

F POLICY IMPLICATIONS OF GLOBAL INTEGRATION AND THE WTO

1. INTRODUCTION

This section considers the policy implications of recent developments in trade theory and the challenges arising from more open trade. The discussion in Section C examined in detail much of the theoretical basis for the gains from trade. Subsequent discussions also identified a number of economic factors that have the potential to reduce those gains or to skew their distribution. While in traditional trade theories even unilateral liberalization is beneficial, the “new-new” trade theory stresses the attractiveness of reciprocal trade opening. This is because productivity improvements are driven by additional exports, and lower profit margins lead to the exit of low-productivity firms.

High trade costs can inhibit participation of more countries in international trade and reduce the potential volume of trade transactions. Beyond high trade costs, many poor countries face supply-side constraints that make it difficult to increase trade even when market access is not a constraint. There may be significant costs to adjusting to trade liberalization if, for example, factors of production are sector specific. Trade can create winners and losers in a country. Recent technological changes may make it more difficult to predict winners and losers from liberalization, which could add to anxieties about market opening. Some of the new trade theories also suggest that differences among countries have the potential to result in some countries losing at the same time as their partners gain from trade liberalization.

This section discusses the policies that will need to be crafted to cope with some of these challenges. Policy instruments beyond traditional border measures will need to be deployed. There is also a need for coherence in how these various policy instruments are used. While most measures have to be taken at the national level, there is a role for international cooperation and institutions like the WTO. It will not, however, be feasible to cover all the possible responses to the challenges identified in previous sections. Instead, the approach adopted here is to be selective and to deal with those that have been highlighted the most in previous sections.

2. ADDRESSING TRADE COSTS AND SUPPLY CONSTRAINTS

As discussed in Section D, falling trade costs marked the post-World War II era and played a large role in the global trade expansion of the period. But this general pattern of falling trade costs hides important differences between high-income and low-income countries. In practically all of the important components of trade costs discussed in Section D (tariffs, non-tariff measures, transport costs, telecommunications costs), these costs are at much higher levels for low-income countries than for high-income countries (see Table 12, Section D). Trade costs are on average higher in low-income countries because of the absence or poorly developed nature of their physical infrastructure, such as seaports, airports, railways, road networks and telecommunications, which are necessary to conduct international trade. The absence or poorly developed nature of infrastructure represents a major constraint to expanding domestic production.

There are many examples of how low-income countries suffer from infrastructure deficiencies. While high-income OECD countries had 42 kilometres of roads (per 100 square kilometres of area), low-income countries averaged less than 18 kilometres.¹ High-income OECD countries had three times more first-class airports than middle-income countries and seven times more than low-income countries.² In 2002 the international internet bandwidth per person was over 2 kilobits in high-income countries but only 20 bits in middle- and low-income countries (the average for the least developed countries (LDCs) was only half a bit per person).³ Mainline connections per 1,000 persons in 2005 averaged over 500 in high-income countries but did not even reach 135 in middle- and low-income countries. Even though mobile phone subscriptions have surged dramatically around the globe, there is still a big gap between high-income countries (with subscription rates of 83 per cent in 2005) and middle- and low-income countries (where the rate was 25 per cent in 2005).

Government policies and regulations that adversely affect the provision of infrastructure and the supply of its services exacerbate the situation. This observation, of course, can apply to high-, middle-

or low-income countries. There may be a designated public monopoly in the telecommunications sector. There could be significant restrictions on the rights of foreign ships in terms of transporting goods and passengers. Investment rules and regulations may limit the degree of foreign participation in the transport and telecommunication sectors.

Customs formalities may lead to long delays for obtaining clearance of imported goods. The data collected by Micco and Perez (2001) on the median number of days for customs clearance show a huge disparity among countries, with the least efficient taking 30 days to clear imports while the more efficient take one or two days. The absence of certain government measures may also contribute to higher trade costs and supply constraints. Without competition policy, for example, anti-competitive behaviour can flourish in those sectors that are crucial to the economy. Fink et al. (2002) found price-fixing agreements in liner transport which they argue have significantly increased transport prices.

(a) Measures at the national level

At the national level there are two broad types of actions that could be taken to expand the productive potential of the economy. The first would be the provision of public goods and this is an urgent need in low-income countries. There should be more public investment in physical infrastructure essential to carrying out production and trade or allowing traders cheaper access to international markets. A second and equally important action would be to make changes to policies or regulations that prevent efficient use of already existing infrastructure, deter private-sector investments to build infrastructure or act simply as “red tape”. As noted earlier, these policy or regulatory changes may be needed not only in low-income countries but even in high- or middle-income countries.

But directing more investments to infrastructure is more easily said than done because low income-countries are typically short on tax revenues. Thus governments in low-income countries will need to look beyond their own resources and tap other sources of financing for infrastructure. Sizeable funds for infrastructure may involve official development assistance or private-sector financing (both foreign and domestic). One of the most encouraging examples of how the private sector

can respond to economic opportunities available in infrastructure investments is the explosive growth of mobile telephony across the world, even in many low-income countries. Countries in sub-Saharan Africa, for example, saw the number of mobile phone subscribers soar from about 1 per 1,000 in 1995 to 125 per 1,000 in 2005.⁴

Beyond increasing public and private investments in infrastructure, countries will need to consider making changes to domestic policies and regulations. More domestic competition and liberalization of the transportation sector should increase efficiency in the provision of transport services. Government monopoly in telecommunications or lack of competition in the sector raises costs. But cheaper telecommunications services are an important ingredient for electronic commerce, participation in international trade and the development of successful centres of offshoring. Countries should also examine the scope for streamlining customs procedures and enhancing transparency in the administration of trade regulations. The adoption of international standards can make it easier for a country's exports to penetrate foreign markets. These measures and regulatory changes would enhance the efficient use of already existing infrastructure. They should also increase the incentives for private investments, whether local or foreign, to contribute to the provision of vital infrastructure.

(b) International cooperation

Beyond these national initiatives, there is a role for international action and international institutions. The international community can help draw attention to the problems faced by low-income countries and help mobilize or direct needed resources. As was noted earlier, governments in low-income countries may be unable to generate adequate resources from domestic taxes to finance all their infrastructure requirements. The international community can also provide the needed expertise through technical cooperation. Finally, some of the required changes in policy and regulations may well have an international dimension and need to be negotiated with foreign partners. International institutions can serve as fora for negotiations and as vehicles for implementing international accords. This sub-section will focus on the role that the WTO is playing in all of these areas.

The current negotiations in the WTO allow members the opportunity to bind current access and make new market-opening commitments in those areas that can contribute significantly to reducing trade costs and increasing the productive capacity of low-income countries. Among the most relevant services sectors are maritime transport, telecommunications and distribution. (While transport by air is becoming more and more important in international trade, the General Agreement on Trade in Services (GATS) unfortunately does not cover measures affecting the transport of passengers and freight by scheduled and non-scheduled services).

With the high growth of trade in time-sensitive goods, express delivery services are bound to prove important. At present, express delivery services are not explicitly covered by the Classification List generally used by WTO members for scheduling purposes under the GATS, which has led some members to propose the creation of such a sub-category under communication services. Since May 2005, 30 WTO members have tabled revised offers in services, although not all cover these sectors.⁵ There appears to be plenty of room for other WTO members to make additional offers.

The huge disparity in customs clearance times among countries underlines the large potential for improvements in the area of customs formalities. In July 2004, WTO members launched negotiations on trade facilitation. This has been part of the WTO's work programme since the Singapore Ministerial Conference in 1996, when Ministers mandated the start of exploratory and analytical work on the simplification of trade procedures. The objective of the current negotiations is to clarify and improve WTO rules so as to further expedite the movement, release and clearance of goods, including goods in transit.⁶ The WTO clearly recognizes the differing capacities of its membership to meet requirements in this area and so the negotiations also aim at enhancing technical assistance and support for capacity building in trade facilitation. It is important to note that the provision of technical assistance goes beyond the WTO, and other international organizations, such as the International Monetary Fund (IMF), the Organisation for Economic Cooperation and Development (OECD), the United Nations Conference on Trade and Development (UNCTAD), the World Customs Organization (WCO) and the World Bank, are collaborating with the WTO in this field.

There is a continuing work programme on electronic commerce which is intended to examine all trade-related issues connected to global electronic commerce. Given the potential that electronic commerce holds for developing countries, one important focus of the work programme is to respond to the economic, financial and development needs of developing countries in this area. With respect to product standards, technical regulations and sanitary and phytosanitary (SPS) measures, considerable opportunities exist for reducing trade costs through, for instance, the implementation of WTO agreements.

The Agreement on Technical Barriers to Trade encourages members to use relevant international standards as a basis for technical regulations. Although the effects of standards on the direction and size of trade flows tend to be complex, there is empirical work which documents how the adoption of international or common standards can have a positive and significant effect on trade.⁷ Moenius (1999), for example, estimates that a 10 per cent increase in the number of shared standards between trading partners enhances their trade by about 3 per cent. Given that food and agricultural products tend to be more prominent in the exports of developing countries, it is particularly important for them to be able to comply with SPS measures in export markets. Some of the case studies in the recent International Food Policy Research Institute study (2003) demonstrate the pitfalls faced by developing countries in failing to comply with such measures. They showed that developing countries whose access to export markets was denied due to SPS issues experienced substantial costs in terms of lost sales, reduced market share and additional investments required to re-enter export trade.

Since the beginning of the current round of Doha negotiations, there has been a massive expansion in the WTO's technical cooperation programme. Beginning in 2001, the programme has averaged several hundred technical assistance and capacity-building activities each year. Many of these activities are of course undertaken in collaboration with other partner organizations. WTO technical cooperation focuses on building institutional and human capacity to understand and implement WTO agreements and to participate in trade negotiations. As noted earlier, implementation of WTO agreements can enhance a country's market access opportunities. Thus, to take the example of SPS measures, the Standards and Trade Development Facility is

assisting developing countries to enhance their expertise and capacity to analyse and to implement international SPS standards, improve their human, animal and plant health, and therefore their ability to gain and maintain market access.

Beyond collaborating with other international organizations and donors on technical assistance in WTO-specific areas, the WTO participates in broader collaboration arrangements with multilateral institutions to address the supply-side constraints faced by developing countries. For example, the Integrated Framework (IF), which brings together the WTO, the IMF, the International Trade Centre (ITC), UNCTAD, the United Nations Development Programme (UNDP) and the World Bank, is intended to support LDC governments in trade capacity building and mainstreaming trade issues into their national development strategies. Through a diagnostic trade integration study, the IF helps developing countries identify the constraints faced by their traders and those sectors of greatest export potential together with a plan of action for integrating into the global trading system. The plan of action is subsequently integrated into the country's national development plans and becomes an important target area for development assistance or donor support.

(c) Aid for Trade

The Aid for Trade work programme was launched at the Hong Kong Ministerial Conference in December 2005. The initiative is intended "to help developing countries, particularly LDCs, to build the supply-side capacity and trade-related infrastructure that they need to assist them to implement and benefit from WTO agreements and more broadly to expand their trade."⁸

Aid for Trade includes technical assistance, infrastructure, the development or further improvement of productive capacity and adjustment assistance – helping with the costs associated with tariff reductions, preference erosion, or declining terms of trade. The infrastructure component of Aid for Trade has a direct impact on efforts to reduce trade costs and to expand productive capacity in low-income countries. As noted earlier, the implementation of some WTO agreements enhances the export prospects of WTO members. Technical assistance to help members implement such agreements can therefore be considered

part of the effort to reduce trade costs and to address supply-side constraints. The involvement of the WTO in these efforts arises from its role in creating opportunities for countries to benefit from participation in international trade. The WTO also has a mandate to seek to achieve coherence in global economic policy making. The initiative helps national and international agencies responsible for development understand the trade needs of WTO members, and assist them in developing adequate policies.

The Task Force on Aid for Trade established at the Hong Kong Ministerial Meeting in 2005 was assigned the responsibility of "operationalizing" Aid for Trade. In 2006 the Task Force came up with a set of recommendations on how this could be achieved. The recommendations aim to make it easier to identify the needs of individual countries, to determine the appropriate response from donors and to bridge the gap between donor response and a country's needs. It has also recommended that the WTO can play a monitoring role by undertaking a periodic global review of the initiative based on reports from a variety of stakeholders.

The monitoring would involve global tracking of financial flows, self assessments by partner and donor countries, three high-level regional meetings and a series of periodic reviews in the WTO's Committee on Trade and Development, a global Aid for Trade review and a debate in the General Council. The global review undertaken in November 2007 at the WTO showed that Aid for Trade has assumed growing importance in most donor programmes. The resources for Aid for Trade averaged \$21 billion over the 2002-05 period and now represent over 30 per cent of bilateral programmes (OECD, 2007a). The OECD report also expected that the high profile enjoyed by Aid for Trade was likely to be maintained, and possibly even expanded over the medium term.

The immediate goals for 2008 include improving monitoring, advancing implementation and strengthening ownership of the initiative by developing countries. In terms of monitoring, the most important improvement needs to be made in measuring the impact, rather than merely the flows of assistance, of Aid for Trade. The OECD, the World Bank and other institutions with expertise in this area are looking at performance indicators that could be used for this purpose.

To move implementation of the Aid for Trade initiative to the next level, a series of national and sub-regional Aid for Trade reviews in Africa, Latin America and the Caribbean, and Asia and the Pacific would be held in 2008. These reviews are intended to advance the implementation of national and sub-regional plans. As noted earlier, there is already an existing mechanism – the Integrated Framework (IF) – through which LDCs benefit from Aid for Trade. Finally, everything is being done to encourage developing countries to take a more active and direct role in the initiative. There is a growing list of countries that are in the process of holding Aid for Trade events as a way to mobilize both domestic and international support.

3. DEALING WITH THE SOCIAL CONSEQUENCES OF LIBERALIZATION

Some of the gains from trade liberalization come about from the reallocation of resources to those sectors of the economy where a country has comparative advantage. While such reallocations are necessary to reap the benefits of trade reform, they also often imply losses for some individual workers. They may, for instance, result in some workers losing their jobs. The consequences of temporary job losses can be harsh and in many countries policies are in place to assist those temporarily out of work. Those policies are often general in nature, in the sense that they target any individual affected by job loss independent of its cause. But examples also exist of policies that target explicitly those who have lost their jobs for trade-related reasons or specific regions or sectors affected by trade.

The discussion in previous sections has shown that for some the negative effects of trade reform may be permanent as they may face lower revenues in absolute or relative terms after trade liberalization. Given that the overall gains from trade are positive, it is in principle possible to redistribute those gains to make everybody better off. Whether such redistribution policies are introduced or not are decisions that have to be taken at the domestic level. Again the question arises as to whether equity concerns related to trade liberalization should be addressed by specific trade-related policies or whether they can be addressed by more general economy-wide redistribution policies.

(a) General policies to assist those negatively affected by trade

i) Facilitating transition

Two types of labour market policies regarding job loss can be distinguished: (passive) income support during periods of unemployment and so-called active labour market policies that attempt to facilitate re-employment.

Social protection systems

Modern economies need to constantly reallocate resources, including labour, from old to new products, from bad to good firms (Blanchard, 2005). At the same time, workers value security and insurance against job loss. In response to this, economies have used different tools to provide a buffer against the most negative consequences of job loss. These tools include job-security regulation that makes it harder for employers to lay off workers and unemployment benefits that provide workers with a certain level of income during periods of unemployment. However, both types of policies may negatively affect the reallocation process, i.e. the process of job loss inherent in the growth process and also the adjustment process following trade liberalization. The question therefore arises whether a trade-off between efficiency and insurance exists and how far this should go.

In this context, Blanchard (2005) argues that it is important to provide generous unemployment insurance, but that it ought to be conditional on the willingness of the unemployed to train for and accept jobs if available.⁹ He argues in favour of protecting workers, rather than jobs, thus indicating a preference for unemployment insurance (potentially co-financed by companies) rather than job-security regulation. Sapir (2006) illustrates that Nordic European countries (Denmark, Finland, the Netherlands plus Sweden) combine generous and comprehensive unemployment benefits with relatively “loose” job-security regulation. He argues that such a system provides insurance to workers and is at the same time “efficient” as these countries are characterized by high employment rates when compared to the OECD average.

Blanchard (2005) also suggests that the cost of low-skilled labour could be reduced through lower social contributions paid by firms at the low wage

end and that work could be made more attractive to low-skill workers through a negative income tax rather than a minimum wage.

Numerous industrialized countries, in particular in the European Union, are characterized by generous social protection systems that differ significantly when it comes to the detail (Sapir, 2006). An important challenge for these countries is to design systems whereby the unemployed continue to have incentives to look for jobs, ensuring that generous social protection systems do not introduce significant inefficiencies. Social protection in low-income countries is typically confined to the minority of workers who are part of the formal economy. This is because it is difficult to introduce systems of social insurance for workers in the informal economy and agricultural sector who are outside the fiscal system; levels of poverty are also high in these sectors.

A major challenge faced by low-income countries is therefore to devise and extend alternative means of providing social protection to workers in the informal economy (Jansen and Lee, 2007). In middle-income countries, where formal employment is more significant, there is often more scope for providing social protection to workers who are adversely affected by trade and related economic reforms. However, very few of these countries have systems of unemployment insurance even though such schemes are financially and organizationally feasible.

Active labour market policies

Active labour market policies are intended to facilitate the re-integration of the unemployed into the labour market as well as the reallocation of labour necessitated by structural change or geographical, occupational and skill mismatches. They include measures such as retraining schemes for the unemployed, job-search assistance, direct employment-creation programmes such as public works schemes, credit and training programmes to promote self-employment, and employment subsidies to promote the hiring of vulnerable groups such as low-skilled workers and new entrants to the labour force.

Active labour market policies are widely used in industrialized countries where they are increasingly being seen as a preferable alternative to passive income support to the unemployed.¹⁰ Coupled with measures to increase the incentive (and obligation) to seek work, such measures appear to have the potential to raise the employment rate (Sapir,

2006). Hybrid systems of income support and active labour policies have also been suggested. Heitger and Stehn (2003), for instance, propose the re-interpretation of the unemployment insurance system as an employability insurance system. Under such a system, an individual who is laid off could take his insurance entitlement and use it to finance the training needed to find another job.

While many developing countries implement elements of active labour market policies, such as public employment services, skill-development programmes and various direct employment creation schemes, the scale of these activities and the resources devoted to them are typically limited (Jansen and Lee, 2007).

ii) Redistribution policies

As in the case of social protection and labour market policies, redistributive policies fall in the domain of domestic policy making. Most industrialized countries have redistributive policies in place, but they differ significantly. Redistributive policies are, for instance, more extensive in Europe than in the United States even though pre-tax inequality is higher in the United States (Alesina and Angeletos, 2005). Alesina and Angeletos (2005) show that different beliefs about the fairness of social competition and what determines income inequality influence the redistributive policy chosen in a society.

A large body of economic literature has analyzed different redistribution policy options. The discussion in this Report focuses on the analysis of redistribution policies in the context of trade reform. In particular, two questions have been reviewed: are the efficiency losses introduced through redistribution policies smaller than the efficiency gains from trade and is it possible to redistribute from capital to labour if capital is more mobile at the global level than labour?

Traditional trade models have predicted that trade would lead to a rise in the wage premium in countries that are relatively well endowed with skilled labour and a rise of the capital-wage ratio in countries that are relatively well endowed with capital. It comes therefore as no surprise that economists have attempted to analyse the effect of redistribution policies within these models. Such policies tend to introduce two distortions into the economy.

The first distortion comes from the policy itself since it distorts incentives. The need to pay for the compensation scheme creates the second distortion. Using a traditional, full employment model of trade, Dixit and Norman (1980; 1986) have argued that it is possible to use commodity taxes to compensate the losers from trade liberalization without exhausting the benefits from freer trade. Brecher and Choudhri (1994) have raised concerns about this result by showing that in the presence of unemployment this scheme may not work. Instead, they show that in such a setting and under reasonable conditions, fully compensating the losers may eliminate all of the gains from trade. Feenstra and Lewis (1994) have also shown that when factors of production are imperfectly mobile, a compensation scheme on the basis of commodity taxes may neutralize the benefits from trade. Davidson and Matusz (2006) estimate that the total cost of compensation remains quite modest and never rises above 5 per cent of the net benefit from liberalization.

Another question that has received significant attention in the public finance literature in recent years concerns the incidence and optimality of taxes when factor markets become more integrated. One standard model is built on the assumption that capital becomes more and more mobile across countries or regions while labour is rather less mobile or even assumed to be immobile (Janeba, 2000).

Increasing mobility of capital has important consequences for tax policy because a higher elasticity of capital relative to labour would call for lower tax rates on capital on efficiency grounds. This has at least partly undesirable distributional consequences. In particular, it significantly restricts the possibilities for governments to redistribute from capital to labour, which may be a matter of concern if the inequality between capital and labour earnings increases, for instance, as a result of increased globalization. Several contributions to the literature have recommended international tax coordination or even tax harmonization in order to reduce the strong downward pressures on the taxation of capital income (Rodrik and van Ypersele, 2001; Razin and Sadka, 2004). International tax coordination would allow countries to reap the benefits of capital mobility, while compensating the losers of increased openness.

(b) Specific trade adjustment programmes for workers

i) Can specific trade adjustment programmes be justified?

Providing specific assistance to workers displaced by trade liberalization can be justified if these workers face worse job prospects than other unemployed individuals. Evidence on whether this is the case is scarce and is mainly based on US data on recipients of Trade Adjustment Assistance (TAA). The US TAA is one of the few programs explicitly targeting trade adjustment. As it has been around for several decades – it was introduced in 1962 – sufficient data are available to analyse differences between TAA recipients and recipients of “ordinary” unemployment benefits in the United States.¹¹

Decker and Corson (1995) find that during the 1980s, recipients of TAA in the United States were more likely than other unemployed individuals to have been laid off due to plant closures, to have experienced longer jobless spells, to have suffered a larger decline in wages and were less likely to be recalled to their old job.¹² They also find that TAA recipients were more highly paid before lay-off than other unemployed workers.¹³ In a more recent study, Kletzer (2001) does not find significant differences between those who lose their jobs because of trade liberalization and other unemployed workers in terms of levels of work experience before job loss, educational attainments, re-employment rates, re-employment wages and sectors in which they find re-employment.¹⁴

The latter may explain why, according to Aho and Bayard (1984), the political argument for government intervention is the best argument for specific programmes to supplement a more general, and less generous, job loss programme where such programmes are in place. The political argument is that certain interest groups have sufficient political power to block or delay socially beneficial changes unless they are generously compensated and otherwise assisted. According to Aho and Bayard (1984), the case for a special programme such as TAA for trade-displaced workers is that the alternative to TAA is increased trade barriers or greater difficulty in reducing existing trade restrictions because of the political power of the potential “losers”.

Numerous references in the economic literature suggest that political concerns may, indeed, have played a fundamental role in introducing and revising trade-adjustment assistance programmes in the United States. According to Feenstra and Lewis (1994), for instance, the introduction of TAA in 1962 was used to “compensate workers for tariff cuts under the Kennedy Round of multilateral negotiations”. Baicker and Rehavi (2004) point out that in 1993 Congress created the NAFTA Transitional Adjustment Assistance as part of the push to secure the passage of the Agreement. This programme explicitly targeted workers who lost their jobs as a result of trade with Canada or Mexico or through plant relocations to these countries. The same authors link the recent revision of US TAA, in the context of the so-called Trade Adjustment Reform Act 2002, to the US administration’s desire to obtain congressional renewal of the “trade promotion authority”.

Nevertheless, in countries that lack wide-ranging social protection systems, the introduction of adjustment programmes of limited duration, targeting those negatively affected by trade reform can be justified on the grounds of the above-mentioned equity concerns or on grounds of efficiency concerns. Efficiency concerns may, for instance, be related to problems of labour-market congestion that can occur if the local labour market is relatively small and workers are relatively immobile (Aho and Bayard, 1984).¹⁵ Efficiency concerns have also been invoked by Levy and van Wijnbergen (1995) in their analysis of agriculture liberalization in the context of NAFTA in Mexico. The authors argued in favour of gradual trade liberalization together with a well-targeted adjustment programme of investments in land improvements in order to transform a loser from trade reform (rain-fed land) into a winner from trade reform (irrigated land). They argued that gradual trade liberalization would make it possible to reap the combined benefits of transformation and trade without having to experience a period of losses.¹⁶ Such an adjustment programme would also have had the potential to reduce the level of migration from rural to urban areas that took place in certain parts of Mexico in the aftermath of NAFTA liberalization (Nadal, 2000).

ii) Designing specific trade-adjustment programmes: the example of retraining programmes

Training programmes often form part of the “active labour market policies” discussed above and have in

many cases had a positive impact on employment.¹⁷ In the context of targeted (trade) adjustment programmes for workers, however, the effects of retraining schemes have sometimes been considered disappointing. The following discussion illustrates that outcomes are likely to depend significantly on the design of such programmes.

With respect to the US TAA training component, Decker and Corson (1995) find that the training provided through trade-adjustment assistance does not seem to increase re-employment wages. While Marcal (2001) also fails to find evidence that training increased re-employment wages, she finds some evidence that trainees had higher employment rates relative to recipients not in training and to those who had exhausted unemployment insurance benefits. Matusz and Tarr (1999) cite similar evidence based on government-sponsored retraining programmes in Hungary and Mexico in the context of public sector downsizing. Evidence for Hungary suggests that workers who participated in the programme had a slightly higher chance of getting re-employed compared with those who did not. Furthermore, the wages of participants upon re-employment were slightly higher compared with those of non-participants in the programme who later became re-employed. The trainees also subsequently obtained jobs that had longer durations. In Mexico, the retraining programme seemed only to be effective in increasing the chance of finding a job or getting a higher wage for trainees who had previous work experience and for adult male participants, respectively.

Rama (1999) gives some hints as to the reasons for disappointing outcomes of retraining programmes. He analyzes a case of public-sector downsizing by Spain in the 1980s that had only limited success in relocating workers to alternative industries, in spite of extremely large retraining programmes. Rama (1999) argues that failure was partly due to retraining being focused on updating previous skills rather than on acquiring new ones.

In order to be successful, training courses may need to target specific skills demanded in expanding sectors. In the context of the privatization of Brazil’s Federal Railway, for instance, an attempt was made to adapt training courses to the particular needs of laid-off workers.¹⁸ For this purpose, regional labour markets were studied in detail by labour market specialists in an attempt to determine the nature and composition of the market, relative to supply and demand. This information was used

to help organize training and to determine what was necessary to achieve optimal results from the company's efforts to help participants of the incentive programme to re-enter the job market.¹⁹

iii) Targeting adjustment assistance

According to traditional trade theory, adjustment is expected to take place across sectors as production factors move from import-competing sectors to exporting sectors. Adjustment assistance, therefore, was often targeted at particular sectors or was conditional on the sectors being affected by import surges. Traditionally, eligibility for assistance under the US TAA was based on increases of imports of articles of the same nature or directly competitive with articles produced by sectors that subsequently experienced layoffs (Magee, 2001).

The 2002 reform of TAA broadened the definition of the eligible set of workers significantly (Baicker and Rehavi, 2004). It now includes workers laid off in plant relocations, reflecting the concern of off-shoring. The new definition also reflects awareness of the fact that workers may be affected by trade even though their employer is not directly active in trade. Under the new definition, secondary workers employed by upstream suppliers or downstream customers of firms affected by trade liberalization may also be eligible for trade adjustment.

Recent trade literature, however, suggests that even such a broadened definition may fail to capture all workers affected by trade and that, more generally, it may prove to be impossible to identify all workers affected by trade liberalization. As discussed in previous sections, recent studies indicate that adjustment processes may not only be observed between sectors but that significant job reallocation may also take place within sectors. In particular, the traditional approach has been challenged by the so-called “new-new trade models”. These studies predict that trade reform will trigger job creation and job loss across sectors as both net-exporting and net-importing sectors will have expanding high-productivity firms and low-productivity firms that shrink or close down (Bernard et al., 2007b). For policy-makers, this implies significant reshuffling of jobs within sectors.²⁰ This also implies that a wider range of jobs are at risk in all sectors.

While traditional trade models would suggest that policy-makers who wish to assist workers focus on

so-called comparative disadvantages sectors, i.e. those that can be identified as import-competing sectors, more recent research suggests that such targeted intervention is not justified. Instead, this research may explain why surveys in industrialized countries have revealed that workers in very different types of industries feel greater job insecurity as countries liberalize (Scheve and Slaughter, 2004). Baldwin (2006a) argues that it will be increasingly difficult for policy-makers to predict the direction and nature of employment changes.

(c) Helping workers to adjust: a role for international cooperation?

The possible role for international initiatives in helping to deal with the social consequences of trade reform have mostly been discussed in the context of adjustment problems. In particular, it has been argued that trade reform should be designed in such a way that adjustment is as painless as possible for workers, in particular the less privileged. Gradual liberalization would, for instance, give labour markets time to adjust and avoid temporary unemployment surges due to labour market congestion (Aho and Bayard, 1984). It has also been argued that it could be helpful for developing countries to receive international funding to deal with negative social aspects of the adjustment process following trade reform.

i) Multilateral trade agreements and adjustment

Multilateral trade liberalization is by its very nature a gradual process and in this respect leaves room for adjustment processes to take place smoothly. Many WTO agreements contain more or less explicit provisions that aim to facilitate their adoption. In particular, they often specify phased-in implementation periods, with developing and least-developed countries usually being granted longer implementation periods than industrialized countries.²¹

Multilaterally agreed trade rules also offer countries several safety valves that can be used to address adjustment problems.²² In particular, the so-called “safeguard” provisions in WTO agreements offer members the possibility to react subsequently to problems caused by unforeseen import surges. Bacchetta and Jansen (2003), however, argue that the safeguard provisions target adjustment problems

faced by firms rather than those faced by workers. In particular, the WTO Agreement on Safeguards seemingly wants to facilitate the restructuring of industries hurt by import competition rather than the reallocation of workers who consequently lost their jobs.

ii) Financing temporary trade-adjustment assistance in developing countries

The discussion above illustrates that most industrialized countries have more or less generous social protection systems in place, sometimes combined with trade-specific adjustment programmes. In many developing countries, in particular least-developed countries, both types of schemes are missing. In the absence of any social protection, unemployment – even for a short period – may cause considerable hardship in developing countries. Or, as Winters (2000) puts it, for the poorest “even switching from one unskilled informal sector job to another could cause severe hardship”.

To the extent that the introduction of wide-ranging social protection systems in middle- and low-income countries takes time, the introduction of targeted trade-adjustment assistance could be justified in countries lacking more general systems. The challenge is to design them in such a way that they are effective. The analysis of existing trade-adjustment assistance schemes in industrialized countries can provide some guidance on this. The question also arises as to whether there could be a role for the international community in contributing to the funding of such schemes.

4. DO ALL COUNTRIES GAIN FROM TRADE? THE ROLE OF TECHNOLOGY

From the discussion of major trade theories and associated empirical evidence in Section C, it seems reasonable to conclude that the gains from trade are universal – that is, shared among all countries participating in international trade. However, several studies have highlighted the possibility that, under certain circumstances, one country may gain less than its trading partner or even lose when trade is liberalized (although global gains always remain positive).²³ This may be of obvious concern to policy-makers trying to emphasize the benefits of trade opening. Two key aspects in the

distribution of gains from trade across countries appear to be countries’ relative size and level of technological development, and the relationship of these issues with other relevant factors. For instance, as described in Section C.1.b, differences in the availability of resources may influence the choice of technology. The latter may change rapidly in open economies and, therefore, alter the initial situation of gains from trade. Since the economic size of a country cannot easily be changed, at least in the short-term, technology appears to be an important factor shaping a country’s expectations of trade benefits. In Section C.3.d, it was noted that technological leadership can even make up for size disadvantages.

The theoretical literature examined in Section C.4.a emphasizes that while the general presumption is that trade liberalization enhances innovation and world growth, several counteracting effects may be at work. This implies that, at least in theory, it is possible to have varying effects on growth, whereby some countries benefit while others are negatively affected by a reduction in trade barriers. The evidence that is extensively reviewed in Section C.4.b points to the limited relevance of these counteracting effects. In particular, the evidence at the firm-level in both developed and developing countries for several trade liberalization episodes attests that trade reforms improve the growth of plant productivity and, hence, the overall growth of the economy (see also Sections C.3.a and C.3.c).

Nonetheless, policy-makers still believe that trade may lead to “incorrect” specialization. The notion of “incorrect” specialization is based on the assumption that the spread of technology across borders is limited while (as discussed in Section C.4.b) empirical literature finds that knowledge developed in one country has positive effects on other countries through trade. However, a possible counter-argument could be that while this form of technology transfer is present in general, not all countries may benefit from it.

From a policy perspective, the question remains as to whether a country should welcome the possibility to trade with technologically advanced partners or shun it, and what it can do to reduce technological differences. By the same token, it must be asked how trade itself can act as a mechanism for technology transfer and what policies may encourage such exchanges. These issues are discussed in turn.

(a) Technological differences and international trade

Traditional approaches, be they Ricardian models or variants of the Heckscher-Ohlin framework that include technological differences, have emphasized that the more “different” countries are from one another, the higher is the potential for mutual gains from trade opening. Smaller countries also prefer to trade with larger countries, as they reap more of the surplus if the terms of trade change in their favour, as is likely to happen. As far as dynamics are concerned, in Section C.4.a it was noted that a country that is large enough to influence world prices via the volumes it exports, i.e. even a “smaller” country supplying a highly specialized product, can see its terms of trade worsen if it experiences faster capital accumulation or productivity growth than the rest of the world. Hence, “export-biased” growth can hurt a country that is sufficiently large to influence its terms of trade.

Building on the idea of import- versus export-biased growth, Krugman (1990) has argued that catching-up by technologically backward countries may lead to welfare reductions in the advanced country, whereas technological progress in the leading country benefits all. In this model, technological progress is biased towards technology-intensive industries. In other words, progress in the technological leader is biased towards goods that other countries do not produce themselves (and, hence, they benefit from lower prices, while the leader’s terms of trade loss is outweighed by its productivity gains). By contrast, technological progress in the less advanced countries leads to competition with the leading country’s current exports, and while production of new exports in these countries also benefits the technologically advanced country (since they have become cheaper), the leader risks paying more for its traditional imports, i.e. technologically less sophisticated products, in view of real wage increases abroad. This line of thought has received renewed public attention, when Nobel-prize winner Paul Samuelson argued that the recent rise in outsourcing to developing countries could wipe out the gains from trade in the industrialized world (Samuelson, 2004).

While agreeing that productivity improvements in a low-wage country in relation to a previously imported good can hurt the former exporter, Bhagwati et al. (2004) maintain that the outsourced services

in question (before the arrival of the internet) used to be non-traded and did not constitute exports by advanced economies. Hence, the benefits from importing cheaper services arise in the usual manner for the outsourcing countries. Nevertheless, Krugman’s (1990) basic analysis is still valid if developing countries become better at producing the goods currently exported by advanced nations. Bhagwati et al. (2004) contend, however, that with both sides producing a range of products in the real world, consumption and production effects of growth tend to offset each other and leave the direction of terms of trade changes undetermined. With net effects being modest, the authors discount the possibility of significant terms of trade changes following productivity improvements and skill accumulation abroad.

The “new” trade theory and more recent advances mostly do not consider country differences and the consequences that these may entail.²⁴ Where certain approaches have allowed for such differences, the more advanced country usually realizes larger gains from international trade, in contrast to the scenarios discussed above. In the monopolistic competition model, owing to the presence of scale economies and transport costs, the gains from trade for countries that are similar in all respects apart from size may be different. The home market effect together with weak counteracting forces can lead to an agglomeration of industry in the larger trading partner. Technological superiority resulting in higher productivity could be expected to further promote the size advantage of a trading partner by raising its market potential.

In the heterogeneous firm model with country differences described in Section C.3.d, a higher level of technological development in the home country makes it harder for trading partners to enter that market. This is akin to a situation where the initial level of competition is already high (e.g. because the market is larger) and it is more difficult for foreign competitors to find their niche. At the same time, firms from a technologically advanced country also find it easier to compete in foreign markets, and the overall productivity effects from firm selection and share-shifting are amplified. Demidova (2006) notes that technology has to be understood broadly in this context to include, for instance, an inadequate trading infrastructure that affects the overall level of firm productivity in a country.

In short, each of the various trade theories presented in this Report is built on a specific, narrow set of assumptions and abstracts from different aspects of the situation in the real world. It is quite natural that the theories explaining the gains from trade do not offer a unified view of the implications of country differences. Reality is likely to be a complex overlay of the different factors that each framework identifies as an underlying rationale for trade and of the different terms of trade and real income changes that may follow. The degree to which differential gains are realized across countries also depends on the prevalence of other economic conditions, such as the flexibility or rigidity of labour markets, that are often simplified or not explicitly considered in such models.

However, especially from a firm-level perspective, it seems fair to say that policies fostering technological progress, be it in the narrow sense of research and development (R&D) promotion or in a broader sense that includes public services and infrastructure, strengthen a country's position in international trade.²⁵

What can policy-makers do to promote a country's technological advancement? The literature has shown that the rate of technological change is determined not only by domestic innovation but also by the international diffusion of technology, particularly in developing countries.

Many of the policies to foster innovation domestically are also conducive to encouraging the transfer of technology from abroad. These include improvements in a country's education system and support for R&D (including the interaction between basic research and its application to specific uses), the provision of a regulatory environment that allows inventors to appropriate the rewards of their work, notably patent protection, and the creation of a market structure that creates the incentives for entrepreneurs to innovate and constantly improve their competitive position.²⁶ Such policies seek to ensure that new knowledge can be absorbed domestically and that foreign providers are ready to do business in the first place. They matter to all of the different mechanisms through which technology may be transferred, be it trade, foreign direct investment (FDI) or partnerships. Broader policies also have an impact. For example, infrastructure investments may be particularly important to attract FDI, and labour market regulations and the efficiency of financial institutions may play a

key role in ensuring the widespread diffusion of technology within a country.²⁷

Most of these policies are implemented at the national level. However, in certain policy areas international cooperation and coordination may be beneficial. Within the WTO, a Working Group on Trade and Transfer of Technology has been established in order to consider possible recommendations that might be taken within the mandate of the WTO to increase flows of technology to developing countries. For example, some members expressed the view that a number of provisions in the Trade-related Aspects of Intellectual Property Rights (TRIPS) Agreement had an important role to play in technology transfer. The Aid for Trade initiative was also mentioned in the context of capacity building and the development of human capital.²⁸

Hoekman et al. (2004b) have raised the question as to what extent special and differential (S&D) treatment is needed, for instance in order to subsidize R&D efforts, but conclude that, in general, WTO rules do not constrain many of the policies commonly used to encourage the international transfer of technology. To the contrary, policies that reduce trade barriers and uncertainty in international trading relationships have the potential to increase the international transfer of technology. This has been demonstrated in a number of empirical studies finding that increased trade flows promote technology transmission not only via direct trade links between countries but also indirectly through the network of trade relations by partner countries (Keller, 2004; Lumenga-Neso et al., 2005). In the following sub-section, the channels through which trade fosters the spread of technology will be analyzed in more detail.

(b) International trade and technology transfer

The following sub-section reviews how the international flows of information that accompany trade imply that technical improvements in a sector developed in one country may improve productivity in other countries. This channel is independent of whether or not the receiving country is active in the same sector. However, while international trade increases exposure to foreign knowledge, not all countries are in an equal position to take advantage of it. This sub-section also examines the role of the world trading system (and of international

organizations more generally) in facilitating technology transfers. Unfortunately, technological innovations produced in advanced economies may not respond to the needs of developing countries.

Technological knowledge is embodied in products. Trade leads to the international spread of technology because: (a) technologically advanced intermediate goods become available for production; (b) the technological specifications of intermediate and final goods can be studied; and (c) it favours person-to-person communication.

There is an important difference between technology acquired via the use of advanced intermediate inputs and that acquired via the learning of the technology embodied in a product. In the former case, employing the foreign intermediate good involves the implicit usage of the design knowledge that was created with the R&D investment of the foreign inventor. The technological knowledge of the blueprint is embodied in the intermediate good, and the use of the technologically advanced intermediate good increases the importing country's productivity. As long as the intermediate good costs less than it would cost to produce domestically, which includes the R&D costs of product development, there will be a gain from having access to foreign intermediate goods. This gain is sometimes called "passive" technology spillover (Keller, 2002). Although an importing country has access to the results of foreign R&D activity, the technological knowledge embodied in the imported intermediate good as such is not available to domestic inventors, only the manufactured outcome of it is.

This contrasts with the situation when the importing country acquires the knowledge embodied in the imported good, whether intermediate or final. Knowledge is acquired by reverse engineering, copying, or communicating with the suppliers of the product. In this case, the knowledge obtained through communication and/or the copying of imported goods will probably not be lost even if communication or imports are interrupted. Once the technology has been acquired, the foreign technology remains in the country. This process of learning is likely to be less expensive than the original expenditure needed to create the knowledge, and therefore a gain is associated with it. This gain is commonly defined in economic literature as an "active" spillover, since it requires the active participation of the importer.

Notwithstanding the role of international trade in the spread of technology, in particular by increasing countries' exposure to advanced technologies, there are still important reasons for productivity differences across countries. Economic studies have emphasized several factors determining whether technology is successfully acquired by another country. These are associated with the notion of "absorptive capacity" – the idea that a firm or country needs to have certain types of skills and institutions in order to be able successfully to adopt foreign technological knowledge. As technical knowledge is generally needed to use more advanced technology, a certain level of domestic know-how (Caselli and Wilbur, 2001; Hanushek and Kimko, 2000) and domestic R&D (Cohen and Levinthal, 1989 and Griffith et al., 2000) is a prerequisite in order to benefit from technology transfers. Equally important are an effective business environment, macroeconomic stability and good governance since taking advantage of knowledge spillovers requires risky investments that depend on these factors (see Acemoglu et al., 2007 for a formal model on the role of contractual institutions and World Bank, 2008, for a general discussion).

Is there a role for international organizations in promoting the spread of technology? Recent studies have pointed out that there is often a mismatch between technologies developed at the world frontier (i.e. in the advanced economies that produce most innovations) and the needs of the adopting country.

The lack of effective enforcement of intellectual property rights and the inability to pay for innovation in less developed economies lead firms in the advanced economies to target the needs of their own domestic markets (Diwan and Rodrik, 1991, Acemoglu and Zilibotti, 2001, and Bonfiglioli and Gancia, 2007). As a result, technologies that travel through trade may not be appropriate for importing countries.

Inappropriate technologies limit the extent of technical development. Importantly, these problems cannot easily be solved by individual countries' policies. For instance, the enforcement of intellectual property rights may imply a prisoner's dilemma²⁹ whereby each developing country prefers other countries to enforce property rights in order to encourage producers in advanced economies to manufacture technologies more appropriate to their needs. This suggests an important role for

international organizations in coordinating the enforcement of property rights and in encouraging the production of technologies more appropriate to the needs of less-developed countries (Acemoglu and Zilibotti, 2001). As free-riding problems in patent policy are more severe the larger the number of independent countries involved in the global economy, the significance of an international patent agreement increases with the number of sovereign decision-makers (Grossman and Lai, 2004).

Several issues on the role of the multilateral trading system (and of international organizations in general) in promoting the international spread of technology are still open to discussion. These issues include the meticulous design of intellectual property rights agreements (e.g. differential rules for least developed countries, harmonization of criteria for patentability and novelty), the role of other policies (e.g. subsidies, temporary movement of people, monitoring), and the extent to which such policies should be embedded in a multilateral trade agreement. The discussions held over the past few years in the Working Group on Trade and Transfer of Technology have brought to the fore many of the complexities involved.³⁰

5. CONCLUSIONS

This section has examined a number of the problems that countries face in the light of today's increased level of economic integration and the forces that both economic theory and reality suggest will continue to pose new challenges. As noted in the introduction to this final section, the approach has been selective in regard to these challenges. The problems addressed here include continued high trade costs and deficiencies in production capacity that plague low-income countries, the social or re-distributional consequences of more open trade,

and the technology gap between rich and poor countries. It would be raising false hopes to say that all of these problems can be solved immediately or that policies exist to deal with all of them.

The aim of this section has been to identify what could be done both at the national and international levels in order to address some of the problems highlighted above. Most of the solutions require national actions. Countries need to increase public investments in infrastructure and consider changes in economic policies to increase the efficient utilization of existing infrastructure or to encourage more private domestic and foreign investments into those sectors. Beyond investments in physical infrastructure, countries can also do more to address social protection and to promote more flexible labour markets.

But there is also room for international action. International organizations can assist by coordinating the enforcement of property rights and by encouraging the production of technologies more appropriate to the needs of less developed countries. In the context of the WTO, countries could use the opportunities offered by the current Doha Round to lock in reforms or changes to economic policies. Simply implementing existing WTO agreements can also help to increase access to international markets. Finally, the Aid for Trade initiative shows how the WTO can create a coherent platform for directing the international community's resources in a targeted way to help poor countries participate more fully in the ongoing process of global economic integration. While the challenges that have been identified in this Report can seem formidable, they are not insurmountable with the appropriate domestic policy responses and with international cooperation.

Endnotes

- 1 Table IIB.6 in World Trade Report 2004, p. 118.
- 2 Table IIB.7 in World Trade Report 2004, p. 120.
- 3 All subsequent figures cited in this paragraph are taken from the World Bank's World Development Indicators 2007.
- 4 Data based on the World Bank's World Development Indicators 2007. Djiofack-Zebaze and Keck (2006) examined the impact of telecommunications liberalization on both sectoral performance and economic growth for a panel of Sub-Saharan African countries. The authors found that more competition and better regulation lowered prices and improved availability of telecommunications services both in the mobile and fixed-line segments. Finally, better performance of the African telecommunications sector, in turn, improved real GDP per capita.
- 5 Revised services offers have been submitted by: Australia; Bahrain; Brazil; Canada; Chile; China; Colombia; Egypt; European Communities and its member states; Honduras; Hong Kong, China; Iceland; India; Japan; Korea; Liechtenstein; Macao, China; Malaysia; Mexico; New Zealand; Norway; Peru; Singapore; Suriname; Switzerland; Chinese, Taipei; Thailand; Turkey; United States; and Uruguay.
- 6 The WTO rules explicitly referred to are GATT Article V (Freedom of Transit), Article VIII (Fees and Formalities connected with Importation and Exportation), and Article X (Publication and Administration of Trade Regulations).
- 7 See for example Deutsches Institut für Normung (2000) and Swann et al. (1996).
- 8 Paragraph 57 of the Hong Kong Ministerial Declaration.
- 9 OECD (2006a) uses the term "mutual obligation" in this context.
- 10 See, for instance, the discussion in chapter 5 of OECD (2007b).
- 11 The European Union established a so-called European Globalization Adjustment Fund in 2006.
- 12 In contrast, studies focusing on the 1970s found that workers receiving TAA were more likely to be recalled to their old job, less likely to switch industries and did not have longer unemployment spells than other displaced workers (Richardson, 1982).
- 13 Magee (2001) finds that unionized workers and those displaced by trade from less-developed countries were more likely to have their TAA petitions approved.
- 14 See also Irwin (2002) and the more extensive discussion of Kletzer (2001) in section E.2 above.
- 15 The finding by Scheve and Slaughter (2001) that home ownership with a manufacturing mix concentrated in comparative-disadvantage industries is correlated with support for trade barriers, indicates that "immobility" may be related to home ownership.
- 16 Storm (2003) makes a related call for policies to increase land productivity and gradual policy reform in the context of agricultural trade liberalization in India.
- 17 Chapter 4 of OECD (2005a) and chapter 3 of OECD (2006b) review international evaluation findings showing long-run positive effects of some training programmes.
- 18 See Estache et al. (2000).
- 19 There were significant problems with the design of the training program, as workers were paid allowances related to the training program, before the programs even started. This reduced the incentives for workers to participate in training courses. Also, some courses started so late that workers had already found new jobs.
- 20 Wacziarg and Wallack (2004) focus on the pattern of reallocation of labour following trade liberalization. They examine the impact of trade liberalization episodes on movements of labour across sectors for 25 countries, mainly developing and transition economies, and find weakly negative effects of liberalization on the extent of inter-sectoral labour shifts at the economy-wide 1-digit level of disaggregation. They find increased sectoral change after liberalization at the more disaggregated 3-digit level within manufacturing, although the estimated effects are statistically weak and small in magnitude. They also find that the effects of liberalization on labour shifts differ across individual countries, in a way related to the scope and depth of reforms.
- 21 Longer implementation periods for developing countries are just one form of special and differential treatment (S&D) contained in WTO Agreements. For a discussion of existing forms of S&D and debates on possible S&D reform as well as the underlying rationale for S&D in trade agreements see Keck and Low (2006) and World Trade Organization (WTO) (2007c).
- 22 The references to adjustment issues in the "aid for trade" debate have been discussed above.
- 23 Of course, the different rationales for international trade may also imply distributional concerns within each country, and policy questions arising in that regard are further discussed in Section E.3.
- 24 This is understandable, since initially these models were developed to explain trade between similar countries and in similar goods.
- 25 As was said before, comparative advantage-based theories of trade are built on the existence of country differences in either technology or resource endowments. From this perspective, it is therefore hardly possible to derive any conclusion as to whether e.g. technology transfer is desirable in order to close a technological gap. However, it is worth noting that, over time, comparative advantage certainly is not cast in stone. The pursuit of policies to foster technological progress and educational attainment may broaden or even shift the base of a country's comparative advantage, as witnessed, for example, by the evolution of Japan from being an exporter of labour-intensive goods to becoming successively an exporter of capital- and human capital-intensive products.
- 26 World Trade Organization (WTO) (2002b) examines in an in-depth fashion how new technologies are created, how they are transferred across countries and how they are diffused within a country.
- 27 World Trade Organization (WTO) (2002a) provides a comprehensive overview of government policies related to transfer of technology as well as a compilation of country experiences.
- 28 Among other things, it has also considered different indicators for an assessment of the cross-border flow of technology and reviewed country experiences with technology generation and its transfer via different mechanism. See, for example, World Trade Organization (WTO) (2007b).
- 29 In game theory, the prisoner's dilemma characterizes a situation where beneficial cooperation does not emerge. The game assumes that players (the prisoners) can either cooperate or not and that cooperation involves a higher joint welfare than non-cooperation. However, if the others choose to cooperate, each player acting individually is better off by deviating and choosing non-cooperation. As all players are trying to maximize their individual welfare, the only rational equilibrium implies the inferior situation of non-cooperation.
- 30 See, for example, the overview provided in Hoekman et al. (2004b) and the regular reports by the Working Group on Trade and Transfer of Technology, such as World Trade Organization (WTO) (2007b).

