empirical literature in the 1980s and 1990s focused on changes in the so-called skill premium, i.e. the wage difference between high- and low-skilled workers.

The measurement of skills varies depending on the kind of data available. Plant- or firm-level datasets typically differentiate between production and non-production or blue-collar and white-collar workers. Studies using these data consider the wage difference between white- and blue-collar workers to reflect skill differences. Although this categorization is rather imprecise, Goldberg and Pavcnik (2007) note that “cross-tabulations of matched worker and employer surveys at the plant level in the United States and the United Kingdom indicate a close relationship between the production/non-production status of workers and their educational level”.

The measurement of skills is sometimes based on occupational classification data. Some occupations require more skills than others, and based on this consideration, economists have attempted to match occupations with skills. Hijzen et al. (2005), for example, use the New Earnings Survey Panel Dataset (NESPD) in a study of the effects of offshoring on relative rewards. Measures based on occupational datasets score high in terms of international comparability because standardized classifications like SOC (Standard Occupational Classification) exist. Unfortunately the availability of datasets distinguishing workers based on their occupations is limited.

Another commonly used measure is wage data providing information on educational attainment – based on the assumption that the higher the level of education, the more skilled the worker. Internationally comparable data for educational attainment based on the International Standard Classification of Education (ISCED) exist

and economists often use this classification to distinguish three skill levels: low (up to primary education), middle (up to upper secondary education) and high (tertiary education).

Labour share of income

In recent years, empirical work on the impact of trade or globalization on inequality has become increasingly interested in the contrast between labour and capital income. One measure used to capture this difference is the labour share of income, i.e. the ratio of total compensation to workers over national income (International Monetary Fund, 2007b). Its measurement is subject to a number of methodological problems, especially how to define workers and what to include in compensations. One of the difficulties is how to deal with the income of the self-employed (Gomme and Rupert, 2004).

Gini coefficient

The Gini coefficient gives more detailed information on the entire income distribution of households in an economy and takes into account the fact that an individual household may have several sources of income. It is a measure of statistical dispersion, defined as a ratio with values between 0 and 1. A low Gini coefficient indicates more equal income or wealth distribution, while a high Gini coefficient indicates more unequal distribution. 0 corresponds to perfect equality (everyone having exactly the same income) and 1 corresponds to perfect inequality (where one person has all the income, while everyone else has zero income).

Percentile shares

Some studies, like International Monetary Fund (2007a), use the relative income shares of different income groups as the relevant measure of income inequality. The quintile share, for instance, is defined as the cumulative income of one-fifth of the population divided by the total income. The income distribution is perfectly equal if all the income shares are equal. A related measure is the ratio of the top 20 per cent of the population

versus the bottom 20 per cent. This could be interpreted as a measure of income polarization. Recent years have witnessed an increased interest by economists in measures of polarization in the light of evidence that growth in US inequality since 1990 has been concentrated in the top end of the distribution (Lemieux, 2007).

Information on labour shares, percentile shares and Gini coefficients tends to be based on

household income statistics. Atkinson (2003) points out that certain types of capital gains are typically not captured in such statistics which may have led to inequality being increasingly understated. In the United States, for instance, capital gains from the sale of stock holdings are not included in the income measure, nor is the net imputed return on equity in one's own home.

It has, for instance, been argued that the recent entry of China and other low-income developing countries in world markets has shifted the existing patterns of comparative advantage of middle-income countries, such as Argentina or Colombia. Wood (1999) postulates that, while in the 1960s and 1970s middle-income countries had a comparative advantage in goods of low-skill intensity, in the 1980s and 1990s, when low-income developing countries started exporting to the rest of the world, the comparative advantage of middle-income countries shifted to goods of intermediate skill intensity.

The effect of trade reform on income distribution may also depend on initial income levels, as argued by Milanovic (2002). His findings suggest that at very low average income level, it is the rich who benefit from openness. As income level rises, that is around the income level of Chile, Colombia or Czech Republic, the situation changes and it is the relative income of the poor and the middle class that rises when compared with the rich. It seems that trade openness makes income distribution worse before making it better – in other words, the effect of openness on a country's income distribution depends on a country's initial income level.

Another explanation for the increasing wage difference between high and low-skilled workers, i.e. the so-called skill premium focuses on the pattern of protectionism prior to trade liberalization in many developing countries, and on the skill intensity of the sectors that were the most affected by trade reforms. Several studies on countries including Colombia, Mexico and Morocco have noted that, contrary to expectations, it was the unskilled labour-intensive sectors that were protected the most prior to trade reform. As a consequence, when protection was lifted, wages of the unskilled went down.

It has also been argued in the trade literature that technological change and trade should not be treated as separate phenomena as they are likely to have an impact on each other. Several recent papers have postulated that, even though technological change may have played a greater role than particular trade policy changes in increasing inequality, technological change was itself a response to more trade openness so globalization was indirectly responsible for the increase in inequality. It could, for instance, be the case that the previously mentioned entry of low-income countries into world markets may have led to faster technological change in middle-income countries in their efforts to remain competitive. Goldberg and Pavcnik (2007), however, point out that the empirical evidence on the interaction between trade openness and technological change and their effect on inequality is so far mixed and inconclusive.

The “new-new” trade theory framework may provide another explanation as to why inequality increases have been observed in both developed and developing countries. As discussed in previous sections of this report,⁸ the main idea of the relevant trade models is that trade openness leads to an “upgrading” of firms, with the most productive firms expanding their operations while less productive firms reduce their operations. In order to establish a connection between compositional changes within an industry and the inequality debate, it would be necessary to show that “higher-quality” firms have a higher demand for skill so that “firm upgrading” triggers an increase in inequality (Goldberg and Pavcnik, 2007). Empirical evidence from the United States suggests that exporting is a skill-intensive activity (Bernard and Jensen, 1997). Harrison and Hanson (1999) also find that exporters employ a higher share of white-collar workers than non-exporting plants in Mexico.

Certain models analyzing the phenomenon of offshoring predict that it will trigger increased

inequality in developing countries. Antras et al. (2006) show that “globalization leads to the formation of international teams in which northern managers supervise teams of southern workers: offshoring”. Offshoring thus permits the geographic separation of production and problem solving and the relocation of physical production in the South. It leads to the creation of routine jobs and an increase in production in the South, and to the creation of knowledge-intensive jobs or firms and a decrease in production in the North. This implies that the pattern of trade is such that the South is a net exporter of physical goods while the North is a net exporter of knowledge services. Globalization also affects the level and structure of earnings of individuals, both in the North and in the South. In particular, globalization leads to an increase in “within-worker” wage inequality, that is wage inequality among non-managers, in the South. This is the case because globalization improves the quality of managers with whom certain southern workers are matched, thus raising the productivity of these workers and increasing their wages.

Overall it appears that the particular mechanisms through which globalization affects inequality are country, time and case-specific and that the effects of trade liberalization need to be examined in conjunction with other concurrent policy reforms.

ii) How are the gains from trade distributed in industrialized countries?

With the increasing importance of the phenomenon of offshoring, the focus of the empirical literature analyzing the relationship between globalization and inequality has changed. A number of recent studies, for instance, analyze the relative importance of different aspects of globalization. In that literature a distinction is typically made between trade, offshoring and migration. As offshoring often implies cross-border movement of capital, there has been an increased interest in the gains of capital as opposed to the gains of labour from trade liberalization. The variables used to measure inequality have also changed. Recent literature has increasingly moved away from comparing the wages of blue- and white-collar workers and instead uses data based on occupational classifications or micro-level datasets that allow researchers to evaluate the “tradability” of different types of tasks or the extent to which tasks are repetitive and can easily be computerized.

Also in recent empirical studies, technology continues to be included as a factor affecting inequality and is typically found to be the main driving force of distributional changes (see Box 17).

Box 17

Inequality: how much is technology, how much is trade?

Much of the empirical work on trade and wage inequality for industrialized countries in the 1980s and 1990s focused on the relative importance of trade liberalization and technological change for explaining inequality in developed countries. Inequality was typically measured in terms of wage inequality between skilled and unskilled workers, where white-collar workers were supposed to represent skilled workers and blue-collar workers represented unskilled workers. The estimated impact of trade on the rise in inequalities differs widely across the various studies, some giving an overwhelming role to technological change and others claiming that trade was mostly responsible. Towards the end of the 1990s, Cline (1997) concluded in his overview of the relevant literature that international influences contributed by about 20 per cent to the rising wage inequality.

More recent studies also find that technological change has a higher impact than trade on inequality. International Monetary Fund (2007a), for instance, finds that technology is the main driver of inequality, in terms of the Gini index. This, in particular, is the case in developing countries, whereas the study finds that technology and globalization (in this study defined as trade and FDI together) have a similar level of negative effect on equality in industrialized countries. Technology is also found to be the main force increasing the income share of the top 20 per cent of the population and decreasing the income share of the bottom 20 per cent. The effects of globalization on both are very small. International Monetary Fund (2007b) compares the effect of technological change and globalization on the labour share of unskilled workers and finds that technological change has a dominant effect. In that study the term “globalization” embraces trade, offshoring and immigration.

Skilled versus unskilled labour

Recent waves of offshoring of skilled jobs, for instance in the IT industry, have raised awareness that high achievements in formal education do not necessarily provide a guarantee for a bright professional future. Increasingly there is discussion about which types of skilled jobs will be maintained in open industrialized economies.

In fact, the empirical literature on the link between trade and changes in wages between high and low-skilled workers has never been very explicit as to the skill levels of those taking advantage of increases in wages for skilled labour. As mentioned previously, many relevant studies have used data on the wage difference between white-collar and blue-collar workers. White-collar workers do indeed include management-level employees who have probably a high level of education. But they also include administrative staff with relatively low levels of education. In contrast, blue-collar workers may well include employees with an engineering degree. The white- versus blue-collar distinction thus only gives a rather rough approximation of skill differences and is not a very useful indicator for those wishing to adjust skill supply to changes in skill demand.

More recent studies have used data based on educational or occupational classifications, or micro-level datasets that allow researchers to evaluate the “tradability” of different types of tasks or the extent to which tasks are repetitive and can easily be computerized. Ekholm and Hakkala (2006) and OECD (2007c) are two examples of studies that define skill groups according to educational attainment. Ekholm and Hakkala (2006) analyze the effect of outsourcing on skill demand in Sweden and OECD (2007c) performs a similar exercise for Japan. Both studies distinguish three skill levels:⁹ lower secondary, upper secondary and tertiary education. Both studies find that outsourcing has shifted demand away from the intermediate skill level, i.e. workers with upper secondary education.

Hijzen et al. (2005) show different results for the United Kingdom and find that international outsourcing has had a negative effect on the demand for the most unskilled workers. These authors, however, base their three skills groups on an occupational classification. In particular, they consider managers, administrators and professional occupations to be high skilled. The semi-skilled

group comprises associate professional and technical occupations, clerical and secretarial occupations, craft occupations, personal and protective service occupations and sales occupations. The unskilled group comprises plant and machine occupations and “other occupations” that are considered unskilled.

A third strand of literature uses micro-level datasets and focuses on the type of tasks performed by workers. This approach and the terminology used is linked to recent theoretical work analyzing the phenomenon of offshoring in terms of “task trade” (Grossman and Rossi-Hansberg, 2006b). So far the relevant empirical work has mainly attempted to define which types of tasks can be traded and may potentially be offshored. Whether a country ends up importing, i.e. and thus offshoring, these tasks or exporting them, will – as in the case of “ordinary” good trade – depend on aspects like comparative advantage.

Van Welsum and Reif (2006) and van Welsum and Vickery (2005) argue that tradable services are characterized by four features: IT intensity, output that is IT transmittable, tasks that are codifiable, and tasks that require little face-to-face interaction.¹⁰ Such tasks may include high-skilled jobs, such as security analysts, or low-skilled jobs, such as switchboard operators, and are not necessarily sector specific. Blinder (2007) approaches the question of tradability in a somewhat different way and focuses on two questions. First, does a worker need to be in a specific location in the home country to perform the job (for example, child care worker). If the answer is yes, the relevant job is qualified as highly “non-offshorable”. If the answer is no, the second question asks whether workers have to be physically close to their work unit to perform their job. If the answer to that question is no, the relevant job is classified as highly “offshorable”.¹¹ Van Welsum and Vickery (2005) estimate that 20 per cent of total US employment is offshorable and Blinder (2007) considers 22-29 per cent to be offshorable. Neither study provides straightforward insights into how many jobs have been or will actually be offshored.

At this stage, trade economists do not appear to have clear answers as to how trade and offshoring will affect the demand for skills in the near future. It has been argued that trade and offshoring flows may change continuously and thus lead to frequent changes in the demand for skills. This argument seems to be confirmed by signals from employer

organizations indicating that it is increasingly hard to predict which skills their members will need in only two to three years' time.

Labour versus capital

Labour income represents only a fraction of total income and studies focusing on wage inequality, such as the ones discussed in the previous paragraphs, therefore only provide limited information on changes in income inequality. Developments in the agricultural sector, which still plays a predominant role in many developing countries, are not reflected in data on manufacturing wages. In addition, wage data do not give any information on possible additional revenues of workers – for instance, through investments in shares. More importantly, changes in the returns to capital are not captured by the evolution of wage inequality. This is an important shortcoming in a time where capital is expected to obtain a disproportionately large share of the gains from globalization, leading to some concern about the divergence between capital and wage income. One of the reasons for this evolution is that with the increasing integration of very populated economies, such as China and India, the global supply of labour has significantly increased, thus exacerbating the relative scarcity of capital. As a consequence the value of capital is bound to go up (Rogoff, 2005).

In a recent study, the International Monetary Fund (2007b) analyzes the effect of globalization on labour shares (as opposed to wage inequality or income distribution). “Globalization” is measured in this study as the combination of trade, immigration and offshoring. The study also differentiates between employees in skilled sectors and those in unskilled sectors.¹² The study finds that technological change and globalization have had a negative impact on the share of workers in unskilled sectors and that the effect of technological change was stronger. The study also finds that the impact of globalization was greater on the share of workers in skilled sectors than in unskilled sectors and that this effect was mainly driven by offshoring activities.

Ochsen and Welsch (2005) analyze the factors determining the distribution of functional income in West Germany for 1976-94. They find that the shares of capital and high-skilled labour benefited from technological progress, whereas the share of low-skilled labour was adversely affected by technological progress. The effect of technology

on the two labour shares was enhanced by the substitution of intermediate inputs for low-skilled labour. To the extent that this substitution involves imported intermediates, increased trade openness hurts low-skilled labour. That is, trade seems to have hurt low-skilled labour mainly by imported intermediates taking the place of low-skilled labour. However, the overall contribution of trade to changes in income distribution was small, as the year-to-year variation in the low-skilled labour share can be attributed to input prices, technological progress and trade-induced structural change in the proportion 19:77:4.

Changes in earnings distribution: increasing dispersion at the top end

A phenomenon that has received a great deal of attention in very recent literature on income distribution is the one of increasing earnings dispersion at the top of the distribution. Lemieux (2007) describes that growth in US inequality since 1990 has been concentrated in the top end of the distribution, while inequality in the low end of the distribution has declined, at least for men. These recent developments are not consistent with standard models of technological change that were suggested as the leading explanation for the growth in inequality in the 1980s.

Atkinson (2007) examines evidence for 12 OECD countries and finds that the evolution of the income of the bottom 10 per cent of the population between 1980 and 2005 differed significantly across countries. Leaving aside eastern Europe (Poland and Czech Republic in his sample), the data do not show a general pattern of decline in the bottom 10 per cent. In France, the income of the bottom 10 per cent in the income distribution even increased. Much clearer is the rise in top earnings since 1980, and the fanning out of the upper part of the distribution. The income of the top 10 per cent rose by more than 15 per cent in the United Kingdom and the United States, by close to 10 per cent in Western Germany and by close to 40 per cent in Portugal (since 1982).

Atkinson argues that these changes at the upper-end of the income distribution can not be explained by technological change. He provides other explanations, one of them referring to the so-called superstar theory, that is associated with Rosen (1981) and has also been explored in trade literature

(Manasse and Turrini, 2001). According to this theory, technological change and trade openness give the most talented individuals the possibility to exploit their talents more widely. Accordingly their earnings rise exponentially, while less brilliant individuals experience a declining demand for their services, because technology and openness allow for demand to be redirected to the exceptional individuals. Lawrence (2008) also makes reference to the same argument when stating that “globalization more broadly construed has played some role in increasing the size of relevant markets and thus incomes of CEOs, sports stars, entertainers, and software producers”. He further argues that what he calls super rich inequality has to a large extent been driven by factors of domestic origin, such as technological changes, institutional developments such as financial deregulation, changes in US corporate practices and rising asset markets.

(c) Trade, inequality and calls for protectionism

If some individuals lose or expect to lose from trade liberalization, they may want to push policy-makers towards protectionism. Those expecting to gain from trade liberalization, on the other hand, are expected not surprisingly to be in favour of trade liberalization. Depending on how policy-makers take their decisions, distributional consequences of trade reform rather than overall welfare effects may affect policy decisions. If policy-makers want to win an election and expect a majority of voters to be in favour of trade liberalization, they are more likely to pursue pro-trade policies. If policy-makers are heavily dependent on campaign contributions, their decisions may depend on whether the better-organized and better-paying lobbies are in favour of or against liberalization.

The discussion in previous sections has shown that traditional trade theory provides varying views on who would vote in favour of free trade. The Heckscher-Ohlin (H-O) framework, where there is free movement of labour across sectors, predicts that production factors that are relatively abundant in a country will gain from trade liberalization, while those that are relatively scarce will lose. In labour abundant countries, for instance, labour will gain from trade liberalization, while other owners of other factors – like capital or land owners – will lose. In the Ricardo-Viner (R-V) model, rewards tend to vary by industry of employment. In the latter set-up,

some or all employees cannot move across sectors and those employed in import-competing industries are expected to lose from trade liberalization, while those employed in exporting industries are expected to gain. The R-V model has often been considered to reflect the short-term effects of trade liberalization, while the H-O framework reflects the long term.

If trade policy is determined by a majority vote, the tariff will be determined by the sources of income of the average voter. In economies that are not perfectly egalitarian, i.e. in all economies, median voters’ capital/labour endowment is lower than the relative capital/labour endowment of the overall economy (Alesina and Rodrik, 1994). Mayer (1984) has shown that in this case and if trade is of the Heckscher-Ohlin type, median voters will be in favour of positive tariffs in countries that import labour-intensive goods, i.e. industrialized countries, and will be in favour of import subsidies in countries that import capital-intensive goods, i.e. developing countries.

In practice, import subsidies are rarely observed. There are several possible explanations for this. One focuses on the fact that individuals often do not know in advance whether they will be among the winners or losers of trade liberalization. Fernandez and Rodrik (1991) show that in this case there is a tendency for voters to prefer the status quo. This occurs even in a model where everyone is perfectly informed about the overall gains and losses in each industry as the result is entirely driven by the assumption that individuals cannot predict their individual returns. Therefore, there is a tendency to apply tariffs to offset import competition and to preserve the status quo for income distribution.

Dutt and Mitra (2002) find quite strong empirical support for Mayer’s median voter model based on another prediction generated by it. If the set-up is used to compare countries with varying degrees of inequality, the median voter model predicts that in capital-abundant countries increased inequality leads to higher tariffs, while in labour-abundant countries increased inequality leads to reduced tariffs. In other words, increased inequality is expected to be associated with more restrictive trade policies in industrialized countries, but with more open trade policies in developing countries. Dutt and Mitra (2002) find these expectations confirmed in their empirical analysis.

The notion that increased inequality in capital-abundant countries may lead to calls for higher tariffs also reflects the ongoing debate on protectionism in the United States. Dew-Becker and Gordon (2005) drew attention to the fact that median salaries and income in the United States had grown far less than average income in recent decades, because half of the income gains had gone to the top 10 per cent of the income distribution.¹³ Scheve and Slaughter (2007) argue that stagnating or falling incomes explain the increasingly protectionist sentiment in the United States: “policy is becoming protectionist because the public is becoming more protectionist, and the public is becoming more protectionist because incomes are stagnating or falling”.

There is also empirical evidence that voting or voting intentions within individual countries correspond to what the Heckscher-Ohlin framework would predict. Scheve and Slaughter (2001), for instance, find that in the United States lower skills, measured by education or average occupation earnings, are strongly correlated with support for new trade barriers.¹⁴ Balistreri (1997) compares the predictions of the Heckscher-Ohlin framework with survey data on Canadians’ views about the proposed Canadian-US Free Trade Agreement (CAFTA). He finds that individuals holding occupations that were relatively abundant in Canada were in favour of CAFTA, whereas the opposite was true for individuals in occupations that were scarce when compared with the United States.

The median voter approach applied to a Heckscher-Ohlin set-up fails to explain the frequently observed phenomenon that a relatively small industry that does not have support from the majority of eligible voters succeeds in gaining tariff protection. Mayer (1984) shows that the specific factor multi-sector model, i.e. the Ricardo Viner model, is more appropriate for studying such industry-specific efforts to raise a given tariff. In such a model, higher tariffs on a given import lead to significant gains for the average specific-factor owner in the protected industry but to rather small losses for average specific-factor owners in all other industries. The small number of big potential gainers, therefore, has much greater incentives to participate in the political process than the large number of small potential losers, whenever significant voting costs exist.

Mayda and Rodrik (2005) use cross-country datasets on attitudes towards trade to compare the validity

of the Heckscher-Ohlin and the Ricardo-Viner predictions. They find that pro-trade preferences are correlated with an individual’s level of education, in the manner predicted by Heckscher-Ohlin. But they also find support for the specific factors approach (Ricardo-Viner) as they find that preferences over trade are also correlated with the trade exposure of the sector in which an individual is employed. Individuals in non-traded sectors tend to be the most pro-trade, while individuals in sectors with a revealed comparative disadvantage are the most protectionist.¹⁵

Grossman and Helpman (1994) also use a specific-factor model in their commonly called “protection for sale” set-up. In this set-up, policy-makers care for voters’ well-being but also for campaign contributions. Those involved in import-competing industries may choose to join forces and to try to influence policy decisions through campaign contributions. Grossman and Helpman (1994) show that tariffs will be higher in industries that are better organized, that have more political power (reflected in their model by a higher ratio of domestic output in the industry to net trade) and that have lower import demand elasticities (reflecting the fact that the demand for imports is less sensitive to price changes). Olson (1965) has shown that smaller groups will find it easier to organize collective action. This explains why relatively small sectors such as agriculture or textiles have received a lot of protection in industrialized economies (Krugman and Obstfeld, 2006).

Bombardini (2005) points to an empirical issue that is not explained by the Grossman and Helpman (1994) approach: data show that sectors with a larger firm size dispersion tend to have higher levels of protection. She develops a model that is able to explain this finding. In this model, firms differ in size and lobbying is costly. Her model predicts that what matters for the strength of a lobby (and therefore the equilibrium level of protection) is not the size of the sector *per se*, but the share in total sector output of those firms that make a contribution to the sector’s lobby. This share of industry output produced by firms participating in the lobby, in turn, is a result of the coordination of individual firms and depends on the size distribution of firms within the sector. In other words, in sectors with larger firm size dispersion, the largest firms will hold a larger share of the total industry output and a set of lobbying firms will emerge that is in the position to appropriate a large share of the

benefits of protectionism. Their lobbying activity is behind the empirical regularity that sectors with a larger firm size dispersion have higher levels of protection.

In Bombardini's (2005) set-up, firm size determines the benefits from lobbying. "New-new" trade theory attributes an even larger importance to the notion of firm size as it links the benefits from trade reform to firm size. In particular, set-ups with fixed market-entry costs and firm variations (Melitz, 2003) yield the theoretical prediction that large firms in a given sector will support reciprocal trade liberalization while small firms will oppose it. By contrast, all firms will oppose unilateral liberalization of their final goods market. The reason for this is simple. Unilateral trade liberalization would raise the degree of competition in the local market (by allowing more firms to enter), thereby depressing market shares and profits. Therefore, all domestic firms – irrespective of their size – are expected to oppose it. When it comes to reciprocal trade liberalization, the story is starkly different. Such a liberalization yields selection and share-shifting effects that are favourable to large, export-oriented firms and detrimental to small, domestic-oriented firms. The former will support it, the latter will oppose it.¹⁶

2. TRADE AND STRUCTURAL ADJUSTMENT

Having an economy that is open to trade implies both the opportunity to sell goods and services to foreign markets as well as an additional source of competition from abroad. Trade openness, therefore, implies an additional source of economic "shocks" that can affect – positively or negatively – domestic firms, workers and other productive inputs. Trade liberalization and a continued openness to trade result not only in the growth of some domestic firms that take advantage of access to new markets but also the decline of other domestic firms that shrink and go out of business when confronted with a new source of competition. As firms grow or shrink, workers may leave one job to start another.

Until recently, empirical research in international trade has focused on industry-level adjustment – i.e. industries taking advantage of comparative advantage or scale economies would expand in response to export opportunities and withdraw resources from industries shrinking in the face of

newfound competition from imports. However, new sources of data at the firm and worker level within these industries have allowed researchers to inquire into the adjustment process at a much more detailed level of analysis.

(a) How do import-competing firms adjust to trade reform?

One area in which there has been a recent increase in empirical research involving firms, plants and international trade is how import-competing firms respond to trade liberalization. According to standard comparative-advantage based models of trade, introduction of import competition through trade liberalization leads to a reduction in the size of one area of the economy as resources are shed and picked up in the growing sector of the economy. As observed in the earlier discussion on firms and exporters of various types, however, the theoretical predictions of representative firm models do not always match actual practice. What does the data suggest for the import-competition side of the market?

Economists have investigated a number of firm-level experiences across a variety of countries.¹⁷ In order to address these questions, researchers have focused on countries for which firm or plant-level data was available over time and in which there was a relatively clean "natural experiment" via a trade liberalization shock.¹⁸ Thus, there have been a number of studies assessing firm-level characteristics of the shock of trade liberalization in countries (and time periods) as diverse as Chile (1973-79), Turkey (1983-86), Cote d'Ivoire (1984-86), Mexico (1984-89), Canada (1988-96), Brazil (1991-94) and India (1991-97).

A central focus of the major studies in this literature is on what economists refer to as the "import discipline hypothesis", i.e. that an increase in trade openness forces previously shielded domestic producers to respond in ways that are efficiency- or welfare-enhancing from an economic point of view. For example, firms shielded from imports may not have faced much competition (acting as monopolists or engaging in collusive arrangements, for instance). This allowed them to charge high price mark-ups over marginal costs. Furthermore, firm-level productivity may improve for various reasons, including more competition leading to increased effort and increases in innovative activity,